

# MEDICAL CARE ECONOMIC RISK

## Measuring Financial Vulnerability from Spending on Medical Care

Panel on Measuring Medical Care Risk in Conjunction with  
the New Supplemental Income Poverty Measure

Michael J. O'Grady and Gooloo S. Wunderlich, *Editors*

Committee on National Statistics  
Division of Behavioral and Social Sciences and Education  
and  
Board on Health Care Services  
Institute of Medicine

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PANEL ON MEASURING MEDICAL CARE RISK IN CONJUNCTION  
WITH THE NEW SUPPLEMENTAL INCOME POVERTY MEASURE

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This report has been reviewed in draft form by individuals chosen for their diverse perspectives and technical expertise, in accordance with procedures approved by the Report Review Committee of the National Research Council (NRC). The purpose of this independent review is to provide candid and critical comments that will assist the institution in making its published report as sound as possible and to ensure that the report meets institutional standards for objectivity, evidence, and responsiveness to the study charge. The review comments and draft manuscript remain confidential to protect the integrity of the deliberative process.

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Although the reviewers listed above provided many constructive comments and suggestions, they were not asked to endorse the content of the report nor did they see the final draft of the report before its release. The review of this report was overseen by Melvin Worth, senior Institute

of Medicine fellow (retired), Sun City Center, Florida (coordinator), and Jonathan S. Skinner, Economics Department and the Dartmouth Institute for Health Policy and Clinical Practice, Dartmouth College (monitor). Appointed by the NRC, they were responsible for making certain that an independent examination of this report was carried out in accordance with institutional procedures and that all review comments were carefully considered. Responsibility for the final content of this report rests entirely with the authoring panel and the institution.

Michael J. O'Grady, *Chair*  
Panel on Measuring Medical Care Risk in  
Conjunction with the New Supplemental  
Income Poverty Measure



# Contents

<b>SUMMARY</b>	1
<b>PART I: REVIEW AND RECOMMENDATIONS</b>	13
1 Introduction	15
2 Concepts of Medical Care Economic Burden and Risk	27
3 Concepts of Resources	51
4 Measures of Medical Care Economic Risk and Recommended Approach	67
5 Data Sources	89
6 Implementing Measures of Medical Care Economic Burden and Risk	101
References	107
Acronyms and Abbreviations	111
Appendix: Biographical Sketches of Panel Members and Staff	113
<b>PART II: RESOURCES FOR THE STUDY: DEVELOPING A MEASURE OF MEDICAL CARE ECONOMIC RISK— WORKSHOP SUMMARY</b>	119
1 Introduction	121
2 Context for the Workshop	125
3 Measuring Medical Care Economic Risk	133
4 Issues in the Development of Thresholds	155
5 Issues in Defining Resources	175

6	Implementation Issues	191
7	Recap of Issues and Next Steps	203
	References	215
	Appendix: Workshop Agenda and Presenters	217
	<b>PART III: RESOURCES FOR THE STUDY: BACKGROUND PAPERS</b>	<b>223</b>
	Conceptual Framework for Measuring Medical Care Economic Risk	225
	<i>Sarah Meier and Barbara Wolfe</i>	
	Incorporating Data on Assets into Measures of Financial Burdens of Health	267
	<i>Jessica S. Banthin and Didem Bernard</i>	
	An Assessment of Data Sources for Measuring Medical Care Economic Risk	281
	<i>John L. Czajka</i>	



# Summary

The United States has seen major advances in medical care over the past decades, but access to care at an affordable cost is not universal. Many Americans lack health care insurance of any kind, and many others with insurance are nonetheless exposed to financial risk because of high premiums, deductibles, copays, limits on insurance payments, and uncovered services. One might expect that the U.S. poverty measure would capture these financial effects and trends in them over time. Yet the current official poverty measure developed in the early 1960s does not take into account significant increases and variations in medical care costs, insurance coverage, out-of-pocket spending, and the financial burden imposed on families and individuals. Although medical costs consume a growing share of family and national income and studies regularly document high rates of medical financial stress and debt, the current poverty measure does not capture the consequences for families' economic security nor their income available for other basic needs.

In 1995, a panel of the National Research Council (NRC) in *Measuring Poverty: A New Approach* recommended a new poverty measure, which compares families' disposable income to poverty thresholds based on current spending for food, clothing, shelter, utilities, and a little more. The panel also recommended that the federal government develop a separate measure of medical care risk that would track the economic risk to families and individuals of lacking adequate health insurance coverage.

The panel's recommendations stimulated extensive collaborative research involving several government agencies on experimental poverty measures that led to a new research Supplemental Poverty Measure (SPM),

which the U.S. Census Bureau first published in November 2011 and will update annually. Analyses of the effects of including and excluding certain factors from the new SPM showed that, were it not for the cost that families incurred for premiums and other medical expenses not covered by health insurance, 10 million fewer people would have been poor according to the SPM, and the SPM poverty rate in 2010 would have been 3 percentage points lower (Short, 2011:Table 3a).

Yet, although the SPM subtracts out-of-pocket medical care costs in the calculation of disposable income, it does not directly measure the burden of out-of-pocket medical care expenses nor does it address the medical care economic risk to the population in terms of the adequacy of their health insurance coverage to pay for their expected health care needs. The implementation of the Affordable Care Act (ACA) provides a strong impetus to think rigorously about ways to measure medical care economic burden and risk. As new policies—whether part of the ACA or other policies—are implemented that seek to expand and improve health insurance coverage and to protect against the high costs of medical care relative to income, such measures will be important to assess the effects of policy changes in both the short and the long term on the extent of financial burden and risk for the population.

### PANEL CHARGE

The U.S. Department of Health and Human Services (HHS) is responsible for carrying out the provisions of the ACA, which is intended to extend health insurance coverage to most Americans. To monitor the effectiveness of health care reform in reducing out-of-pocket medical care expenses for low-income families and children, HHS can make use of the new SPM, but the SPM does not fully address the medical care risk to the population in terms of the adequacy of their health insurance coverage to pay for their expected health care needs. HHS would also find useful a companion measure of medical care economic risk (MCER), which estimates the proportion of families and children who are at risk of incurring high out-of-pocket medical care expenses, including health insurance premiums, in relation to their resources. Such a measure would enable HHS to answer such questions as which groups face a greater likelihood of economic insecurity due to lack of or inadequate health insurance coverage.

In fall 2010, the Office of the Assistant Secretary for Planning and Evaluation in HHS requested the National Academies to convene an ad hoc panel of experts to

organize, commission papers for, and conduct a public workshop to critically examine the state of the science in the development and implementation of a new measure of medical care risk as a companion measure

to the new Supplemental Poverty Measure. The workshop will examine retrospective and prospective measures of medical care risk, defined as the risk of incurring high out-of-pocket medical care expenses (including insurance premiums) relative to income . . . and other related issues. Based on the workshop and its deliberations, the panel will prepare a report with findings and recommendations that will help the field to move forward to implement a new measure of medical care risk that will be valuable for monitoring the implementation of health care reform. The report will include a summary of the workshop and commissioned papers.

In response to this request, the National Research Council's (NRC's) Committee on National Statistics, in collaboration with the Board on Health Care Services of the Institute of Medicine, appointed a nine-member panel representing a range of expertise related to the scope of the study. The panel executed its charge through the conduct of a workshop, commissioning background papers, holding panel meetings, and reviewing research and other reports. The goal of the panel was to move forward toward developing measures to inform policy that are feasible to collect and estimate and that will monitor changes in medical care economic risk and burden as health care reform is implemented and other relevant public- and private-sector changes occur.

On the basis of the workshop discussions and its own review and deliberations of the issues, the panel developed conclusions and recommendations in five areas: (1) concepts of medical care economic burden and risk, (2) concepts of resources, (3) measurement of medical care economic risk, (4) data sources, and (5) development and implementation of the panel's proposed measures. Recommendations in this summary are numbered by the chapter in which they appear in the body of the report.

## CONCLUSIONS AND RECOMMENDATIONS

### Concepts of Burden and Risk

There is a conceptual difference between medical care economic burden and risk, and the panel thinks that measures of both are needed to inform national and state policy and to assess economic trends. Burden is a retrospective measure that examines actual out-of-pocket spending for health insurance and medical care relative to a family's available resources. Risk is a prospective measure that assesses the likelihood that a family's future out-of-pocket medical care expenditures would be high or unaffordable relative to the family's resources.

### Measuring Medical Care Economic Burden

The panel proposes that a measure of medical care economic burden be estimated by the U.S. Census Bureau in conjunction with estimating the SPM. This would be done by comparing a family or individual's actual out-of-pocket medical spending with resources available for medical care. (Chapter 2 provides details of the calculation, which involves taking a family's SPM measure of resources, adding back its out-of-pocket medical spending, and subtracting its nonmedical needs as represented by the SPM poverty threshold for the family.) The difference would be expressed by the extent to which families and individuals who are already poor in terms of having insufficient resources for their nonmedical needs are moved deeper into poverty because of their medical costs and the extent to which those who are not poor are moved into poverty or below a low multiple of poverty, such as 100 percent or 250 percent. Estimates of these effects should be provided separately for health insurance premiums and other expenses for medical care and should also take account of important features of the new national health care policy, which include a major role for states going forward, premium subsidies and other features of affordability that are linked explicitly to multiples of the poverty thresholds, and continued policy differences by age. To inform policy, it is important that the SPM and the measure of medical care economic burden reflect trends in actual spending—not hypothetical spending. Thus, there should be no adjustment for underutilization of medical care in the definition of resources.

**Recommendation 2-1:** The panel recommends that the U.S. Census Bureau refine its Supplemental Poverty Measure (SPM) reports and tables to include the estimated effects of medical care economic burden on poverty by component, showing the effects of premiums separately from other out-of-pocket expenses. It further recommends that the SPM reports and tables include the estimated effects of medical care economic burden by region or state, recognizing that aggregation over time or by groups of states may be necessary to obtain reliable estimates.

**Recommendation 2-2:** The panel recommends that the U.S. Census Bureau examine medical care economic burden in its Supplemental Poverty Measure (SPM) reports and tables by providing estimates of the number of people who move from higher to lower multiples of the SPM poverty thresholds—including thresholds above and below the poverty level—because of their health insurance premiums and other out-of-pocket medical care costs.

**Recommendation 2-3:** The panel recommends that the U.S. Census Bureau report findings on medical care economic burden in its Supplemental Poverty Measure reports and tables separately for the populations under age 65 and ages 65 and older.

**Recommendation 2-4:** The panel recommends that the U.S. Census Bureau continue to use a definition of resources for the Supplemental Poverty Measure and estimates of medical care economic burden that incorporates estimates of actual out-of-pocket spending on health insurance premiums and other out-of-pocket expenses for medical care. The Census Bureau should not model potential spending for people lacking health insurance coverage.

### Concepts of Resources

The choice of a measure of resources for use in measuring MCER<sup>1</sup> will be tightly constrained by the choice of a survey to serve as home to a measure of MCER, and in this decision the measurement of medical care risk is likely to dominate the measurement of resources. Nevertheless, it is important to understand the key issues that exist in defining resources and the potential implications of including or excluding particular types of resources.

The resources available to families and individuals to meet their financial needs include not only income, but also assets—the product of families’ saving and investment activities over the life course. With regard to income, the panel encourages the Census Bureau to update its concepts and improve its measurement of money income (used in the official poverty measure) and disposable income (used in the SPM) in its household surveys, particularly self-employment income and new forms of retirement income that are neither regular flows nor lump sums, as traditionally understood.

In the context of how people pay for extraordinary and, especially, unexpected medical care expenses, the role of assets cannot be overlooked. To exclude all assets from the resources used to measure MCER, and in so doing make it a measure of income-related economic risk, ignores accumulating evidence on how families prepare for potentially high medical expenditures and how well they are able to absorb them. Consequently, the panel concludes that the resources component of a measure of MCER must take account of a portion of assets if the goal is to assess resources available to pay for medical care costs currently and over time. The panel further concludes that only financial assets that a family can access relatively quickly

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<sup>1</sup>The measure of resources for medical care economic burden is derived from the SPM as discussed above.

should be considered in determining the amount to be included and that assets of all family members should be used to determine family resources without regard to employment status or age.

Although the panel concludes that the calculation of an annuitized value from the family's liquid assets is a compelling approach, there are operational issues that we could not examine. Consequently, the method for calculating the asset contribution to resources will need to be determined by the federal agency charged with producing the measure of MCER. The asset contribution derived in this manner should be added to disposable income to provide the measure of resources for evaluating MCER.

**Recommendation 3-1:** The panel recommends that the U.S. Census Bureau modify its concepts and measurement of money income and disposable income to better account for income flows from self-employment and from new forms of retirement income for use in measures of poverty and medical care economic risk and burden that are derived from its household surveys.

**Recommendation 3-2:** The panel recommends that, for measuring medical care economic risk, a portion of liquid assets be included in the resources of all persons, regardless of age or employment status. Only assets that the family or individual can access relatively quickly should be considered in determining the amount to be included—namely, financial assets held outside retirement accounts, the posttax value of assets held in retirement accounts, and, in principle, the amount received from a reverse mortgage (treating it as income rather than as an asset), acknowledging the limitations of existing data.

**Recommendation 3-3:** The panel recommends that the method for calculating the share of liquid asset contribution to resources for measuring medical care economic risk be determined by the federal agency charged with producing the measures and that the methodology be based on one of two options—either a fixed share of assets or an annuitized value. The share of liquid asset contribution derived in this manner should be added to disposable income to provide the measure of resources for evaluating medical care economic risk.

### Measures of MCER and Recommended Approach

In addition to measuring retrospectively the financial burden from actual out-of-pocket medical care spending, the panel agrees with the 1995 NRC panel that it is important to develop a measure of medical care economic risk that can assess the exposure to, or potential for incurring, future

expenses. This is especially true because of the skewed nature of medical care costs. The panel considered various methods, including retrospective and prospective approaches, to constructing a measure of MCER as distinct from economic burden. The outcome of interest is a measure of risk, for example, the expected number (or fraction) of families and their individual members who, as a result of out-of-pocket spending for medical care services and premiums, would be in poverty or some multiple of poverty as defined by the SPM. For medical care risk to differ from the medical care burden of large expenditures, it must be based on the distribution of future out-of-pocket expenditures that an individual or household may face given their characteristics at some baseline point in time. Thus, it is a forward-looking or prospective measure as distinct from the burden measure, which is retrospective.

In order to understand the effects of financial exposure to medical care costs on available household income across the U.S. population, it is necessary to calculate the probability for families with particular characteristics of having out-of-pocket premiums and spending on medical care services greater than their resources available for medical care spending. Ideally, the calculation would reflect the actual terms of family members' health insurance coverage, their age, gender, and health status, the income of the family, and the composition of the family for a large number of families. Practically speaking, it must be constructed on the basis of information that is available from the Medical Expenditure Panel Survey (MEPS) or the Current Population Survey Annual Social and Economic Supplement (CPS ASEC). Both surveys, however, have limitations in terms of relevant information collected, as discussed below. The trade-offs in the choice between these two surveys leads to a two-pronged strategy.

Although the concept of MCER is prospective, 1 year of retrospective cross-sectional data could be used to estimate it, which facilitates timeliness and makes it possible to use nonpanel data like the CPS ASEC. The retrospectively determined burden of out-of-pocket medical care spending for a given year can be used as a simple predictor of MCER in the following period. However, nonpanel data sources systematically exclude recent deaths and those who have entered institutions in the immediate past time period—two groups known to have high health care expenditures, so information about the impact of these transitions on out-of-pocket medical care spending will have to come from other sources. Another problem is that the characteristics that predict out-of-pocket medical care spending must logically be defined at the start of the year. So the groupings of individuals or families with similar characteristics predictive of expected medical care spending (called “risk cells” in this report) cannot be defined using current medical care spending because that would produce overly small amounts of observed variation in spending. Nonetheless, in the short

term, with the data now being collected, the CPS ASEC could be used to report the burden of out-of-pocket medical care spending retrospectively, roughly 10 months after the end of the calendar year for which income and spending are reported. Furthermore, with additional assumptions, the retrospective measure of burden could serve as a proxy for the prospective MCER.<sup>2</sup>

Then why continue to pursue construction of a prospective measure of MCER? With its richer data on health conditions, distribution of spending by service type, and 2-year panel, MEPS offers the opportunity to learn much more about the interplay of health status, health insurance, income, and out-of-pocket medical care spending with respect to family finances. Over the next several years, as the landscape of health insurance coverage in the United States undergoes substantial change, understanding the underlying drivers of any shifts in the impact of out-of-pocket medical care spending on family financial resources will be extremely important. With 2 years of data, one can use data on second-period expenses and base-period characteristics together with multivariate regression methods to estimate the probability that a family with given characteristics will have an expenditure large enough to push it to the poverty threshold.

However, the truly prospective measures that require 2 or more years of data run up against limitations in the available data sources (discussed in the “Data Sources” section); they also run up against the dearth of relevant literature on which to base prediction models. Although much is known about total health care expenditures, very little is known about family and individual covariates that predict family out-of-pocket medical care spending or the impact on family finances.

This situation dictates a research agenda to consider several possible alternative analyses to better understand these issues before making highly specific recommendations on a prospective measure of MCER. The results of these analyses can be used to inform the move from a purely retrospective approach based on burden to a more prospective approach. Research topics include the predictive value at the family level of out-of-pocket medical care spending in year 1 in relation to spending in year 2 and the stability of the relationship; the added predictive value of expanding the covariate list to include other family characteristics, such as the age, gender, and health status of members; whether to build a family model or an individual model that subsequently combines individual predictions for the family; because individual characteristics are the strongest predictors of future average expenditures, how to roll up individual predictions into a composite family measure that is predictive of future family out-of-pocket medical care

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<sup>2</sup>The measure of burden discussed here is similar to but not the same as that recommended for regular publication above, which adheres to the SPM definition of resources.



expenditures; how to combine distributions of expenditures for individual family members into the family's distribution around its expected amount; and the pros and cons of regression methods versus cell-based approaches.

All of these topics require detailed information, not all of which is currently available. Moreover, in the absence of sufficient research on the distribution of out-of-pocket costs relative to SPM thresholds, it will be necessary to do that work empirically. For example, one would expect that a working poor family with one or more members in fair or poor health might have a substantial risk even without a hospitalization or high-cost drug regimen. An emergency department visit or a flare-up of a chronic condition might be enough to drop such a family below the threshold. For a middle-income family, however, it might take a larger health shock such as an uncovered hospital stay.

**Recommendation 4-1:** Given what limited work has been done in the field on issues in measuring medical care economic risk (MCER) prospectively, the panel recommends that appropriate federal agencies—the Agency for Healthcare Research and Quality, the Office of the Assistant Secretary for Planning and Evaluation, or both—perform a series of analyses using the Medical Expenditure Panel Survey to examine different prospective MCER measures.

**Recommendation 4-2:** The panel recommends that the results of the analyses from Recommendation 4-1 be used to inform the move from a purely retrospective approach based on burden to a more prospective approach for measuring medical care economic risk.

### Data Sources for Developing and Producing an MCER

The data requirements for developing a measure of medical care economic risk are not the same as the requirements for producing a measure on a recurring basis. Development has more extensive data needs than production, but production requires annual data that are available on a timely basis from a large federal sample survey that represents the civilian noninstitutionalized population.

To develop a prospective measure of MCER requires longitudinal data, so that medical expenditures (and resources) observed prospectively over the course of a period—ideally a year—can be related to characteristics observed at the start of that period that are potentially predictive of medical expenditures. Actual out-of-pocket expenditures for premiums and other medical care expenses in the prior year may be the strongest predictor of expenditures during the current year, and although they are not a baseline characteristic per se, these expenditures ought to be included in the devel-

opment of a predictive model of prospective risk. Both the risk variables and the resources variables must be recorded at the person level, so that the variables in each case can be aggregated to the health insurance unit (for aspects of modeling risk) and family levels (for comparing risk with resources). Sufficient information on family relationships must be included to enable the membership of each health insurance unit and family to be identified.

The panel looked closely at three longitudinal surveys: MEPS, the Survey of Income and Program Participation (SIPP), and the Health and Retirement Study (HRS). None of the three surveys collects all of the variables that would be required to develop a prospective measure of MCER, as described in Chapter 4. Most notably, none of the three surveys collects a description of the services and treatments covered by each person's health insurance plan, and none of them collects sufficient information with which to assess each sample member's potential liability for out-of-pocket medical costs. MEPS collected detailed information on the health insurance plans of sample members in 1996 but has not done so again. Other survey-specific data gaps exist as well, which limit how fully each survey could support the modeling of MCER. These are discussed in detail in the report.

In summary, none of the surveys is nearly as strong as one would like in its measurement of key baseline characteristics. With its strong measures of chronic health conditions and very high quality expenditure data, MEPS is clearly superior to SIPP. The HRS could provide a supplemental data source for the one-fifth of households that fall into its universe of people over age 50. Estimates from the HRS could be used to validate the model estimates from MEPS for this segment of the population (or perhaps just the elderly).

Once a model of MCER has been developed, the estimates could be used directly (in MEPS), or the predictive model could be applied to another data set that provides measures of the relevant baseline characteristics. The latter approach offers a way to make the measurement of MCER more timely and to extend the measure to a larger and possibly more representative sample. For production, in addition to MEPS, the panel considered the CPS ASEC, the National Health Interview Survey, the American Community Survey, and the Consumer Expenditure series quarterly survey. The CPS ASEC is the source of both the official poverty measure and the SPM, to which the MCER measure is intended as a companion. Producing the two measures from the same survey would enable more direct comparisons than if the two were based on different surveys. The CPS ASEC is the only one of the surveys that can estimate disposable income currently, using imputations for taxes and commuting expenses, but it lacks a measure of liquid assets and has limited information on health conditions. MEPS cannot currently estimate disposable income because it does not collect or

impute such variables as taxes, commuting, and child care expenses. These components could be imputed to MEPS or added to the MEPS questionnaire in the future.

Although the panel favors a prospective measure of MCER over a retrospective measure, the more substantial data requirements of the prospective measure cannot be fully met with an existing survey. The MEPS longitudinal file comes closest to meeting these requirements, with the HRS providing a means to validate the results of MEPS modeling for older people.

**Recommendation 5-1:** The panel recommends that the development of a model for estimating a prospective measure of medical care economic risk be carried out with the Medical Expenditure Panel Survey (MEPS) longitudinal file. The panel also recommends that the Health and Retirement Study (HRS) be used to validate the results of the MEPS modeling for at least the elderly, if not the entire population over age 50, which the HRS sample represents.

**Recommendation 5-2:** The panel recommends that the Census Bureau and the Agency for Healthcare Research and Quality assess the merits of adding items to both the Current Population Survey Annual Social and Economic Supplement and the Medical Expenditure Panel Survey to at least partially address the most critical data limitations identified for measuring medical care economic risk.

### Implementing Measures of MCER and Burden

Throughout its review and deliberations, the panel has aimed to develop rigorous yet practical approaches to defining and measuring the financial burden and risk associated with out-of-pocket medical care costs. Specifically, we focused on how exposure to medical care expenses can threaten families and individuals with being driven into poverty. Through commissioned papers, workshop presentations and discussions, and deliberations, we sought to bring to bear the latest research and data. We have also kept in mind what actually can be done by government agencies without major infusions of additional staff or funding.

For the introduction of a measure of MCER to be successful, clear lines of responsibility for its implementation must be established. The two federal agencies with the greatest expertise in the development and implementation of such a measure are the U.S. Department of Health and Human Services and the U.S. Department of Commerce. The panel thinks that a subcabinet-level coordinating group would help to ensure that a measure of MCER moves forward in its development and launch. This

coordinating group would provide guidance to the agencies producing the measure and suggest changes in methodology or appropriate data sets. The leadership of agencies with contributions to make to the construction and implementation of the measure could constitute such a group. The panel also suggests that one or two members of the coordinating group be chosen from outside government with relevant expertise in the measurement of poverty and financial burden of health care. Having one or more outside members would enhance the transparency and credibility of the process as well as provide the government with the latest thinking from the scholarly community outside the government.

Based on these findings and conclusions the panel provides the following recommendations for implementation:

**Recommendation 6-1:** Because technical and cross-departmental efforts such as the construction and maintenance of a measure of medical care economic risk (MCER) require both political and resource support, the panel recommends that the secretaries of the U.S. Departments of Health and Human Services and Commerce be jointly responsible for developing and reporting measures of MCER (and burden) on an annual basis with involvement of the U.S. Office of Management and Budget chief statistician. This effort should coincide with the production and release schedule for the Supplemental Poverty Measure.

**Recommendation 6-2:** The panel further recommends the creation of a medical care economic risk coordinating group composed of senior officials from the U.S. Department of Health and Human Services, the U.S. Census Bureau, and the U.S. Office of Management and Budget to provide oversight and make suggestions for needed improvements.

**Recommendation 6-3:** The panel recommends that funding for the current data collection efforts be maintained at a level to ensure that rigorous, accurate calculations of measures of medical care economic burden and risk can be made.

## **PART I**

# **REVIEW AND RECOMMENDATIONS**



# 1

## Introduction

Advances in medical care in recent decades, such as new and improved surgical techniques and prescription drugs, have greatly benefited the health of many Americans. At the same time, the costs of medical care have risen greatly, and many Americans lack adequate health insurance coverage to meet their needs for care and for financial protection in the event of illness or injury. A new Supplemental Poverty Measure (SPM), which takes account of health insurance premiums and other out-of-pocket medical care costs, became available in November 2011. It showed that, were it not for the cost that families incurred for premiums and other medical expenses not covered by health insurance, the poverty rate in 2010 would have been 3 percentage points lower (Short, 2011:Table 3a).

The SPM was based on the work of a National Research Council (NRC) panel, which in 1995 issued a report, *Measuring Poverty: A New Approach*, that led to extensive research, culminating in the new measure as a supplement to the outdated official poverty measure. The NRC panel also recommended a separate measure of the economic risk to families because of inadequate health insurance coverage for needed medical care.

With the passage of the Affordable Care Act (ACA) and as new policies are implemented that seek to expand and improve health insurance coverage and to protect against the high costs of medical care relative to income, such a measure will be particularly important to inform policy. The goal of this report is to help move the field forward toward development of a measure of medical care economic risk. This introductory chapter provides historical background on the measurement of poverty in the United States and the role of medical care expenses, summarizes issues in accounting for

the financial burden of medical care, states the charge to the panel and describes the scope and limitations of the study, and outlines the organization of the report.

## BACKGROUND

The U.S. poverty measure is an important indicator of economic well-being that influences public opinion and public policies. The official poverty thresholds are used to determine eligibility for many government assistance programs, and the measure plays a role in planning and evaluating government programs for low-income people and assessing the effectiveness of public policies in alleviating economic deprivation.<sup>1</sup>

The current official poverty measure was developed in the early 1960s by Mollie Orshansky, staff economist in the Social Security Administration (SSA). It was first used by the Office of Economic Opportunity and then adopted as an official statistic by the U.S. Bureau of the Budget (now the Office of Management and Budget, OMB) in 1969. SSA published the poverty measure until 1967, when the Census Bureau assumed the responsibility of publishing the measure on an annual basis using data from the Current Population Survey (CPS). Over the years, social and economic conditions changed, along with changes in public policies and an overall increase in the standard of living, making the measure less adequate for its intended uses.

The official poverty measure has weaknesses in both the definition of family resources and the specification of the thresholds. These thresholds are set at the same level across the country, without regard to geographic variations in the cost of living, and they have not been updated for real growth in the standard of living, but only to account for inflation. The definition of family resources does not include near-cash in-kind support from such sources as the Supplemental Nutrition Assistance Program (SNAP, formerly the Food Stamp Program), the school meals programs, and other programs for low-income populations. It also fails to deduct federal, state, and payroll taxes paid by families, expenses for work (child care and other work-related expenses), and child support payments to another household.

Most important for this report, the official poverty measure does not take account of the dramatic increases in medical care costs and spending since the measure was first adopted. At that time, national health care spending accounted for only 5 to 6 percent of gross domestic product compared with nearly 18 percent today.<sup>2</sup> The rapid growth in medical care costs relative to income, particularly for middle- and low-income families,

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<sup>1</sup>This, and the next section, draws heavily on National Research Council (1995:Chapter 1).

<sup>2</sup>See <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html>.



increasingly competes for resources to cover other basic needs. Taxes, work-related expenses, and child support are not available to cover such basic needs as food, clothing, and shelter, and neither are medical care expenses for insurance premiums, copays, deductibles, or other out-of-pocket costs.

In response to a request from the U.S. Congress, in 1992 the Committee on National Statistics (CNSTAT) at the National Academy of Sciences/National Research Council (NAS/NRC)<sup>3</sup> established the Panel on Poverty and Family Assistance: Concepts, Information Needs, and Measurement Methods to address the various concerns about the poverty measure as well as the related conceptual and methodological issues in establishing standards for welfare payments to needy families. The panel concluded that the current measure needs to be revised; it no longer accurately reflects the differences in the extent of economic poverty across population groups and geographic areas or over time.

In its 1995 report, *Measuring Poverty: A New Approach*, the CNSTAT panel proposed an approach that separates the measurement of economic poverty from the measurement of medical care needs and the adequacy of resources to meet those needs. The proposed concept for the poverty thresholds includes such budget categories as food and housing but not medical care. For consistency, the panel proposed that medical insurance benefits *not* be added to income and that out-of-pocket medical care expenses (including health insurance premiums) be *subtracted* from income as part of determining families' disposable income that is available for nonmedical basic necessities (National Research Council, 1995:51-52). Because the proposed revised poverty measure would not directly address the availability of affordable medical care, the panel further recommended that the federal government develop a separate measure of medical care risk that would estimate the economic risk to families and individuals lacking adequate health insurance coverage (National Research Council, 1995:69).

The issuance of the CNSTAT report prompted numerous meetings at which policy analysts and researchers considered ways to implement the panel's recommendations for a new and improved poverty measure. The Census Bureau and the Bureau of Labor Statistics (BLS) collaborated on extensive research to develop and evaluate experimental NRC-based poverty measures, which have been published on the Census Bureau's website.<sup>4</sup> These measures incorporate technical improvements to the proposed NRC measure; they also vary one or more aspects of the proposed measure when there was not agreement on the best implementation (e.g., including medical care premiums and other out-of-pocket expenditures in the threshold

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<sup>3</sup>The National Research Council is the operating arm of the National Academy of Sciences.

<sup>4</sup>These experimental measures, which are updated regularly, are available at <http://www.census.gov/hhes/povmeas/>.

versus deducting such expenditures from resources). However, there was no movement to replace the official poverty measure.

In the late 2000s, there was renewed interest in revisiting the 1995 panel's recommendations with the goal of agreeing on a revised poverty measure that would supplement rather than replace the official measure. The House Committee on Ways and Means developed draft legislation, introduced in 2008 and again in 2009 as the Measuring American Poverty Act of 2009, which incorporated the NRC recommendations; the official measure would have been termed the "historical measure."

More recently, an Interagency Technical Working Group (ITWG) on Developing a Supplemental Poverty Measure, under the leadership of OMB, directed the Census Bureau in cooperation with BLS to calculate a new Supplemental Poverty Measure from the CPS Annual Social and Economic Supplement (ASEC) and to publish it concurrently with the official measure beginning in September 2011 (Interagency Technical Working Group, 2010).<sup>5</sup> (Failure to obtain needed funding delayed the publication of the SPM until November 2011.)

This new supplemental measure adopts the NRC recommendation to deduct medical insurance and other out-of-pocket expenses from resources prior to determining poverty status. By design, it does not fully address the economic risk to the population in terms of the adequacy of their health insurance coverage to pay for their expected health care needs, which the CNSTAT panel proposed would be covered by a separate measure. However, such a measure has yet to be developed.

### STATEMENT OF THE PROBLEM

As aptly stated by Meier and Wolfe (in Part III of this report), the challenge in poverty measurement with respect to medical care need and economic risk has not been identifying the problem, but rather determining the best methods to resolve it. Prior to the 1995 NRC report, research focused on a single measure of economic poverty that would account for medical care needs and resources. Yet achieving agreement on what would constitute a conceptually sound and operationally feasible approach proved stubbornly intractable. The 1995 panel observed (National Research Council, 1995:223):

The issue of how best to treat medical care needs and resources in the poverty measure had bedeviled analysts since the mid-1970s, when rapid growth in the Medicare and Medicaid programs (and in private health

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<sup>5</sup>The ITWG included representatives from BLS, the Census Bureau, the Council of Economic Advisers, the Department of Commerce, the Department of Health and Human Services, and OMB.

insurance) led to a concern that the official measure was overstating the extent of poverty among beneficiaries because it did not value their medical insurance benefits. Yet after almost two decades of experimentation, there is still no agreement on the best approach to use.

As noted by the panel (see National Research Council, 1995:224), two problems make it very difficult to arrive at a single solution that both achieves the necessary consistency between the threshold concept and the resource definition of a poverty measure and is feasible to implement. The first problem is that medical care benefits are not very fungible; they may free up resources to some extent, but by no means do they have the fungibility of, say, SNAP benefits. SNAP benefits are essentially interchangeable with money, both because virtually all households spend at least some money for food, so the receipt of SNAP benefits frees up money income for consumption of other goods and services, and because the maximum SNAP allowance is low enough that it is unlikely that households would receive more benefits than the amount they would otherwise choose to spend on food. Neither of these conditions holds for medical care benefits; not all families have medical care needs during a year, and, although medical care benefits for low-cost services (e.g., a prescription drug or a doctor visit) may free up money income for other consumption, the “extra” benefits received from insurance (or free care) to cover expensive services (e.g., surgery) are not likely to free up money income to the same degree. Moreover, individual and small group insurance premiums tend to increase with age and illness because older or disabled populations on average have higher levels of health care spending due to poor health.<sup>6</sup> At the same time, with any cost-sharing, older and sicker people will have higher out-of-pocket spending for medical care even if they have exactly the same insurance policy as younger, healthier people. This means that simply adding the insurance value of health care services to families’ resources would make the sicker and the older population look “rich” when, in fact, they might have inadequate resources for food, clothing, and shelter.

The panel further noted (National Research Council, 1995:224-225) that any attempt to develop thresholds that appropriately recognize needs for medical care runs into the second problem: such needs are highly variable across the population, much more variable than needs for such items as food and housing. Everyone has a need to eat and be sheltered throughout the year, but some people may need no medical care at all, and others may need very expensive treatments. One would have to develop a large

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<sup>6</sup>Beginning in 2014, the Affordable Care Act will eliminate a number of techniques for adjusting or “rating” insurance premiums on the basis of such characteristics as preexisting medical conditions or health status (see [http://101.communitycatalyst.org/aca\\_provisions/setting\\_premiums](http://101.communitycatalyst.org/aca_provisions/setting_premiums)).

number of thresholds to reflect different levels of medical care need, thereby complicating the poverty measure. Moreover, the predictor variables used to develop the thresholds (e.g., age, self-reported health status) may not properly reflect an individual's medical care needs during any one year: some people in a generally sicker group may not be sick that year and vice versa for people in a generally healthier group. As a result, it would be very easy to make an erroneous poverty classification.

Another issue is how to account for out-of-pocket medical care costs. Even groups with medical insurance coverage, such as the elderly, pay some of their medical expenses directly, and the dollar amounts for such expenses as health insurance premiums, deductibles, copayments, and payments for uncovered services can be high. Yet little thought had been given prior to the 1995 NRC report as to how to adjust the poverty thresholds or the family resource definition to appropriately account for these costs.

The publication of the 1995 NRC report stimulated extensive research on various elements of the NRC-proposed measure of economic poverty, but it prompted only a few studies on developing a separate measure of medical care economic risk—including those by Doyle (1997); Doyle, Beauregard, and Lamas (1993); Moon (1993); and Short and Banthin (1995). Since that time, hardly any more work has been done, despite increasingly high medical care costs and spending, including increases in insurance premiums and other out-of-pocket expenses, that have put families at increasing financial risk.

Recent preliminary estimates of the financial burden of medical care among the U.S. population based on National Health Interview Survey data collected from January 2011 through June 2011 show that, in the first 6 months of 2011, 20 percent of people—or 1 in 5—were in a family having problems paying medical bills in the past 12 months; 26 percent of people—or 1 in 4—were in a family paying their medical bills over an extended period of time; and almost 11 percent of people—or 1 in 10—were in a family that had medical bills they were unable to pay at all. Overall, 32 percent of people, rising to 41 percent of poor people and 46 percent of near-poor people, were in a family experiencing one or more of these kinds of problems in paying for medical care (Cohen, Gindi, and Kirzinger, 2012).

Renewed interest in a measure of medical care economic risk has come about from the enactment of the Patient Protection and Affordable Care Act of 2010 (ACA), which is designed to significantly extend health insurance coverage in the United States and reduce the financial burden of premiums and other out-of-pocket expenditures for low- and middle-income families. Its passage underlines the potential usefulness of a measure of medical care economic risk that could monitor the effects of various ACA provisions, as well as changes in other medical care programs such as Medicare, on the economic well-being of the U.S. population. The measure would provide

policy makers with a targeted indicator of the level of financial risk faced by Americans due to medical care costs.

## THE PANEL STUDY

### Contract Charge to the Panel

The U.S. Department of Health and Human Services (HHS) is responsible for carrying out the provisions of the ACA. To monitor the effectiveness of health care reform in providing coverage for low-income families and children, a new SPM became available to HHS in fall 2011; the new measure subtracts health insurance premiums and other out-of-pocket expenses for medical care from income in determining a family's resources for basic needs (see Short, 2011). To the extent that provisions of the ACA or changes in other health care programs affect premiums and other out-of-pocket expenses, the SPM poverty rate will be higher or lower than otherwise. However, the SPM will not directly assess the extent to which population groups are likely to incur medical care needs that put them at financial risk.

HHS would also find useful a companion measure of medical care economic risk, which estimates the proportion of families and children who are at risk of incurring high out-of-pocket medical care expenses, including health insurance premiums, in relation to their resources, for monitoring the effectiveness of health care reform. Such a measure would enable HHS to answer such questions as which groups face a greater likelihood of economic insecurity due to lack of or inadequate health insurance coverage.

In fall 2010, the Office of the Assistant Secretary for Planning and Evaluation in HHS requested the NRC and the Institute of Medicine (IOM) to convene an ad hoc panel of experts to

organize, commission papers for, and conduct a public workshop to critically examine the state of the science in the development and implementation of a new measure of medical care risk as a companion measure to the new Supplemental Poverty Measure. An agenda for the workshop will be developed by the panel to examine retrospective and prospective measures of medical care risk, defined as the risk of incurring high out-of-pocket medical care expenses (including insurance premiums) relative to income. It will consider the variability of risk across populations and the vulnerability of population groups, including the insured, underinsured, and uninsured and those with chronic health conditions, acute but not catastrophic conditions, catastrophic conditions, and other relevant issues. Based on the workshop and its deliberations, the panel will prepare a report with findings and recommendations that will help the field to move forward to implement a new measure of medical care risk that will

be valuable for monitoring the implementation of health care reform. The report will include a summary of the workshop and commissioned papers.

As expressed by the sponsor, much work has been done on a new income poverty measure, the Supplemental Poverty Measure, but the medical care economic risk measure is a separate measure and needs to move forward.

In response to this request, the NRC's Committee on National Statistics, in collaboration with the IOM's Board on Health Care Services, appointed a panel of nine members representing a range of expertise related to the scope of the study.

### Study Approach

Developing a measure of medical care economic risk presents many difficult issues relating to defining risk, resources, and financial burden. Such issues include

- considering basic concepts, such as prospective versus retrospective measures, the difference between measures of incurred financial burden and expected financial risk, and the unit of analysis (family or individual);
- categorizing and estimating health risks (acute, chronic, catastrophic) for population groups and the associated costs;
- establishing thresholds for medical care affordability;
- determining adequacy of health insurance benefit plans;
- determining if and how to adjust components of the measure for people living in different geographic areas or other factors;
- deciding on what to count as resources to meet medical care expenditure needs (specifically, whether and how to count assets in addition to income); and
- determining how best to achieve operational feasibility, data quality, and timeliness of the resulting medical care economic risk measure.

The panel executed its charge to “critically examine the state of the science in the development and implementation of a new measure of medical care economic risk as a companion measure to the new Supplemental Poverty Measure” through the conduct of a workshop, panel meetings, and background research. The panel’s goal was to advance the development of a measure to inform policy that is feasible to collect and estimate and that will monitor changes in medical care economic risk as health

care reform is implemented and other relevant public- and private-sector changes occur.

The panel met face to face three times. The first meeting focused on planning the workshop as called for in the study contract, including development of an agenda and identification of potential participants. To avail ourselves of expert and detailed analysis of key issues beyond the time and resources of our members and as called for in the study contract, the panel commissioned three background papers from experts in the subject areas, which appear in Part III:

- “Conceptual Framework for Measuring Medical Care Economic Risk” by Sarah Meier and Barbara Wolfe;
- “Incorporating Data on Assets into Measures of Financial Burdens of Health” by Jessica S. Banthin and Didem Bernard; and
- “An Assessment of Data Sources for Measuring Medical Care Economic Risk” by John L. Czajka.

The workshop on Developing a Measure of Medical Care Economic Risk was held on September 8, 2011, and a summary prepared by the rapporteur is included in Part II. The second meeting of the panel was held immediately following the workshop to deliberate on the workshop discussions and to reach agreement on a preliminary outline of the final report. The third and final meeting was devoted to reviewing the draft chapters and reaching consensus on the panel’s findings and recommendations.

### Scope and Limitations

The scope of the study is complex, covering a wide range of issues from concepts and definitions to issues of thresholds and resources, sources of needed data, methods, implementation, and application in assessing program performance. Many other issues relevant to the broad subject areas of health and health care exist. Although the panel recognizes their importance, their discussion is beyond the scope of this study. Within the constraints of time and available resources, the panel did not address every issue but covered those areas specifically called for in the contract charge. For example, we addressed medical care and not all aspects of health and health care; we addressed issues of financial risk of medical care and not all medical care risks; and we focused on survey data rather than on modeling issues. The panel also did not examine the impact of various insurance plans on out-of-pocket spending or address the appropriate treatment of medical care benefits and costs in measures of inequality.

More broadly, time and resources did not permit the panel to carry out the original analysis that will be necessary to construct and refine spe-

cific measures of medical care economic risk and burden. The panel has endeavored to provide as much guidance as possible for needed research and implementation, acknowledging that there are many issues that can be resolved only on the basis of empirical work.

Regarding available survey data, the panel notes that the CPS ASEC, which is the basis for the official poverty measure and the SPM and the most feasible source for producing timely measures of medical care financial burden and risk, excludes institutionalized populations, most members of the armed forces, and the homeless. (This is true of most major federal household surveys.) This limitation places constraints on measuring medical care economic risk for two reasons: (1) the definition of the survey universe excludes respondents who are institutionalized residents at the time of the survey; and (2) the cross-sectional design does not capture transitions into or out of nursing homes and similar long-term care facilities.

To fully capture nursing home transitions and associated costs, one would need a longitudinal survey design that included both the institutionalized and noninstitutionalized components of the population, with a mortality follow-back instrument to fill in the information lost due to participant nonresponse after the time of death. With such data, prospective measures could be developed for the component of the population that was noninstitutionalized at the start of, say, a 1-year follow-up period, to capture an array of medical care and long-term care costs that are currently unmeasured. The downside of a longitudinal design is the time delay in getting a measure needed to monitor the implementation of a policy or program.

In one sense, it does not matter that data on transitions are lacking, because the official poverty measure and the SPM both exclude the institutionalized, so that people who move into nursing homes move out of the universe for poverty measurement. However, this is a particularly significant limitation for the measurement of prospective risk, in that the biggest health-related economic risk for many elderly must be excluded.

## ORGANIZATION OF THE REPORT

The panel used three criteria to guide the development of the report and its recommendations. First, the subject areas examined must be relevant to and within the scope and purview of the panel's contract charge. Second, the evidence and analysis should be sufficient to support and justify the panel's findings, conclusions, and recommendations. Third, recommendations should be clearly stated and attainable at reasonable cost.

The report is organized in a manner responsive to the contract charge. Part I contains the panel's review, conclusions, and recommendations. Parts II and III contain the resources obtained and used by the panel to assist



in our deliberations. Part II is a summary of a public workshop held on September 8, 2011, and Part III contains three background papers on key issues commissioned from experts in the field.

Following this introduction, Chapter 2 describes the conceptual difference between medical care economic burden due to actual out-of-pocket medical expenses and medical care economic risk, discusses why both measures may be needed to inform national and state policies and assess trends, and outlines why it is important to keep the measures conceptually distinct. It also recommends an approach to measuring burden. Chapter 3 addresses concepts of resources and what should be included in a measure of financial resources for assessing medical care economic risk and burden.

Chapter 4 focuses on developing the concept of medical care economic risk as distinct from burden. It considers various methods, including retrospective and prospective approaches, to constructing a measure of medical care economic risk and outlines the panel's proposed approach.

Chapter 5 covers data sources for estimating the components of a medical care economic risk index. Finally, Chapter 6 highlights the panel's key conclusions and recommendations for moving forward to develop and implement a measure of medical care economic risk.

Although the principal intent of this report is to address the specific concerns of the sponsor as defined in the contract charge, the panel hopes that the report will provide guidance to a wider audience responsible for the implementation of relevant policies and programs. The panel also hopes the report will provide the basis for further research on the broader issues of measuring the benefits and costs of medical care for the U.S. population.



## Concepts of Medical Care Economic Burden and Risk

As stated in Chapter 1, the 1995 National Research Council (NRC) report *Measuring Poverty: A New Approach* recommended separating the measure of economic (nonmedical) poverty from assessing the adequacy of resources to meet medical care needs. The recommended approach was to determine the poverty status of a family based on whether its after-tax income, plus its near-cash in-kind benefits minus work-related expenses, child support payments, and out-of-pocket payments for medical care expenses (including insurance premium payments), was less than the family's needed level of spending for food, clothing, shelter, utilities, and a little more. This approach makes possible a Supplemental Poverty Measure (SPM) that can show explicitly how many more people are considered poor because their resources are inadequate to meet essential needs based on disposable income after taking into account spending on medical care expenses. The traditional official U.S. poverty measure cannot make this determination because it uses before-tax money income as the definition of family and individual resources.

As directed by the U.S. Office of Management and Budget, the Census Bureau added questions about out-of-pocket spending on insurance premiums and medical expenses to its Current Population Survey Annual Social and Economic Supplement (CPS ASEC) in 2010 to enable inclusion of medical care expenses and premiums in SPM estimates.<sup>1</sup> The results

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<sup>1</sup>These questions gave estimates that compared favorably with estimates of out-of-pocket medical care costs in the Medical Expenditure Panel Survey (see Czajka, in Part III of this volume).

for 2010 were published by the Census Bureau in November 2011 (Short, 2011). Using the traditional measure, the poverty rate for 2010 was 15.2 percent. Using the new SPM, the poverty rate was 16.0 percent. The biggest change was among the elderly, for whom the poverty rate was 9.0 percent under the old poverty measure and 15.9 percent under the SPM (Short, 2011:6). This is not surprising given that the elderly as a group have the most need for medical care, pay premiums for Medicare (and often private insurance), and often have high out-of-pocket expenses for copays, deductibles, and noncovered services.

The Census Bureau went further to provide sensitivity analyses of the effects of including and excluding particular factors from the new SPM. These analyses indicated that the effect of subtracting out-of-pocket expenses for medical care and insurance premiums from net income after taxes, in-kind transfers, child support payments, and work-related expenses was to increase the poverty rate by 3.3 percentage points in 2010—from 12.7 percent to 16 percent poor. This represents an increase of about 10 million people who were counted as poor by the SPM because of their medical care expenses—during 2010 (Short, 2011:9).

These 10 million people who were pushed into poverty—as well as people who would have been poor even if they did not have any medical care expenses but were further impoverished by their out-of-pocket medical care expenses—represent the proportion of the population who experienced the economic burden of medical care expenses in their families' inability to meet their nonmedical needs. Over time, the SPM will be able to track changes in the extent to which individuals and families with modest or low incomes are impoverished as a result of spending on health insurance premiums and other medical care expenses that are high relative to their incomes. However, although the Census Bureau has the data available, its current reporting does not assess the extent to which families or individuals who are poor without considering medical care expenses are pulled deeper into poverty (well below the threshold) as a result of health insurance premiums and medical care expenses, nor does its reporting assess the extent to which families or individuals with higher incomes pay large percentages for medical care.

With the enactment of the Affordable Care Act (ACA) in 2010, national policy set a goal of making health insurance and medical care affordable by providing income-related premium subsidies and tax credits and establishing national standards for health insurance to ensure access with financial protection for essential medical care services. The ACA establishes four tiers of health insurance coverage that will be available through new health insurance exchanges, operated at the state level. The tiers set the minimum amount of coverage most people must have to meet the requirements of being insured beginning in 2014. They also serve as benchmarks for premium and cost-sharing subsidies provided to lower and

middle-income people who buy their own insurance in exchanges (Kaiser Family Foundation, 2011b). All qualified plans are required to insure a range of medical care services, including physicians, prescription medications, laboratory and diagnostic tests, and hospital care.

People purchasing coverage through the exchange will be able to choose among four different levels of cost-sharing, with all plans required to include an out-of-pocket maximum after which the insurance plan would cover costs in full. These levels of coverage are specified using the concept of an “actuarial value”:

- 1st tier (bronze) actuarial value: 60 percent, meaning on average a person would pay 40 percent of the costs of medical care and the health plan would cover 60 percent.
- 2nd tier (silver) actuarial value: 70 percent.
- 3rd tier (gold) actuarial value: 80 percent.
- 4th tier (platinum) actuarial value: 90 percent.

To satisfy the requirement to have insurance, people will be required to have insurance at least at the bronze level. For families with incomes of 400 percent of poverty or higher, plans in all tiers would have an out-of-pocket maximum of \$5,950 per person or \$11,900 per family.

Income-related premium assistance will be available for plans at the silver level with additional income-related cost-sharing subsidies for individuals and families with incomes below 400 percent of poverty. The ACA's income-related premium and benefit provisions are relatively more protective the nearer household income is to poverty, recognizing that such households have limited income resources to pay for either premiums or out-of-pocket expenses for medical care. As illustrated in Table 2-1, the additional cost-sharing subsidies will result in a higher actuarial value than silver for those with incomes below 200 percent of the official poverty thresholds, including lower out-of-pocket maximums. Those buying coverage on their own and not eligible for the Medicaid expansion (up to 133 percent of poverty) will be eligible for a federal subsidy to help pay for the cost of premiums.<sup>2</sup>

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<sup>2</sup>For a summary of the Affordable Care Act provisions related to health insurance and estimates for different levels of coverage, see Kaiser Family Foundation (2011a) at <http://healthreform.kff.org/scan/2011/august/national-health-council-analysis-examines-potential-cost-of-essential-health-benefits-package.aspx>. Also see Congressional Research Service reports: *Medicaid and Children's Health Insurance Program Provisions in PPACA* (2010a); *Medicare Provisions in the Patient Protection and Affordable Care Act (PPACA)* (2010b); and *Private Health Insurance Provisions in the Patient Protection and Affordable Care Act (PPACA)* (2010c). For more information on actuarial values, see <http://www.kff.org/healthreform/upload/8177.pdf>.

**TABLE 2-1** Premium Tax Credits and Cost-Sharing Protections Under the Affordable Care Act

Federal Poverty Level (2011)	Income	Premium Contribution as a Share of Income	Out-of-Pocket Limits	Actuarial Value: Silver Plan
<133%	S: <\$14,484 F: <\$29,726	2% (or Medicaid)		94%
133-149%	S: \$16,335 F: \$33,525	3.0-4.0%	S: \$1,983 F: \$3,967	94%
150-199%	S: \$21,780 F: \$44,700	4.0-6.3%		87%
200-249%	S: \$27,225 F: \$55,875	6.3-8.05%	S: \$2,975	73%
250-299%	S: \$32,670 F: \$67,050	8.05-9.5%	F: \$5,950	70%
300-399%	S: \$43,560 F: \$89,400	9.5%	S: \$3,967 F: \$7,933	70%
≥400%	S: ≥\$43,560 F: ≥\$89,400	—	S: \$5,950 F: \$11,900	—

Four levels of cost sharing:

- 1st tier (bronze) actuarial value: 60%
- 2nd tier (silver) actuarial value: 70%
- 3rd tier (gold) actuarial value: 80%
- 4th tier (platinum) actuarial value: 90%

Catastrophic policy with essential benefits package available to young adults and people whose premiums are 8%+ of income.

NOTES: Actuarial values are the average percentage of medical costs covered by a health plan. Premium and cost-sharing credits related to silver plan. F = family; S = single person.

For additional details, see The Commonwealth Fund Health Reform Resource Center: What's in the Affordable Care Act? Available: <http://www.cmwf.org/Health-Reform/Health-Reform-Resource.aspx>.

SOURCE: Collins et al. (2012).

By expanding coverage to those who are currently uninsured and by setting standards for health insurance benefits, the ACA seeks to limit not only the economic burden of medical care expenses, but also the risk that individuals or families will forgo needed medical care because of the cost or be at financial risk if they should become sick or injured during the year.

Note that the ACA provisions and poverty thresholds for tax credits for premiums and enhanced benefits apply to people under age 65. Current policies are quite different for those aged 65 and older or disabled and eligible for Medicare. As illustrated in Figures 2-1 and 2-2, for people eligible for Medicare, the threshold for eligibility for full Medicaid coverage ranges, at state option, from 75 to 100 percent of poverty for those who are aged, blind, or disabled. For those with incomes at or near poverty,

Pathway to Eligibility	Income Eligibility Level <sup>a</sup> (individual/couple)	Asset Limit <sup>b</sup> (individual/couple)	Covered Costs and Benefits <sup>c</sup>
Full Medicaid	<75% of poverty to <100% of poverty (SSI income eligibility, varies by state)	\$2,000/\$3,000 (varies by state)	Medicaid benefits, Medicare Part A and Part B premiums and cost sharing
Qualified Medicare Beneficiary (QMB)	<100% of poverty (\$10,830/\$14,570)	\$8,100/\$12,910	Medicare Part B premiums and cost sharing
Specified Low-Income Medicare Beneficiary (SLMB)	100% - 120% of poverty (\$12,596/\$17,484)	\$8,100/\$12,910	Medicare Part B premiums
Qualified Individual (QI)	120% - 135% of poverty (\$14,621/\$19,670)	\$8,100/\$12,910	Medicare Part B premiums
Qualified Disabled and Working Individual (QDWI)	<200% of poverty (\$21,660/\$29,140)	\$4,000/\$6,000	Medicare Part A premiums
<b>Optional Coverage</b>			
Medically Needy <sup>d</sup>	Must spend income down to a specified level to qualify		
Poverty Level	≤100% of poverty		
Special Income Rule for Nursing Home Residents	Institutionalized individuals with income <300% of the SSI level	\$2,000/\$3,000	Medicaid benefits, Medicare Part A and Part B premiums and cost sharing
HCBS Waiver	Must be eligible for institutional care		

**FIGURE 2-1** Medicaid and Medicare savings programs eligibility pathways and benefits for medicare beneficiaries, 2010.

**NOTES:** HCBS = home and community based services; SSI = Supplemental Security Income.

<sup>a</sup>Applicants are allowed a \$20 disregard from any income before their income is measured against the poverty levels.

<sup>b</sup>States have flexibility to modify asset limits; some have no asset limits. Asset limits for QMB, SLMB, QI, and QDWI include \$1,500 per person for burial expenses.

<sup>c</sup>Cost-sharing is covered up to the amount Medicaid pays, at states' discretion.

<sup>d</sup>Medicaid benefits may be more limited than for SSI eligibility.

**SOURCE:** Kaiser Family Foundation (2010), Figure 5.1. Available: <http://www.kff.org/Medicare/8103.cfm>.

Low - Income Subsidy Level	Monthly Premium	Annual Deductible	Copayments
Individuals with Medicare and Medicaid	\$0	\$0	\$1.10 - \$2.50/generic name; no copayments after total drug spending reaches \$6,440
Individuals with Medicare and Medicaid in nursing homes	\$0	\$0	No copayments
Individuals with income <135% of poverty and resources <\$8,100/individual; <\$12,910/couple	\$0	\$0	\$2.50/generic \$6.30/brand name; no copayments after total drug spending reaches \$6,440
Individuals with income 135%-150% of poverty and resources <\$12,510/individual; \$25,010/couple	Sliding scale up to \$31.94*	\$60	15% of total costs up to \$6,440; \$2.50/generic \$6.30/brand name thereafter

FIGURE 2-2 Medicare Part D prescription drug benefit subsidies for low-income beneficiaries, 2010.

NOTES: The 2010 poverty level is \$10,800/individual and \$14,600/couple. Resources include \$1,500/individual and \$3,000/couple for funeral or burial expenses. \*\$31.94 is the national monthly Part D base beneficiary premium for 2010.

SOURCE: Kaiser Family Foundation (2010), Figure 3.4. Available: <http://www.kff.org/Medicare/8103.cfm>.



there are various thresholds for further help with premiums or cost-sharing related to Medicare Part A (hospital) or Part B (doctor and other provider) benefits. A different set of poverty-related thresholds applies for prescription drug premiums and cost-sharing through Part D (see Figure 2-2). As a result, current national and state policies are, in effect, assessing medical care economic burden and potential risk differently for the elderly than for the under age 65 population.

This chapter describes the conceptual difference between medical care economic burden and risk, discusses why the panel thinks both measures are needed to inform national and state policy and to assess trends, and indicates why it is important to keep the two measurement efforts conceptually distinct. In our discussion of the economic burden of medical care expenses, the panel endorses the 1995 NRC recommendations regarding the approach to incorporating medical care expenses into supplemental poverty measures. Specifically, the 1995 panel recommended that a family's actual level of spending on medical care—premium payments and out-of-pocket medical care expenses—not be included in the definition of resources available to meet the family's nonmedical needs. The 1995 panel recommended that the adequacy of the family's resources to meet its medical care needs be reflected in separate measures.

As discussed below, our panel proposes building on the 1995 panel's approach to assessing burden, so as to enable policy makers to assess trends over time, by providing a retrospective assessment of how the burden of medically related expenses is changing across the income spectrum and for different population groups and different geographic areas of the country. Recommendations are provided that expand on the current SPM and recent guidance from the Interagency Technical Working Group (ITWG) (2010).

The chapter concludes with a discussion of why a measure of medical care economic risk, in addition to metrics that assess medical care economic burden, would add value and how the two approaches to assessing affordability and the impact of policy changes could support each other. Chapter 4 further develops the concept of medical care economic risk, discusses how risk measures could be useful for policy, and proposes approaches for assessing medical care economic risk.

## CONCEPTUAL OVERVIEW

Health insurance and medical care in the United States are expensive. The most recent estimates indicate that the average annual premium for a family health insurance policy reached \$15,073, a figure based on employer-sponsored group insurance, rising three times faster than wages since the start of the decade (a 168 percent increase in premiums compared

with a 50 percent increase in wages).<sup>3</sup> For low- and even middle-income individuals and families, health insurance costs have become increasingly unaffordable unless employers pay a substantial share of premiums or the household is eligible for assistance through public programs. People who seek individual insurance face higher premium costs even apart from the lack of employer subsidy.

Although expensive, health insurance is essential to ensure affordability of medical care with financial protection. Given the high costs of medical care, financial risks are very high if a family member or individual is sick or injured and the family or individual is uninsured. Indeed, the purpose of health insurance is to pool risks over the population and over lifetimes so as to protect individuals and families from being unable to afford essential care when faced with a medical event, such as pregnancy, cancer, a heart attack, or a bone fracture, or when faced with ongoing costs due to chronic disease, such as diabetes or congestive heart failure. Particularly for those with annual incomes below or near the federal poverty level (\$22,350 for a family of four in 2011) or with modest incomes within two to three times of the poverty level (\$45,000 to \$67,000 for a family of four in 2011), the costs of a significant health event without health insurance would be likely to result in the family's going into debt, forgoing essential care, or being unable to meet other basic family needs.

Having health insurance, however, is not a guarantee that needed medical care will be affordable for a family. Today, not only are employers requiring families to share more in the rising cost of premiums, but also the policies they provide have larger deductibles and coinsurance rates that make medical care less affordable. Policies sold on the individual market and in the small-group market also often have limits on the amount that insurance will pay for specific benefits or overall—leaving individuals and families fully exposed to all costs above these limits.<sup>4</sup> A catastrophic health event with limited benefits or limited coverage (for example, maximum annual caps on what the plan will pay or specific limits on benefits) can expose a family to the economic risk of poverty or bankruptcy even though the family has insurance. Such households could be considered “underinsured”—remaining at high financial risk although insured all year (Schoen et al., 2011; Short and Banthin, 1995). At the same time, being without

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<sup>3</sup>Kaiser Family Foundation and Health Research and Educational Trust, Employer Health Benefit Survey, 2011 Annual Survey, September 27, 2011, and related chartpack. Available: <http://ehbs.kff.org/pdf/2011/EHBS%202011%20Chartpack.pdf>.

<sup>4</sup>Note that limits may be of less concern in the future as a result of the ACA insurance market reforms. Starting in 2010, the ACA prohibits lifetime limits and begins to restrict the use of annual limits, which will be prohibited in 2014. For phased-in thresholds, see Commonwealth Fund Health Reform Research Center, detail at <http://www.cmwf.org/Health-Reform/Health-Reform-Resource.aspx#IntTool&cat={8A4BB2D4-0219-47D1-9CEB-1CB899A97E37}&page=2>.

health insurance coverage altogether clearly exposes families to the risk of not being able to afford their medical care.

To assess both the economic burden and the risks of medical care costs, the 1995 panel recommended two kinds of measures. It first recommended that the poverty measure (now the SPM) adjust income for taxes, tax credits, near-cash transfers, child support payments, work-related expenses, and premiums and other medical care expenses paid out-of-pocket, to look at what income would be necessary to cover basic costs of living excluding medical care. When the other income adjustments are made first and the subtraction of medical care expenses is then performed and the effects shown separately, as the Census Bureau has done for the SPM, then this becomes an estimate of *burden*, or how many more people are poor when their medical care expenses, including premiums paid out-of-pocket, are taken into account. The 1995 panel also envisioned a measure of medical care economic *risk* that would assess the family's ability to financially access available medical care needed to maintain health or for the treatment of a health crisis. The economic risk of not being able to afford one's needed medical care is reflected in either a high probability of not receiving the needed care or of not being able to meet other family needs.

Conceptually, burden and risk of medical care expenses offer two perspectives to assess the extent to which individuals and families have affordable health insurance that is adequate to ensure access to medical care with financial protection against out-of-pocket medical care expenditures including premiums. Throughout this report, we refer to burden and risk as distinct concepts and discuss why both metrics are needed and how the two can inform each other.

- Burden is a *retrospective* measure that examines actual out-of-pocket spending for health insurance and for medical care relative to a family's available income resources.
- Risk is a *prospective* measure that assesses the likelihood that a family's future out-of-pocket medical care expenditures would be high or unaffordable relative to the family's income resources. As discussed further below and in more detail in Chapter 4, the risk concept requires knowledge of whether the household has insurance as well as information about the insurance benefits and cost-sharing. It also requires knowledge of characteristics, such as health status, that predict future needed care.

Both concepts of the burden and risk of medical care expenses are based on defining what constitutes a family's resources available for medical care spending. Both concepts also require specifying how the family's medical care should be compared to their resources. One question is whether the

comparison to define affordability should be absolute (based on a difference) or relative (based on a percentage of available resources).

This chapter first looks at burden in the context of the SPM, which takes medical care spending into account, then considers relative measures of burden, and, finally, discusses the value added of developing a new measure of medical care economic risk.

## MEDICAL CARE ECONOMIC BURDEN

Medical care economic burden measures what individuals and families spend out-of-pocket for health insurance and medical care. Using poverty as an absolute threshold is one approach to assessing the affordability of medically related economic burden. Starting in March 2010, the Census Bureau added questions to its annual household survey about medical out-of-pocket expenses for insurance premiums and medical care services to use in constructing a new SPM.

### SPM Treatment of Medical Care

The SPM threshold concept for families' basic needs includes food, clothing, shelter, utilities, and a little more, but not medical care premiums or other out-of-pocket expenses. Its definition of available resources for nonmedical expenses is based on the economic concept of family income: the maximum amount of consumption that the family could achieve from current income (see Chapter 3 for a discussion of resource definitions). Unlike the official poverty measure's definition of resources that focuses on pretax income received in cash, the SPM's measure of resources is an after-tax measure of income that includes the transfer income the family received in-kind that could be used to meet its nonmedical needs. For example, the market value of benefits from the Supplemental Nutrition Assistance Program (formerly the Food Stamp Program), the Special Supplemental Nutrition Program for Women, Infants, and Children, and free or reduced-price school meals is included as a source of income available to meet the family's food needs. The market value of other government programs that provide noncash benefits to help meet the family's other nonmedical needs (shelter and utilities) is also included in the SPM resource measure. To reflect the reality that work-related expenses will be incurred by working families and will not be available for spending on nonmedical needs (food, clothing, shelter, and utilities), the SPM measure subtracts the amount of work-related expenses, including the amount of child care paid by the family (the market value of the child care up to a maximum minus any subsidy received by the family). It also subtracts child support payments for children in another household. Finally, and most importantly for the work of this panel,

the SPM measure of resources subtracts the family's out-of-pocket medical expenses (both premium amounts and the family's direct payments for any medical care utilized by the family) incurred during the year.

### **Defining Resources for Medical Care Economic Burden**

Although the SPM's definition of available resources reflects what could be spent on nonmedical needs, it is not appropriate for directly examining a family's ability to meet its past year's medical expenses. That is because the family's past year's medical spending is subtracted from its resources, and the family's medical needs are not accounted for in the SPM thresholds. A measure appropriate for this purpose would define resources available for the family's medical spending by taking its SPM measure of resources and then adding back its out-of-pocket medical spending but subtracting its nonmedical needs (that is, the SPM poverty threshold for the family).

The result of these calculations for families that do not have sufficient resources to meet their nonmedical needs would be a negative value. For these families, the amount of available resources for medical spending should be set to zero. A further complication will occur for families that receive in-kind transfers. It is possible (although not likely) that the market value of in-kind transfers may exceed the family's needs for nonmedical spending. Although the family will not be poor by the SPM measure, the value of these in-kind transfers is not fungible and consequently is not available to pay for the family's medical spending. The appropriate modification to account for this potential problem would be to start with the SPM definition of resources, then subtract both the family's medical spending and market value of in-kind transfers and then subtract the positive difference between the family's needs and the market value of the in-kind transfers it received.

It should be noted that the SPM definition of available resources and the proposed definition of resources for measuring medical care economic burden are based on a family's income and consequently do not account for the fact that the family's assets may be available to defray its out-of-pocket medical costs. Chapter 3 discusses the potential role of assets and how a consideration of easily liquidated financial assets could be incorporated into resources to assess the financial risk of being unable to meet health care needs or being driven into poverty.

It should also be noted that the SPM definition of a family, which is proposed for measuring medical care economic burden as well, begins with but extends beyond the traditional Census Bureau definition that is used for the official poverty measure. The traditional family definition includes two or more people in a household, one of whom must be the householder or reference person, who are related by blood, marriage, or adoption. Related

subfamilies (for example, a single parent and child who are related to the householder) are considered part of the family. Unrelated individuals in a household, such as roommates and boarders, are treated as single-person families, as are members of a subfamily in the household, none of whose members is related to the householder (for example, a boarder who has a family member living with him or her). Foster children and other unrelated children under age 15 are not included in any family for poverty measurement because no income data are available for them.

The SPM definition starts with the traditional definition and adds the following household members to the family: cohabitators and their children and any other unrelated children who are cared for by the family, such as foster children. This definition is broadly similar to the consumer unit definition that is used to develop the SPM poverty thresholds (Short, 2011:19). Although the SPM family definition does not necessarily correspond to the definition used for various kinds of health insurance coverage, employing the same family definition for measuring medical care burden as for the SPM is important for comparability.

### **Illustrative Effects of Medical Care Costs on Poverty**

The Census Bureau is now publishing the number and characteristics of the poor using the SPM, along with tables that show the net impact of each adjustment to the SPM estimates if all other adjustments were in effect. As shown in Table 2-2, subtracting medical care expenses from net after-tax and transfer income significantly increased the SPM poverty rate in 2010 along with the number of people considered poor with income too low to afford basic necessities.

Compared with the SPM adjusted for taxes, near-cash transfers, child support payments, and work-related expenses but not for spending on medical care or health insurance, the adjustment for medical care out-of-pocket costs increases the poverty rate for all age groups. At the same time, adjusting for taxes, transfers, child support payments, work-related expenses, and medical out-of-pocket costs results in an SPM that increases the percentage of the elderly who are considered poor and lowers poverty rates among children compared with official poverty rates.

The adjustment does not, however, take into account people with net incomes above the poverty threshold who have medical expenses that are high relative to their income and who may well be forgoing medical care, going into medical debt, or unable to meet other daily living expenses. Nor does it count the uninsured with incomes above poverty who are at risk if they become sick of seeing their net income fall below the poverty threshold.

**TABLE 2-2** Medical Out-of-Pocket Expenses and the Census Supplemental Poverty Measure

2010	Poor in Millions	Percentage Poor			
		All	<18	18-64	65 or older
Poverty rate without adjustment for taxes, transfers, or medical care	46.6	15.2%	22.5%	13.7%	9.0%
Supplemental Poverty: adjusted for taxes and transfers but not medical care	38.9	12.7%	15.4%	12.4%	8.6%
Supplemental Poverty with adjustment for medical expenses (premiums and care)	49.1	16.0%	18.2%	15.2%	15.9%

SOURCE: Short (2011).

**AFFORDABILITY: ABSOLUTE OR RELATIVE CONCEPT?**

The measurement of medical care economic burden discussed above is framed in the context of an absolute measure of affordability related to poverty, but there can also be relative measures of affordability that apply to families along the entire income spectrum.

Affordability is in fact a difficult concept to define and consequently to operationalize. There is consensus in the literature that affordability needs to be considered in relation to a family’s resources. For example, a \$5,000 medical procedure might be affordable to a high-income individual earning more than \$100,000 a year but unaffordable to someone making the minimum wage and already struggling to pay rent and cover food and transportation costs. Considering income, there are two separate measures of affordability that one could adopt:

1. **An absolute measure:** having sufficient available resources to meet the cost of one’s medical needs after meeting the cost of nonmedical needs and necessities. The research SPM is one example of such an absolute measure. Another example is the work by Gruber and Perry that assesses consumer expenditures for necessities at varying poverty-related income levels for the amount of “discretionary” income that remains after paying for other necessities (Gruber and Perry, 2011).
2. **A proportional or relative measure:** not having to spend a high percentage of available income on one’s medical needs. Relative measures of affordability require defining thresholds for what is affordable and what is not. Examples of the use of this type of mea-

sure are the work of Banthin, Cunningham, and Bernard (2008), Schoen et al. (2011), and Short and Banthin (1995), who examine medical expenditures as a percentage of income.

Thresholds for such a relative measure could also vary relative to income. For example, the Children's Health Insurance Program sets a maximum of 5 percent of income for out-of-pocket medical care expenses for families with incomes below 200 percent of poverty to reflect incomes that are already stretched to meet basic nonmedical needs. The goal is to avoid driving such families into poverty from medical care expenses. Relative thresholds could be higher for families with incomes in the middle of the income distribution and could exclude from consideration those with high incomes.

Similarly, as illustrated in Table 2-1, the ACA varies thresholds for "affordability" for premiums or protection for medical care expenses depending on income relative to poverty. For incomes below 133 percent of poverty, the law provides for full Medicaid coverage without premiums and with nominal cost-sharing. At higher income levels, the law establishes different thresholds for premium tax credits. Above 400 percent of poverty, the law in essence assumes that families will be able to afford premiums and out-of-pocket expenses given the new standards for insurance that will prevail starting in 2014—namely, bronze or better with an essential benefit package.

Comparing the two types of approaches to affordability, the panel concludes that the absolute measure is more appropriate in the context of poverty analysis because it directly incorporates other needs of the family into the measure. Consider a family that does not have sufficient resources to meet its nonmedical needs. Yet its medical needs might only represent 1 percent of its available resources. Although this is a "small" percentage of available resources, medical care is unlikely to be affordable because a family living in poverty by definition does not have sufficient resources to meet its other basic needs. Alternatively, consider a high-income family whose medical care needs represent 15 percent of its available resources, yet, if the family purchased all of their medical needs, it would still have substantial resources remaining to meet its nonmedical needs.

Although both measures rely on being able to develop measures of available resources and the medical needs of a family, the advantage of the absolute measure is that it does not require an independent determination of which thresholds to use to define affordability. In the absolute measure, the nonmedical needs of the family and its available resources define affordability, whereas the proportional measure would require a consensus on what is a "high" percentage of available resources.



The ACA in effect adopts both absolute and relative standards for affordability as families with incomes above the official poverty threshold are often living on incomes with little room for spending beyond daily living costs and relatively low payments for health insurance. For the population under age 65, the ACA expands eligibility for Medicaid with full premium support and nominal cost-sharing to individuals and families with incomes up to 133 percent of poverty (including single and childless adults) in an effort to reduce both the burden and the risk of medical costs driving the near-poor into poverty or competing with other necessities for those already poor (see Figure 2-3). Above 133 percent of poverty, the ACA sets income-related thresholds for premiums and insurance benefits that ask families to pay more as a share of income as incomes increase. The premium tax credit provisions seek to hold premiums to under 5 percent of income for incomes below 150 percent of poverty and to 6 percent to a maximum of 9.5 percent of income for incomes ranging from 200 to 400 percent of poverty. The ACA also substantially lowers out-of-pocket limits and provides enhanced actuarial value (lower cost-sharing) for those with incomes below 200 percent of poverty to guard against families being unable to afford essential medical care although insured.

In Gruber and Perry’s analysis (2011) of the potential of these provisions to make health insurance and health care affordable, they conclude that the provisions appear relatively well targeted, based on current expen-

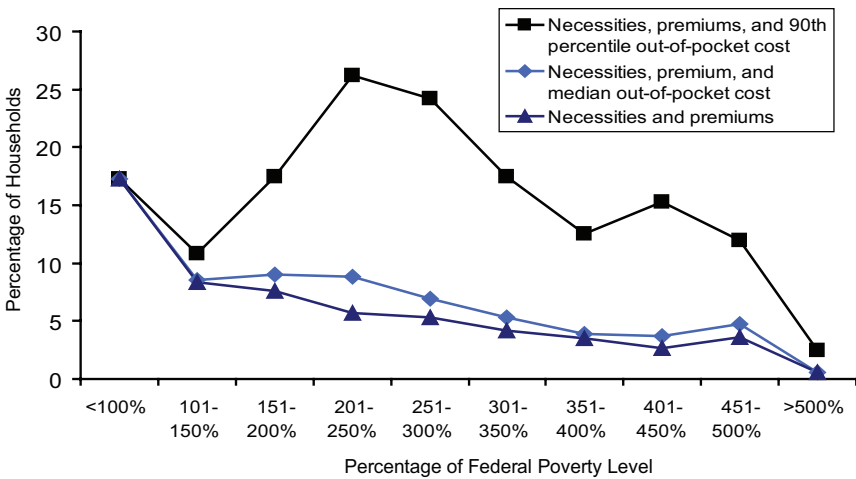


FIGURE 2-3 Percentage of households that may not have room in budget for health care costs, after full ACA implementation.

SOURCE: Gruber and Perry (2011).

ditures for other necessities. An estimated 90 percent or more of households with incomes up to 400 percent of poverty will be able to afford the costs of necessities, premiums, and average out-of-pocket costs for medical care based on current consumption patterns. However, their analysis indicates that, in the 200 to 300 percent of poverty range, those with health care needs that put them in the top 10 percent of the spending distribution could face unaffordable costs.

As the ACA insurance provisions are implemented, it will be important to have a measure of the economic burden of medical care costs (premiums and out-of-pocket spending) that assesses whether the reforms lower the burden for those with incomes near or below poverty and moderate the risk of expenditures that are high relative to incomes in the targeted poverty ranges. It will also be important to assess whether the source of high economic burdens comes from required premium payments, indicating that premium subsidies are inadequate, or from out-of-pocket medical care expenses, pointing to potential gaps in insurance benefit design. Such assessments are possible with data collected by the Census Bureau for purposes of the SPM.

The new law also relies on states to set up insurance exchanges, provide choices of plans that will be eligible for premium tax credits, and expand Medicaid. States vary in their enthusiasm and commitment to implement the legislation. Based on Medicaid's historic experiences, states also vary in how easy or difficult they make it to enroll. Thus, the extent to which new provisions for premium assistance and limits on out-of-pocket exposure for medical care succeed in lowering burden and risks for poor, low-income, and middle-income families may vary substantially across states.

Currently available data enable a cross-sectional perspective on medical care economic burden using essentially a 1-year time horizon for income and medical-related expenses. To the extent that individuals or families incur expenses in 1 year that result in debt they are paying off over time, measures related to current-year spending will capture at best the amount paid off in the current year and any new medical expenses. The measures will be unable to assess whether some households incur high expenses year after year. Because of this limit it would be useful to continue to build on the Supplemental Poverty Measure to assess and track how medical care economic burden changes over time.

## RECOMMENDATIONS FOR MEASURING MEDICAL CARE ECONOMIC BURDEN

### **Providing Additional Information in Census Bureau SPM Reports**

In the context of new national medical care policy that makes a commitment to affordability with explicit standards and thresholds, the im-

portant roles that states will play going forward, and policy differences by age, the panel recommends three actions for consideration in future Census Bureau publications to show the extent of medical care economic burden in relation to the SPM. All three recommendations assume continuation of the current treatment of medical care out-of-pocket expenses in the SPM resource definition—that is, subtracting medical spending from net income adjusted for taxes, in-kind transfers, child support payments, and work-related expenses.

**Recommendation 2-1:** The panel recommends that the U.S. Census Bureau refine its Supplemental Poverty Measure (SPM) reports and tables to include the estimated effects of medical care economic burden on poverty by component, showing the effects of premiums separately from other out-of-pocket expenses. It further recommends that the SPM reports and tables include the estimated effects of medical care economic burden by region or state, recognizing that aggregation over time or by groups of states may be necessary to obtain reliable estimates.

By this recommendation the panel supports not only showing the effects on SPM poverty estimates of the composite measure of out-of-pocket medical care spending, as is currently done, but also showing separately the effects of spending on out-of-pocket premiums and medical care costs to assess the impact of each on the SPM estimates. The panel also urges that Census Bureau SPM reports provide not only national estimates, but also estimates at the state or regional level to assess how medical care economic burden varies geographically. If state samples are not sufficient for single-year estimates, the Census Bureau should consider combining years or combining estimates for specific geographic areas that include several states, or both.

Reporting such data annually will provide an absolute measure of the number of people who become poor as a result of medical costs, the extent to which it is premiums or other spending on medical care or both that move people into poverty, and the extent to which medical care economic burden varies depending on where individuals and families live. This information will be important to efforts to track changes as Medicaid expansions and other insurance reforms unfold. It will also provide information during recessions regarding whether insurance reforms are able to protect families when their incomes fall.

**Recommendation 2-2:** The panel recommends that the U.S. Census Bureau examine medical care economic burden in its Supplemental Poverty Measure (SPM) reports and tables by providing estimates of the number of people who move from higher to lower multiples of the

**SPM poverty thresholds—including thresholds above and below the poverty level—because of their health insurance premiums and other out-of-pocket medical care costs.**

By dividing the population into poverty-related groups up to 400 percent of poverty, the Census Bureau could use estimates of spending on premiums and medical care to assess whether such expenses are moving families into or nearer to poverty or are moving already-poor families into deeper poverty. For example, after accounting for medical care expenses, how many households move from above 200 percent of poverty to below 150 percent or below 100 percent of poverty? How many already-poor families (considering their disposable income before subtracting medical care costs) are moved below 75 percent or 50 percent of poverty?<sup>5</sup>

**Recommendation 2-3: The panel recommends that the U.S. Census Bureau report findings on medical care economic burden in its Supplemental Poverty Measure reports and tables separately for the populations under age 65 and ages 65 and older.**

Very different health insurance coverage policies currently apply for those reaching age 65 and eligible for Medicare compared with the population under 65. Because of this difference, it would be useful to report all measures of economic burden and risk separately for the populations under age 65 and ages 65 and older. Another reason to show estimates separately for the two age groups concerns differences in asset holdings. There is substantial evidence (see Table 2-3) that people under age 65 with incomes at or below 300 percent of poverty have few resources (including assets) to draw on in the event of a health episode that leads to medical care costs that are high relative to their incomes (see Banthin and Bernard, in Part III of this volume). The elderly tend to have greater assets than those under age 65, although, as illustrated in Table 2-3, for those near poverty (income below 200 percent of poverty), assets, including the net value of homes, are often meager to last a lifetime. Half of the elderly in the near-poverty range have less than \$77,300 in total assets. Banthin and Bernard (Table A-2, in Part III of this volume) provide a full distribution. (See Chapter 3 for a discussion of the potential role of assets in measuring medical care economic risk.)

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<sup>5</sup>The Census Bureau in November 2011 prepared a special tabulation for the New York Times that is a limited example of what the panel has in mind. See <http://www.census.gov/hhes/povmeas/methodology/supplemental/research/SpecialTabulation.pdf>.

**TABLE 2-3 Median Total Net Assets Among Nonelderly and Elderly Households by Poverty Group, 2008**

	Under Age 65	Age 65 and Older
All incomes: Median Net Assets	\$20,151	\$146,334
Poor (<100% poverty)		
Percentage poor	13.8%	10.3%
Median net assets	\$0	\$20,686
Low Income (100-199% poverty)		
Percentage low income	17.4%	26.1%
Median net assets	\$2,341	\$77,301
Middle Income (200-399% poverty)		
Percentage middle income	31.5%	29.0%
Median net assets	\$15,518	\$136,472
High Income (400% poverty)		
Percentage high income	37.3%	35.7%
Median net assets	\$133,838	\$355,370

SOURCE: Analysis of MEPS 2008. Poverty uses CPS definition of family. Assets include the net value of financial and nonfinancial assets, including real estate. Bantnin and Bernard (2012) (in Part III of this volume).

### **Should the Census Bureau Consider Adjusting Medical Care Spending for Underspending by the Uninsured?**

Measuring the actual economic burden of medical care, as is done in the expanded SPM reports recommended here, will underestimate the impact on uninsured people who may spend less than judged medically necessary, given their health care needs, because they cannot afford medical care.<sup>6</sup> The ITWG suggested that the Census Bureau investigate the “pros and cons” for the SPM resource definition of making an upward adjustment to medical care spending for the uninsured, based on what they might have spent if insured, considering their age and health status (Interagency Technical Working Group, 2010). Such an adjustment would point out that the uninsured are at risk even if they did not incur medical care expenses.

The panel agrees with the need to include the uninsured in any assessment of people who are at risk for going without needed health care

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<sup>6</sup>In speaking about spending for medical care received by uninsured people, we mean incurring medical expenses without regard to whether the bills are paid or not. To the extent that the uninsured are unable to pay or incur medical debt and unpaid bills, the current questions added to the CPS ASEC may actually undercount medical care economic burden because the survey asks about actual out-of-pocket expenses for medical care. Efforts to assess prospective risk would look at the risk of incurring medical expenses regardless of whether the expenses are paid.

because of costs or who are potentially at financial risk if they should have an illness or injury and be unable to postpone care. Indeed, research studies regularly find that the uninsured with low incomes spend a high share of their income on health care although they also report going without recommended care because they cannot afford it. That said, the panel thinks that modeling risk prospectively should be separate from metrics that measure actual spending retrospectively. Projecting medical economic risk should take into account insurance coverage, health status, and income to predict the population at risk of potentially unaffordable costs (see Chapter 4).

The strong advantage of the SPM and annual counts of poverty rates is that all of the estimates are based on what happened as reported in household surveys—rather than estimates of what might have happened. To the extent that policies succeed in enrolling the uninsured into plans that provide affordable insurance with low or no premiums for those who are below or near poverty, with insurance choices that enhance access with protection against out-of-pocket medical care bills, the economic burden approach currently used by the Census Bureau should find a reduction in the number of people who are impoverished by out-of-pocket medical care costs as well as a drop in the number of uninsured. Similarly, for those with insurance, if policy reforms result in benefit standards that improve protection and new premium subsidies that lower premium costs, the medical economic burden approach that the Census Bureau is currently using should indicate a reduction in the number of insured families with low incomes that have high out-of-pocket medical care costs for medical care. If, however, policy reforms fail to limit premiums or out-of-pocket costs relative to income, the current medical burden approach of the SPM would indicate either no improvement or more people impoverished due to medical spending. To inform policy, it will be important for the Census Bureau's SPM data to reflect trends in actual spending—not hypothetical spending. Therefore, there should be no adjustment for underutilization of medical care by the uninsured in the SPM estimates of medical care economic burden.

**Recommendation 2-4:** The panel recommends that the U.S. Census Bureau continue to use a definition of resources for the Supplemental Poverty Measure and estimates of medical care economic burden that incorporates estimates of actual out-of-pocket spending on health insurance premiums and other out-of-pocket expenses for medical care. The Census Bureau should not model potential spending for people lacking health insurance coverage.

Contrary to the Interagency Technical Working Group's suggestion that the Census Bureau explore an adjustment for potential underuse of medical care for the uninsured, we recommend that the Census Bureau continue

to use actual spending in its SPM estimates. Assessment of potential risk should be done using separate measures of medical care economic risk that take into account such characteristics as age, health status, whether or not the family or individual has insurance, and insurance benefit designs. It will be important to keep metrics that assess burden anchored in retrospective costs—what actually happened—and distinct from measures of risk that predict medical spending prospectively to assess the population at economic risk as a result of being uninsured or inadequately insured.

### MEDICAL CARE ECONOMIC RISK

At the same time, we agree with the 1995 panel recommendations that it is important to also develop a new measure of medical care economic risk that prospectively assesses financial risk to low- or middle-income families who are either uninsured or inadequately insured given their incomes and health status. The latest data from the Census Bureau indicate that about 50 million people, 16.3 percent of the noninstitutionalized population, were uninsured in 2010 (Short, 2011).<sup>7</sup> If individuals live in families that do not have sufficient income to meet their nonmedical needs and thereby qualify as poor, it should follow that all of the uninsured who are poor will not be able to “afford” their needed medical care without facing a bigger deficit with regard to their nonmedical needs. In other words, any uninsured family or person considered poor based on income, not counting medical care spending, is at risk because the SPM poverty thresholds, by design, do not include an allowance for medical care needs and instead subtract out-of-pocket medical care spending from resources. (It is also arguable that the official poverty thresholds, first developed from 1955 data for 1963 and updated for inflation since that time, do not include an adequate allowance for today’s levels of medical care.) The SPM estimates only disposable income needed for housing, food, and other nonmedical necessities. Although the poor are at the greatest risk of being uninsured (31.4 percent were uninsured in 2010—almost twice the average rate in the population), the poor constitute only 29.1 percent of the uninsured population.<sup>8</sup> The majority of uninsured individuals (62.8 percent) live in families whose incomes are more than 125 percent of the poverty threshold. But how many of these individuals could “afford” to have their health care needs addressed? How many are forgoing care or going into debt to pay for

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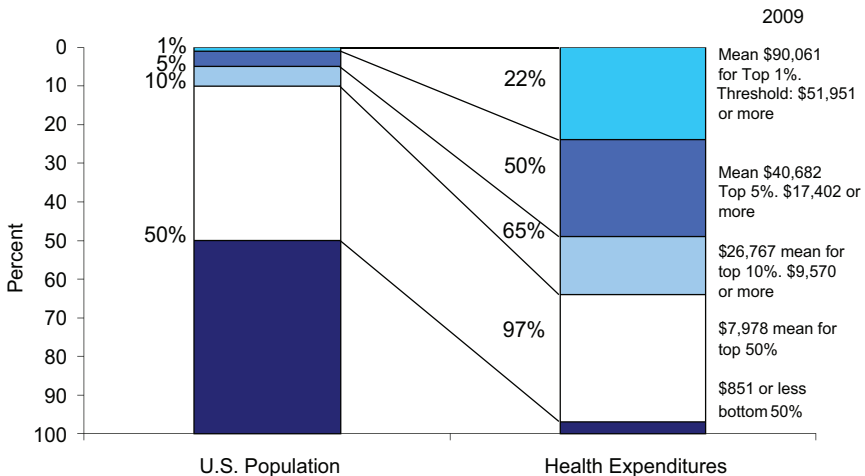
<sup>7</sup>The statistics cited were taken from the Census Bureau website and Census Table Creator: <http://www.census.gov/hhes/www/cpstables/032011/health/toc.htm>. In the P60 reports, the Census Bureau only reports the relationship between income and insurance coverage, not poverty status.

<sup>8</sup>The definition of poverty used in these statistics is the current official poverty definition, not the SPM definition reflecting the 1995 panel’s recommendations.

care or are at risk for very high costs relative to their incomes in the event of a significant health event?

The same questions apply to those with public or private insurance with policies that would provide inadequate protection in the event of a major health event, either because of very high cost-sharing, limits on the total amount the insurance will pay, or gaps in essential benefits. A measure of medical care economic risk is needed to assess the exposure to, or potential for, incurring expenses in the future.

This is especially true because of the skewed nature of medical care costs. Each year the sickest 10 percent of the population accounts for about two-thirds of all spending, and the sickest 5 percent accounts for about half of total spending. At the same time, the healthiest half of the population accounts for just 3 percent of total spending (see Figure 2-4). The spending levels for each of the groups, not surprisingly, are very different: among the sickest 1 percent in 2009, each person spent more than \$50,000, with an average of \$90,000. In contrast, the healthiest half of the population spent \$850 or less in 2009. Analysis over time indicates that a significant share of the sickest people remain “sick” in the following year—about 40 percent of the top 10 percent are in this group the following year. However, there is also substantial movement, as any major health event results in a shift in spending levels (Cohen and Yu, 2012).



**FIGURE 2-4** Health care costs concentrated in sick few—sickest 10 percent account for 65 percent of expenses.

NOTE: The means are for the respective percentiles up to that value. Thresholds indicate dividing points between groups.

SOURCE: Analysis of MEPS, S. Cohen, Agency for Healthcare Research and Quality, for NAS Panel Report, April 13, 2012.



To the extent that insurance benefits are well designed, coverage would facilitate and pay for access to essential, effective care when in need and also encourage preventive care and ongoing care for chronic disease to avoid deterioration in health status and still higher health care costs. With information about health, age, work status, and other predictors of health care needs *and* information about insurance status and type, a measure of medical care economic risk would be able to predict the likelihood that different population groups would incur high out-of-pocket medical expenses, assuming they received care based on their health needs. Conceptually, such a measure would capture the extent to which the uninsured are using far less medical care than expected given their age and health status (underutilization) and also whether insurance policies are leaving low- or middle-income patients and their families at risk of economic costs that would be high relative to their incomes if they became sick—whether or not actual spending occurred (see Meier and Wolfe, in Part III of this volume).

In combination with measures that track medical care economic burden, such a measure of medical care economic risk would add value over time by identifying the source of risk. For example, as stated earlier in the chapter, once fully implemented, the ACA insurance provisions will offer the uninsured and low-income households a choice of plans with different actuarial values (labeled bronze, silver, gold, and platinum). Because these benefit designs may be relatively standardized, it would be possible to include an additional question in such surveys as the CPS ASEC and the Medical Expenditure Panel Survey regarding plan choice level, or at some point in the future merging this information with enrollment files, especially for those who receive premium assistance.<sup>9</sup> Using a combination of retrospective data on past spending patterns, it would be possible to project risk in advance of enrollment changes (see Chapter 4 on modeling medical care economic risk and Chapter 5 on potential data sources for development and implementation of a model).

Such modeling is analogous to what actuaries do when estimating next year's premium rate for a specific population with a specific insurance benefit choice. Such premium projections include patient out-of-pocket costs as well as payments covered by the insurance plan. There are several issues in developing such a prospective measure of medical care economic risk for purposes of assessing the potential that medical care expenses could impoverish a family or lead to forgone care as a result of costs. These include having sufficient information on (1) predictors of health risks (such as jobs, chronic conditions, age and sex, past history of health problems),

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<sup>9</sup>We note that the Department of Health and Human Services is already taking steps to include on a regular basis or to test some of the information that will be required to measure medical care economic risk; see <http://aspe.hhs.gov/hsp/12/surveyenhancements/ib.shtml>.

(2) resources, and (3) the type of insurance to estimate financial exposure. With such information, as a companion to the SPM and consistent with the measure of medical care economic burden, a measure of medical care economic risk could be calculated for families (and unrelated individuals), as defined in the SPM.<sup>10</sup>

As with metrics to assess burden, a measure of medical care economic risk could be used either in conjunction with an absolute standard, such as a poverty measure, or with a relative standard, with thresholds that vary by poverty-income groups. A difference in approaches is that a measure of medical care economic risk would not necessarily have to take premiums into account, as premiums could be treated as regular recurring expenses.

Ideally, a measure of medical care economic risk would also provide information on the gains in welfare from having insurance that ensures access to essential care and that protects against economic risk when sick, at a premium cost that is affordable relative to income. For example, it could capture the extent to which patterns of care shift away from admissions to the hospital for potentially preventable complications of chronic disease or indicators of receipt of care, such as preventive dental care and early detection and treatment of cancer, that can improve quality of life and potentially avoid premature death.

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<sup>10</sup>The SPM expands the family concept used in the official poverty measure to include same-sex spouses, unmarried partners, foster children, and other unrelated children. The expanded family is designed to match or at least better approximate the family unit used in the Consumer Expenditure Survey, which is the data source for the SPM poverty thresholds (Provencher, 2011).

# 3

## Concepts of Resources

This chapter examines issues in defining resources for use in measuring medical care economic risk (MCER)—the prospective risk that an individual or family will be unable to afford needed medical care or will be at high financial risk.<sup>1</sup> In the end, the choice of a measure of resources will be tightly constrained by the choice of a survey to serve as home to a measure of MCER, and in this decision the measurement of medical care risk is likely to dominate the measurement of resources. Nevertheless, it is important to understand the key issues that exist in defining resources and the potential implications of including or excluding particular types of resources. The official measure of poverty in the United States as well as the new Supplemental Poverty Measure (SPM) are income-based and therefore more appropriately described as measures of income poverty. The resources available to families in meeting their financial needs also include assets—the product of families’ saving and investment activities over the life course. In this chapter we consider what sources of income should be included in the definition of resources in measuring MCER and whether some portion of assets should be included in resources as well. In Chapter 5, we review the strengths and weaknesses of alternative data sources for measuring resources in addition to measuring premiums and other out-of-pocket medical care costs.

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<sup>1</sup>As we noted in Chapter 2, the proposed measure of medical care economic burden, which is derived from the SPM, will use the SPM definition of resources.

## CONCEPTUAL ISSUES IN DEFINING RESOURCES

A fundamental question facing the panel is whether the definition of resources to be used in measuring MCER should be equated with either of the income concepts that the Census Bureau employs in producing the official estimates of poverty in the United States or the new SPM published in November 2011, or whether a different concept would be more appropriate. In this section we discuss the Census Bureau income concepts and some of their limitations, review two alternative income concepts (Haig-Simons and federal income tax) and a consumption-based concept, and discuss the role of assets in meeting financial needs.

### Income Concepts in Poverty Measures

The Census Bureau uses a reasonably well-defined concept of money income to produce the official, annual estimates of household income and poverty for the United States. A family's annual money income, as measured in the Current Population Survey Annual Social and Economic Supplement (CPS ASEC), is compared with a threshold value that varies by family size; the number of children under age 18; and for one- and two-person households, whether the family reference person is age 65 or older. For the SPM, the Census Bureau substitutes a measure of disposable income for money income and uses an alternative set of thresholds. The two sections below define these two income concepts, laying out what they include and what they do not include.

#### Money Income

The Census Bureau's concept of money income as applied in the CPS ASEC is defined as total pretax cash income excluding lump sum payments and capital gains (Ruser, Pilot, and Nelson, 2004). Common sources of income that may be received as lump sums and therefore excluded from money income include bequests, life insurance (both survivor benefits and withdrawals of accumulated cash value unless converted to an annuity), and cashouts or withdrawals of pension and retirement funds. In excluding lump sums, the Census Bureau distinguishes between lump sums and regular payments, implying that these are the only two ways that income from these sources can be received. With the growth of new types of retirement accounts, which we discuss below, people make periodic withdrawals that are neither regular payments nor lump sums as these terms are commonly understood. This ambiguity is one of the issues with the application of the concept of money income—particularly for the measurement of economic well-being.

Another issue is that, in being restricted to cash, money income excludes the value of noncash benefits, which have become increasingly important in sustaining a segment of the population. Benefits from the Supplemental Nutrition Assistance Program (SNAP, formerly the Food Stamp Program) have an explicit cash value, which recipients use to purchase food. The free and reduced-price meals that students receive through the National School Lunch and School Breakfast Programs have an explicit monetary value as well, although their value is more restricted in its use than SNAP benefits. Housing subsidies are another type of noncash assistance that can be assigned a value. For decades, researchers and the Census Bureau itself have used the reported value of SNAP benefits and assigned cash values to other noncash benefits in order to develop alternative measures of income for the purpose of measuring the contribution of federal and state programs to combating poverty (see, for example, DeNavas-Watt, Cleveland, and Webster, 2003; Smeeding, 1982).

### **Disposable Income**

As a general concept, disposable income subtracts taxes from a pretax measure of income. The Census Bureau's concept of disposable income, as used in the SPM, adds the cash value of noncash benefits while subtracting not only taxes, but also work-related expenses (including child care), child support payments to another household, and medical care out-of-pocket expenses (including premiums).<sup>2</sup> Disposable income is intended to reflect the income that is actually available to families to meet their economic needs for food, clothing, shelter, utilities, and other basic necessities.

### **Limitations of CPS Income Concepts**

Chapter 5 discusses a number of issues that affect the quality of income measured in household surveys. This chapter focuses on conceptual issues that contribute to the CPS ASEC underestimating income from two sources: retirement and self-employment.

### **Retirement Income**

As people approach age 65, they reduce their work hours at an increasing rate, and many move into formal retirement. As this process unfolds, earnings decline as a share of total family income and are replaced by a variety of types of retirement income. The vast majority of retirees receive

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<sup>2</sup>Work-related expenses are capped at the amount of the secondary earner's earnings.

Social Security benefits, which many supplement with income from other sources. Not long ago, many received a traditional defined benefit (DB) pension, whereby employers paid retirees and their survivors a monthly benefit for life. In the private sector, DB pensions have been largely replaced by newer forms of retirement income in which employers and employees contribute funds to pension and profit-sharing accounts that the employees manage as financial investments until they need to withdraw funds to meet needs in retirement. DB pensions generate a regular income flow, very much like Social Security benefits, but the newer, defined contribution (DC) pension plans do not. Similarly, individual retirement accounts (IRAs) allow individuals to create their own tax-advantaged savings plans completely separate from employment. Here, too, the resources that people accumulate in such plans are later tapped by making withdrawals rather than receiving fixed payments. These new options for replacing the earnings that are forgone in retirement have given rise to both conceptual and measurement issues in determining how to value the resources that these plans generate.

Withdrawals from savings, in general, are not construed as income under the Census Bureau or alternative income concepts discussed below, but the tax-advantaged savings plans that are replacing DB pensions receive a different treatment. Thus, for purposes of federal income taxes, distributions from these plans are counted in adjusted gross income (AGI)—and taxed as ordinary income—except for returns of contributions made with after-tax dollars and rollovers to other tax-advantaged retirement vehicles. Similarly, CPS ASEC money income includes regular payments from an IRA, Keogh, 401(k), 403(b), or similar thrift plan. “Regular” is interpreted by the respondent, but comparisons with fund withdrawals that can be documented with administrative data indicate that very little of what is withdrawn from these funds is being reported as income in the CPS ASEC. For example, in 2004, Americans withdrew \$139.9 billion from IRAs, excluding rollovers, according to data collected by the Internal Revenue Service (IRS) (Bryant, 2008). Of this total, \$101.7 billion or 73 percent was taxable—that is, counted in AGI. For the same year, the CPS ASEC estimated only \$6.8 billion in regular payments from not only IRAs but also Keogh and thrift plans (Czajka and Denmead, 2011). Another Census Bureau survey, the Survey of Income and Program Participation (SIPP), separates regular and lump sum withdrawals from IRAs, Keoghs, and thrift plans. The CPS ASEC estimate for 2009 was 23.4 percent of the SIPP estimate of regular withdrawals from these plans and 15.5 percent of the SIPP estimate of total withdrawals (Czajka and Denmead, 2011).

Withdrawals from the newer sources of retirement income are still dwarfed by payments from more traditional plans—namely, Social Security benefits and DB pension payments—and the CPS ASEC captures high percentages of these income sources (over 90 percent for Social Security; see

Czajka and Denmead, 2008). The mix is shifting, however, and the implication is that, without a new approach to defining and measuring retirement income from nontraditional sources, the CPS ASEC will understate the income of the elderly by an increasing amount in the years to come, which could introduce a trend toward overestimating medical care economic risk.

### **Self-Employment Income**

Theoretically, self-employment income is a net income: the revenue taken in by a business over a period of time minus the expenses incurred over the same period of time in order to generate that revenue. If a business generates inventory, then that would be factored in as well. If the business has a single owner (a sole proprietor), then all of the net income from the business should be assigned to the single owner. Alternatively, a business may have multiple partners, in which case the partnership's net income is allocated among the partners. A given partner's share of the net income is determined by that partner's ownership share in the partnership.

Determining the net income from a business can be exceedingly complex. The proprietor's tax return provides one measure, but is a tax-based measure conceptually appropriate for determining the contribution of the business to the owner's overall economic well-being? The designers of the SIPP thought otherwise. They recognized that a business owner may draw a salary from a business, which could provide a positive income flow even if the business lost money overall. Rather than measuring just the profit or loss from a business, then, SIPP included in self-employment income the salary that the owner drew from a business. The net profit or loss was added to the salary to produce a measure of total self-employment income from that business for a given reference period.

The Census Bureau has not adopted in the CPS ASEC the SIPP approach to defining and measuring self-employment income. For this and other reasons, the CPS ASEC identifies substantially less self-employment income than the SIPP. For 2009, the SIPP estimate of aggregate self-employment income was 80 percent higher than the CPS ASEC estimate (Czajka and Denmead, 2012). Most of the difference occurred among families above 400 percent of poverty, for whom SIPP self-employment income was double that of the CPS ASEC, but SIPP was higher at all ranges of relative income above 150 percent of poverty.

## **Other Income Concepts**

### **Accrued Versus Realized Income**

An issue that must be addressed in defining income is whether income is counted as it is accrued or when it is realized (Nelson, 1987). Consider, for

example, a DC pension plan. The employer makes periodic contributions to the employee's account. Each year the account earns interest or dividends or both. After many years, the employee begins to withdraw funds from the account. If income is counted as it is accrued, then the employer's contributions will be counted in the year that they are made, and the interest and dividends will be counted in the year that they are credited to the account. If income is counted when it is realized, neither the employer's contributions nor the interest and dividends will be counted until they are withdrawn. The purpose for which income is being measured determines which of these approaches is more appropriate. For macroeconomic applications, counting income as it accrues is equivalent to counting income as it is generated by the economy, and that will generally be the preferred approach. For applications to measuring the adequacy of income to meet recipients' needs, however, counting income as it is realized may be more appropriate. The distinction between accrual and realization of income will be important when we consider what to do about assets when defining resources for the purpose of measuring MCER.

### **Haig-Simons Income**

A frequent starting point for discussions of alternative income concepts is the notion advanced by Haig (1921) and later Simons (1938) that economic income is consumption during a period plus the change in net worth. Stated somewhat differently, economic income is the amount that can be consumed (over a specified period of time) without changing net worth. Implicit in this notion is the idea that a net growth in assets—or a net reduction in debt—is as much a part of income as a salary or wages. Haig-Simons income provides a useful framework for thinking about the broad range of resources that might be included in a measure of MCER.

### **Tax-Based Income**

Providing a sharp contrast to the accrual focus of Haig-Simons income is the concept of income that is applied to individuals by the federal tax code. This tax-based concept, which recognizes income only when it is realized, for the most part, is important to the discussion in this chapter not only to highlight the differences that exist in how income is defined, but also because major household surveys—including some that we discuss in Chapter 5—sometimes refer their respondents to their tax returns when collecting data on income. Tax-based concepts of income have become more relevant to medical expenditures with the passage of the Affordable Care Act, which imposes a uniform income concept defined in the tax code for determining eligibility for Medicaid, the Children's Health Insurance Pro-



gram, and the new health insurance premium tax credits and cost-sharing reductions created under the law.

AGI, which is calculated on the front page of IRS Form 1040, is the amount of the taxpayer's income that is subject to tax. Exemptions and deductions are subtracted from AGI to determine taxable income. Although there is substantial overlap between Census money income and AGI, AGI excludes some sources that are included in Census money income, excludes portions of other sources that are in Census money income, and includes some additional sources that are not included in Census money income.

The following sources, which are included in Census money income (although not necessarily well reported by survey respondents), are not taxable and therefore are excluded from AGI (Henry and Day, 2005):

- Interest and dividends on funds held in tax-deferred retirement accounts—these become taxable only when funds are withdrawn;
- Tax-exempt interest from state and municipal bonds;
- Workers' compensation;
- Veterans' benefits;
- Benefits from private disability insurance if the premiums were paid by the taxpayer;
- Public assistance and Supplemental Security Income;
- Child support;
- Assistance from friends and relatives; and
- Educational assistance used for tuition and books (i.e., educational expenses).

Of these, only tax-exempt interest is even reported on the tax return, and it appears on a separate line rather than as part of a total interest amount. If a survey questionnaire follows the tax return, then it would have to include separate questions to capture these several sources.

Moreover, the two largest components of Census money income—wage and salary income and Social Security benefits—are not fully taxable for most people and therefore may not be fully included in AGI. Taxable wage and salary income excludes pretax deductions for a variety of special purposes, which have been growing in type and total value. These include

- Contributions to a 401(k) or similar plan, which can be as high as 12 percent of gross earnings for workers who are not nearing retirement and higher for older workers, who are allowed to make contributions above 12 percent if they set aside less than the maximum amount in earlier years;
- Funds set aside for health care flexible spending accounts (up to \$5,000 annually through 2012 and dropping to \$2,500 thereafter);

- Funds set aside for dependent care (up to \$5,000 annually);
- Health insurance premiums paid by the employee (this can be well above \$10,000 annually for family coverage); and
- Transportation expenses (up to \$125 monthly for transit fares as of 2012 and even more for parking).

Amounts excluded as pretax deductions are not reported on the tax return, so a survey questionnaire that asks respondents to report amounts from their tax returns will exclude these amounts from wage and salary income unless they are collected separately. These exclusions can add up to a sizable fraction of gross income over much of the earnings distribution, although there is age variation in the use of these different deductions. Younger families are more likely to use the dependent care deduction, whereas older families and individuals are more likely to set aside large amounts for flexible spending.

Social Security benefits may be wholly or partially excluded from taxation, depending on the total amount of the benefits and the taxpayer's other income.<sup>3</sup> Unlike other nontaxable income or the nontaxable portion of wage and salary income, all Social Security benefits must be reported on the tax return so that the nontaxable portion can be calculated. A survey questionnaire that asks respondents to report their Social Security benefits could request either the total or taxable amount (or both). If the questionnaire is not explicit about which one should be reported, a respondent could report either the total or taxable benefits, and which one was reported might not be evident from the response.

AGI also includes sources that are not included in Census money income. AGI includes capital gains except for the one-time exclusion of gains from the sale of a principal residence and the exclusion of capital gains that occur within a tax-deferred retirement account until they are withdrawn from the account. AGI also includes state income tax refunds received in the prior year, gambling winnings, and all withdrawals from retirement plans—not just regular withdrawals—except when such withdrawals are rolled over into another tax-deferred plan.

### Consumption-Based Resource Measures

A number of economists argue that for the purpose of measuring the adequacy of resources for people at low-income levels, a measure based on consumption is more appropriate than a measure based on income (see, for example, Meyer and Sullivan, 2003). Income, it is said, understates

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<sup>3</sup>Railroad Retirement benefits are treated the same way, but we focus on Social Security benefits because they cover far more people.

well-being to a greater extent than consumption. This may be more a measurement issue than a conceptual one. That is, consumption tends to be reported more accurately than income among those with low income. At higher income levels, the reverse may be true. In addition, at higher income levels, people consume less of their income, so consumption will tend to understate well-being.

For the measurement of MCER, consumption-based measures are problematic, as MCER represents the likelihood of incurring medical consumption beyond what a family or individual can afford. If one includes out-of-pocket medical expenditures in the measure of resources, then such expenditures become affordable by definition. Another, more general issue with consumption-based measures of resources became evident in hindsight in the lead-up to the global recession beginning in 2008. Spending beyond one's apparent means (one's income) may indicate a risk of defaulting on future obligations—creating exactly the situation that MCER is intended to quantify. But consumption-based measures do have merit in pointing out that families that are consistently able to spend more than they take in as measured income are tapping into additional resources that are readily available. At a minimum, this should lead us to consider more directly the role of assets as resources.

### ROLE OF ASSETS IN MEETING FINANCIAL NEEDS

In the context of how people pay for extraordinary and, especially, unexpected expenses, the role of assets cannot be overlooked. Assets accumulate over a lifetime. Under models of life-cycle saving, people accumulate savings (including funds held in retirement accounts) during their working years and then draw on these savings in retirement. Savings, together with Social Security and pensions, replace the earnings forgone in retirement.

A number of researchers have used data from the Health and Retirement Study to explore the relationship between health and the accumulation of assets. Several studies focused on expenditures in the last year of life, most recently Marshall, McGarry, and Skinner (2010). Others have looked at a broader span of years. Coile and Milligan (2009) examined the response of asset holdings to acute health events and new diagnoses. De Nardi, French, and Jones (2010) investigated savings behavior as a response to potential medical costs. More recently, Poterba, Venti, and Wise (2010) assessed the relationship between health and asset accumulation among the elderly and near-elderly. Using an index of health status constructed from a combination of self-reports, diagnoses, and activities of daily living, they found positive relationships between health and asset accumulation, which imply that poor health reduces asset accumulation. These last findings are of particular interest because they suggest that individuals with poor health

not only face greater prospects of high medical expenditures in the future, but also will be less well prepared to finance such costs.

Using data from the Medical Expenditure Panel Survey (MEPS), Banthin and Bernard (in Part III of this volume) compared the distribution of net assets by relative income of the elderly and the nonelderly in 2006, 2007, and 2008 (pooling the 3 years to increase sample sizes for key subgroups). The poor and low-income elderly had substantially more assets than the nonelderly, and in the upper deciles of the asset distribution, these assets became substantial. MEPS understates net assets relative to the Survey of Consumer Finances—a survey focused on the measurement of wealth—so it is possible that sizable assets extend even lower in the wealth distribution than these findings suggest.

To exclude assets entirely from the resources used to measure MCER, and in so doing make this a measure of income-related economic risk, ignores accumulating evidence on how families prepare for potentially high medical expenditures and how well they are able to absorb them. Unlike the measurement of income poverty, which compares a family's income with a poverty threshold representing minimally sufficient expenses defined over a broad class of families, our proposed measure of MCER is intended to reflect the risk of incurring not only ordinary or expected expenses but also extraordinary expenses that are specific to each family. To meet these expenses without being pushed (further) into poverty, a family with sufficient assets could elect to draw on these additional resources. If the goal of the measure of MCER is to assess a family's ability to pay for both expected and unexpected medical care costs, then the resources component of that measure must take account of at least a share of the assets that a family could readily convert into income.

In expanding the definition of resources in this way, our goal is not to provide an alternative measure of poverty, but to assess how large a future medical expense (over the next calendar year) a family could absorb without falling (deeper) into poverty. Resources counted under a measure of MCER but not the SPM will not move a family out of poverty but will reduce the risk that a family's medical expenses could send the family deeper into poverty. We note that with the SPM definition of income, funds withdrawn from a retirement account to help cover medical or other expenditures in the prior year could in fact show up as income (depending on how the respondent interprets the questions on income from retirement accounts). Our recommendation to include a portion of assets in the resources used to measure MCER is loosely equivalent to applying this notion prospectively. Instead of counting only assets that were in fact converted to income (and from limited types of assets), however, our prospective measure of MCER would count assets that could be converted to income, and from a potentially broader array of sources.

### **What Assets Should Be Counted?**

If assets are to be included as potential resources for assessing MCER, then we must consider what assets should be counted and how these assets should be included. In determining what assets should be counted in resources, the panel considered the types of assets that families hold, the access that they have to these assets, and whether assets should be included in resources for the entire population or just a portion of the population.

#### **Types of Assets**

Assets are commonly divided into financial assets and property assets. Financial assets include checking and savings accounts, certificates of deposit, stocks and mutual funds, and a variety of retirement accounts, which are primarily tax-advantaged. Property assets include homes, vehicles, rental and other real property, and businesses. The net value of property assets is the difference between what they would command if sold and the amount of debt that is held (through mortgages and loans). Families may have other liabilities in addition to those related to the purchase of property. Such liabilities must be considered in assessing the amount of assets available for the consumption of medical care. These include the tax liabilities that would be incurred in withdrawing funds from tax-advantaged retirement accounts and from any other accounts for which withdrawals would generate capital gains.

#### **Access to Assets**

A critical consideration in determining what types of assets to include in resources and how much value to assign these assets is the extent to which families have ready access to these assets. Financial assets are more accessible, clearly, than property assets, but through home equity loans and reverse mortgages, the elderly (and even younger persons) are able to extract fungible resources from the equity that they have built up in their homes. Assets held in tax-advantaged retirement accounts present unique issues for access. First, there are age restrictions on who can withdraw funds from these accounts without incurring significant financial penalties. For example, 59-and-a-half is a critical age for withdrawing funds from retirement accounts. Second, accounts held by employers may require substantial lead time to withdraw funds, making them effectively inaccessible for meeting short-term needs. This is particularly true prior to age 59-and-a-half, although much less of an issue after that age. Third, the taxes that must be paid on funds withdrawn from tax-advantaged accounts of any type (which are generally taxed as ordinary income) may not present

an immediate issue for withdrawing funds, but they lower their effective value.

Many of the surveys that could potentially support a measure of MCER collect no asset data or limited types of asset data (see Chapter 5), so fine distinctions among asset types may be of little use in the implementation of a measure of MCER. With that in mind, the panel recommends that a share of the value of financial assets held outside retirement accounts along with the posttax value of assets held in retirement accounts be taken into consideration as resources in measuring MCER (see “Conclusions and Recommendations” section). In principle, we would also include the amount received from a reverse mortgage, and we would include it as income rather than an asset, but we recognize the limitations of existing data.

### **Whose Assets?**

For those who are still dependent on earnings to meet their basic needs, having to dip into financial assets to cover a needed medical expenditure may create a financial hardship down the road, due to a reduction in the savings needed later in life. The panel considered whether to include assets in the resources of persons at all ages or to do so only for persons who were no longer working or who had reached an age at which most people were not working. The availability of Medicare to those who reach age 65 changes the calculus for expected out-of-pocket expenditures for medical care, which affects prospective MCER when sick. For this reason, the panel thinks that MCER needs to be estimated separately for persons over and under age 65.

People retire across a wide range of ages, however, and they accumulate assets at widely varying rates. If assets were counted for all persons, regardless of employment or age, then the amount of assets accumulated—not an arbitrary cutoff—would determine the amount of assets included in resources. Other things being equal, retired persons and elderly persons would tend to have more liquid assets than those who are still working or who are not elderly, but the assets of younger persons or working persons who have accumulated more than their peers would not be excluded. Hence, although MCER needs to be estimated separately by age, the panel thinks it is a more acceptable approach to take account of assets for people of all ages and employment statuses in the estimation than counting or not counting assets depending on age or employment. However, the restrictions on access to funds held in retirement accounts prior to age 59-and-a-half would have to be recognized—by either excluding such funds from liquid assets below this age or discounting their value.

### How Much Asset Value Should Be Counted in Resources?

Treating a family's entire pool of liquid assets (as the panel defines them) as a resource that is available to offset a medical need is not a viable option, because this approach does not address the long-term financial hardship that would be created if a family consumed too large a share of its assets on medical expenditures—or any other purpose—in a single year. But if only a portion of a family's accessible liquid assets can be counted toward offsetting MCER, how should that portion be determined? We consider two general approaches and their pros and cons.

#### Asset Share

If a family's liquid assets grow at a rate of  $x$  percent per annum, on average, a family can withdraw that fraction of its liquid assets each year—minus any taxes owed on distributions from tax-advantaged accounts—without consuming principal. Adding a uniform fraction of liquid assets to income would provide a measure of resources that is consistent with a family's ability to spend without drawing down its assets at an unacceptable rate.

Banthin and Bernard (in Part III) added 5 percent of net assets to annual income in order to assess the relative burden posed by family medical expenses. Families were identified as having high burdens if their expenditures exceeded a specified percentage (for example, 5, 10, or 20 percent) of this adjusted family income. They performed the same calculation without adding assets to income in order to assess how much the inclusion of assets reduced the burden of medical expenses at different income levels. The figure 5 percent was chosen as being “very close to what financial planners advise” as a draw-down rate for families in retirement.

#### Annuitized Value

Pension actuaries have a widely accepted approach to converting a lump sum amount into an annual payment. Commonly, the annual payment grows at an assumed rate of inflation. Life expectancy, as reflected in age and sex at a minimum, is the critical variable in determining the amount of the annual payment, with an interest rate and an inflation rate being included in the calculations as well. The actuarial approach is especially well suited to assigning an income value to assets, and the key assumptions can be based on those that are used in the annual reports of the Social Security and Medicare trustees or those that are used by the IRS to calculate minimum required distributions from IRAs (see, for example, Internal Revenue Service, 2011). A critical difference between the actuarial approach and the

first approach is that it allows the share of assets that would be added to resources to grow with age (declining life expectancy). More importantly, the methodology is well grounded in theory and well established in practice.

### Pros and Cons

Defining the asset contribution to resources as a fixed percentage of asset value, rather than amount earned on assets during the most recent year, would prevent a large decline in the value of assets from producing negative family income. Likewise, calculating an annuitized value from the balance of liquid assets would also avoid generating a negative contribution during a year in which the value of asset holdings declined broadly. Furthermore, the actuarial approach is consistent with established methods of converting asset balances into income streams, which is exactly the need that we are addressing, and the assumptions that it requires could be obtained from those that are published each year by the Social Security and Medicare trustees. The drawback of the second approach is its complexity, given the limitations of the asset data to which it would be applied.

## CONCLUSIONS AND RECOMMENDATIONS

The official poverty measure uses a concept of Census money income in conjunction with a set of thresholds, originally developed as the cost of a minimum diet times three for all other needs. A new supplemental poverty measure uses a different concept of income that includes tax credits, expenditures, and certain cash-equivalent benefits in conjunction with different thresholds. We have recommended (see Chapter 2) continuing the Census approach for purposes of defining income and resources for the SPM poverty measure, including recommended additional analysis related to medical care economic burden.

A fundamental question for the panel is whether the resources used to assess prospective MCER should be equated with either of these two income concepts or whether a different concept would be more appropriate.

We find, first, that there is a growing deficiency in both income concepts with respect to the treatment of retirement income, which is critical to the measurement of resources for the elderly, which is the age group with the greatest medical care needs. If resources are to be equated with income, then at a minimum this deficiency must be addressed—down the road if not in the near term. A deficiency with respect to the measurement of self-employment income is also notable, and this affects the nonelderly population.

We find, second, that for those who have access to them, assets are a potentially important resource for meeting unexpected medical needs—



particularly among the elderly, who may be depending in part on accumulated assets to offset the loss of earnings in retirement. We recommend that a portion of liquid assets be included in the resources of all persons, regardless of age or employment status except where restrictions on access may apply (as in retirement accounts). Although the panel finds the calculation of an annuitized value from the family's liquid assets a compelling approach, we have not examined all the operational ramifications of adopting it, and thus we defer to those who are charged to implement a medical care economic risk measure. As to the choice between Census money income and disposable income, we recommend the use of disposable income, augmented by a portion of liquid assets, to facilitate comparisons with the SPM.

**Recommendation 3-1:** The panel recommends that the U.S. Census Bureau modify its concepts and measurement of money income and disposable income to better account for income flows from self-employment and from new forms of retirement income for use in measures of poverty and medical care economic risk and burden that are derived from its household surveys.

**Recommendation 3-2:** The panel recommends that, for measuring medical care economic risk, a portion of liquid assets be included in the resources of all persons, regardless of age or employment status. Only assets that the family or individual can access relatively quickly should be considered in determining the amount to be included—namely, financial assets held outside retirement accounts, the posttax value of assets held in retirement accounts, and, in principle, the amount potentially received from a reverse mortgage (treating it as income rather than as an asset), acknowledging the limitations of existing data.

**Recommendation 3-3:** The panel recommends that the method for calculating the share of liquid asset contribution to resources for measuring medical care economic risk be determined by the federal agency charged with producing the measures and that the methodology be based on one of two options—either a fixed share of assets or an annuitized value. The share of liquid asset contribution derived in this manner should be added to disposable income to provide the measure of resources for evaluating medical care economic risk.



## Measures of Medical Care Economic Risk and Recommended Approach

This chapter considers various methods, including retrospective and prospective approaches, to constructing a measure of medical care economic risk (MCER) and then outlines the panel's proposed approach and recommendations. As stated in Chapter 1, the sponsor's charge to the panel included conducting a public workshop to critically examine the state of the science in the development and implementation of a measure of medical care economic risk as a companion to the new Supplemental Poverty Measure (SPM). From the workshop, commissioned papers, and our deliberations, the panel considered retrospective and prospective measures of the risk of incurring high out-of-pocket medical care expenses relative to income, the variability of risk across populations, and the differential vulnerability of groups with different health and coverage status.

The chapter focuses on developing the concept of MCER as distinct from economic burden due to actual medical care expenses, which is addressed in Chapter 2 (see also Meier and Wolfe, in Part III of this volume). The outcome of interest is a measure of risk, for example, the expected number (or fraction) of families and their individual members who, as a result of out-of-pocket spending for medical care services and premiums, would be in poverty or some multiple of poverty as defined by the SPM. For the *medical care risk* to differ from the *medical care burden* of large expenditures, it must be based on the distribution of future out-of-pocket expenditures that an individual or family may face given their characteristics at some baseline point in time. Thus, it is inherently a forward-looking or prospective measure as distinct from the burden measure, which is both retrospective and a statement about averages rather than distributions.

In the remainder of the chapter, the panel

- sets out a more developed concept of MCER;
- reviews the merits of a refined and information-rich prospective measure as compared with a simpler retrospective measure;
- presents a retrospective measure of MCER based on the Current Population Survey Annual Social and Economic Supplement (CPS ASEC);
- sketches a prospective measure based on the 2-year Medical Expenditure Panel Survey (MEPS) longitudinal file;
- considers how best to use information about individuals to ultimately construct a family-based measure of MCER; and
- notes the issues that are not addressed by the panel's recommended strategy.

### A CONCEPT OF MCER

A core goal of health insurance is to pool risks of potentially high medical care costs across the population and over people's lifetimes. Through health insurance, families lower their financial risk and have a more predictable expense in the form of an insurance premium that, in theory, can be budgeted for as a share of income and resources. For the insured, MCER thus has two components—premiums and out-of-pocket expenses for medical care not covered by insurance. For the uninsured, MCER has only the out-of-pocket component, although the uninsured may well experience other adverse effects, such as delaying needed care and experiencing anxiety from the lack of insurance coverage. The discussion below discusses ways to assess the financial risk.

A measure of MCER is needed to answer the following questions: What kinds of health events will push families or individuals into poverty or otherwise substantially compromise their financial well-being? What is the chance of those events occurring to different kinds of families? How do such events differ for different kinds of people? Because spending on out-of-pocket expenses for medical care services is not normally distributed, other measures besides the mean and variance are needed to adequately reflect the distribution of medical care out-of-pocket spending for families with different characteristics. We have identified two different situations to use for expressing the prospective risk that a family or unrelated individual faces.

*1. One uncovered hospital stay away from poverty:* What would happen if a family had a major out-of-pocket expense, such as that for an average-sized hospitalization? Might that be sufficient to push the family

below the SPM threshold? (The answer depends on insurance coverage, out-of-pocket payments for premiums, and cost-sharing for services received.) What is the probability of such an event, given the characteristics of that family and its members, including income and type of insurance?

With employment-based coverage or either Medicaid or Medicare, the risk that out-of-pocket spending for medical care services impoverishes a family is probably smaller than otherwise. Likewise, in a relatively young population, the probability may also be small because of lower health risks. In contrast, low-income working families who do not qualify for Medicaid or employer-sponsored group insurance could be expected to pay more out-of-pocket for medical care, with a risk of falling below the SPM threshold that will vary according to family members' health. If such families bought insurance on their own, the full cost of premiums would contribute substantially to their out-of-pocket medical care spending.

*2. If family income is low enough, even a small health shock with moderate out-of-pocket spending might push an individual or family into poverty.* For those closer to the poverty threshold, it might not take much of a medical event or episode of illness to push the family to or below the threshold. Even in good health, families with incomes less than the poverty threshold are poor. What happens to people who become sick in those families?

We propose to quantify the concept of risk for a family as the estimated probability that next year's medical spending is greater than the difference between the family's SPM poverty threshold and its resources as defined for the SPM, with two differences—first, actual out-of-pocket medical care expenses would not be subtracted from resources (in contrast, the retrospective SPM poverty measure does subtract such expenses from resources); and, second, a small percentage of liquid financial assets would be added to SPM resources (as recommended in Chapter 3) as soon as there are data to make that possible.<sup>1</sup> For families whose resources defined as above fall below the SPM poverty threshold, the estimated probability is 1 (100 percent), whereas for millionaires with insurance with a maximum out-of-pocket spending limit, the estimated probability is 0. Many Americans will have some estimated probability between 0 and 1, which means that they will not be in poverty when healthy but that some possible level of medical care spending will push them into poverty.

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<sup>1</sup>Because the proposed quantification of risk is rooted in the SPM, projected medical spending needs to be calculated at the family level, using the SPM definition of family (see Chapter 2). Later in this chapter, we discuss the relative merits of family versus individual-based approaches for predicting family out-of-pocket medical care expenditures.

The measure of MCER that we propose in this chapter addresses both of the situations above: for middle-income families with a high cap on cost-sharing, family medical care out-of-pocket spending at the 90th percentile of the distribution of out-of-pocket expenditures could be enough to push them into poverty; and for families close to the SPM threshold, the 50th percentile of medical care out-of-pocket spending might be enough. From calculations based on suitable data on each family's distance to the SPM threshold and the distribution of their expected out-of-pocket expenses for medical care, one can summarize in tables or graphs what fraction of families will be pushed into poverty by expenditures of a specific size or at each level of future income as a percentage of the SPM threshold.

Furthermore, one can ask whether a particular event or set of chronic and acute illnesses would move a family down to 150 percent of the poverty threshold or any other multiple of the threshold compared with the situation when its resources were not this low and its members were healthy. One can also distinguish the effect on available resources of out-of-pocket premiums from the effects of other medical care out-of-pocket spending beyond premiums.

#### THE IDEAL VERSUS THE FEASIBLE: DATA NEEDS, TIMELINESS, AND REFINING A MEASURE OF MCER

“Essentially, all models are wrong, but some are useful.”<sup>2</sup>

To understand the effects on available family income across the U.S. population of various kinds of financial exposure to medical care costs, one needs to calculate the probability for families with particular characteristics of having out-of-pocket premiums and spending on medical care services greater than their resources minus the SPM threshold (excluding the correction for out-of-pocket spending for medical care and adding a portion of liquid assets). Ideally, the calculation would reflect the actual terms of health insurance coverage; the age, gender, and health status of family members; and the composition of the family for a large number of families.

Practically speaking, the calculation must be constructed on the basis of information that is available from MEPS or the CPS ASEC (which is the basis for the SPM calculations). These surveys, however, do not include finely detailed information on plan coverage (which affects both out-of-pocket premiums and spending for medical care services). Moreover, the annual cross-sectional CPS ASEC does not document transitions in insurance status, which can occur for many reasons, including loss of a job and changes in health status, such as the acquisition of Medicaid by a low-income

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<sup>2</sup>Box and Draper (1987:424).

woman who becomes pregnant (which would also affect her premiums and spending for medical care). The CPS ASEC has very limited information on health status and does not collect information on financial assets, a portion of which we recommend be included in resources for measuring MCER. MEPS follows families over 2 years, permitting the use of characteristics in year 1 to predict out-of-pocket premiums and services spending in year 2, consistent with the notion of risk, but MEPS has one-fifth the sample size of the CPS ASEC, and there is a significant delay until MEPS data are available for analysis.

The trade-offs in the choice between these two surveys lead to the two-pronged strategy outlined in the following two sections. See also the discussion of data sources in Chapter 5 and in Czajka (in Part III of this volume).

### USING RETROSPECTIVE DATA TO CALCULATE MCER

Although the concept of MCER is prospective, we discuss how 1 year of retrospective cross-sectional data could be used to estimate a risk measure. One does not need to have prospective data or repeated measures on a family over time to measure risk. Indeed, the retrospectively determined burden of out-of-pocket medical care spending for a given year—and the proportion of people whose medical burden pushed them into poverty last year—can be used as a simple predictor of MCER in the following period. A retrospective burden-based measure of risk will be significantly easier to calculate than the aggregate and relative likelihoods that, based on certain characteristics, families will be reduced to poverty in a future period. At the same time, a burden-based measure may not be as informative regarding the characteristics that are related to risk and the distribution of risk, as a prospective measure that is developed with 2 years of panel data for the same families. We draw these distinctions out below.

#### Using Cells with 1 Year of Data

In principle, one can develop estimates of MCER based on cells of families with similar characteristics or by multivariate regressions of family-level out-of-pocket medical care spending.<sup>3</sup> Each of these methods, regression and cell-based, can be interpreted as a metaphor for what insurance does. The regression approach can be seen as people investing in their own future, with small losses from the premium when health spending is low transferred to pay medical bills in the less frequent periods when spending

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<sup>3</sup>The cell-based approach can be thought of as a regression model with mutually exclusive categories. We use the term multiple regression to describe models that do not necessarily have mutually exclusive categories or cell indicators.

is very high. The cell-based approach can be seen as people getting together so that those who are fortunate in health, with low out-of-pocket spending, subsidize their unlucky neighbors.

Cell-based approaches group similar people or families into cells, and then they use the medical care spending experience of the members of a cell (this year's experience to create not only a measure of burden, but also one of risk) as a proxy for the range of possible outcomes for each member of the cell (next year's risk). If all the families in a cell are equivalent *ex ante*, as reflected in base-period health status, demographic characteristics, insurance coverage, and income and other resources, then the average of their experience on out-of-pocket expenditures is an estimate of burden. For risk, one can use the observed dispersion across the families within the cell or estimate the probability that some family reaches one of the common poverty thresholds (50, 100, or 200 percent of poverty). The observed probability of an out-of-pocket expenditure sufficient to take the family below the poverty threshold is an estimate of the risk for each member of the cell because the cell is homogenous in terms of observable characteristics and risk adjusters.

The advantage of this method is that it needs only 1 year of data, which has two benefits—timeliness and allowing the use of nonpanel data like the CPS ASEC.<sup>4</sup> A disadvantage is that because nonpanel data sources systematically exclude recent deaths and those who have entered institutions in the immediate past time period—two groups known to have high health expenditures—it will be necessary to use other data sources and the relevant literature to provide an estimate of the missing information for those two transitions and their impact on out-of-pocket medical care spending. Although decedents and institutionalized people are not in poverty, the transitions to death and to institutions will often impose major drains on their families' resources and could push other members of the household into poverty.

The cells for the retrospective measure must be formed on the basis of characteristics that predict spending. These characteristics and their weights used to build cells typically come from preliminary analysis using a regression approach that calculates an individual's expected payments based on observable characteristics in a prior year (including diagnoses or other health information) from other data sources, such as MEPS. A problem is that, to actually produce the estimates of retrospective MCER from a data source such as the CPS ASEC, the characteristics that predict

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<sup>4</sup>As discussed in Chapter 5, the CPS employs a panel sample design in that monthly samples rotate in and out of a sample on a schedule that ensures that 75 percent of the sample addresses in a given month were included in the previous month's sample, and 50 percent were included in the sample 12 months earlier. The purpose of this design feature is to reduce the sampling variance for estimates of month-to-month or year-to-year change—not to enable longitudinal analysis. The limitations of the CPS ASEC for longitudinal analysis—and why we do not propose such use here—are explained in Chapter 5.



out-of-pocket medical care spending must logically be defined at the start of the year in that data set. So, cells cannot be defined by current spending because that would produce overly small observed variation in spending. Similarly, health characteristics and the risk adjustors based on them that predict spending may be the result of health shocks throughout the year and not defined at the start.<sup>5</sup> In most data sets, some covariates are measured before and some measured afterward. For example, one typically knows income at the end of the year, not before.

If in the past year a given percentage of families had out-of-pocket spending for both premiums and care received, then one could use data on the expenses incurred to say that families with certain characteristics were more or less likely to fall below the poverty threshold last year. If the world were in a steady state—that is, there were no changes in the general cost of care, insurance plans, mandates, or the business cycle—then that retrospective analysis would provide a consistent prediction as long as the covariates were measured at the start of the year. Two-year panels solve this problem by using first-year information to predict second-year behavior.

In the CPS ASEC, one could use also logistic regression of an indicator defined as out-of-pocket medical care spending greater than or equal to the difference between SPM-adjusted income (without the subtraction of out-of-pocket spending) and the SPM family characteristics. The same caveats on when predictor variables are measured would apply.

### An Initial Retrospective Measure of MCER

In the short term, with the data now being collected, the CPS ASEC could be used to report the burden of out-of-pocket medical care spending retrospectively, roughly 10 months after the end of the calendar year for which income and spending are reported. Furthermore, with additional assumptions, the retrospective measure of burden could serve as a proxy for the prospective MCER: for example, if  $x$  percent of families and individuals were moved into poverty this year, then the same  $x$  percent is the best estimate of those who will be in poverty next year, assuming no other major policy initiatives or differences in the business cycle.<sup>6</sup>

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<sup>5</sup>If one develops risk adjusters for health conditions based on 1 year of health experience and uses that experience to explain expenditures for that year, one would arrive at a biased assessment of the variance because the covariates are not independent of the out-of-pocket spending (see Manning, Newhouse, and Ware, 1982).

<sup>6</sup>The preliminary analysis of MEPS, discussed below, could help to identify which family characteristics were most important in predicting out-of-pocket medical care expenditures. Instead of relying on parametric models, the probability of a family being at or near poverty could be determined empirically if risk cells were based on particular family or individual characteristics.

Using the range of cell mates' experience this year as the distribution of possible expenditures next year for each individual or family in the cell permits the calculation of distributions with only 1 year of cross-sectional data. Cells would be defined by families' characteristics as close to the start of the year as data permit so that the rest of the year is prospective to those definitions. Individuals could be grouped into cells by predicted next-year expenses. Handel (2011), for example, uses adjusted clinical groups (a case-mix system based on claims-defined diagnoses) together with other characteristics to do this, but the diagnosis cost groups form of risk adjustment system, RxRisk (a risk assessment instrument that uses automated pharmacy data systems to characterize chronic conditions to predict future costs), or some combination of relative risk algorithms could also be used (see the description of methods for the Dutch health insurance system in van de Ven et al., 2007, for a mixed risk equalization/adjustment system). Either total expenditures or discrete types of expenditures could be grouped.<sup>7</sup> The Gaussian copula methods used by Handel to combine different types of spending could be adapted to account for within-family correlation in grouping individual out-of-pocket medical care spending into a family-level variable.

To estimate the full range of spending next year from this year's data, one must adjust for the general increase of spending to be expected next year, and for any people missing from the data. If the survey does not include people who died or entered institutional care during the year, their numbers and risk of spending experience could be estimated separately based on cell characteristics and the outcomes for these virtual people (who are missing at the follow-up survey) added to the range of possibilities in the cell for those who survived or who are in a noninstitutional setting by the end of the year. One could either base the cells on out-of-pocket spending or base them on total spending, and then use a standard insurance policy or actual terms of coverage to calculate the resulting out-of-pocket spending.

Each member of the cell would be assumed to have the same distribution, which should be acceptable for combining with their family resources and thresholds to calculate percentiles in the tail of the distribution that

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<sup>7</sup>In the absence of detailed information on different coverage for different types of health care services, it may be sufficient to examine out-of-pocket expenditures combining all of the types of care or to group classes of insurance into the following categories: uninsured, public based on poverty or categorical eligibility, Medicare, group insurance. We are not aware of any major national data set that contains the level of detail on coverage that Handel (2011) has and that also has an adequate response rate and spans the age range necessary for this task. See the work of Goldman and colleagues on the Future Elderly Model, a demographic and economic simulation model designed to predict the future costs and health status of the elderly, at <http://roybal.healthpolicy.usc.edu/projects/fem.html>.

represent *medical care economic risk*. If the cells are big, say 200 cases, then experience within the cell will be a good estimate over the entire distribution. If the cells are small or if one wants to know more extreme tails, one will have to model them, or combine experience on rare events from many cells.

### A PROSPECTIVE APPROACH BASED ON 2 YEARS OF DATA

Because this feasible set of calculations based on the annual CPS ASEC is somewhat informative, why should we continue to pursue construction of a prospective measure of MCER? What could be its added value? With its richer data on health conditions, distribution of medical care spending by service type, and 2-year panel, MEPS offers the opportunity to learn much more about the interplay of health status, health insurance, and out-of-pocket medical care spending with respect to family finances as well as to more accurately assess how risk varies with health. Over the next several years, as the landscape of health insurance coverage in the United States undergoes substantial change, understanding the underlying drivers of families' choices of insurance coverage and their out-of-pocket health care spending and the effects on their resources will be extremely important.

With 2 years of data, as are available from MEPS, one can employ multivariate regression methods to develop predictions about expected outcomes or their distributions. The difference between this and the cell-based approach is that, with cells, one does not share information across different groups. In regression, however, the estimated model has a more limited specification and shares information across observations, under the assumption that the response to individual covariates can be jointly modeled. In reality, these methods are not exclusive alternatives. With limited data or if one combines responses across individuals in the same family, acquiring meaningful detail on risk may require a mixed approach.

Another alternative is to use data on second-period expenses and base-period characteristics together with multivariate regression methods to estimate the probability that a family with given income and resources, family composition, and health will have an expenditure large enough to push the family to the poverty threshold. In the absence of sufficient research on the distribution of out-of-pocket costs relative to SPM thresholds, it will be necessary to do that work empirically.<sup>8</sup> For example, one would expect that a working poor family with one or more members in fair or poor health might have a substantial risk even without a hospitalization or high-cost drug regimens. An emergency department visit or a flare-up of a chronic condition might be enough to drop the family below the threshold.

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<sup>8</sup>See the recommendations for research in this area on the following pages.

Moreover, if one allows for the baseline list of covariates to include insurance status but does not model the impact of next year's expenditures as if that family maintained its baseline insurance status, one can avoid the concern that some individuals could have a moderate or very large health care expenditure that would lead them to be eligible for some programs (such as Medicaid) and thus have lower out-of-pocket medical care spending than if the same events had to be evaluated with baseline coverage.

### Needed Research for a Prospective MCER Measure

The truly prospective measures that require 2 or more years of data, or with surveys that have complete baselines, imply moving away from the more timely CPS ASEC to other data sources. Here, there are a number of issues of limitations with currently available data. Just as important, however, is the dearth of relevant literature on which to base the models. Although substantial data are available on how mean expenditures of individuals respond to such individual characteristics as age, gender, and health and to such family characteristics as income and insurance status, there are very few data on the responses in terms of distributions or variances at either the individual or the family level. In the case of single-person families, there is no issue. But how does one combine the information across family members, when ages and health status vary so much across different family members? What types of statistical or econometric models perform well?

Of equal importance is the dearth of information on what factors predict out-of-pocket medical care spending. Clearly, insurance status will play as large a role as prospective illness, but not much work has been done on this. The panel found that although much is known about total health care expenditures, very little is known about family and individual covariates that predict family out-of-pocket medical care spending or family finances. This situation dictates an analytic agenda before highly specific recommendations can be made on a prospective measure of MCER.

Health services researchers and health policy analysts have substantial experience with mean expenditures adjusting for observable individual and family characteristics at the individual level. There is much less work that has been done on out-of-pocket medical care spending at the individual level.<sup>9</sup> The panel's examination of out-of-pocket medical care spending (excluding the out-of-pocket premium) from the MEPS data on adults in 2004 suggests that out-of-pocket spending for medical services has the usual health expenditure characteristics (Banthin and Bernard, in Part III

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<sup>9</sup>A notable exception is the work by Dana Goldman and his colleagues on the Future Elderly Model. That study does not deal with general noninstitutionalized population, however (Goldman et al., 2004).

of this volume). There are zeroes for those who do not use health care services or have very generous policies. For those with any out-of-pocket spending, their spending is skewed, but not as skewed as total expenditures. The skewness is probably large enough to require attention. Whether the statistical methods used for total expenditures would be the same as for out-of-pocket expenditures either in degree or kind is not known.

We do not know which variables matter for out-of-pocket medical care spending. We suspect that chronic disease and age will matter because prescription drugs may not be fully covered by insurance. Because the fraction of the population with mental health or dental coverage is less than that with medical care coverage, one would expect that mental health status and oral health would affect out-of-pocket spending for medical services.

To get at the variability in the burden, one can look at the retrospective burden variance within cells, or one could employ multivariate methods for the variance of expenditures conditional on characteristics. Although models for conditional means of expenditures given characteristics of the family and its members are common at the person level, they are not at the family level. This may require some work for the variance function. But given the skewed characteristics of out-of-pocket medical care spending, it will probably not be sufficient to look at the mean and variance of such spending and total health expenditures at the family level. One would need to observe responses to deductibles and stop-losses to assess the impact on out-of-pocket spending. This has been done by Keeler and colleagues (1988) for the RAND Health Insurance Experiment. But that study required much more extensive modeling of behavior than one would expect the U.S. Census Bureau to do, or it would require more detail on insurance plan details than is commonly available.

As noted, for the mean family burden, one has only to add the conditional means for the individuals as long as the individual means condition on family composition and income. But for the distribution of out-of-pocket medical care spending or its variance, it is more complicated than keeping track of means, variance, and covariances among the family members.

Because there is much to learn about the drivers of out-of-pocket medical care spending for families of varying size, composition in terms of ages, health status, insurance coverage, and resources, we recommend a series of analyses based on MEPS to test out various alternatives and to answer such questions as what factors (e.g., chronic conditions) add to the predictive value of previous spending for future out-of-pocket spending. Such analyses are also needed to answer a series of questions about which approach to use in modeling a family's out-of-pocket medical care expenses and risk as a function of individual characteristics (age, gender, health status) and family characteristics (income, insurance status—which may vary by family subunit). Past research on mean or adjusted health expenditures indicates

that the most predictive of variables include age, gender, and health status (status per se or case-mix and severity). But in moving to measures of the family distribution of out-of-pocket spending or its variance, how does one combine individual data into a meaningful model for the family? There is very little guidance on this score in the literature.

The panel thinks that the U.S. Department of Health and Human Services needs to consider several possible alternative analyses to help better understand these issues. The Agency for Healthcare Research and Quality, the Office of the Assistant Secretary for Planning and Evaluation, or both agencies need to perform a series of analytical studies using MEPS. The results of these analyses can be used to inform the move from a purely retrospective approach that uses medical care economic burden as a proxy for risk to an approach that estimates risk directly.

These studies should include an analysis of both the cell-based approach to estimating the expected amount of spending and the use of regression methods to understand the expected risks; both are important to the development of appropriate alternatives to the short-term strategy that we have offered. The needed analyses should address the following questions:

- At the family level, how does current out-of-pocket medical care spending or its two major components (out-of-pocket premiums and other out-of-pocket payments for services) predict next year's out-of-pocket spending? How stable is this relationship in the near term?
- If one expands the covariate list to include other family characteristics besides the first-year out-of-pocket medical care spending, what relationships can be seen in terms of predictive ability?
- Because individual characteristics are the strongest predictors of future average expenditures, how does one roll up individual predictions into a composite family measure that is predictive of future family out-of-pocket medical care expenditures? If there is an indicator for having a chronic disease or cluster of diseases for any member of the family, how well does this (and similar family constructs based on individual health characteristics) predict future out-of-pocket spending in the prospective measure or explain burden in the retrospective measure?
- If one begins with the distribution of individual expenditure distributions net of observed individual and family characteristics, how does one best combine these into the family's distribution around its expected amount? The Handel (2011) approach has some promise, but one needs to know how well that approach actually approximates the family's distribution, especially in the

context in which different family members may have different insurance coverage.

- As an alternative to regression methods, a cell-based system needs to be developed based on a few characteristics of individuals within families and family characteristics. This may be coarser than what one would get with an ASEC cell-based approach because of the limited number of characteristics and sample sizes available.

In all of these cases, the panel is concerned about the overall distribution of out-of-pocket medical care spending more than the overall mean prediction. We are also interested in recovering the likelihood that a family with given characteristics will have an out-of-pocket spending large enough that its SPM-adjusted income less that spending falls below the poverty threshold or some specified multiple of poverty, such as those embedded in the Affordable Care Act (ACA).

**Recommendation 4-1:** Given what limited work has been done in the field on issues in measuring medical care economic risk (MCER) prospectively, the panel recommends that appropriate federal agencies—the Agency for Healthcare Research and Quality, the Office of the Assistant Secretary for Planning and Evaluation, or both—perform a series of analyses using the Medical Expenditure Panel Survey to examine different prospective MCER measures.

These analyses would include different approaches to determine their relative performance. How does a coarser cell-based system compare with results based on multivariate regression? What is added by including more family and individual characteristics? How well do methods such as Handel's approach perform compared with the specific (retrospective and prospective) approaches we suggest?

**Recommendation 4-2:** The panel recommends that the results of the analyses from Recommendation 4-1 be used to inform the move from a purely retrospective approach based on burden to a more prospective approach for measuring medical care economic risk.

Note that MEPS would be used for this comparison for three reasons: (1) it has multiple waves of short panel data available to start working with; (2) it has good measures of both health and medical care spending in one survey compared with other general population surveys; and (3) it separates out-of-pocket spending into premiums and spending on services. One would expect that as more people are covered or those who are covered have better insurance, the out-of-pocket premium component will rise

while the nonpremium component will fall because the demand for health care has been shown to be inelastic with respect to the out-of-pocket price (Newhouse et al., 1993). Understanding the impacts of the two separately as well as jointly would inform policy choices.

### SPECIFIC ISSUES IN ESTIMATING MCER

We discuss below in more detail three specific issues in estimating medical care economic risk, which will need to be addressed in the analyses we recommend: family versus individual approaches to estimating MCER for a family unit, allowing for insurance plan choice and determining the predictors of choice, issues of selecting variables for cell determination or as covariates, and data and estimation issues.

#### Family Versus Individual Approaches

Our outcome of interest is the impact of MCER on family income, particularly for those families with relatively low incomes, who may be pushed below the SPM level by relatively high out-of-pocket medical care spending. However, one can predict family out-of-pocket spending from data on individuals in two ways. If one sums up individual spending into family spending before doing other analysis, one can try to estimate the family spending directly based on such family-level variables as age-gender mix, family composition, income and assets, and the mix of underlying health conditions, comorbidities, and severity of health conditions. Alternately, one can start with predicting the out-of-pocket medical care spending of individuals based on individual characteristics and then combine those predictions for each family.

It is generally easier to define a set of variables to predict future total or out-of-pocket medical spending for the individual than it is to define such variables for the family unit. Predicted individual out-of-pocket spending must then be combined for all family members to get back to family spending and to assess the likelihood that the family's out-of-pocket medical care spending will cause it to fall below its SPM threshold. The estimated means for the family members can simply be added. However, the variability in out-of-pocket expenditures and more generally the distribution of family-level expenses also depend on the correlation among family members, which can reflect the family's response to the joint budget constraint (because income is shared among individuals) or unobserved commonalities in preferences or health status. Thus, a method is needed for mapping from individual distributions to a family distribution that reflects the correlation in the underlying out-of-pocket (or total) expenditures of family members. If family members' spending is positively correlated, the variance of the sum is greater than the sum of the variances of constituent members.



Similarly, it is harder to create cells of families whose spending is expected to be similar next year than it is to create cells of individuals with similar expected spending. In both cases, starting with families gets the correlation of family expenses automatically—but at a cost in sample size and in difficulty of defining the predictors. Moreover, past research has typically shown that the major drivers of mean expenditures are individual characteristics—age, gender, diagnoses, severity, and health status. Meier and Wolfe (in Part III of this volume) offer motivation for starting at the individual level and then aggregating to the family, taking an approach with some similarities to Handel’s Gaussian copula methods (2011). Parts of their argument seem eminently reasonable, not only because major determinants of out-of-pocket spending are individual (age, health status, and health shocks), but also because insurance coverage can vary for each family member.

A reason to favor a family approach is that joint decision making within a family about medical spending can be embedded in or overlap with insurance coverage and common access to family resources. Major determinants of health are not only individual (age, gender, and health status), but also family (collectively managed income and assets). For example, a family may not be eligible for Medicaid as a whole, but the children could be eligible for the Children’s Health Insurance Program and either or both parents could be eligible for health insurance from work or other sources. The family thus makes decisions subject to the terms of the separate insurance plans and an overall family budget constraint for out-of-pocket medical care spending and spending on other goods and services net of taxes and transfers. In addition, health shocks to one individual may be partially covered by his or her insurance, but the remainder will be paid with resources that could be used for the whole family in terms of health or other goods and services subject to relevant budget constraints.

### **Allowing for Insurance Choice and Predictors of Plan Choice**

Although it is probable that choices and change in coverage will continue to occur, it is much easier to calculate burden and risk if families are assumed to stick with whatever coverage they have. If instead they are offered a menu of insurance choices, the model must decide whether to build in inertia (generally by assuming that only a random subset of families think about switching) and what criteria the families will use to make choices. Predicting plan choice needs to reflect both economic rationality and reality and so should ideally reflect out-of-pocket premiums, out-of-pocket spending on services, financial risk aversion, anxiety about difficult decisions between spending and health, and the value of care. If premiums are experience-rated, modelers must decide how quickly premiums are updated, which in turn affects adverse selection, death spirals, and other

market problems studied in this literature (Handel, 2011; Keeler, Carter, and Newhouse, 1998; Rothschild and Stiglitz, 1976).

### Issues in Selecting Variables

Analysts need to be mindful of issues regarding the variables to be used in the cell determination or as covariates. One issue is that income and insurance are jointly determined with health care use. For example, there are time costs and losses in income that will be incurred if a person does not have full sick leave when visiting the doctor or recuperating from illness and hospitalization; see various reports from the Employee Benefit Research Institute showing the substantial fractions of workers without such coverage over the years. The sicker one is, the larger the loss if not covered by full sick leave. As another example, if a person qualifies for special insurance coverage due to pregnancy or to being categorically eligible (such as for renal dialysis), then he or she may be insured and have lower out-of-pocket expenditures than would otherwise be the case. Some programs confer coverage retrospectively. Eligibility is also complicated by income and asset criteria.

For estimating risk from a rate cell, the cell cannot be formed on the basis of insurance status or by income or assets. It can be formed on the basis of family composition, health status, completed education as a proxy for future income, and the likelihood of having coverage from the beginning of the year or baseline (using coverage information available at the end of the year may be a necessary stopgap approach in the short run).

For the regression approach, one can include prior-year covariates as predictors of what will happen in the second year, but these characteristics may not hold in the second period. If a family has some Medicaid coverage in the first year, it is more likely to have coverage in the second year, but that is not guaranteed. Similarly, if a family has low income due to ill health in the first year, it is more likely, but not guaranteed, to have it in the second year.

We emphasize that the risk analysis will be quite different from more traditional burden approaches used for descriptive work or work that adjusts for certain characteristics. Those efforts typically do not deal with cause and effect directly but are merely partial correlation work used for descriptive purposes or to assess differences across groups of social or policy interest.

### Data and Estimation Issues

There is a trade-off between the cell-based and multivariate regression approaches when the sample size is not large enough to create crisply

demarcated, homogenous cells. Without enough observations to use cell experience for setting probabilities, we need to say something about how coarse cells compromise the goal that we want and that could be achieved with a larger data set.

Most of what has preceded in this discussion works under three assumptions: (1) there is sufficient information on family structure and income and on the health and details of insurance coverage of each of the members of the family; (2) a health shock is not enough in its own right to change the nature of one's coverage—in other words, one cannot be eligible for some insurance policy or public program by the nature of the health event (counterexamples include blindness, pregnancy if low income, and renal failure and dialysis); and (3) there are enough sample cases of families with the same family structure, income, coverage, and health status that one can identify equivalent or very nearly equivalent families to form a risk cell sufficient to use the observed distribution as a source of the risk cell specific distribution.

As a practical matter, the assumptions regarding data are not likely to hold with current large-scale data collection efforts (see Chapter 5). Most data sources do not include detailed information on eligibility and coverage provisions for either public or private insurance. Most data sets that would have sufficient information for common risk adjustment methods are small relative to the number of combinations of age, family structure, and health of families that would be needed.

Another concern is that most of the common risk adjusters are statements about expected amounts of spending, not the distribution of that spending, based on small or modest sample sizes, using multiple waves of the data. Thus, any risk classification system needs to be able to handle coarse risk cells for individuals and to find a method for combining data on individuals with varying risks internally within families. This may require the health equivalent of the family composition algorithm used in the calculations of the SPM thresholds. Then the question becomes: Is the family-equivalent health risk a weighted average of the individual risks that reflect measures of how well baseline health predicts subsequent expenditures? How well does such a measure forecast both family means and variances? If one were to address only single-person families, how well does current expected experience also affect the variability in that number?

#### ISSUES CONSIDERED BUT NOT ADDRESSED IN THE MCER PROPOSED APPROACH

Four issues that the panel considered but decided not to address in its proposed approach for developing an MCER measure are summarized below.

- Defining out-of-pocket medical care spending as some percentage of family income. As discussed in Chapter 2, we decided to rely on multiples of the SPM poverty threshold for assessing the effects of MCER, rather than to measure affordability as a percentage of income and other resources.
- Geographic variation in out-of-pocket medical care spending due to variation in both prices and quantities. The panel has not made any recommendations on geographic variation. The original poverty measure has the same set of thresholds nationwide. The SPM varies the thresholds geographically by differences in housing costs. However, given both the unsettled issue about geographical variation in health expenditures generally and in terms of how payments for Medicare in particular should or do vary, we think a decision to introduce geographic variation into the MCER should wait for results from both the current Institute of Medicine studies on geographic variation and adjustment.<sup>10</sup>
- Underspending by uninsured and inadequately insured people. As discussed in Chapter 2, this proposed measure looks only at financial risk, not the health risks and broader implications for family well-being of forgone health care as a result of inadequate coverage.
- Predicting the impact of different insurance plans on out-of-pocket medical care spending and total spending. Available data do not support detailed analysis of the effects of various types of insurance coverage on medical spending by families and individuals, although it would be desirable to model these effects so that the impact of changes in coverage could be assessed.

If it were possible to obtain the necessary data on insurance plan details, it would be desirable to model the effects of changes in those details—for example, when premiums rise and to the extent that families have to pay for part or all of their premiums out-of-pocket, their medical care economic burden increases; if there is a move to a high deductible plan, the risk from out-of-pocket expenditures may increase. It would also be desirable to model the effects of changes in copays, coinsurance, and stop-losses (out-of-pocket maxima) on families' share of costs or limits on covered benefits. When a family's share declines, other things being equal, its burden and risk would decrease except that members may have incentives to obtain more care of

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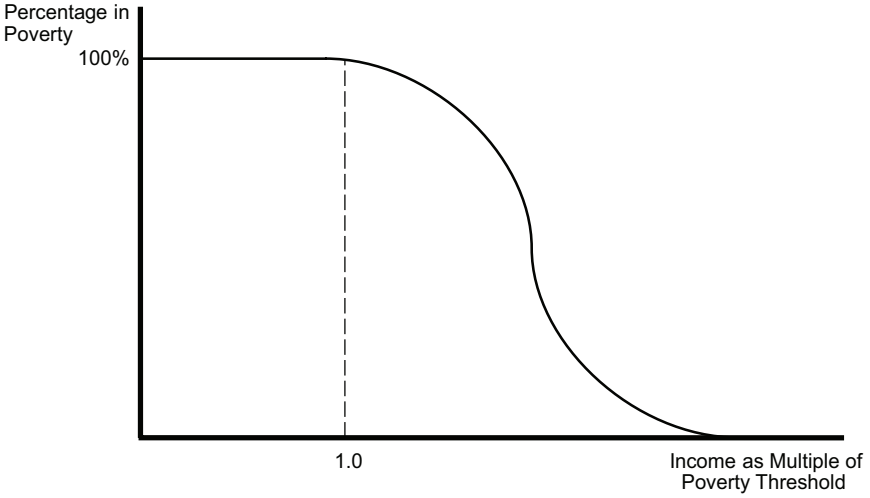
<sup>10</sup>IOM Committee on Geographic Adjustment Factors in Medicare Payment (see <http://www.iom.edu/Activities/HealthServices/GeographicAdjustments.aspx>) and Committee on Geographic Variation in Health Care Spending and Promotion of High-Value Care (see <http://www.iom.edu/Activities/HealthServices/GeographicVariation.aspx>).

incremental value to them (the incremental value is the positive difference between their marginal out-of-pocket price and the marginal cost of those resources in the health care market). This additional care has some benefit, but must be paid for out-of-pocket or by the insurance pool's premiums without a compensating change in premiums to that patient or family, or by compensating changes in take-home income/wages.

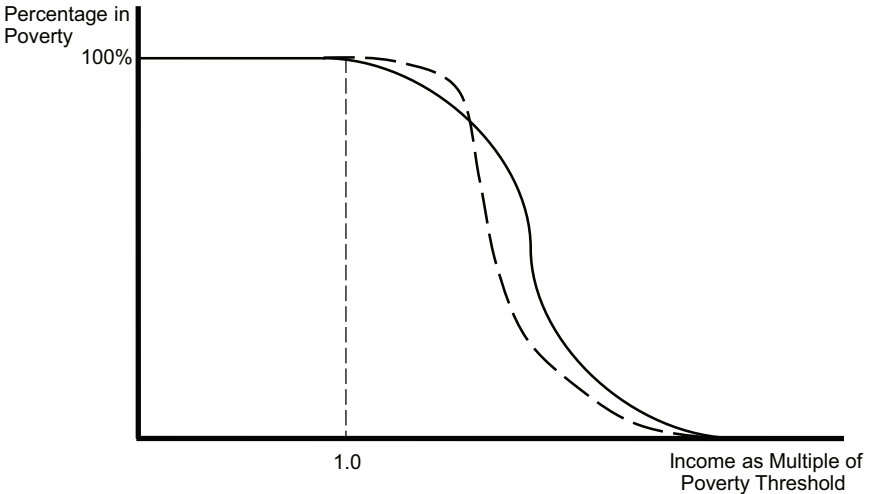
To incorporate these effects, the sample would need to be partitioned into large insurance categories, such as uninsured, Medicaid, health maintenance organization, private insurance (a few types), Medicare, etc. Under the ACA, it would be useful to distinguish between the various insurance levels (bronze, etc.). For private insurance, if one has details on the actual premiums and coverage provisions, one may standardize by adjusting total spending and out-of-pocket spending from actual to a standard, using the details of insurance to let the coinsurance rate at the time of spending affect the quantity of care obtained and thus out-of-pocket spending. Eventually, one will have to decide how to adjust uninsured spending to what it would have been if the individual were in Medicaid or a standard private policy and other possible policy shifts, such as from a private policy to being uninsured. One can calculate the range of spending for uninsured people either by looking at unadjusted spending in cells of uninsured people, and then adjusting later for their getting a different insurance policy, or by adjusting to a standard policy before grouping cases into cells and predicting adjusted spending, which is then adjusted back from the standard to their coverage in each policy simulation.

### USING THE MCER MEASURE FOR POLICY MONITORING AND ASSESSMENT

We conclude by illustrating the usefulness of a measure of MCER. Figure 4-1 shows the probability of out-of-pocket medical care spending exceeding the difference between family income and the SPM target threshold as a function of the family's ratio of income to the SPM target. These probabilities depend on income, health, and the age composition of families; the graph looks like a survival curve if one goes from very low to high income. If there were a set of results from before the ACA was implemented and one after 2014 when it is largely implemented, as Figure 4-2 illustrates, then the area between the pre- and post-curves would become one measure of improvement. The usual caveat about confounded changes in a before-and-after study (for example, the global recession), applies: Both spending and the SPM depend on these external factors. In principle, however, one can simply label each family by its income compared with the SPM target and calculate the probability that out-of-pocket medical care spending will take it below the target. In Figure 4-2, the curved black line is



**FIGURE 4-1** The probability of out-of-pocket medical care spending exceeding the difference between family income and the SPM threshold.  
**SOURCE:** Developed by the panel to illustrate the relationship between income and medical care economic risk described in the text.



**FIGURE 4-2** The probability of out-of-pocket medical care spending exceeding the difference between family income and the SPM threshold after a shift in out-of-pocket premiums due to incomplete subsidy for health insurance and reduced out-of-pocket spending, as with the transition of the uninsured to coverage under ACA.  
**SOURCE:** Developed by the panel to illustrate the relationship between income and medical care economic risk described in the text.

prior to full implementation of the ACA, and the dashed black line is some time after full implementation. As healthy previously uninsured people (i.e., those without much out-of-pocket spending for health care) in households slightly above the poverty line have their incomes reduced to less than the SPM by premiums post-ACA, the dashed curved line is initially above the black solid curved line. However, the lines soon cross, as less healthy people who are newly insured experience out-of-pocket premiums plus spending for care that is less than their prior out-of-pocket spending, and thus their household incomes are not reduced below the SPM threshold.





## Data Sources

The development and production of a measure of medical care economic risk (MCER) depend on the available data. This chapter reviews the data sources that might be used to construct a measure of MCER. Our discussion covers both the medical expenditure risk and financial resources components of a potential measure. In the end, the choice of a survey to serve as home to the measure is tightly constrained by the available options. Nevertheless, it is important to understand the strengths and limitations of available data on all elements that are relevant in determining the cost of addressing potential medical care needs and the ability of families and individuals to pay for those costs.

### **OVERVIEW OF SURVEY DATA ON MEDICAL CARE COSTS AND FINANCIAL RESOURCES**

In reviewing potential data sources, we distinguish between development and production applications. The data requirements for developing a measure are not the same as the requirements for producing a measure on a recurring basis. Development has more extensive data needs than production, but on a number of dimensions the requirements are less demanding. For production, the survey must be (1) annual, (2) representative of the civilian noninstitutionalized population, (3) released on a timely basis, and (4) have a sample sufficiently large to provide precise measures of change in MCER over time.

### Data Requirements for the Measurement of MCER

To develop a prospective measure of MCER requires longitudinal data, so that medical care expenditures observed prospectively over the course of a period—ideally a year—can be related to characteristics observed at the start of that period.<sup>1</sup> Relevant baseline characteristics include those that are potentially predictive of medical expenditures. These include the following:

- General health status
- Chronic conditions—in particular, conditions that are associated with actual or potential expenditures
- Health insurance coverage
- Breadth of services/treatments covered
- Potential liability for out-of-pocket costs—copays, deductibles, and caps on personal expenditures
- Current health insurance premiums

Actual out-of-pocket expenditures for medical care in the prior year may be the strongest predictor of expenditures during the current year, and although they are not a baseline characteristic per se, these expenditures ought to be included in the development of a predictive model of prospective risk. Both premiums and other out-of-pocket expenditures should be included.

With longitudinal data, out-of-pocket medical expenditures and premiums over the course of the next year would be compared with resources over the same period to determine the economic burden imposed by medical expenditures. This burden measure would become the dependent variable in a model predicting economic risk in the second year from the set of baseline characteristics listed above. This model would then be applied to the data set used to estimate MCER on an annual basis. Requirements for the resources component include

- Earned income
- Unearned income, equivalent to the unearned component of Census money income
- Cash value of in-kind benefits, such as the Supplemental Nutrition Assistance Program, school free and reduced-price breakfast and lunch programs, and housing assistance
- Taxes paid—federal, state, and payroll
- Work-related expenses, including child care and commuting
- Liquid assets

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<sup>1</sup>Chapter 4 also discusses the calculation of a retrospective measure of MCER using CPS ASEC data. We focus here on the preferred prospective measure, which requires longitudinal data.

The in-kind benefits, taxes, and work-related expenses items are needed in conjunction with earned and unearned money income to construct disposable income. We recommend in Chapter 3 that a portion of liquid assets be included in family resources as well.

Finally, both the risk variables and the resources variables must be recorded at the person level, so that the variables in each case can be aggregated to the health insurance unit level (for aspects of modeling risk) and family level (for comparing risk with resources). Sufficient information on family relationships must be included to enable the membership of each health insurance unit and family in a household to be identified.

### Data Sources for Development of a Measure

The panel looked closely at three longitudinal surveys: the Medical Expenditure Panel Survey (MEPS) (see <http://www.meps.ahrq.gov>), the Survey of Income and Program Participation (SIPP) (see <http://www.census.gov/SIPP>), and the Health and Retirement Study (HRS) (see <http://hrsonline.isr.umich.edu>). The HRS has the immediate disadvantage of not covering the entire population; its universe is persons over 50 at its broadest. In addition, the interview frequency for the HRS is every 2 years whereas MEPS and SIPP currently conduct two to three interviews per year. (SIPP is being redesigned to conduct one interview per year.) With MEPS and SIPP, then, one can observe expenditures in the year following the measurement of baseline characteristics. That the HRS collects expenditure data covering the time since the last interview (typically 2 years) could affect their quality, although comparisons suggest that means and distributions of expenditures are generally similar to MEPS outside the upper tail (Hurd and Rohwedder, 2009). The quality of the income and asset information collected in the HRS—especially for retired persons—is a particular strength (on the comparison of Current Population Survey and HRS income data, see Hurd and Rohwedder, 2006).

Table 5-1 summarizes the collection of relevant variables in the three surveys. None of the three surveys collects all the variables that would be required to develop a prospective measure of MCER as described in Chapter 4. Most notably, none of the three surveys collects a description of the services and treatments covered by each person's health insurance plan, and none of the surveys collects sufficient information with which to assess each sample member's potential liability for out-of-pocket medical costs, although MEPS and the HRS do collect limited information: participation in health maintenance organizations in MEPS and the HRS and whether coverage for a preexisting condition is limited in the HRS. As noted by Czajka (in Part III of this report), MEPS collected detailed information on the health insurance plans of sample members in 1996 but has not done

**TABLE 5-1** Collection of Variables Needed to Develop a Prospective Measure of MCER in Three Longitudinal Surveys

Variable	MEPS	SIPP	HRS
<b>Measures of Health</b>			
General health status (poor to excellent)	X	X	X
Activity limitations	X	X	X
Functional limitations	X	X	X
Chronic medical conditions	X		X
<b>Measures of Health Insurance Coverage</b>			
Current health insurance coverage	X	X	X
Services/treatments covered			
Potential liability for out-of-pocket costs	<i>a</i>		<i>a,b</i>
Current health insurance premiums			X
<b>Measures of Medical Expenditures</b>			
Prior year insurance premiums	X <sup>c</sup>	X	
Prior year out-of-pocket expenditures	X	X	X
Insurance premiums during the next year	X <sup>c</sup>	X	X
Out-of-pocket expenditures during the next year	X	X	X
<b>Measures of Resources</b>			
Earned income	X	X	X
Unearned income	X	X	X
In-kind benefits	<i>d</i>	X	<i>d</i>
Taxes paid		<i>e</i>	
Commuting and child care expenses		X	
Liquid assets	X <sup>f</sup>	X	X
<b>Measures of Family Relationships</b>			
Relationship to the householder	X	X	<i>g</i>
All parent-child relationships	X	X	
All marital relationships	X	X	

NOTES: HRS = Health and Retirement Study; MEPS = Medical Expenditure Panel Survey; SIPP = Survey of Income and Program Participation.

<sup>a</sup>Data include participation in health maintenance organizations.

<sup>b</sup>Data include whether coverage for a preexisting condition is limited.

<sup>c</sup>Collected for private health insurance but not for Medicare.

<sup>d</sup>Supplemental Nutrition Assistance Program (formerly Food Stamp Program) benefits are the only in-kind benefits collected.

<sup>e</sup>Taxes paid are collected in a topical module once per panel, but nonresponse is very high and missing data are not imputed.

<sup>f</sup>Assets are collected only once per panel, so they will be present for only half of an annual sample. Asset data are not included in the public use file.

<sup>g</sup>Person-level data are collected on just the sample member (over 50) and spouse.

SOURCE: Developed by the panel from published questionnaires and codebooks.

so again.<sup>2</sup> Thus, the development of a prospective measure of MCER will have to be accomplished without accounting fully for the impact of health insurance coverage on potential out-of-pocket costs.

Other survey-specific data gaps exist, which limit how fully each survey could support the modeling of MCER. MEPS does not collect Medicare premium payments (although these might be imputed based on income) or most of what distinguishes disposable income from money income. MEPS collects data on assets only once, in the final interview for each panel. Such data would therefore not be usable as a baseline characteristic. Liquid assets could be projected backward, however, and that might be acceptable even though some assets may have been used in paying for exceptional medical costs. With only a portion of liquid assets being included in resources, following the panel's recommendation in Chapter 2, the asset component of resources is relatively insensitive to this type of error.

SIPP collects no data on chronic medical conditions, which is likely to be one of the most important predictors of subsequent medical expenditures, given that none of the surveys collects information on the details of health insurance coverage. SIPP does collect information on in-kind benefits and commuting and child care costs, but its data on taxes paid do not appear to be useful.

The HRS lacks information on insurance premiums paid since the prior interview, although it obtains current premiums, which may provide a reasonably good proxy. The HRS has the same limitations as MEPS with respect to disposable versus money income, but, unlike MEPS, liquid assets are available as a baseline characteristic. The HRS captures some additional information that could be useful in modeling the economic burden of medical expenditures. The survey asks respondents with large out-of-pocket medical expenses how they financed these expenditures (although the response categories combine earnings and savings, which would be useful to separate), and it collects information on assistance that children may have provided with payments. In addition, Medicare claims data have been linked to the HRS, expanding the survey's available data on expenditures—primarily for the population ages 65 and older.<sup>3</sup>

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<sup>2</sup>MEPS has added a few more questions on types of health insurance coverage to support analysis of the ACA and is considering what additional questions and content might be tested and added to the Insurance Component. Interest centers on employer plans and offerings, firm size, actuarial value, stop-loss policies, wellness programs, and additional detail on the characteristics of self-insured plans and small employer anticipated exchange participation. (See <http://aspe.hhs.gov/hsp/12/surveyenhancements/ib.shtml>.)

<sup>3</sup>The HRS also serves as the central data source for the Future Elderly Model (FEM), a microsimulation model developed by the University of Southern California and RAND Roybal Center for Health Policy Simulation. The FEM combines data from the HRS, MEPS, the Medicare Current Beneficiary Survey, and the National Health Interview Survey and can be used to predict health status and economic outcomes for individuals 51 and older. For an example of an application of this model see Lakdawalla, Goldman, and Shang (2005).

It is possible to exploit the panel design features of the CPS sample (see Chapter 4) to conduct longitudinal analyses with successive annual supplements. Half of the addresses that are included in the CPS ASEC sample in a given year were included in the sample the prior year. Such analyses encounter serious obstacles, however. The sample units are addresses, not the persons living at those locations. Persons who move during the year (about 14 percent of the population, based on recent estimates) would be excluded from any longitudinal analysis, introducing an obvious bias, as moving may be related to changes in circumstances that are relevant to medical care expenditures, resources, or family composition. Nonresponse to the supplement (about 15 percent currently) may introduce further bias in addition to reducing the number of sample households present in 2 consecutive years. On top of these concerns, the CPS is weaker than the other three surveys in its collection of data elements needed to model medical care expenditure risk.

In summary, none of the surveys is nearly as strong as we would like in its measurement of key baseline characteristics. With its strong measures of chronic conditions and very high-quality expenditure data, MEPS is clearly superior to SIPP. The HRS could provide a supplemental data source for the one-fifth of households that fall into the HRS universe. Estimates from the HRS could be used to validate the model estimates from MEPS for this segment of the population (or perhaps just the elderly), although differences in the variables available to serve as predictors would have to be taken into account.

### **Data Sources for Production of a Measure**

Once a model of MCER has been developed, the estimates could be used directly (in MEPS), or the predictive model could be applied to another data set that provides measures of the relevant baseline characteristics. The latter approach offers a way to make the measurement of MCER more timely and to extend the measure to a larger and possibly more representative sample.

Because longitudinal data would not be required but production would impose other requirements, the set of surveys that could potentially serve this purpose is not the same as the three evaluated above. We include MEPS—but the full-year consolidated file rather than the longitudinal file. The consolidated file has an annual reference period and combines two successive, overlapping panels. We do not include the HRS or SIPP. The HRS represents too little of the population to be used for production. Although there are a number of issues with the use of SIPP for this purpose (see Czajka, in Part III), the survey's abutted panel design has the

most serious implications for measurement.<sup>4</sup> It has been shown that the measured poverty rate declines over the life of a SIPP panel independently of the true trend, and there is an especially steep decline over the first two to three waves (Anderson and Fields, 2010; Czajka, Mabli, and Cody, 2008; Weinberg, 2003). When the 1995 National Research Council panel recommended a new poverty measure that would be produced from SIPP (National Research Council, 1995), the Census Bureau developed plans to restore the overlapping panel design, whereby a new panel was started each year; however, this was not done (Weinberg, 1999). Overlapping panels ensure a uniform bias for cross-sectional, annual estimates, which is why MEPS does not have the same problem as SIPP.

In considering surveys that meet the requirements for production outlined earlier, we restrict our attention to surveys conducted by the federal government. If a measure of MCER is to be produced by the federal government on an annual basis, closely tied to the release of the SPM, the data used to construct that measure must be obtained from a federal survey or surveys. The data collection schedule and the quality and consistency of the data that are collected are critical elements in the production of an annual measure that can be used to track changes in medical care financial risk over time. Although there are serious limitations to the relevant data being collected in federal surveys at the present time, full federal authority over all of the processes that contribute to the production of a measure of MCER is essential to ensuring the integrity and viability of the measure. In addition to MEPS, then, we consider the CPS ASEC (see <http://www.census.gov/hhes/www/hlthins/data/index.html>), the National Health Interview Survey (NHIS) (see <http://www.cdc.gov/NCHS/NHIS.htm>), the American Community Survey (ACS), and the Consumer Expenditure (CE) series quarterly survey (see <http://www.bls.gov/cex>). The responsible agencies for these surveys are the U.S. Census Bureau for the CPS ASEC, SIPP, and ACS, the National Center for Health Statistics for NHIS, the Agency for Healthcare Research and Quality (AHRQ) for MEPS, and the Bureau of Labor Statistics for the CE.

The CPS ASEC provides a standard for statistical precision because of its role as the official source of monthly unemployment estimates and annual poverty rates and its widespread use for estimating the percentage of the population without health insurance coverage. The CPS ASEC collects interviews from about 80,000 households each year. MEPS and NHIS samples vary in size over time. The largest recent MEPS sample, for calen-

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<sup>4</sup>With the abutted panel design, which was introduced in 1996, successive panels are end to end—that is, the start of one panel coincides with the completion of the preceding panel. Previously, a new panel was started each year, as is the case with MEPS.

dar year 2009, had fewer than 15,000 households, whereas the 2011 NHIS was projected to have a final interviewed sample of 35,000 households (U.S. Government Accountability Office, 2012). Like MEPS, the annual sample for the CE quarterly survey is under 15,000 households. The ACS, in contrast, collects data from about 2 million households each year. To put this in perspective, the mean state sample in the ACS is larger than the NHIS national sample (the median ACS state sample is considerably smaller). The ability of the ACS to support estimates for states and large metropolitan areas at levels of precision comparable to some of these national samples is appealing, but as we show, the data elements are too limited for our needs. Of the five surveys, the CPS ASEC has the most timely release, just 6 months after the completion of data collection and 9 months after the end of the survey reference period. The CPS is also the source of both the official poverty measure and the SPM, to which the MCER measure is intended as a companion (Czajka, in Part III). Producing the two measures from the same survey would enable more direct comparisons than if the two were based on different surveys.

Table 5-2 summarizes the collection of variables needed to produce an annual prospective measure of MCER. Measures of medical expenditures are required only for the prior year—where they are used as baseline characteristics. The model will predict medical expenditures during the next year as a function of the baseline characteristics. Although model development will focus on the fullest set of baseline characteristics, the model will have to be reestimated using just those baseline characteristics that are available for a particular survey. Fewer baseline characteristics imply a weaker model unless the baseline characteristics that are omitted have no impact.

Because none of the longitudinal surveys provides detailed information on what is actually included in health insurance coverage, such variables will not be included in the predictive model, so the absence of such variables from all five surveys, although a major limitation for modeling, is beside the point. Only MEPS and the NHIS provide information on functional limitations and chronic medical conditions, which are likely to be important predictors. The NHIS lacks information on prior year premiums or out-of-pocket expenditures, however. What it does include are several questions relating to the financial burden posed by medical care. In 2011, the NHIS added three new questions that asked whether the family had problems paying its medical bills in the past 12 months, whether there were medical bills that were being paid over time, and whether there were medical bills that the family was unable to pay at all. The NHIS is also very weak on resources. MEPS collects much more information on resources but lacks the components that differentiate money income from disposable income.

The CPS ASEC is the only one of the surveys that can estimate disposable income currently, but it lacks a measure of liquid assets. Given that



**TABLE 5-2** Collection of Variables Needed to Produce an Annual Prospective Measure of Medical Care Economic Risk

Variable	CPS				
	ASEC	MEPS	NHIS	ACS	CE
Measures of Health					
General health status (poor to excellent)	X	X	X	X	
Activity limitations	X <sup>a</sup>	X	X	X <sup>a</sup>	
Functional limitations		X	X		
Chronic medical conditions		X	X		
Measures of Health Insurance Coverage					
Current health insurance coverage	X <sup>b</sup>	X	X	X	
Services/treatments covered					
Potential liability for out-of-pocket costs					
Current health insurance premiums					
Measures of Medical Expenditures					
Prior year insurance premiums	X	X <sup>c</sup>			X <sup>d</sup>
Prior year out-of-pocket expenditures	X	X	<sup>e</sup>		X <sup>d</sup>
Measures of Resources					
Earned income	X	X	X	X	X
Unearned income	X	X		X	X
In-kind benefits	X <sup>f</sup>	<sup>g</sup>			<sup>g</sup>
Taxes paid	X <sup>b</sup>				<sup>i</sup>
Child support paid	X				
Commuting expenses	X <sup>b</sup>				
Child care expenses	X				X
Liquid assets		X <sup>j</sup>			X <sup>k</sup>
Measures of Family Relationships					
Relationship to the householder	X	X	X	X	<sup>l</sup>
All parent-child relationships	X	X	X		
All marital relationships	X	X	X		

NOTES: ACS = American Community Survey; CE = Consumer Expenditure Survey; CPS ASEC = Current Population Survey Annual Social and Economic Supplement; MEPS = Medical Expenditure Panel Survey; NHIS = National Health Interview Survey.

<sup>a</sup>Blindness, deafness, and limitations in four activities of daily living are the only items collected.

<sup>b</sup>Coverage by type is ever in the prior calendar year rather than at the time of the survey.

<sup>c</sup>Collected for private health insurance but not for Medicare.

<sup>d</sup>Expenditures during the past quarter are collected in each quarterly interview.

<sup>e</sup>Includes questions on the financial burden posed by medical care.

<sup>f</sup>Food stamp (SNAP) benefits are reported, as is the receipt of other in-kind benefits, but the value of these other benefits is simulated.

<sup>g</sup>Food stamp (SNAP) benefits are the only in-kind benefits collected.

<sup>h</sup>Amounts are simulated rather than reported.

<sup>i</sup>Income taxes withheld from earnings are collected.

<sup>j</sup>Assets are collected only once per panel, so they will be present for only half of an annual sample. Asset data are not included in the public use file.

<sup>k</sup>Financial assets are collected, but retirement accounts are not separated from other accounts.

<sup>l</sup>Data are collected for the consumer unit rather than the family or household. It is not possible to reconstruct data for health insurance units when they differ from consumer units.

SOURCE: Developed by the panel from published questionnaires and codebooks.

components of disposable income are or were previously imputed in the CPS ASEC to create a number of alternative poverty measures (taxes and commuting expenses are currently simulated or imputed, and child care expenses and child support payments were previously imputed), similar imputations could be performed with MEPS as well—or the additional variables could be added to the MEPS questionnaire in the future.

Both the ACS and the CE fall short in a number of other ways. The ACS collects only limited measures of health, and the CE collects none. The ACS collects no medical expenditure data, nor does it collect from persons unrelated to the householder the relationship information needed to construct health insurance units or families. The CE does collect expenditure data, but this is done for “consumer units,” and when these do not align with health insurance units or families, the latter cannot be constructed.

Given the data limitations shown here and the possibility that the research to develop a prospective measure may show little gain over a retrospective measure, production of a retrospective measure of MCER remains an option. Ideally, such a measure would take account of measures of chronic health conditions and functional limitations, which are available in MEPS and the NHIS, and it would also take account of features of health insurance coverage, which are not available in any federal household survey. Minimally, however, it would require only measures of prior year premiums and out-of-pocket expenditures, along with prior year measures of all of the resources that would be needed for a prospective measure, assuming that disposable income as defined for the SPM, plus a portion of liquid assets, would be used as the measure of resources. In essence, a retrospective measure of medical care economic risk of this kind would be similar to a retrospective measure of financial burden, as described in Chapter 2, with the exception of including a portion of liquid assets in the former measure. The CPS ASEC falls short only on liquid assets although it relies on simulation and imputation for a number of the components that distinguish disposable income from Census money income. MEPS has liquid assets, but for only half the sample, and it lacks most of the components that distinguish disposable income from Census money income. MEPS also lacks prior year insurance premiums for Medicare, but otherwise meets the minimal requirements for a retrospective measure.

## CONCLUSIONS AND RECOMMENDATIONS

Although the panel favors a prospective measure of MCER over a retrospective measure, the more substantial data requirements for developing a model with which to estimate the prospective measure cannot be fully met with an existing survey. The MEPS longitudinal file comes closest to meeting these requirements.

**Recommendation 5-1:** The panel recommends that the development of a model for estimating a prospective measure of medical care economic risk be carried out with the Medical Expenditure Panel Survey (MEPS) longitudinal file. The panel also recommends that the Health and Retirement Study (HRS) be used to validate the results of the MEPS modeling for at least the elderly, if not the entire population over age 50, which the HRS sample represents.

For production, the choice is less clear. The MEPS full-year consolidated file and the CPS ASEC have different strengths and different limitations with respect to required data elements, making them difficult to compare. On other points of comparison, the CPS ASEC is more timely than MEPS, has five times the sample size, and serves as the source of the complementary SPM. On balance, these considerations favor the CPS ASEC if it can be shown that a predictive model of MCER can be transported successfully from MEPS to the CPS ASEC. If MCER depends too heavily on the measures of chronic medical conditions and functional limitations that are present in the MEPS but not the CPS ASEC, then the CPS ASEC would not be a satisfactory choice.

If the development effort should demonstrate that a prospective measure is itself not viable at present or not sufficiently different from a retrospective measure, then the CPS ASEC would be a stronger choice for this alternative measure. In this case, however, there may be value in using MEPS to create a supplemental measure, in which MCER could be associated with the chronic conditions and functional limitations that MEPS measures but the CPS ASEC does not.

A principal limitation of using either MEPS or the CPS ASEC for either a prospective or retrospective measure of MCER is the lack of information on insurance coverage beyond the general categories of employer-sponsored, Medicare, Medicaid, individually purchased, or other sources. After 2014 when the major insurance reforms of the Patient Protection and Affordable Care Act (ACA) take place, the Census Bureau or AHRQ could consider adding a question about the level of coverage in terms of bronze, silver, or gold levels of actuarial value. This information could serve as a proxy for plan type and cost-sharing for insured families in the lower income ranges. Individuals and families may also become more aware of out-of-pocket costs for premiums because ACA requires that this information be included in tax filing. For the CPS ASEC, the value of its health insurance data for measuring MCER could be enhanced by capturing coverage at the time of the interview in addition to or instead of the prior calendar year. Other items to consider adding to the CPS ASEC include functional limitations, chronic medical conditions, and liquid assets. Items to consider adding to MEPS include additional in-kind benefits, federal and state income taxes,

and commuting and child care expenses. These items would enable MEPS to replicate the SPM more effectively.

**Recommendation 5-2:** The panel recommends that the Census Bureau and the Agency for Healthcare Research and Quality assess the merits of adding items to both the Current Population Survey Annual Social and Economic Supplement and the Medical Expenditure Panel Survey to at least partially address the most critical data limitations identified for measuring medical care economic risk.

## Implementing Measures of Medical Care Economic Burden and Risk

In the preceding chapters, the panel has aimed to develop rigorous yet practical approaches to defining and measuring the experienced financial burden and the prospective financial risk associated with premiums and other out-of-pocket medical care costs. Specifically, we focused on how exposure to medical care expenses can threaten families and individuals with being driven into poverty. Through commissioned papers, workshop presentations and discussions, and deliberations by our panel representing expertise from economics, actuarial science, health care financing, poverty research, and statistics, we have brought to bear the latest research and data and considered the most rigorous methods. We have also kept in mind what actually can be done by government agencies without major infusions of additional staff or funding. This concluding chapter sustains that practical perspective by outlining how a new measure of medical care economic risk (MCER), as well as a measure of burden, might be implemented.

### RESPONSIBILITY FOR DEVELOPING AND MAINTAINING THE MEASURES

For the introduction of measures of burden and risk, particularly a new measure of MCER, to be successful, clear lines of responsibility for its implementation must be established. The two federal agencies with the greatest expertise in the development and implementation of such a measure are the U.S. Department of Health and Human Services (HHS) and the U.S. Department of Commerce. The former has responsibilities for health policy and deep understanding of health insurance coverage,

and the latter in measuring income and poverty. More specifically, within HHS, several agencies would be important to successful implementation: the Office of the Assistant Secretary for Planning and Evaluation, given its current work on poverty thresholds and history of working closely with the U.S. Census Bureau on poverty measures; the Agency for Healthcare Research and Quality, given its expertise and responsibility for the Medical Expenditure Panel Survey; and the National Center for Health Statistics, as the federal government's principal agency for health statistics. Within the Commerce Department, the Census Bureau, because it conducts the Current Population Survey (CPS) and has accomplished extensive work on poverty measures, should clearly be involved.

The Office of Management and Budget (OMB), specifically its Statistical Policy Office, also needs to be involved, given that its predecessor issued the directive in 1969 establishing the official poverty measure, as well as the major role played by the chief statistician in the development of the Supplemental Poverty Measure (SPM), including co-chairing the Inter-agency Technical Working Group.

As explained in the report, the U.S. poverty measure is an important indicator of economic well-being that influences public opinion and public policies. Looking at its history, the current official poverty measure, developed in the early 1960s, is long outdated. Over the years, social and economic conditions changed along with changes in public policies and an overall increase in the standard of living, making the measure less adequate for its intended uses. The measure no longer provides an accurate picture of the extent of economic poverty, the differences among population groups and geographic areas, or the differences over time. The measure has weaknesses both in the definition of family resources and in the concepts of the thresholds. In particular, it does not take into account dramatic increases and variations in medical care spending, out-of-pocket costs, and health insurance coverage.

A congressionally mandated panel of the National Research Council (NRC) issued a report in 1995 that proposed a revised measure of poverty and recommended that the federal government develop a separate measure of medical care risk that would measure the economic risk to families and individuals of lacking adequate health insurance coverage (National Research Council, 1995). Much research has been conducted on different elements of the NRC-proposed poverty measure, leading, after many years, to the release of the new SPM in 2011. Much less work has been done on a potential measure of medical care economic risk. The passage of the Affordable Care Act and changes in other health care programs have made it important to revisit the conceptual and measurement issues for assessing medical care economic risk (a prospective measure) and medical care economic burden and to develop a useful measure for policy analysis and

public understanding. Our panel thinks that a subcabinet-level coordinating group would help to ensure that a measure of MCER does not flounder in its development and launch.

**Recommendation 6-1:** Because technical and cross-departmental efforts such as the construction and maintenance of a measure of medical care economic risk (MCER) require both political and resource support, the panel recommends that the secretaries at the U.S. Departments of Health and Human Services and Commerce be jointly responsible for developing and reporting measures of MCER (and burden) on an annual basis with involvement of the Office of Management and Budget chief statistician. This effort should coincide with the production and release schedule for the Supplemental Poverty Measure.

**Recommendation 6-2:** The panel further recommends the creation of a medical care economic risk coordinating group composed of senior officials from the U.S. Department of Health and Human Services, the U.S. Census Bureau, and the U.S. Office of Management and Budget to provide oversight and make suggestions for needed improvements.

The coordinating group would provide guidance to the agencies producing the measure and suggest changes in methodology and appropriate data sets as required. The leadership of agencies with contributions to make to the construction and implementation of the measure could constitute such a group. For example, the coordinating group might include the assistant secretary for planning and evaluation in HHS, who plays a comparable role in the development of the Annual Trustees Reports for both Medicare and Social Security and on the 5-year technical review panel of the Medicare Trustees modeling and methodology; the director of the Census Bureau, given that the Census Bureau would presumably play the primary role in producing the MCER, as it does for the official poverty measure and the SPM; and the chief statistician from OMB, given OMB's role in coordinating statistical and data policy across the entire federal government. OMB would also be in a position to take a policy lead in dealing with other offices within the White House if changes need to be made in the MCER in years to come.

The panel also suggests that one or two members of the coordinating group be chosen from outside government. These outside members would have a role similar to the public trustees who serve on both the Medicare and Social Security Board of Trustees. Having one or more outside members would enhance the transparency and credibility of the process as well as provide the government with the latest thinking from the scholarly community outside the government. The outside members should possess relevant

expertise in the measurement of poverty and the financial burden of health care. One responsibility of the coordinating group could be to produce a report accompanying the release of the annual MCER measure that raises any data, methodological, or policy issues relevant to the measure.

### DATA ISSUES

The panel has made specific recommendations regarding which data sets should be used for measures of medical care economic burden and risk. These recommendations address data sets currently collected by either HHS or the Census Bureau.

**Recommendation 6-3: The panel recommends that funding for the current data collection efforts be maintained at a level to ensure that rigorous, accurate calculations of measures of medical care economic burden and risk can be made.**

As pointed out in Chapter 1, one substantial deficiency in the calculation of a measure of medical care economic risk is the lack of information available about people who enter institutional care, such as nursing homes. Because the CPS does not collect data on these populations, they are excluded from the universe for both the official poverty measure and the SPM. This presents a particularly significant limitation for the measurement of prospective risk in that one must exclude what is, for many elderly, their biggest health-related economic risk. This problem may have a solution in the future given ongoing advances in data collection, adoption of electronic medical records, and the linking of surveys with administrative data. The panel's recommendations are based on the current collection of available federal data sources. However, new and better data will become available in future years. The panel urges that these new data sources be evaluated as they become available to determine if their use would produce a more accurate measure. An appropriate role for the interagency coordinating group could be the assessment of these new data sources.

### METHODOLOGICAL ISSUES

The panel has proposed a methodological approach to calculating a measure of MCER (as well as the more easily calculated measure of burden), that we think will provide the most accurate information available. However, we are not so presumptuous as to assume that we have answered every design question correctly. Further methodological work will be necessary. In many ways, the deliberations of this panel have raised as many questions as they have answered. For example, the use of assets to offset



health care spending and the dynamics of cross-subsidies of medical care costs in a nontraditional family have not been fully specified in our recommended approach. Much more research is necessary to inform the complete specification of the measure.

Future improvements in the data available will also require reexamination of the MCER methodology. We think that both HHS and the Census Bureau, under the guidance of the interagency coordinating group, should make the appropriate investments to ensure that this research be done to improve the measurement of medical care economic risk and burden in the future.

### REPORTING

The introduction of a new measure of medical care economic risk will require thoughtful exposition and communication if the estimates are to be generally understood and accepted by policy makers, the media, and the public. It would be a disservice to simply release a new measure without a well-constructed explanation of what the measure does and does not represent. The panel envisions an analytic report produced by HHS and Commerce, which, following external review, would accompany the annual release of the MCER. This analytic report should provide policy makers, the media, and the public with an explanation of the measure and what it shows in a rigorous but nontechnical manner.



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# Acronyms and Abbreviations

ACA	Affordable Care Act of 2010 [commonly used shortened version of the Patient Protection and Affordable Care Act of 2010]
ACG	adjusted clinical group
ACS	American Community Survey
ADL	activity of daily living
AGI	adjusted gross income
AHRQ	Agency for Healthcare Research and Quality
ASEC	Annual Social and Economic Supplement [to the Current Population Survey]
ASPE	Assistant Secretary for Planning and Evaluation [in HHS]
BLS	Bureau of Labor Statistics
CBO	Congressional Budget Office
CE	Consumer Expenditure Survey
CHIP	Children's Health Insurance Program
CPS	Current Population Survey
DB	defined benefit
DC	defined contribution
DCG	diagnosis cost group form of risk adjustment system
FPL	family poverty level
GDP	gross domestic product

HHS	U.S. Department of Health and Human Services
HIPAA	Health Insurance Portability and Accountability Act of 1996
HMO	health maintenance organization
HRET	Health Research and Education Trust
HRS	Health and Retirement Study
HSA	health savings account
HTHS	Health Tracking Household Survey
IADL	instrumental activity of daily living
IOM	Institute of Medicine
IRA	individual retirement account
ITWG	Interagency Technical Working Group [on Developing a Supplemental Poverty Measure]
JSM	Joint Statistical Meetings
LIHEAP	Low Income Home Energy Assistance Program
LTC	long-term care
MCBS	Medicare Current Beneficiary Survey
MCER	medical care economic risk
MEPS	Medical Expenditure Panel Survey
MPS	Medical Providers Survey
NAS	National Academy of Sciences
NHIS	National Health Interview Survey
NLTCS	National Long Term Care Survey
NRC	National Research Council
OMB	U.S. Office of Management and Budget
RxRisk	risk adjustment system that uses information from automated outpatient pharmacy data systems to characterize chronic conditions
SCF	Survey of Consumer Finances
SIPP	Survey of Income and Program Participation
SNAP	Supplemental Nutrition Assistance Program [formerly Food Stamp Program]
SPM	Supplemental Poverty Measure
SPR	supplemental poverty rate
TANF	Temporary Assistance for Needy Families
TRIM3	Transfer Income Model, version 3
WIC	Special Supplemental Nutrition Program for Women, Infants, and Children



# Appendix

## Biographical Sketches of Panel Members and Staff

**Michael J. O’Grady** (*Chair*) is president, West Health Policy Center. Prior to this position, he was a senior fellow in the Health Policy and Evaluation Department with NORC at the University of Chicago. He is a health policy expert with 24 years of experience working in Congress and the U.S. Department of Health and Human Services (HHS). From 2003 to 2005, he was the assistant secretary for planning and evaluation at HHS, where he directed both policy development and policy research across the full array of issues confronting the department. Previously he served as the senior health economist on the majority staff of the Joint Economic Committee of the U.S. Congress, focusing on Medicare reform, the uninsured, and other national health care issues. He has also served as a senior research director at Project Hope’s Center for Health Affairs. For several years, he was a senior health adviser to the chairman of the Senate Finance Committee. He also was a senior analyst for the Bipartisan Commission on the Future of Medicare, the Medicare Payment Advisory Commission, and the Physician Payment Review Commission. He spent several years with the Congressional Research Service of the Library of Congress and the Office for Civil Rights in both the U.S. Department of Health, Education, and Welfare and the U.S. Department of Education. He has a B.A. in political science from Alfred University and a Ph.D. in political science from the University of Rochester.

**David M. Betson** is an associate professor of economics and public policy and former director of the Hesburgh Program in Public Service at the University of Notre Dame. His previous positions have been at the Institute

for Research on Poverty at the University of Wisconsin–Madison and the U.S. Department of Health, Education, and Welfare. His research has dealt with the impact of tax and transfer programs on the U.S. economy and the distribution of income. A particular research interest is child support policy; he has written academic papers and consulted with numerous state governments on the development of their child support guidelines and served as a member of the Washington State Commission on the Review of Child Support Guidelines. In 2004, he was named a national associate of the National Research Council for outstanding contributions to its work, including service on the panel that produced the 1995 report, *Measuring Poverty: A New Approach*, and the planning group that organized the workshop described in the 2005 report, *Experimental Poverty Measures: Summary of a Workshop*. He has a Ph.D. in economics from the University of Wisconsin–Madison.

**John L. Czajka** is a senior fellow at Mathematica Policy Research in Washington, DC. He joined Mathematica in 1978 after a year as lecturer in sociology at the University of California, Berkeley. His work has focused on statistical and policy applications of program administrative data and the evaluation of estimates obtained from survey data. He has directed many studies of health insurance coverage, including analyses of the dynamics of coverage over time and the impact of the Children’s Health Insurance Program on trends in children’s coverage. Much of his research has been conducted for federal agencies, including the Statistics of Income Division of the Internal Revenue Service; the Office of the Assistant Secretary for Planning and Evaluation and the Centers for Medicare & Medicaid Services in the U.S. Department of Health and Human Services; and the Social Security Administration. He is a fellow of the American Statistical Association and a past president of the Washington Statistical Society. He has served on many National Research Council panels, including the panel that produced the 2009 report, *Reengineering the Survey of Income and Program Participation*, and the panel that produced the 2001 report, *Evaluating Welfare Reform in an Era of Transition*. He has a B.A. in government from Harvard University and a Ph.D. in sociology from the University of Michigan.

**Edwin C. Hustead** was senior vice president in charge of the Hay Group actuarial practice Arlington, Virginia, and all Hay Group governmental actuarial and benefits consulting. From 1980 until his retirement in 2007, he was responsible for analyzing and reporting on the financial condition of many governmental employee retirement plans. Prior to working at the Hay Group, he was the chief actuary at the U.S. Office of Personnel Management with responsibility for assuring the actuarial soundness of the largest employee benefit system in the United States. He directed many large-scale

federal projects, including a series of projects to assist the Congressional Research Service in the analysis of national health care reform proposals and a major series of projects to design and implement the Federal Employees Retirement System. He has also directed a number of comparisons of benefits plans, in the United States and worldwide, for large employers. He was co-chair of the 2004 Technical Review Panel on the Medicare Trustees Report. He is currently chair of the Medicare Steering Committee of the American Academy of Actuaries, a fellow of the Society of Actuaries, and a member of the Academy of Actuaries. He participated in the Society of Actuaries committees that produced the UP94, GAR94, and RP2000 mortality tables and chaired the Academy of Actuaries Task Force on Medical Savings Account. He received a B.A. in mathematics from Franklin and Marshall College in 1963.

**Emmett B. Keeler** is a professor at the Pardee RAND Graduate School, an adjunct professor at the School of Public Health at the University of California, Los Angeles, and senior mathematician at RAND. In the pathbreaking RAND Health Insurance Experiment, he investigated the theoretical and empirical effects of alternative health insurance plans on episodes of treatment and on health outcomes. The resulting microsimulation model has been used to study spending and insurance choice. Recently, he led a large study to evaluate a new model for helping people with chronic diseases manage their health better. He served on the National Research Council panel that produced the 2010 report *Accounting for Health and Health Care: Approaches to Measuring the Sources and Costs of Their Improvement*. He has taught at Harvard University and the University of Chicago while on leave from RAND. He is the author or co-author of numerous refereed articles and four books. His research interests are in cost-effectiveness analysis, insurance design, health economics, and health services research. He is a member of the Institute of Medicine and in 2003 was named distinguished investigator by AcademyHealth for his contribution to the field of health services research. He has a B.A. in mathematics from Oberlin College in Ohio and a Ph.D. in mathematics from Harvard University.

**Willard G. Manning** is a professor in both the Harris School of Public Policy Studies and the Department of Health Studies, in the Division of the Biological Sciences, at the University of Chicago. His primary area of interest is the effects of health insurance on health care and health. He has studied the demand for various health services under both fee-for-service cost-sharing and prepaid insurance, as well as the impact on the appropriateness of care and health status. In recent work, he has examined the optimal insurance coverage for preventive care and treatment, considering

the trade-off between the costs from moral hazard and the gains from risk-pooling across medical services and over time in health insurance. He has also examined the health effects of insuring the formerly uninsured when the near-elderly become Medicare-eligible at age 65. He has examined statistical, measurement, and economic issues in modeling the use of health services and health care expenditures. His research interests further include the economics of poor health habits, such as smoking and heavy drinking. He is a member of the Institute of Medicine. He has a B.S. from the California Institute of Technology and an M.A. and a Ph.D. in economics from Stanford University.

**Wilhelmine D. Miller** is a senior fellow with NORC at the University of Chicago and a lecturer in health policy at George Washington University (GW). She served as associate director of the Robert Wood Johnson Foundation's Commission to Build a Healthier America at the GW School of Public Health and Health Services, overseeing the preparation of the 2009 report *Beyond Health Care: New Directions to a Healthier America*. Previously, she was a senior program officer at the Institute of Medicine, directing various committees that assessed the health, economic, and community consequences of uninsurance and that made recommendations to federal agencies for incorporating cost-effectiveness information in analyses of regulations addressing human health and safety risks. Her research interests include the uses of cost-effectiveness analysis in health care, the ethical dimensions of resource allocation decisions to improve population health, and policies to reduce socioeconomic inequalities in health. Her degrees in health policy and management and political philosophy are from Harvard and Georgetown Universities, respectively.

**Cathy Schoen** is senior vice president for policy, research, and evaluation at the Commonwealth Fund in New York. She is a member of the fund's executive management team and research director of its Commission on a High Performance Health System. Her work includes strategic oversight and management of surveys, research, and policy initiatives to track health system performance. From 1998 through 2005, she directed the Task Force on the Future of Health Insurance. Prior to joining the fund in 1995, she taught health economics at the University of Massachusetts (UMASS) School of Public Health and directed special projects at the UMASS Labor Relations and Research Center. Previously, she directed the Service Employees International Union's research and policy department. In the late 1970s, she was on the staff of President Carter's national health insurance task force, where she oversaw analysis and policy development. Prior to federal service, she was a research fellow at the Brookings Institution in Washington, DC. She has authored numerous publications on health policy

issues, insurance, and national and international health system performance and coauthored the book, *Health and the War on Poverty*. She holds an undergraduate degree in economics from Smith College and a graduate degree in economics from Boston College.

**P.J. Eric Stallard** is research professor in the Social Science Research Institute and associate director of the Center for Population Health and Aging in the Duke Population Research Institute at Duke University. His research expertise includes modeling and forecasting for medical demography and health and long-term care actuarial practice. He is principal investigator on a research grant from the Society of Actuaries and on two research subcontracts to Duke from Purdue and Columbia Universities, the primary grantees, funded by the National Institute on Aging. He is senior investigator on three other research grants from the National Institute on Aging covering the areas of health, disability, long-term care, and mortality. He is a fellow of the Conference of Consulting Actuaries, a member of the American Academy of Actuaries, and an associate of the Society of Actuaries. He chairs the American Academy of Actuaries' Long-Term Care Committee. He recently completed service as a deputy editor at *Demography* with responsibilities for the demography of aging, actuarial science, and mathematical demography. Previously, he served on the Social Security Advisory Board's 2007 Technical Panel on Assumptions and Methods. He has a B.S. in psychology from Duke University (1988).

**Gooloo S. Wunderlich** (*Study Director*) is a senior program officer for the Committee on National Statistics, where she has directed numerous studies on such topics as measuring food insecurity and hunger, reviewing the National Children's Study research plan, new measures of disability, and improving health care cost projections for the Medicare population. She has over 50 years of experience at the program and policy levels in health and population policy analysis, research, and statistics in the U.S. Public Health Service, President's National Advisory Commission on Rural Poverty, the U.S. Bureau of the Census, and at the National Academies. Her professional interests and experience have focused on the conduct and analysis of national health care surveys, analysis and public policy formulation relating to population research, family planning, aging, long-term care, disability, and a wide range of health policy issues. Prior to joining the National Academies in 1990, she was director of the Division of Data Policy in the Office of the Assistant Secretary for Health in the U.S. Department of Health and Human Services, serving for many years as the focus throughout the Public Health Service for data policy development, planning, analysis, coordination of health information systems, and statistical activities. She directed the review and approval of statistical, research, evaluation, administrative, and

regulatory data collection activities throughout the Public Health Service agencies. She is an elected member of the National Academy of Social Insurance. She received her B.A., M.A., and Ph.D. from the University of Bombay, India, and completed 2 years of postdoctoral studies in sociology and demography at the University of Minnesota and the University of Chicago.

## **PART II**

# **RESOURCES FOR THE STUDY: DEVELOPING A MEASURE OF MEDICAL CARE ECONOMIC RISK— WORKSHOP SUMMARY**





# 1

## Introduction

As stated in Part I, the Office of the Assistant Secretary for Planning and Evaluation, in the U.S. Department of Health and Human Services (HHS), requested the National Academies to convene an ad hoc panel of experts to organize, commission papers for, and conduct a public workshop to explore the development and implementation of a new measure of medical care economic risk as a companion measure to the new supplemental income poverty measure. The workshop will examine retrospective and prospective measures of medical care risk, defined as the risk of incurring high out-of-pocket medical care expenses, including insurance premiums, relative to income (referred to from here on as measure of medical care economic risk). It will consider the variability of risk across populations and the vulnerability of population groups, including the insured, underinsured, and uninsured and those with chronic health conditions, acute but not catastrophic conditions, and catastrophic conditions.

In accordance with its contract charge the Panel on Measuring Medical Care Risk in Conjunction with the New Supplemental Income Poverty Measure held a day-long workshop on September 8, 2011. The presentations and discussions that took place at the workshop are summarized here.

### WORKSHOP FOCUS

The U.S. Department of Health and Human Services is responsible for carrying out the provisions of the Affordable Care Act of 2010 (ACA), which is intended to extend health insurance coverage to most Americans. For monitoring the effectiveness of health care reform in providing coverage for low-income families and children, a new Supplemental Poverty Measure

(SPM) became available to HHS in fall 2011; the new measure subtracts health insurance premiums and other out-of-pocket expenses for medical care from income in determining a family's resources for basic needs (see Short, 2011). Although this new supplemental measure will deduct medical out-of-pocket expenses from resources prior to determining poverty status, it will not adequately address the medical care economic risk to the population in terms of the adequacy of their health insurance coverage to pay for expected health care needs. The implementation of the ACA significantly increases the need for a companion measure of medical care economic risk, which would estimate the proportion of families and children who are at risk of incurring high out-of-pocket medical care expenses, including insurance premiums in relation to their income, for monitoring the effectiveness of health care reform.

The goal of the workshop was therefore to critically examine the state of the science in the development and implementation of a new measure of medical care economic risk. Such a measure needs to be feasible to implement with data that are available or likely to become available in the near future. Its purpose is to serve a monitoring function by reflecting changes in medical care economic risk that are attributable to implementation of health care reform and other factors.

Workshop participants examined

- Concepts of medical care economic risk, examining retrospective and prospective measures of risk;
- Issues surrounding the development of thresholds—the variability of risk across populations, including geographic variations in exposure to medical care economic risk; the vulnerability of population groups, including the insured, underinsured, and uninsured and those with chronic health conditions and acute catastrophic and noncatastrophic conditions;
- Issues in defining resources—what is included in income in determining the ability to pay for insurance and for medical out-of-pocket expenditures, how the self-employed and different age groups pay for big expenses (assets, loans, free care); and
- Implementation issues—data availability currently and prospectively, data quality concerns, and timeliness concerns.

## WORKSHOP ORGANIZATION

The panel developed the agenda for the workshop in line with the contract charge and identified potential participants. To provide expert and detailed analysis of some of the key issues for the workshop beyond the time and resources of its members, the panel commissioned three background papers from experts in the field. The full text of these papers appears in Part III.

The workshop was structured to combine invited presentations and discussions among the participants on the various issues related to the development and implementation of a measure of medical care risk to inform policy that is feasible to collect and that will monitor changes in medical care economic risk over time. The workshop drew people from a wide variety of disciplines and perspectives and from federal and state agencies, the academic community, and private-sector organizations. The workshop agenda and a list of presenters appear in Appendix A. The slides used in support of the presentations are available at [http://sites.nationalacademies.org/DBASSE/CNSTAT/Medical\\_Care\\_Economic\\_Risk/index.htm](http://sites.nationalacademies.org/DBASSE/CNSTAT/Medical_Care_Economic_Risk/index.htm).

### PLAN OF THE WORKSHOP SUMMARY

This report is a summary of the presentations and the discussions flowing from the presentations during the sessions outlined in the agenda. Following this Introduction, Chapter 2 sets the context for the workshop. Chapter 3 focuses on the concept of a medical care economic risk measure, the criteria for a useful measure, and the pros and cons of retrospective and prospective measures. Chapter 4 discusses issues in the development of thresholds, tracking geographic variations in exposure to medical care economic risk, trends in financial burden of expenditures from chronic conditions, and trends in health insurance. Chapter 5 addresses issues in defining resources, starting with assessing the distribution and measurement of resources and using income and asset data from the Medical Expenditures Panel Survey, followed by presentations on how the elderly finance medical care and the financial burden of long-term care among the elderly. Chapter 6 discusses implementation issues, including availability, quality, and timeliness of data. Chapter 7 recaps the issues and next steps that may advance the current efforts from the perspective of the participants attending the workshop for developing a measure of medical care economic risk.

It is important to be specific about the nature of this report, which was prepared by the workshop rapporteur. It is a factual summary of what transpired at the workshop and is therefore limited to the views and opinions of those participating in the workshop, reflecting their concerns and areas of expertise and is confined to the material presented. The presentations and discussions were also limited by the time available for the workshop. Neither the workshop nor this summary is intended as a comprehensive review of research relative to a medical care economic risk measure, nor is it designed to generate consensus conclusions or recommendations from the participants. Workshops such as this, even though they are not designed to produce consensus recommendations and conclusions, can be very helpful in documenting what is happening in a field and providing a sense of where the field can move forward.



## Context for the Workshop

To set the context for the workshop, in the opening session the panel's sponsor spoke about the need and requirements for developing a measure of medical care economic risk. Kathleen Short provided background on the development by the Census Bureau of the new Supplemental Poverty Measure (SPM).

### SPONSOR'S PERSPECTIVE

**Don Oellerich** (Office of the Assistant Secretary for Planning and Evaluation) provided the sponsor's perspective regarding the need for and the importance of a well-constructed index to help assess people's medical care economic risk. One of the things that moved him on the issue and ultimately led to the current project was a paper called *Who Is at Risk?: Designing a Medical Care Risk Index* (Doyle, 1997). Clearly this measure needs to be institutionalized; although the current effort has been linked by some to the Census Bureau's release of the SPM, it is independent of it.

In a report called *Measuring Poverty: A New Approach*, a panel of the National Research Council (1995) recommended that there be an economic measure of the ability to afford basic everyday common necessities—food, clothing, shelter, utilities, and a little bit more. The 1995 panel further recommended that a separate measure be developed to measure the economic risk of having medical care costs that exceed people's ability to pay, even if they have enough income otherwise to meet their basic needs of food, clothing, shelter, and a bit more.

That was 1995, he said, and here we are 16 years later. Although some work was done toward developing this new medical care economic measure following the 1995 report, most of the work focused on the main income poverty measure, culminating in the SPM that the Census Bureau, along with the Bureau of Labor Statistics (BLS), has undertaken.

One can question why, with the implementation of health care reform, a medical care economic risk measure is still needed—particularly because health care reform has the promise of expanded coverage, both public and private, increased subsidies for low-income and moderate-income households, the removal of preexisting conditions, the removal of annual and lifetime limits, and the availability of the bronze, silver, and gold benefit packages.

Oellerich emphasized that it will be a very important measure, especially now that health care reform is going into various stages of implementation. It can be used to monitor the increase or decline in the number of people at economic risk and to gauge the extent of people's risk because of medical care needs that they cannot afford, even if they have enough income to meet their other basic needs.

Oellerich noted that the issues are related to defining risk, resources, and financial burden. In talking about risk, one is talking about a forward-looking measure, not a backward-looking one. That is the difficult part, he said. One can always look back and say, X percent of the population with an income of Y had medical expenses exceeding 10 or 20 percent of their household income or assets. Looking forward at risk is much more difficult. He concluded by reiterating that a lot of work has been done on the new income poverty measure, the SPM, and the medical care economic risk measure is a separate piece that needs similar effort to move forward.

## THE SUPPLEMENTAL POVERTY MEASURE

**Kathleen Short** (Census Bureau) provided background on the development of experimental poverty measures and the SPM at the Census Bureau. She explained that the Census Bureau's work on the SPM is heavily influenced by a document by the Interagency Technical Working Group (ITWG), *Observations from the Interagency Technical Working Group* (March 2010), which laid out some initial plans for how the Bureau would move forward with the SPM.

This document essentially endorsed the recommendations of the 1995 National Research Council (NRC) report *Measuring Poverty: A New Approach*. It also stressed that the new measure would not replace the official poverty measure and would not be used for resource allocation or program eligibility. It is intended to be a statistical measure of poverty. Without

funding, the Census Bureau and BLS will produce national estimates for a Research SPM (report was issued November 2011).

The 1995 NRC panel struggled with how to incorporate medical care needs into a poverty measure. The 1995 report observed that such needs are highly variable across the population, much more variable than needs for such items as food and housing. Some people may need no or little medical care, whereas others may need very expensive treatments and spend a lot on medical care, resulting in a skewed distribution. If medical care needs are incorporated into the threshold, then one would end up with a large number of thresholds to reflect different levels of medical care need, thereby complicating the poverty measure. As a result, it would be very easy to make an erroneous poverty classification. The NRC panel therefore recommended a two-index poverty measure: (1) a measure of economic poverty, which would look at resources adequate to obtain nonmedical necessities (food, clothing, shelter, and utilities), and (2) a measure of medical care risk, which would measure medical insurance coverage or resources adequate to buy needed treatment.

The economic poverty measure became the SPM which excludes medical care. The SPM thresholds for economic poverty therefore do not include any medical care needs, and the resources that are compared with that threshold to determine poverty status subtract medical out-of-pocket expenses from income to determine the measure of resources available for other basic necessities. It also does not add the value of medical benefits to income.

### Experimental Poverty Measures<sup>1</sup>

Based on the recommendations of the 1995 NRC report, the Census Bureau, with BLS, prepared a set of experimental measures as illustrative examples of what a new economic poverty measure would look like. In 2000, an Open Letter on Revising the Official Measure of Poverty was sent to the Office of Management and Budget and the director of the Census Bureau, with suggestions on how to move forward with the economic

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<sup>1</sup>The experimental poverty measures have been updated regularly and are available at [www.census.gov/hhes/povmeas/methodology/nas/index.html](http://www.census.gov/hhes/povmeas/methodology/nas/index.html).

poverty measure.<sup>2</sup> That letter discussed the issue of medical care, modifying somewhat what the NRC panel recommended. Specifically, the letter recommended not using the actual out-of-pocket medical expenses for those without insurance coverage, because their lack of insurance protection, combined with low income, might cause them to spend too little on needed medical care.

Following the receipt of this letter, staff at the Census Bureau developed another experimental measure in which medical care was included in the thresholds. A set of medical care risk indexes was developed to adjust those thresholds. And part of those indexes included an adjustment for the uninsured, essentially assigning them the spending of the insured. That measure is still produced at the Census Bureau and referred to as medical out-of-pocket expenses in the threshold.

### The Interagency Technical Working Group

The ITWG report also focused on medical care. It noted that self-reported out-of-pocket medical expenses will be collected in the Current Population Survey for the first time in 2010. If this proves to be reasonably reliable for statistical adjustment purposes, then these data should be used as the adjustment for medical out-of-pocket expenses for each family, the report said. The ITWG further emphasized that this approach does nothing to estimate the value of medical care that families are receiving relative to their needs, and additional improved measures of the affordability of medical care and/or the quality of medical care may be useful and important—but these are different statistics and will need to be separately developed and funded.

The ITWG also noted the argument that an adjustment to medical out-of-pocket spending should be made for the uninsured, who may be spending less because they lack health insurance and cannot pay for health services. The ITWG therefore recommended that the Census Bureau inves-

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<sup>2</sup>This open letter resulted from a conference held in 1999 on Poverty: Improving the Definition after Thirty Years co-sponsored by the Institute for Research on Poverty, University of Wisconsin–Madison, La Follette Institute of Public Affairs at University of Wisconsin–Madison, and the Brookings Institution, with funding from the Annie E. Casey Foundation. Through a set of meetings, and commissioned papers, a Working Group on Revising the Poverty Measure made agreed upon recommendations for an improved measure. That letter discussed the issue of medical care, modifying somewhat what the NRC panel recommended. Specifically, the letter recommended not using the actual out-of-pocket medical expenses for those without insurance coverage, because their lack of insurance protection, combined with low income, might cause them to spend too little on needed medical care. For further information on the letter, see <http://www.census.gov/hhes/povmeas/methodology/nas/files/2August2000OpenLetterPovertyMeasure.pdf>.



tigate the pros and cons of making such an adjustment and its computation in an SPM.

### The SPM

The SPM includes a set of poverty thresholds. They are developed and calculated at BLS based on 5 years of data from the Consumer Expenditure Survey and include spending on food, clothing, shelter, and utilities. There are separate thresholds by housing status: owners with and without mortgages and renters.

The Census Bureau obtains from BLS a threshold for a two-adult, two-child family, which is adjusted for families of different sizes and compositions using an equivalence scale. That threshold is then adjusted for geographic differences in the cost of housing, using the American Community Survey.

The unit of analysis in the SPM attempts to be consistent with the unit of data collection in the Consumer Expenditure Survey and is slightly different from the official poverty measure. It uses the idea of the census family, although cohabiters and foster children are also included.

The resources used to compare these thresholds are gross money income plus the value of in-kind nonmedical benefits—such as the Supplemental Nutrition Assistance Program; free or reduced-price school meals; the Special Supplemental Nutrition Program for Women, Infants, and Children; housing subsidies; and the Low Income Home Energy Assistance Program—that families can use to meet their food, clothing, shelter, and utility needs minus income taxes, payroll taxes, and other nondiscretionary expenses. The expenses that are subtracted are taxes, medical out-of-pocket expenses, child support paid, and child care and other work-related expenses.

Short next showed the impact on the poverty rates of the additions and subtractions to people's income in order to move from the official poverty measure to the SPM. Looking at the aggregate numbers across the entire population, not much is added to income, but subtractions are substantial in terms of income taxes before credits, payroll taxes, work expenses, and medical out-of-pocket expenses that are very large.

For those who are classified as poor under the official poverty measure, the picture is more balanced, because most of the transfers added in the supplemental measure—food stamps, school lunch, housing subsidies, the earned income tax credit—are aimed at people at the lower end of the income distribution. There are also some subtractions; the main item being subtracted for this group of people is medical out-of-pocket expenses.

The official poverty rate in 2009 was 14.5 percent using the official definition. The poverty rate using the SPM rate is slightly higher at 15.8

percent. Differences between the two measures are also observed across age groups, showing a lower poverty rate with the SPM for children, a slightly higher poverty rate for nonelderly adults, and a much higher poverty rate with the SPM for the elderly.

The impact on the poverty rate (the percentage of people below a given threshold) can be calculated with the inclusion of each element. For example, when the earned income tax credit is added, the supplemental poverty rate goes down by about 2 percentage points. With the addition of food stamps, it falls by about 1.5 percentage points. At the other end, the subtraction of medical out-of-pocket expenses from income raises the poverty rate by 3.4 percentage points.

When these same calculations are done for children, there is a large reduction in poverty rates from the inclusion of in-kind benefits, but not so much when the calculations are done for the elderly. However, subtracting medical out-of-pocket expenses increases the poverty rate for the elderly by 7 percentage points.

Short mentioned recent research on the subject undertaken by the Census Bureau, specifically *Medical Out-of-Pocket Spending Among the Uninsured*, a paper presented at the Joint Statistical Meetings in August 2011. This paper examines the poverty rate under different treatments of medical out-of-pocket spending. One purpose was to make the adjustment to medical out-of-pocket spending for the uninsured. A second purpose was to assess how the SPM might respond to policy changes in health care.

The SPM was calculated under two different environments: (1) assigning to the uninsured the medical spending of the insured and (2) implementing the key features of the Affordable Care Act.

Statistical matching between the insured and the uninsured was used as a method to assign the medical out-of-pocket spending of the insured to the uninsured. And the key provisions of health care reform to be implemented in 2014 were considered, such as adult Medicaid expansion for those with family income up to 138 percent of the family poverty level, eligibility levels for the Children's Health Insurance Program to be maintained by the states, state health insurance exchanges, and insurance premium subsidies for up to 400 percent of the family poverty level. No assumptions were made about any behavioral changes in response to implementing those measures in calculating the effect on the SPM.

SPM rates were calculated under the three scenarios: (1) before any adjustments, the poverty rate was 15.8 percent; (2) when the spending of the insured was added to the uninsured, the poverty rate increased to 19.4 percent; and (3) under the provisions of health care reform, the poverty rate was 16.4 percent, also an increase. Similar results were observed for children and for nonelderly adults. For nonelderly adults, rates calculated by race and ethnicity showed big differences, especially for the uninsured and

for Hispanics. Clearly the uninsured are the ones to whom larger spending is assigned, and Hispanics have a high probability of being uninsured. These findings indicate that, without the health insurance adjustment, implementing the provisions of health care reform would register that people are worse off with this economic poverty measure.

Considering the pros and cons, Short expressed the view that one would not want to make this adjustment because it would be inconsistent with other elements of the SPM, because everything else in the SPM is based on out-of-pocket spending.

The uninsured who become insured are recorded to be worse off economically because they are now spending more than they were spending before. Because increased spending is compared with the same income, without making this adjustment, the rates indicate that, with health care reform and health insurance coverage, people are recorded as worse off.

She ended with the comment that a complementary measure is needed that shows they are better off in the domain of health care with health insurance coverage. The medical care risk measure might fill that need.



## Measuring Medical Care Economic Risk

The first session of the workshop was designed to provide background on the concept of measuring medical care economic risk (MCER): What is the concept? Why is it needed? What are the criteria for a useful measure? How does one measure adverse medical event risk? How does one measure subsequent economic hardship? What are the pros and cons of prospective and retrospective measures?

The session focused on a paper prepared for the workshop on key issues in the conceptualization and measurement of MCER by Sarah Meier and Barbara Wolfe (see Part III of this volume). In their presentation, Meier and Wolfe discussed the need for a measure of MCER, issues in developing a measure, criteria for designing it, and their approach to developing the measure. Three discussants then offered remarks, followed by floor discussion and comments.

### MEASURING MCER: WHY, WHAT, AND HOW

**Barbara Wolfe** (University of Wisconsin–Madison) began by noting the importance of measuring MCER in the measurement of poverty. One reason to seriously consider a separate MCER is to increase the accuracy of the measurement of poverty. MCER is a separate concept or component of poverty—and a complicated one. It is essential to measure those who are deprived in terms of needing medical care in order to accurately capture those who are poor in a broad sense.

Another reason to include MCER, she said, is its increasing importance over the years. Spending on medical care as a percentage of gross domes-

tic product has grown substantially since poverty measurement began. In 1965, it was about 5 percent of U.S. gross domestic product (Congressional Budget Office, 2008:3). In 2010 this percentage grew to about 17.6 percent, and it is projected to grow to about 20 percent by 2020 (Centers for Medicare & Medicaid Services, Office of the Actuary, 2011:1). Therefore, in terms of thinking about individuals' well-being, capturing MCER has become increasingly important.

A third reason Wolfe mentioned to measure MCER is that it is sensitive to public policies that influence medical care coverage, such as Medicaid, Medicare, and provisions of the 2010 Patient Protection and Affordable Care Act (ACA). MCER is a way to capture the success or failure of programs in terms of their effects on both risk and targeting to those with low incomes. It will be ever more important, she said, as the nation moves into the era of expanding coverage under the ACA.

#### **Difference Between MCER and Medical Out-of-Pocket Expenditures**

Medical out-of-pocket expenditures are essentially contributions to health insurance premiums plus out-of-pocket expenditures for expenses not covered by insurance. Medical out-of-pocket is an *ex post* concept: it refers to expenditures—that is, actual utilization rather than risk of need. It is closer to what one thinks about in terms of traditional poverty measurement.

When people need medical care but do not have coverage or have limited coverage and limited income, they tend to underutilize care. When only actual medical out-of-pocket is included in a measure, underutilization is missed. If access to care is increased, leading to more coverage, people get recommended tests and treatments, and in fact their health is improving. In this situation, if the measure captures only medical out-of-pocket, then one may well think that an individual's health is declining because of the additional tests and treatments, believing that they are more vulnerable because their medical out-of-pocket has gone up, even though their health has improved.

Therefore, an out-of-pocket expenditure measure that does not adjust for underutilization is not very satisfactory, either in terms of thinking about people's real underlying needs or the success of programs. It gives the wrong picture for both. Most important, or most essential, it does not capture risk. It does not fit with the whole concept of health insurance, yet it is tied to measuring premiums and types of coverage. So if one thinks about the concept of risk, medical out-of-pocket is not a consistent or reliable measure.

### Key Issues in Developing an MCER Index

Wolfe next discussed a number of major questions that need to be addressed in developing an MCER index, with the authors' position on each one:

- Should the index be an *ex ante* (prospective) or *ex post* (retrospective) measure? Wolfe emphasized that risk is inherently a prospective concept.
- Should the core unit be the individual or the family? Medical care economic risk is an individual concept, even though one's insurance coverage may be at either the individual or the family level. One needs to start at the individual level and then aggregate up to the family level.
- How should underutilization or overutilization be treated? If people have particularly limited or generous coverage, should adjustments be made for both under- and overutilization? It is important to adjust particularly for underutilization, but both need to be kept in mind.
- Should the index be tied to a specific benefit package? Should the measure take a benefit package as is, whether it is a generous package or a very limited one? Or should the measure be based on a specific benefit package and a specified set of benefits in terms of medical risk? Wolfe said their answer is to work with a specific package, although the dimensions of the package have to be explicitly defined, including the extent of its generosity.
- Can such a measure be developed in a relatively short period of time? It is not particularly interesting to have an MCER index that measures risk from 5 years ago. If it takes that long, it is old information. Eventually there will be a trend, but it will not tell much about the success of policies today. Therefore, it is important to have a measure that is relatively easy to develop in a short period of time. The issue of data requirements comes up in this context.
- How complex should the measure be? One can get a more accurate medical care risk index for an individual if more information is obtained and used. But the cost of using more information is that developing the index is likely to take longer. So there is clearly a trade-off between complexity and pragmatic aspects in terms of speed and ease of creating the index.
- How should resources be captured, both in terms of the detail of coverage of individuals and their income? One aspect of this question is that people frequently use their assets, not just their current income flow, to cover medical care expenses. The issue is not so

much the concept of including assets, but, with available data sets, how to possibly move forward and include something about assets. This may be an issue that is too complex to handle.

- How should extreme risks—that is, “upper tail” expenditures—be captured? Risk includes the risks at the upper tail and some individuals facing very high, catastrophic risks. Should that be the focus, at what level should that be set, and how should it be incorporated across members in a family?

Wolfe closed her remarks by summarizing the treatment of medical care needs in poverty measurement. In the original official poverty measure, there is an implicit inclusion of some medical out-of-pocket expenditures, but it does not capture variability—it is a very simple measure. The Supplemental Poverty Measure (SPM) subtracts medical out-of-pocket expenditures from the calculation of family-level resources, but it does not include the value of insurance benefit(s) in resources and does not incorporate variability in medical care needs in the thresholds. The 1995 National Research Council (NRC) report also recommended that appropriate agencies should work to develop one or more “medical care risk” indexes that measure the economic risk to families and individuals of having no or inadequate health insurance coverage. However, the report recommended that such indexes should be kept separate from the measure of economic poverty (1995:225).

### Why a Separate Index?

**Sarah Meier** (University of Wisconsin–Madison) next discussed the need for developing a separate index, reviewed the literature on medical care risk indexes created by a number of people, reviewed various design considerations in developing an MCER index, and suggested a framework for developing this index. She also pointed out some of the limitations and challenges that must be addressed.

She noted that the incorporation of medical care need and resource considerations was problematic in the development of the SPM for two reasons. The first is the nonfungible nature of medical benefits, and the second is difficulties in defining and calculating medical need. Specifically, there is a limited ability to predict future expenditures at the individual level, resulting in misclassification. Perhaps with enough data, expenditures at a group level could be predicted accurately. But what specific expenditures an individual will have in a future period is something that cannot be predicted with any great accuracy. Even if one comes up with a reasonable prediction of expenditures that an individual will experience, variations in this predicted measure might necessitate a number of thresholds.



Developing two separate measures may resolve the problem that medical care insurance benefits are not fungible—that is, they cannot be used for other necessary expenses, such as housing and food. But this approach really pushes many of the difficulties presented by the measurement of medical care need into the domain of the second measure.

### Review of Existing Measurement Strategies

Before identifying strategies for moving forward, Meier briefly reviewed some of the work done to date toward development of a measure of MCER. Two analyses warrant particular emphasis: the first is a 1995 analysis by Short and Banthin, which estimates underinsurance among privately insured adults under age 65. It focuses on economic circumstances in the case of a catastrophic event, in which individuals are assigned to a risk group on the basis of expected expenditures and a catastrophic event is defined for each risk group. An individual is underinsured if the catastrophic event exceeds 10 percent of income.

A second analysis, by Banthin and Bernard (2006), also examines insurance adequacy. It covers the broader population, including the underinsured among both publicly and privately insured. However, this analysis focuses on actual medical expenditures over 10 and 20 percent of family income, an *ex post* concept. So it omits the risk aspect that we are interested in talking about today.

Another measurement strategy is the empirical model developed by Handel (2010). Meier observed that because a major objective of the framework she and Wolfe suggest is to identify an empirical strategy that enables more robust treatment of medical care risk and its implications, they relied on Handel's model to develop an MCER-relevant strategy to model and quantify risk.

Briefly, Handel's method takes a base sample of individuals and applies their claims information into a risk adjustment software model—specifically, the Johns Hopkins Adjusted Clinical Groups (ACG) Case-Mix System model. Based on claims experience—essentially prior diagnosis information—and an individual's demographic characteristics (age and gender), this software comes up with a risk score that is an indicator of the relative risk of individuals if one compares their scores.

Individuals are assigned to a risk cell for each claim type (four categories, including pharmaceutical claims, mental illness-related claims, physician claims, and hospital claims). Each cell includes similarly risky individuals as determined by the Johns Hopkins ACG software. Taking each claim type separately and the risk cells within the claim type, expenditure distributions are fit to the risk cell/claim type combinations, using actual claims experience.

Each individual is assigned a joint claims distribution based on his or her risk profile (risk cell membership for each claim type) and the respective estimated distribution. This joint claims distribution can be mapped to a distribution of out-of-pocket expenditures, which applies the individual's insurance characteristics. Family-level distributions of out-of-pocket expenditures can be formed by aggregating individual distributions and coverage characteristics.

### Steps and Criteria for an MCER

Meier outlined three steps for implementation of the suggested framework for an MCER measure:

1. Baseline measurement of medical expenditure risk at the individual level.
2. Adjustment of individual expenditure risk for risk protection (insurance), followed by aggregation of individual risk measures to form a family-level measure of medical care expenditure risk.
3. Measurement of family economic resources, which preferably would include an annuitized value of financial assets. This process would conclude with an examination of the relative affordability of a family's premium costs and its medical expenditure risk, given its economic baseline.

Prior to detailing the specifics of each step (see Meier and Wolfe in Part III of this volume), Meier highlighted some of the important criteria for the design of a measure of MCER that have been specified in prior literature. As stated previously, the 1995 NRC report recommended a prospective measure of medical expenditure risk, as well as a family-level measure, using the official poverty measure or SPM definition of family.

After the panel's report was published, a paper by Doyle (1997) outlined additional important criteria for a well-designed MCER index:

- The index must reflect risk;
- It must reflect resources and medical need (insurance adequacy, subsidized care, and affordability);
- It must be quantifiable;
- It requires a well-defined accounting period; and
- It must be defined by available data.

Meier went on to identify seven design considerations as particularly relevant to the framework she and Wolfe suggest.

**Individual Health Risk Classification**—basically, the selection of risk factors that would be used to assess risk. This would entail identifying a number of factors that would be predictive of higher, or perhaps lower, next period expenditures. Characteristics that are highly predictive of these expenditures need to be selected. Standard characteristics often selected are age and gender but could also include chronic conditions, disability, and others with high predictive capacity. The problem is that the best predictive model may be extremely complex and include variables that one might not have. Certain considerations need to be introduced when coming up with this classification. These include data limitations, such as availability of a relevant variable and number of observations per risk cell. Also, feasibility considerations, such as complexity, timeliness, and cost, would be important.

**The Definition of Appropriate Medical Care Coverage**—Expenditure risk should be defined under a standard minimum basket of medical care services. A starting point for this could be the benefits standard introduced under the ACA. Once the decision is made to select a minimum basket of medical care services, the next step is to adjust for over- or underutilization observed in the base data set.

**Selection of a Meaningful Risk Measure**—The issue here is how to move from a range of possible outcomes that an individual could have in the next period to a singular measure of economic impact. Meier suggested two potential measures: (1) a measure that reflects a probability of expenditures exceeding an affordability threshold or (2) a measure that would be based on expected expenditures per family unit, in which expected expenditures are conditional on the risk characteristics of unit members.

**Modeling Expenditures**—Going hand in hand with the selection of a risk measure, the developers of an index will need to come up with the best approach for modeling expenditures. Two approaches might be considered. The first is the formation of mutually exclusive risk cells and then moving to fit loss distributions, and the second is a regression-based method.

**Assessing Risk Protection (insurance)**—In addition, developers will need to determine how to best assess the risk protection afforded by insurance. Meier suggested individual-level assessment followed by family-level aggregation. At a minimum, this assessment should include information on deductibles and an out-of-pocket maximum, but ideally it might also include coinsurance and copayments or some measure of actuarial value.

**Measuring Family Resources**—Family resources can be measured using an income definition consistent with the official poverty measure, or the SPM, plus consideration of assets. To account for assets, an annuitized value could be constructed whereby a family is projected to receive the value of an annual flow of income from its financial assets based on the life expectancy of adults in the family, using existing life tables. This annuitized

value would then be added to income and compared with unprotected expenditure risk, which is the risk remaining after the effects of insurance are factored in.

**The Definition of Affordability**—Affordability is another very difficult concept. It can be defined as a family's risk of exceeding an affordability threshold. In this respect, the threshold could be defined as a percentage of family income, which includes the annuitized value of assets. The definition of an affordability threshold should probably vary by the family's relative resource level—that is, its resources relative to the level of income required to cover basic needs under the SPM and the official poverty measure. At least as a starting point, the affordability thresholds outlined in the ACA could be considered.

One of the major questions that will go hand in hand with the design of a measure of MCER is whether any risk, no matter how small, of a catastrophic outcome places a family at economic risk. Basically, every family is going to be at some small amount of risk of experiencing a catastrophic outcome, and there are some difficulties with determining how to treat that.

Meier emphasized that it is important to reach consensus on the conceptualization and measurement of medical care expenditure risk at an early stage of development. In particular, agreement is required on a minimum benefit standard, a concrete definition of affordability (that is, what percentage of income will be the threshold and whether annuitized assets are to be included), whether there are going to be adjustments for underutilization, and data considerations, such as the collection or construction of new variables.

### Concluding Remarks

Meier reiterated that MCER is an increasingly important component of poverty. Risk is prospective and individual but can be aggregated to the family or household level. The approach she and Wolfe favor is that the MCER measure be developed as a separate index. However, she noted, there is potential for incorporation into a single measure in the future. She reiterated that an MCER index is distinct from medical out-of-pocket expenditures because it captures the risk component, which is critically important.

She said that although she and Wolfe have outlined a basic framework for the development of the index, its definition and construction is a very complex process. There are many normative considerations in the design of an index. A well-formed measure requires attention to numerous methodological details. Several areas will require particular focus in future work.

## DISCUSSION

**Pamela Short** (Pennsylvania State University), session discussant, highlighted her thoughts on key concepts for measuring MCER. In her opinion, adhering to these concepts could make the job of measuring that risk easier, rather than harder.

She observed that there are basically two key reasons for measuring MCER separately from the general measure of poverty. First, the purpose of most medical care spending is to get people back to where they were in terms of well-being before a health loss. In keeping with this view, the SPM views medical care strictly as getting in the way of basic consumption. The implicit presumption is that medical care spending does not benefit consumers. The second reason for measuring MCER separately is the large random component involved in medical care spending. There is also a predictable component, which is reflected in adjustments in the SPM. One of the distinguishing characteristics of medical care is that the random component is very large and, for people who actually do get sick, it leaves them in a deprived state compared with other consumption needs.

The stated goal is to measure MCER. Risk is unpredictable, random variation in expenses. In their presentation, Meier and Wolfe have certainly defined risk in these terms, she said. Risk is not to be confused with predictable differences in average expenses. For example, older and sicker people will spend more on average than younger, healthier people. That is an issue in terms of well-being that can be realized with any given amount of resources, but it is not the risk the workshop is concerned with today. Also, risk should not be confused with actual expenditures. Conceptually, risk is an unknown that cannot be measured retrospectively. For example, two uninsured people are both equally at risk, even if only one of them gets sick. So risk has to be measured prospectively.

Another point is that premiums should not be confused with out-of-pocket medical expenses. The key here is that insurance turns random, variable medical expenses into regular, predictable insurance expenses. Insurance premiums are actually a lot more like spending on food, shelter, clothing, and utilities (the basic needs in the SPM) than out-of-pocket medical care spending. So, when one thinks about medical expenses in these terms, perhaps the ACA is a game changer for incorporating medical expenses into poverty measurement. If all are required to buy insurance, then the key question is how much insurance is enough to protect consumption related to basic needs other than medical care.

Where one goes with this depends a little on the planned use of the MCER index. If the index is to be used as a measure of needed income or how well needs are met by a family's income, then a family with insurance does not *need* lots of income to cover uninsured, out-of-pocket expenses.

However, families that are uninsured are at risk for serious deprivation without lots of income to cover the cost of an expensive illness.

If the purpose of the index is to grapple with identifying people who are underinsured and, conversely, to ask the question, “How much insurance is enough?” then the correct way of conceptualizing the question is in terms of the amount of insurance needed to avoid deprivation in the face of a random catastrophic illness or accident. Thinking in those terms, the medical risk component does intertwine with the nonmedical component of the SPM, if one is going to be internally consistent in the measuring systems. People who are adequately insured should have enough insurance to guarantee a minimum level of nonmedical consumption in any state of health—as established by the nonmedical poverty index, the SPM.

The nonmedical consumption threshold, therefore, should include the premiums needed to buy adequate insurance. After 2014, those premiums will vary by age but not by health status. In addition, to be totally consistent, nonmedical resources should not include actual spending under Medicaid and Medicare, but the actuarial value of those programs on average (comparable to a premium).

Short explained that the SPM currently reduces resources by out-of-pocket premiums and out-of-pocket medical expenses. But a possible modification would reduce resources by the out-of-pocket premiums needed to buy an adequate amount of insurance. The right amount of insurance would probably vary by people’s income and circumstances (e.g., household size and age composition). Then, at least conceptually, if people had enough insurance as measured against nonmedical consumption needs, their out-of-pocket medical expenses could be ignored. By construction, they should be able to handle any expenses not covered by the minimally adequate insurance plan.

Thus, one gets to a kind of two-part index or two-part measurement of poverty, she observed. This two-part approach decomposes family medical expenses into predictable family spending on insurance and a random out-of-pocket component, but with a need standard for the first component that reduces and limits the second component. The nonmedical poverty index, the new SPM, would incorporate enough income to buy enough insurance. The second index—on which this workshop is focusing today—would quantify the risk of being poor, as defined by the first index, because of inadequate insurance for the out-of-pocket component. As Meier and Wolfe suggest, Short concluded, that could be the probability of falling into poverty—the probability that high out-of-pocket medical expenses would put a family below the poverty threshold.

**Gary Burtless** (Brookings Institution), the second session discussant, began by stating that the perspective he brings to this discussion is that of

someone who is interested in knowing how one might distinguish between the poor and the nonpoor in the data sets available.

Suppose that most necessities can be purchased either with dollars or with something almost indistinguishable from dollars, for example, food stamps. If everything can be bought with dollars, the 1995 NRC panel proposed a complicated but in principle straightforward way to derive poverty thresholds to identify the specific number of dollars U.S. families need to cover necessities. The panel could not extend this conceptual method to cover the dollars needed to buy necessary medical care, yet they thought that was a necessity also.

Medical care can be purchased with dollars, Burtless observed, but the price of some common kinds of care is so extraordinarily high that few people actually buy it with ordinary dollars. They rely on their health insurance to reimburse the cost of essential care, especially if it is expensive. What about the people who lack health insurance? Or those who must obtain a lot of care that is not covered by their insurance? Or those who are completely uninsured but are in robust good health and are very unlikely to suffer any serious health catastrophe over the next year?

The 1995 NRC panel's solution to this problem was to suggest that family resources be calculated by subtracting the amount of money a family spent on health insurance premiums and out-of-pocket medical expenses—or the predicted amount of money it was expected to spend—from the other resources it had to pay for necessities. If family resources minus out-of-pocket medical expenses were too little to cover the cost of these nonmedical necessities in the thresholds, then the family was to be classified as poor.

Burtless said that many social scientists were dissatisfied with this solution. Based on their paper, he thought that Meier and Wolfe also appear dissatisfied with it. A problem they mention is that actual out-of-pocket spending may not reflect the necessary or recommended level of care (or spending) given family members' health conditions. In other words, families in strained financial circumstances may forgo necessary or recommended care because they cannot afford it. If the NRC panel's recommendation is followed, given the health condition of the members of the family, too few dollars will be subtracted from the family's resources to reflect the necessary care it ought to receive if it is to be classified as nonpoor.

He further stated that he is troubled by a recommendation that would disproportionately lift the poverty rate of groups in the population that have been the direct beneficiaries of so much technical progress and taxpayer assistance to pay for the care—the aged, the disabled, the nondisabled adults and children who benefit under costly public health insurance programs. It seems paradoxical to him that so many public resources are provided to health-challenged and low-income people, yet the proposed

poverty measure recommended by the NRC panel leads to the inference that these populations are relatively poorer than they were in the past when remedies for their infirmities were less successful and insurance options available to them were much less generous.

Burtless observed that officials in the Census Bureau or the Agency for Healthcare Research and Quality charged with collecting and organizing data will be looking for clear and specific guidance on how to take this medical risk recommendation and on how to distinguish people who are poor from those who are nonpoor. He remarked that he is not sure they will find all of the specific guidance that they might be looking for in the Meier and Wolfe paper. The authors have offered judicious views on a lot of the issues, but readers looking for a clear blueprint will not find it.

A given person facing individual-level medical spending risks can be described by a number of characteristics that may help predict the health spending risks he or she will face. Before any actual spending is observed, all one has is a set of indicators about the person to help in predicting the probability distribution of spending amounts over the next year. With good information about the person's current private insurance or potential eligibility for public health insurance in the event of a health crisis, it may be possible to devise a probability distribution of the person's net spending—on insurance premiums and copayments—after reimbursement is received.

The closer one comes to assessing the risks facing a particular person, the wider the predictable inequality of risks across people. The broader and more inclusive the group over which risks are assessed, the less the inequality in risks across people. As the risk measure is estimated over progressively narrower groups, the variation in the probability distribution of their medical spending risk widens.

"Adequate insurance" is the answer to the problem of paying for necessities that have a very wide distribution of required but unanticipatable cost. How does one assess insurance adequacy? The authors offer very helpful comments but perhaps not enough concrete guidance.

The concept of adequate insurance is clouded still further by the fact that public insurance provides complete coverage to specified kinds of care when eligibility is linked specifically to household income. Imagine a 30-year-old woman who is uninsured and has a modest income. If this person experiences a mild health setback, she is going to have to pay for the entire cost out-of-pocket if she is uninsured.

However, if her crisis is more costly, if the health episode is much worse, she may qualify for free or heavily subsidized public health insurance. It will reimburse most of her medical expenses, if not all of the necessary ones. And this is particularly true if the medical episode causes her to lose some or all of her income, bringing her income below the income eligibility limit for Medicaid. In states where the income eligibility limit is



above the poverty threshold, there is in fact a public program, Medicaid, that is supposed to ensure that a person with big medical bills will not be forced into income poverty as a result of the inability to pay critical health bills.

Burtless indicated that in this case he is not sure he understands how Meier and Wolfe's suggestions ought to guide the Census Bureau or any other poverty definer. Is this woman at risk of being poor? Or is the public program out there in fact ensuring that she will not become poor as a result of these emergency medical expenses?

He next listed a set of questions, answers to which would help influence the classification of who is poor and who is not poor:

First, what is the authors' preferred method of distinguishing poor from nonpoor people, taking account of their varying medical risks?

Second, what is the authors' preferred method of measuring medical risk? In particular, how specifically would they go about gathering needed data and assembling the data into a workable index? How narrowly, for example, would they define the population cells over which risk is measured?

Using their preferred method of assessing medical risk, or some other method that they might be willing to accept as a second-best alternative, how would they then use data from the Medical Care Expenditure Panel Survey, the Current Population Survey, the Survey of Income and Program Participation, or some other data set to place given survey respondents into the risk cells that they recommend, and then determine whether that person is a member of a poor family or a nonpoor family? What he is looking for is concrete and specific guidance about how to actually implement their preferred methods, not just a discussion of general principles.

If Meier and Wolfe think their preferred strategy will be rejected as unfeasible or politically unpopular or excessively costly, what do they think is a second-best strategy? And what is a third-best strategy if even second-best is unpopular or unfeasible?

When he finished reading the 1995 NRC panel report, he said, he did not fully agree with its recommendations with regard to handling health insurance and required health care expenses. Nonetheless, he had a concrete idea of how he would proceed and how the Census Bureau would go about estimating poverty under that definition. In conclusion, he reiterated that he wanted to know the bottom line for poverty measurement of Meier and Wolfe's proposals.

**Richard Bavier** (U.S. Office of Management and Budget, retired), the third session discussant, began by directing attention to two poorly supported assumptions, which the 1995 NRC panel needed to justify in order to leave health care out of the poverty thresholds in the first place and which now entangle efforts to design a complementary measure of MCER.

The first assumption was criticized by John Cogan, a member of the 1995 panel, who dissented from the report (National Research Council, 1995:Appendix A). He criticized the panel's assumption that all medical out-of-pocket spending is necessary, citing research that health care is an economic good for which spending varies with income and price. In the body of the report, the panel acknowledged that some health spending may be discretionary but suggested that medical spending by families with limited economic resources is probably all nondiscretionary. That was an assertion rather than an argument, Bavier said. He questioned whether research in the field of health economics over the past 15 years would support this assertion. For example, he asked, are Medigap premiums to obtain first-dollar coverage nondiscretionary?

Second, even household medical expenditures that are nondiscretionary still may not reduce current income available for food, clothing, shelter, and a little more—although the 1995 panel, and now the SPM, assume that they do. Some health care spending, especially involving the unusually high costs the panel was concerned about, may be funded through liquidation of assets or borrowing rather than out of current income. It seems reasonable to expect that, if they could, families would employ assets or borrow to cover high health care costs before they would allow consumption of basics to fall below necessary levels. The NRC panel correctly judged that including wealth in an operational poverty measure would be impractical. But then the panel allowed medical out-of-pocket expenditures financed by wealth to reduce current income, tested against the new poverty threshold. Aside from the inconsistency involved, this introduced an upward bias in the NRC poverty measure.

He reiterated that these two assumptions underlying the SPM are a barrier to designing a useful measure of medical care economic risk. Meier and Wolfe suggest a cell-based approach to modeling medical risk. They also propose that at least the annuitized value of financial assets should be deemed available to meet necessary medical spending needs. The authors do not present their MCER ideas as a finished system, but their approach is reasonable, and they point in the right direction, Bavier said.

However, with the best practical cell-based array of expected medical out-of-pocket spending, Meier and Wolfe's approach would be challenging to operationalize, and large variation in actual medical spending of families within cells will remain. The incidence of disease will vary within a cell, as will severity, and so will treatment intensity and duration. So if one adopts a suggestion to measure both SPM and MCER with the same data set, one is likely to be faced with the following situation. A family will be classified as poor in the SPM after its actual medical care out-of-pocket spending, which happens to be high for families within its MCER cell, is subtracted from current income. The same family will be found not to be at MCER

risk because its expected medical out-of-pocket spending, or its assigned point on the loss distribution within its cell, is affordable when measured against current income plus annuitized financial assets.

Bavier suggested that it may be possible to design a useful MCER that is consistent with the SPM assumptions about medical out-of-pocket spending, although he doubted it. A better solution would be to abandon the NRC approach to medical needs, include medical out-of-pocket in poverty thresholds, and move ahead with MCER based on the other purposes it could serve.

The two weakest points in the 1995 NRC report are the handling of medical care needs and the rationale behind its poverty threshold concept. Both would be corrected by recognizing that needs standards underlying major federal assistance programs for food, housing, medical, and other needs are elected government's judgment of what, in Adam Smith's words, the custom of the country renders it indecent for creditable people even of the lowest order to be without. That is where to start building a poverty threshold that the public and policy makers could understand and support.

Finally, he said, Medicare, Medicaid, and the Children's Health Insurance Program (CHIP) constitute a growing share of all transfers. In 1968, federal and state health care spending represented 29 percent of means-tested assistance. By 2004, health care represented 55 percent, or \$323 billion. An important goal in a new poverty measure is to reflect the major poverty reduction effects of government spending for noncash transfers and tax credits. However, unlike with food or housing transfers that are counted as income, when it comes to health care transfers, the NRC proposal for the measure of poverty does not measure the full effects.

Coverage expansions, that one assumes occur among the uninsured, can affect SPM poverty. However, increases in Medicaid or Medicare utilization and advances in treatments for current beneficiaries may not increase what the NRC panel termed discretionary income at all. Among Medicaid beneficiaries, per capita costs increased 30 percent in real dollars from 1975 to 2008. Among children, the largest eligibility group, the increase was 28 percent. It is unclear how much, if any, of this additional spending could reduce SPM poverty. In fact, when it comes to Medicare, any increase in copayments from increased utilization or new treatments may actually increase the medical care out-of-pocket spending subtracted from income and increase SPM poverty.

The sheer magnitude of public spending on health care means that whatever the conceptual and measurement arguments arrayed against counting public health care coverage as income when measuring poverty, not counting Medicare, Medicaid, and CHIP spending fully is a losing argument with many legislators, at least on the right side of the political spectrum.

## FLOOR DISCUSSION AND COMMENTS

Several participants expressed their views and had questions on the various issues flowing from the presentation by Meier and Wolfe on the conceptual framework of MCER. The authors also responded to some of the comments made by the session discussants.

Wolfe opened the discussion by stating that one of the traditional issues with an absolute poverty line has been that it does not reflect changing standards of living. It keeps the same standard and looks at how people are doing relative to an absolute standard set long ago. Even if a new standard is set, it will still be an absolute poverty line. In contrast, the MCER index by its very nature reflects changing standards of medical care and therefore spending. That is an important distinction and probably another argument for separating the two measures.

In response to Burtless's concern that the paper does not provide a blueprint, Wolfe responded that they were not trying to develop a blueprint. She thought, however, that they came relatively close. They were raising more general questions rather than suggesting to Census Bureau or Agency for Healthcare Research and Quality officials how to go forward.

Also, certain questions they thought were not in their jurisdiction. One example is affordability level. That is really a political question, a value judgment, and not something to which one brings technical expertise.

**Thesia Garner** (Bureau of Labor Statistics) said she was interested in including health insurance premiums in producing thresholds, as Short mentioned. The health insurance premium payment is intended to reduce risk, and there is also one's expected out-of-pocket expenditures during a certain period of time to be taken into account. She thought that BLS staff would want to try to put just the insurance part of the premium into the thresholds; it's a good approach to start with. The issue, though, in the SPM is to come up with an appropriate insurance premium for Medicaid; they do include the insurance premiums for Medicare and perhaps some for CHIP; she is not sure.

Short responded that she was suggesting that for the health care expenses that are paid by public programs, one would want to include something like average spending per person. That might be for separate cells but is very similar to a premium. A premium then just adds on the administrative costs of the insurance. So to the extent that one thinks of turning the random expenses into premium equivalents, that lets one move from individual data to averages, and that could be a big help in terms of the data requirements. She added that sometimes it is not clear why this is done on the threshold side, but in other places it is done on the resource side.

She further observed that the ACA eventually may help with regard to data, but not in the next couple of years. But if one evaluates insurance

based on its actuarial value, then one can get away from individual expenditures and applying a lot of complicated deductibles and coinsurance and so on. If a strong argument is made that everybody should have some guaranteed cap on their out-of-pocket expenses—and the ACA certainly moves in that direction—then that is a critical piece of information.

She noted that there had not been much discussion of Medicare. Here, the gap in Part D would have to close totally to get to an out-of-pocket cap for prescription drugs. Also, one of the main reasons for buying Medigap insurance is that Medicare is still an open-ended liability, as there is no cap on Part B, which covers services by doctors and other providers (Part A covers hospital services).

Meier had a couple of comments. First, there is a very important difference between measuring whether someone is at risk and how much they are at risk and measuring how much it would cost to protect them against risk. The index that she and Wolfe propose would be a measure of whether someone is at risk and how much they are at risk. If someone does have insurance that protects against risk, then the question becomes how that insurance narrows the spectrum of potential outcomes that this person could have.

Second, they do address Medicaid in their paper. It is a well-known problem that not everyone who is eligible for Medicaid applies for it. In their approach, an individual who has not taken up Medicaid is at risk at that moment. However, one can assess the person's eligibility for a program that protects against risk.

Both these issues need to be addressed, she said, but it should be understood that they are two very different things. Moreover, it is not up to Wolfe and her to spell out the vision of moving forward—it is up to the study panel, which needs to be clear on what it wants to measure. And to take that a step further, the ACA is designed with the mandate that everyone should be insured. And the question for the study panel is whether it wants to develop a measure that assumes that is the case and that public policy is directed at ensuring that individuals have enough money to purchase the insurance. Or does it want to design a measure that actually reflects people's current experience? They are two different things.

Meier noted that her presentation did not mention that the discussion of risk cells in the paper does not advocate an expected value approach, because expected value, instead of examining the spectrum of potential outcomes, gives one singular measure that is a poor representation of risk in the catastrophic context. That measure is not one they advocate, she said. Rather, they have advocated looking at a family's probability of falling at the catastrophic end of their potential spectrum of outcomes.

Kyle Caswell (Census Bureau) observed that the conceptual framework first tries to identify some sort of baseline level of risk. It then tries to pos-

sibly make an adjustment for insurance status and then to compare that outcome with some measure of economic resources. But in this cost model, baseline risk would be a function of claim types. Utilization of health care services is certainly influenced by insurance status, so the uninsured, for example, will have fewer claims. The baseline level of risk for the uninsured, before one compares that with a comparable risk of the insured person, is therefore going to be somewhat of a muddled measure at the baseline. He wanted to know if Meier and Wolfe had thought about that, or how they addressed it in their paper.

Wolfe responded that one approach is just to estimate these risk levels for people who are insured. In fact, if there were sufficient observations, one could do it for people who have insurance similar to what one has in mind as the appropriate benefit package. That way would avoid including those with so much coverage that they are using care that may not have much of an effect, as well as dealing with the underinsured or the uninsured problem.

**John Czajka** (Mathematica Policy Research) observed that one of the issues the study panel has to deal with is the intersection between income poverty and this risk index. One can certainly imagine people who are poor by the SPM income measure who would not be considered to have a risk of getting worse. He asked: Is that the right way to think about these two indices?

Short responded that yes, that is what she was thinking. The first part, the SPM-like piece that is really about certain spending and certain income, does not include risk. And the second part is really a measure of risk—if one sets the definition of a catastrophe at the poverty threshold from the first index, then the question really becomes what is the probability of uninsured expenses that would cause a person to fall below that threshold or fall down relative to that standard.

She also responded to Meier's comments, stating that she might have misunderstood what Short meant in speaking about the cost equivalent of someone being at risk, because they are complementary. If someone is at risk of being poor—and that could be a yes/no indicator or a how much at risk indicator—one way of quantifying that is to determine how much money it would take to eliminate that risk. And that is kind of the way she thinks about it in an insurance framework.

**Kenneth Finegold** (Office of the Assistant Secretary for Planning and Evaluation, HHS) mentioned one point that comes up in the context of what spending is necessary: the Dartmouth Atlas-inspired theme that there is unjustified variation in spending geographically, suggesting that overall a substantial portion of medical spending in the country is not necessary and in fact could be avoided (see <http://www.Darthmouthatlas.org>). And some places have found a way to avoid it. The ACA provisions try to adopt some of those methods.

Another point he mentioned is that people think a lot about the year 2014 because the ACA is going to be implemented and lots of things are going to be changed, some of which have been mentioned. One potential value to all this is that it provides a way to measure the impact on people who have insurance now and will remain insured, but their risk for out-of-pocket expenses may be reduced. There are measures of insurance, which will be available after the ACA, so one will be able to say what the impact is on insurance. However, there is the danger that some people may actually show up as poorer because their insurance is covering more and the premium costs are higher.

His last point is that, because of the concern about 2014, there is a lot of concern about 2013 and having a baseline to understand the impact of 2014. And therefore it worries him to hear the suggestion to wait until the ACA is in effect, and then things will be standardized and there will be new data. It will be very important to have all these measures as of 2013, he said, so that when the data on 2014 are available one can say this has changed or has not changed or may have changed in an unexpected direction.

**Willard Manning** (University of Chicago) stated that he can very well build a model that allows him to produce an expected amount from a data set by adding up across components or across family members to get an expected expenditure under a variety of controls. But one of the issues that comes up in the Handel approach is that one is talking about either variances in the simple cases or whole distributions. There are a number of issues to think about. Services are correlated; family members are correlated. Some families have members who are all very healthy, but some will have one member who is more ill than the others, maybe not by much, especially with the elderly. How does one deal with situations in which, when building up expenditures in the Handel approach, one ignores all of those covariances? And one knows that all of those covariances are positive and are actually increasing the dispersion, rather than making it smaller.

Meier responded that, on some level, she has just deferred to the methods in the Handel paper. The specific model that was employed was supposed to take care of these points, although she thinks that family members are treated as being fully independent in the model, which could be problematic. That said, not at the level of the statistical modeling, but at the level of the actual measure, Meier would want expenditures to be modeled as if people were acting on their own. That might sound strange, she said, but one would not want parents to be forgoing services because there was only so much money in the family and they decided to devote their medical care money toward the children in the family, for example. She stated that she knows that in the data indicate decisions in which families are operating as a unit and are allocating their consumption in certain ways. But ideally



the measure should be capturing this idealized consumption that people would have if they were not facing constraints.

Wolfe added that this method takes into account the way the insurance policies are designed. This can be a problem in terms of the data that are available, but in terms of the method, it does take account of family members' utilization. It takes the deductible, which may be a single person's deductible or a family maximum, so all those parameters are taken into account when the family is combined. The characteristics of the insurance plan are not the issue, because if one knows them then one presumably knows them at the family level, and when one combines the risk of the individual family members, then one applies the policy as it applies to the family, if it is a family policy. There may be a data limitation in terms of what is known about the characteristics of insurance policies. But if one had those insurance policy characteristics, then one could aggregate the risk at the family level and then apply the insurance policy.

**David Betson** (University of Notre Dame) complimented Meier and Wolfe on their paper. As a member of the study panel, he cautioned that it is not for the panel to set what is an adequate benefits package. That is not necessarily the members' area of expertise, although some of us certainly could weigh in on those issues, he said. But it is very important to know, as things roll out, what would be available from the data that reflects what is being done in society. In actuarial work, one often hears this kind of referral to typical benefits offered, typical large employer benefits, and typical small employer benefits. So the ACA will help very much because its benefits standards will reduce some of that variation and make data collection easier. But the study panel should not make value judgments, he said.

**Michael Hurd** (RAND) had two comments, one very specific to the paper, another one much more general. The first has to do with the adjustment for out-of-pocket medical expenses. It really affects the elderly the most, and that brings up the issue of assets. The elderly have quite a few assets. The paper recommends annuitizing assets for an income flow, but in fact people do not annuitize. The assets are meant partly to be precautionary assets. Medical expenditures are partly episodic and partly chronic, so people should be allowed to (and in fact do) spend episodically out of their assets. So an annuitization would distort the availability of those economic resources to buffer against risk.

His second comment was much more general. He questioned why the study panel would want to develop a measure of economic ex ante risk. That is a complex undertaking, requiring the joint modeling of economic resources and risk for health care spending and producing ex ante probability distributions that are not just a variance but the very high end because of the skewed distribution of outcomes. These have to be jointly modeled with economic resources because spending varies with economic resources.



People who are more wealthy spend more, and people who are less wealthy spend less, and it happens throughout the wealth distribution. Therefore, it is necessary to model all of those things.

With an ex post measure of outcomes, when comparing outcomes in spending with economic resources, if available economic resources fall below some level, however that is done, it is a very straightforward situation to explain to people. No modeling is needed. The data will allow one to integrate over all the insurance packages and economic positions that people occupy and take account of the covariances between their economic position and their health status and family situations.

Developing the ex ante risk index would be like developing a poverty index to predict that next year X numbers or a fraction of people are going to be in poverty. That is not of interest. Of interest is saying that X many people were in poverty this year and being able to explain it. He suggested that the same should happen with the MCER index.



## Issues in the Development of Thresholds

This session addressed issues related to the development of thresholds. Should thresholds vary for different population groups? How to capture variability of risk across populations, including geographic variations in exposure to medical care economic risk, and vulnerability of population groups by insurance status, age, income, chronic health conditions? How to update the thresholds?

The presentations covered three topic areas affecting the development of thresholds:

1. Geographic variations in exposure to medical care economic risk.
2. Trends in persistent financial burden of medical out-of-pocket expenditures resulting from chronic health conditions.
3. Trends in insurance coverage and their impact on medical out-of-pocket expenses

### **TRACKING GEOGRAPHIC VARIATIONS IN EXPOSURE TO MEDICAL CARE ECONOMIC RISK: MOVING BEYOND ONE NATIONAL ESTIMATE**

**Sara Collins** (The Commonwealth Fund) opened her presentation by observing that high out-of-pocket medical costs are an increasing problem for insured as well as uninsured people. She referred to an analysis relevant to the topic in which she participated on the numbers of underinsured and the trends over time (Schoen et al., 2011). The authors found that national out-of-pocket spending on health care services, not counting premiums,

rapidly rose in both percentages and numbers over the period 2003-2010. Their analysis shows growing numbers of working-age adults who have such high out-of-pocket costs relative to their income that they are underinsured. The authors found that an estimated 29 million people, 16 percent of the adult population, were underinsured, up from 16 million, or about 9 percent, in 2003.

She said that these measures are based on the The Commonwealth Fund's Biennial Health Insurance Survey with a dual frame landline and cell phone sample of 4,000 nonelderly persons. The underinsured were defined as spending 10 percent or more of their income on medical expenses, or 5 percent or more if their incomes were under 200 percent of poverty, or deductibles equal to 5 percent or more of income.

The Affordable Care Act (ACA) will significantly expand and improve health insurance coverage with the expansion in Medicaid, income-related premium tax credits, basic health care plans if states opt to implement one, and reduced cost-sharing to limit the risk of high out-of-pocket costs and also enable timely access to health care.

There are remaining risks, however. Households with low and moderate incomes may still be at risk of high costs depending on the design of health plans and the choices people make among health plans available to them, state health care spending growth, exemptions in the law of certain plans, grandfathered plans, and self-insured plans. Also, state implementation decisions, especially with respect to the exchanges, and state enforcement of insurance market reforms may affect the risk of high costs.

The Insurance Affordability Programs that will be available under the ACA beginning in 2014—Medicaid, the Children's Health Insurance Program, the basic health plan, premium tax credits, and the cost-sharing protections for qualified health plans in the exchanges—will go a long way toward reversing the trends on underinsurance and on the uninsured, particularly for people with incomes under 250 percent of poverty for whom the protections are the greatest.

But even for higher income households, the limits on out-of-pocket spending, market reforms against underwriting the essential benefit package, and guaranteed issue and no preexisting condition exclusions will also offer new protections. Schoen and her colleagues estimated that the ACA could reduce the number of underinsured adults by 70 percent.

Some work published in a Commonwealth Fund issue brief of the ACA's insurance expansions found that 90 percent of households with median out-of-pocket spending would have sufficient room in their budgets for both premiums and out-of-pocket costs after full ACA implementation (Gruber and Perry, 2011). Using data from the Medical Expenditure Panel Survey (MEPS) and the Consumer Expenditure Survey, they established a standard for necessities and then assessed whether there was sufficient

additional income in budgets to pay for both health insurance and out-of-pocket costs.

They used the family economic self-sufficiency standard, which considers such necessities as child care, food, housing, taxes, transportation, and miscellaneous costs, which are defined as 10 percent of other costs. They found risks in the analysis: people with high spending in any given year, such as people with chronic health problems or catastrophic accidents, 25 percent of those with incomes between 200 and 250 percent of poverty would not have had room in their budgets for the premiums and the out-of-pocket costs.

As income rises past 200 percent of poverty, cost exposure also rises. Premium cost-sharing increases from 6.3 to 8.5 percent of income as income moves from 200 percent of poverty to 250 percent of poverty.

Gruber and Perry also found differences by states. Higher shares of people in states with higher cost of living would not have had room in their budgets for premiums and out-of-pocket costs. This is exacerbated for people living in states with a high cost of living who also had high health care spending: more than 30 percent of people in this group with incomes between 200 and 250 percent of poverty did not have room in their budgets for premiums and out-of-pocket costs. The March 2010 Current Population Survey (CPS) asked about total out-of-pocket expenditures, including premiums, and enabled estimates of risk at the state level, an exciting development in terms of tracking and understanding what has been going on across states. The CPS asks about total out-of-pocket costs for medical care services in 2009, including premiums and costs reimbursed by insurance. For households with more than one member, the data files aggregate spending for each family member in total family expense. Preliminary estimates based on one year of data in 2010 indicate significant variation in the percentage of families with high out-of-pocket spending across states. Tracking trends in out-of-pocket costs nationally and by state for those insured, uninsured, and by poverty status will help inform reform implementation and future policies.

Collins briefly explained the data and method used in the analysis she conducted with Bhaven Sampat, Cathy Schoen, and Nicholas Tilipman, from Columbia University. They used the new out-of-pocket spending measure in the 2010 CPS to analyze out-of-pocket cost burden at the household/family level, also using a measure of family income. The CPS asks about total out-of-pocket costs for medical services in 2009, including premiums and costs reimbursed by insurance. For households with more than one member, the data files aggregate spending for each family member in total family expense. They classified a household as insured if all members in the family are insured. Uninsured families are families in which everyone is uninsured or some members are uninsured. They defined out-of-pocket

spending risk, or thresholds, as families that spent 10 percent or more of their income annually on medical needs, or people who spent 5 percent of their income, if their incomes were under 200 percent of poverty. The results show the percentage of families and total counts of people in families with high medical care expenses compared with their income.

Tilipman and Sampat, in their analysis of the 2010 CPS for the Commonwealth Fund, examined two threshold measures of out-of-pocket spending and premiums: 10 percent or more of income and 5 percent or more if income was under 200 percent of poverty.<sup>1</sup> They found that, among all families at the 10 percent or more threshold, 13 percent of families spent 10 percent or more of their income on out-of-pocket expenses. If the 5 percent threshold is added, that jumped up to 17 percent. Among insured families, 11 percent of families spent 10 percent or more of their income on out-of-pocket costs. The percentage increases to 15 percent of families if the 5 percent threshold is added. Among uninsured families, the risks were clearly the highest, with nearly a quarter of these families experiencing high out-of-pocket spending relative to their low incomes, using the combined 10 percent and 5 percent threshold—a big jump when the lower threshold is added.

Families most at risk were those with low incomes, Collins said. Nearly 40 percent of families under 133 percent of poverty had high out-of-pocket costs, and 31 percent of those with incomes between 133 and 199 percent of poverty also had high out-of-pocket spending relative to their incomes.

When they looked at just insured families, 37 percent of those with incomes under 133 percent of the poverty level and nearly 40 percent of those with incomes under 133-139 percent of the poverty level had high out-of-pocket medical care costs and premiums. It shows a combination of low income and also poor coverage options at that income level, less employer coverage among low-income groups, and people in employer plans with high cost-sharing relative to lower paying jobs.

Collins observed that a big advantage of the 2010 data is being able to look at differences across states in medical care cost spending. Families in the Southeastern states were most at risk of spending large amounts of their income on out-of-pocket health care costs, amounting to nearly a quarter of the population in those states spending 10 or 15 percent of their income on out-of-pocket medical care costs. Some of the highest spending states were Alabama, Arizona, Arkansas, Indiana, Kentucky, Mississippi, and Tennessee. Focusing just on insured families, Mississippi and Arkansas had had the highest rates of high out-of-pocket spending, again reflecting

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<sup>1</sup>Analysis of the 2010 Current Population Survey, U.S. Census Bureau, by Nicholas Tilipman and Bhaven Sampat of Columbia University for The Commonwealth Fund.

a combination of low income and poor coverage. New England and the Midwest saw slightly lower rates.

She cautioned, however, that it is important to keep in mind in looking at these rankings that some of these levels are separated by 1 percentage point differences. In all states, families with lower income are most at risk due to higher rates of uninsured and also less protective coverage.

To summarize, 17 percent of families, about 44 million people, had high out-of-pocket costs in 2009 relative to their income. Most at risk were low-income households; nearly 40 percent of insured families under 200 percent of the federal poverty level had high out-of-pocket costs.

High out-of-pocket costs varied dramatically by state, ranging from 12 to 24 percent of families.

Collins observed that the ACA reforms beginning in 2014, with Medicaid expansion, premium tax credits, and lower cost sharing for qualified health plans in the exchanges, the essential benefit package, and market reforms, should lead to a dramatic reduction in the share of families with high out-of-pocket costs as a share of their income both nationally and across states. But risks include ongoing risks of rapid health care cost growth compared with income, families with chronic illness, the design of benefit plans and the state implementation of the exchanges, enrollment coordination between coverage options, the pace of implementation, and the exemptions of health plans from the law. She concluded by saying that all of this suggests a need to monitor the law over time, at the state and national levels.

### HIGH MEDICAL CARE COST BURDENS AMONG NONELDERLY ADULTS WITH CHRONIC CONDITIONS

**Peter Cunningham** (Center for Studying Health Systems Change) presented findings related to trends in out-of-pocket spending and high financial burden, how they have changed over time, how they differ for different population groups, and what they imply for affordability thresholds. When one thinks about affordability thresholds for medical care, the question is whether they should be different for people with chronic conditions or people with health conditions that require high expenditures. Clearly, people with health problems use more health care, and they spend a lot more on health care than people with fewer or no health problems. But does that necessarily mean that they should have a different affordability threshold?

For example, if it is determined that health care should be affordable up to, say, 5 percent of a family's income, is there a reason why that should be different for people with chronic conditions? It could simply mean that people with chronic conditions are going to meet that threshold more often. To make the case that there should be a different threshold for people with

chronic conditions or other health problems, one has to argue that affordability is different in some way for persons with chronic conditions other than simply their high level of spending.

Cunningham pointed out that the ACA does recognize different affordability thresholds based on income as a way of calculating the premium subsidies and even subsidies for cost-sharing. Although he said he is not advocating that there should be a different threshold for people with chronic conditions, such an argument could be made based on the findings of his research, which he presented. The research shows that high medical cost burdens for people with chronic conditions tend to persist over time, and these can often lead to greater accumulated debt, which in any given year creates more financial pressures than simply what they spend in that particular time period.

He stated that most of the findings in his presentation are based on 2008 data from MEPS, which were the most recently available data at the time of the workshop. Most data on expenditures and high medical cost burdens are based on annual estimates, and they are retrospective. But he has also used the panel component of MEPS to look at the persistence of high burden over a 2-year period. High financial burden is defined as out-of-pocket spending for both premiums and services that exceed 10 percent of family income, a definition that is consistent with his past work. Before-tax incomes are used, and assets are not included. Also, the sample is limited to nonelderly adults.

### Health Insurance Coverage by Health Conditions

Using the conditions file and coding by the *International Classification of Diseases*, ninth revision (ICD-9), and the clinical classification codes that are in the MEPS, nonelderly adults were classified on the basis of their insurance status, whether they had any reported conditions during the year, whether they had acute conditions only, and whether they reported one, two, or three or more chronic conditions. The data show that nonelderly adults with multiple health problems were not necessarily at greater risk for high financial burden because of lack of coverage. In fact, among all the conditions looked at, they had the lowest uninsured rates of all the groups. In fact, people with no conditions had the highest uninsured rates, although one has to allow for the fact that there may be people with undiagnosed conditions who were uninsured in that group.

A higher percentage of people with multiple chronic conditions had public coverage (about 19.2 percent), which reflects disability coverage in Medicare and Medicaid. Yet two-thirds of people who had three or more chronic conditions had employer-sponsored private insurance.



Some differences by income were observed. A larger percentage of people with multiple chronic conditions were found in the lowest income group, people who are going to be eligible for Medicaid coverage in the ACA. But the differences in family income by health condition are not tremendous.

### **Out-of-Pocket Spending**

Cunningham next analyzed the data on out-of-pocket spending by the entire family for both out-of-pocket premiums and out-of-pocket services by family income and health condition. He found that out-of-pocket spending did tend to be higher for people with multiple chronic conditions but the differences were much larger for spending related to services. That reflects the fact that premiums tend to be more predictable. Also, more people are going to be in group coverage, for which there is less variation in the rates, whereas the out-of-pocket spending for services is less predictable.

A much larger percentage of people with multiple chronic conditions tended to have out-of-pocket spending that was greater than 10 percent of their income compared with people with even two chronic conditions, and certainly more than people with acute or no conditions.

One conclusion that can be drawn from these findings is that there tends to be a pretty systematic break for people with three or more chronic conditions compared with people with fewer chronic conditions, resulting in a level of seriousness, or intensity of service use, that leads to greater out-of-pocket spending.

### **Trends in High Financial Burden**

Analysis of MEPS data for 2001, 2006, and 2008 shows that, across all condition categories, between 2001 and 2006 there was an increase in the percentage of people with high financial burden, defined as total out-of-pocket spending greater than 10 percent of family income. That reflects real incomes, adjusted for inflation, basically staying flat for that time period, as well as increases in out-of-pocket costs for both premiums and services. After 2006, however, there appears to be a leveling off for most people of out-of-pocket spending relative to income. For people with three or more chronic conditions, spending actually decreased, returning to 2001 levels.

Most of this trend appears to be related to a decrease in out-of-pocket spending for services; for people with multiple chronic conditions, it is related to a decrease in out-of-pocket prescription drug spending. Other data indicate that, during this time period, there has been a marked shift from brand name use to generic use of prescription drugs. So that could be

accounting for some of the decline. It could also be related to a decrease in demand for medical care related to the recession.

Looking at differences in high burden levels by income, as one would expect, the percentage with high burden was much higher for people with low incomes compared with high incomes, and the gap was actually wider for people with multiple chronic conditions.

Data from the 2-year MEPS panel provides an idea of the persistence of high financial burden. These data show that people with multiple chronic conditions were more likely to have high financial burden over the 2 years. The high burden is more likely to be persistent for people with multiple chronic conditions. This is an important finding, because persistent high burden can lead to accumulated medical debt that can last for years and can have a multiplier effect on the medical cost that one faces in any given year. For example, families might be better able to absorb the costs if they have a one-time medical event that results in substantial medical costs. But if that happens again and again because of a chronic condition, that can become financially burdensome over time.

### **Problems Paying Medical Bills**

Analysis of data from the 2007 Health Tracking Household Survey conducted at the Center for Studying Health Systems Change shows that a higher percentage of people with chronic conditions tended to report more problems paying medical bills, probably due in part to the persistence of high medical cost burdens as well as higher debt levels. A total of 29.9 percent of people with chronic conditions reported problems paying medical bills, compared with 18.5 percent of people with no chronic conditions. What is interesting to note is that higher rates of medical bill problems among persons with chronic conditions was not just the result of higher overall spending. Even people with chronic conditions who had relatively low levels of out-of-pocket spending reported more problems paying medical bills, compared with people with no chronic conditions who reported similarly low levels of spending.

### **Conclusion**

Cunningham concluded that these findings suggest that there is something fundamentally different about having chronic conditions, which should be taken into account when setting affordability thresholds. There is evidence that people with chronic conditions do have lower affordability thresholds than other people. That is especially the case for people with multiple chronic conditions. At similar levels of out-of-pocket spending relative to income, people with chronic conditions reported more problems

paying medical bills. This probably reflects the fact that people with chronic conditions are more likely to have persistently high financial burdens, and that contributes to higher accumulated levels of medical debt that stay around for more than just a year.

There would clearly be a lot of practical issues with implementation. Should all chronic conditions be used, or just a select group? Also, some people with chronic conditions are more likely to choose expensive plans that have higher premiums, in order to cover their expenses. Some measure of affordability needs to be incorporated in data collection. It is important, at least from the standpoint of testing different affordability thresholds, to get some real-world experience from people about whether they find certain levels of out-of-pocket spending to be affordable or not.

### TRENDS IN INSURANCE COVERAGE AND THEIR IMPACT ON MEDICAL OUT-OF-POCKET EXPENSES

Gary Claxton (Kaiser Family Foundation) focused mostly on employer-sponsored health insurance and some on nongroup health insurance, where the out-of-pocket expense risks are and how that has changed or not changed over time. He explained that most of the information is from a survey conducted at the Kaiser Family Foundation with the Health Research and Education Trust, but also some data from MEPS, looking at group and nongroup out-of-pocket shares.

#### Health Insurance Characteristics

He opened his presentation with two observations about what we know and don't know about health insurance, and its adequacy, and our ability to characterize whether or not someone has good health insurance, and what that means to out-of-pocket risk.

His first point was that there is a lot that is not known about how good health insurance is. Surveys can provide information about deductibles and out-of-pocket maximums, but they cannot keep people long enough on the phone to ask about limits on rehabilitation services, and whether or not biological drugs are covered at certain levels, whether or not they are part of the out-of-pocket maximum, or all the other things that lead to high exposure to out-of-pocket risk, even when people have what they think is good health insurance.

His second point is that the kind of insurance is as important as any trends in terms of out-of-pocket risks. Small-group health insurance plans are different from large-group plans, and they are both different from nongroup health insurance in terms of out-of-pocket burdens and protections.

Claxton observed that premiums are going up a lot faster than either earnings or inflation, and that has been going on for a long time. It is interesting to note that worker contributions track the increase in premiums. So over time workers have been paying the same share of the premium for employer-sponsored health insurance. Last year, for the first time, the shares for both single and family coverage increased, moving from 16 to 18 percent for single and from 28 to 30 percent for family coverage.

### **Difference Between Small-Firm and Large-Firm Health Insurance**

A small firm is defined as one with 3-199 employees. Listening to a lot of the debate in Washington, he said, one would think that small firms pay more for health insurance and that their health insurance premiums are going up faster. Neither of those statements is actually true. What happens is that workers in small firms pay more for their family coverage, and small firms have higher deductibles. But in general small-firm health insurance is somewhat cheaper. It is about \$700 cheaper now. There seems to be a trend in that direction: for family coverage, small firms seem to be moving away from large firms and having less comprehensive coverage.

Claxton reported that Kaiser Family Foundation started conducting a survey with the Health Research and Education Trust in 1999 to look at the dollar amount of worker contributions over time for single and family contributions by firm size. They found that, for single coverage, small and large firms were much the same in terms of what workers had to contribute, and it went up about the same amount over time. The big difference is for family coverage: covered workers would have to pay much more for family coverage in small firms than they do in large firms—about a \$1,000 difference in the past year. In terms of the share of the premium, the difference for single coverage between small firms and large firms is reversed. Covered workers in small firms on average paid a smaller share of the premium for single coverage, and they paid a much larger share of the premium for family coverage. Part of this has to do with the fact that there are still a number of workers in small firms who have to pay nothing for single coverage. One might guess that this comes from the fact that some insurers require that a certain percentage of workers to enroll before a small firm can get coverage. Small firms are less likely to have Section 125 plans that allow workers to pay their contribution with pretax income. So just covering 100 percent of the premium is a way to get that enrollment.

However, workers in small firms paid on average 35 percent of the cost of family coverage. A family policy was close to \$15,000, not a trivial amount. It is therefore not surprising that workers in small firms are much less likely to be enrolled in family coverage than workers in large firms.

Focusing on the tail of the distribution, the percentage of covered workers in small firms and large firms who had to contribute at least 50 percent of the premium, they found that for single coverage, it was not very common. For family coverage in large firms, it was also not very common. For family coverage in small firms, around 30 to almost 36 percent of covered workers in small firms contributed at least 50 percent of premium. That helps explain why there is a lower percentage of workers taking family coverage in small firms.

Looking at the other end, that is, the percentage of covered workers who contributed 10 percent or less of the premiums, in 1999, at the start of the survey, a substantial portion of workers in small firms contributed nothing for their health insurance. That has actually been going down over time, as it has for the other categories as well.

He next focused on cost-sharing. One of the things that is going on with employer-sponsored health insurance is the movement to consumer-funded, consumer-driven plans. In his survey, these are defined as plans that have a deductible of at least \$1,000 and can be matched with a savings account. So they are either a health savings account (HSA) qualified plan, or they are a high-deductible plan with a health reimbursement arrangement offered by the employer. Enrollment has grown recently in those plans, and it is going to go up again this year. These plans provide workers with higher deductibles. Higher deductibles are usually matched with somewhat higher out-of-pocket maximums. On the plus side for covered workers, in one of these plans, the employer may make a contribution toward an individual's savings account. That is by definition true in a health reimbursement arrangement, because only the employer can contribute to those. For workers who are in an HSA-qualified plan, about 60 percent are in plans in which the employer makes a contribution toward their HSA, but not all workers are in that situation.

One other advantage in terms of out-of-pocket costs that comes from the HSA-qualified plans is that the out-of-pocket maximums have to be genuine maximums. That means that all covered spending actually has to count toward the plan's out-of-pocket maximum. The increase in deductibles is not entirely about people going to consumer-driven plans. The share of workers with plans with a deductible of at least \$1,000 has been steadily rising: it is almost half of covered workers in small firms and about a quarter of workers overall. About 20 percent of covered workers in small firms are in a plan with at least a \$2,000 deductible, comprising about 10 percent of overall workers. Out-of-pocket maximums are also going up, and this is across all different health plans for people who have an out-of-pocket maximum. The distribution of people with single coverage who are in a plan that has an out-of-pocket maximum of at least \$3,000 has

gone up from 22 to 31 percent from 2007 to 2010, and it is going to go up again this year.

Next, using data from MEPS, Claxton described out-of-pocket shares for people with nongroup insurance and group insurance over time. They found that the people with nongroup insurance spend more than half of their total health spending out-of-pocket. That number is pretty persistent. It comes down a little bit over time, but generally it is substantially different than that for people with employer-sponsored insurance, and that is true for both the mean and the median.

He commented on some of the discussion in the earlier session. Work with the American Cancer Society shows that the people who run into trouble are those who have limits on the amount of spending that their policy covers, for example, for radiation. Or they have no real out-of-pocket maximum for drug coverage, and they need biological drugs. Although these situations are fairly rare, their effects can be very large. One does not know about these limits when buying a policy, because this is really a fine point. It is not that uncommon to see a limit on rehabilitation of \$3,000 annually in a policy, which may not be adequate if, for example, one has a stroke.

On another point, there was a lot of talk about actuarial value. Actuarial value can mean many things, and it may or may not be related to an actual scope or breadth of benefits in a benefit package. It can be just the percentage of whatever is covered that is paid for. So if the package covers only hospitalization and it pays for all hospitalization, it has an actuarial value of 100 percent.

To relate it to a broad benefit package, for example, one can talk about what percentage of all spending this insurance would cover. But cutting out services for relatively rare events would not affect the actuarial value very much at all. So, for example, one could take out all spending for biological drugs and change the actuarial value 1 or 2 percent. But for the people who need those drugs, that would wipe them out. So it is very hard to actually characterize these policies as protective, if the topic is the out-of-pocket expenditures that people have for catastrophic risk.

Health reform may or may not help with some of these things. There will be an essential benefit package, potentially, but how much it will deal with the scope and duration limits that insurers are allowed in the benefit package is unknown. Also, large employers and self-funded employers are not subject to the essential benefit package.

## DISCUSSION

**James Ziliak** (University of Kentucky Center for Poverty Research), session discussant, organized his discussion into three unifying themes across the three presentations:

- defining the notion of high burden
- measuring cross-state cost-of-living differences (this applies mostly to the first presentation)
- whether thresholds should vary for different population groups

Ziliak remarked that it was not clear to him why there are different definitions of high medical out-of-pocket spending, depending on income status. In Collins's presentation, out-of-pocket spending greater than 5 percent of income was considered a high burden for those with annual incomes less than 200 percent of the federal poverty line, and greater than 10 percent of annual income for those above 200 percent of the poverty line. Cunningham's talk defined burden mainly at 10 percent, except once when he chose a 9.5 percent cutoff for out-of-pocket premiums.

Ziliak thought that it would be useful to choose one number. The question is, should that cutoff of high burden percentage be an endogenous function of the person's actual spending behavior, or should it be a fixed number closer to the median? Also related to that, high out-of-pocket spending is somewhat of a Southern problem. Using the official Census Bureau definition and state-level poverty rates for 2008, by and large poverty is concentrated in the South at the state level. So choosing a 5 percent cutoff for those living below 200 percent of the poverty line means picking up a higher percentage of people in the South. Also, poverty is known to be correlated with poor health outcomes and is probably also correlated with out-of-pocket spending and lack of insurance.

But to make cross-state comparisons without confounding where the poor live, *per se*, with how medical out-of-pocket spending is occurring as a fraction of income, one might want to choose one particular cutoff, not different thresholds based on income status. Ziliak suggested using a compromise number between 5 and 10 percent, say 7.5 percent. Choosing a fixed line might improve cross-state comparisons.

Given the salience of the measure of medical care economic risk to the Supplemental Poverty Measure (SPM), perhaps using the same measure of cost of living that is currently being adopted by the Census Bureau for the SPM would potentially improve compatibility between some notion of medical care cost measure and the SPM.

He reported on a conference in April 2011, cohosted by his center with the Census Bureau and Brookings Institution, called Cost of Living and the Supplemental Poverty Measure. Its key recommendation to the Census Bureau was a slight modification of what it is currently doing, which is that the adjustment for geographic housing price differences should be based on quality-adjusted rental costs, not making any adjustments for ownership free and clear or ownership at all. That is readily available data in the American Community Survey (ACS). Given the size of the ACS, it is

an effective way that will allow the capture of rural as well as urban parts of the country.

The last issue is, should thresholds vary across population groups? Yes, is Ziliak's answer, but then the real question is how and for whom. Cunningham presented important trends in financial burden across the presence and the number of chronic conditions. Claxton presented interesting trends based on firm size and ownership, looking more at family versus single type firms. If the measure of medical care risk is to be prospective, then it suggests that a model is going to need to incorporate something about chronic conditions, firm size, and perhaps self-employment status, to address what type of economic risk an individual is going to face.

Ziliak then spoke about some work that he has contributed to in the last few years, which is the literature called the value of statistical life, which is designed to try to quantify the money-risk trade-off that individuals face. Sometimes people ask questions such as, How much are you willing to pay in order to avoid a 1 in 10,000 increase in the probability of a fatal injury on the job? That is a classic example of the value of statistical life. It suggests that in thinking about risks and what people face and thinking about thresholds and prospective medical care risks, employment status might be a key demographic variable for breaking out the population, because individuals face substantially different risks of on-the-job injury and fatality, depending on their industry and occupation. The Bureau of Labor Statistics collects these data, the Census of Fatal Occupations in Industries. It is broken down by detailed industry and occupation. It could be easily merged into a data set like the CPS, which also collects industry and occupation.

One of the challenges in thinking about the number of thresholds is to know the optimal number one wants to construct for a medical care index. So if one breaks down by employment versus nonemployment and chronic condition versus no chronic condition, guidance is needed, especially for three or more chronic conditions. Perhaps three or more chronic conditions could be an important criterion on which to split. In the context of Claxton's presentation, he said, firm size seems to be potentially important in terms of demographic groups. However, the CPS does not collect data on chronic conditions.

## FLOOR DISCUSSION AND COMMENTS

Participants expressed their views on the various issues flowing from the presentations.

Collins commented that Ziliak's suggestion of using a 7.5 percent threshold is a good compromise, but one concern might be whether or not it would become an accepted threshold for policy makers, or whether it



would be an acceptable level of expenditures for people, even those in the CHIP program, for example.

The RAND study also used this lower threshold to reflect income that barely covered essentials and also lacked assets and savings among lower income families, she said. Clearly the ACA incorporates a sliding scale measure of both premium affordability standards and cost-sharing.

On the issue of what the affordability threshold should be, Cunningham observed that he did not think that anybody really knows from a strictly empirical basis at which point health care becomes affordable or unaffordable. That has been defined in a lot of different ways.

A lot of the work has used a more normative approach, looking at a moderate- to high-income group to see what their spending is. This means, in effect, looking at various percentile distributions that should be defined as what is affordable. He said he is not completely comfortable with that because of the way a lot of out-of-pocket spending works in health care, especially if there are unexpected costs, such as a need to go to the hospital or a need to get a procedure done. People cannot always adjust their spending based on what they can afford. They get the care that they need at the time they need it, and they deal with the bills later—and that is when medical debt issues come up. There is also the issue of whether affordability should be based on necessary versus unnecessary costs. And nobody really knows exactly what those are, either.

There is also some justification for using a lower threshold for low income, he said. In fact, in the CHIP program, a 5 percent threshold is used; any out-of-pocket costs cannot exceed 5 percent—so there is some justification or rationale. At this time, the threshold that is used, whether it is 5 percent, 10 percent, or some in between, is fairly arbitrary.

**Steven Cohen** (Agency for Healthcare Research and Quality) directed his comments to Cunningham. He found the presentation quite informative, showing what one would expect in terms of moving from no conditions to acute conditions to multiple chronic conditions and using family income and family out-of-pocket expenditures. He suggested that individuals with no conditions probably are in families with people with three or more conditions, if one did the analysis in which the context was at the person level, so they are carrying that risk. Likewise, people at the high end with three or more conditions are carrying individuals with no conditions. There would be a more dramatic step up if one did the analysis by family size. He asked Cunningham if he did that, what kind of tail ends of the burden estimates would he see.

Cunningham responded that he did not analyze the data by family size. He did separate it out by self only versus family plan to get an idea of what the individual spending is. But the family spending is driven by people with health problems, and it is not the case that people with health problems

are clustered in individual families. Sometimes one does see the correlation, but the family spending is driven by people with chronic conditions. The idea of affordability is also part of the question—whether it should be done at the family level, meaning that even people without health problems are carrying the burden. Even the healthy people in families with others who spend a lot on health care are going to be affected by that spending to the extent that it affects decisions regarding other spending that goes on in the household.

Claxton added that, even forgetting about chronic conditions, if one looks at families, the person with the highest spending on average contributes 70 percent of the family's spending generally. It is not just families with chronic conditions; it is generally true that the person who spends the most really drives the family spending.

**Emmett Keeler** (RAND) stated that, as a general point, the generosity of insurance is a way of transforming medical expenses into premiums. With generous insurance, one pays a high premium and has low out-of-pocket expenses. Because it is a transfer, one would always want to include the premiums as part of the research on burden and affordability. He also asked why, in Claxton's presentation, small firms would give up the tax benefits of providing all the premium. He said it must relate to certain market factors that he does not understand.

Claxton responded that focus groups he has conducted with small firms indicate that the average wage in small firms is much lower than the average wage in larger firms. So there is probably less tax benefit there. And given the number of two-worker families now, small firms like it when the family members work at large firms. They feel they need to contribute for their own workers, but small firms are much less likely to do so for the family members. Keeler agreed, pointing out that the same situation occurs in the military health care system.

Claxton added that, based on some focus groups and some additional research done last year, they found that with very small firms, those differences are even more pronounced. Many times the owners of very small firms—with fewer than 20 workers, and in some cases fewer than 10—said that they contributed a certain percentage toward single coverage, which could be 50 or 100 percent, but they contributed nothing in addition for family coverage.

**Thesia Garner** expressed concern about different references to measures. The first session was primarily focused on the medical care risk index. And this session was identified as focusing on thresholds. Ziliak talked about adjusting thresholds, and Cunningham spoke about an affordability threshold or index. She said that they were talking about different things: one is more of an *ex ante* and the other is more of an *ex post* measure. She said she was not sure what this affordability measure is because it is not

the same thing as the Supplemental Poverty Measure, and it does not seem to be the same as a measure of medical care economic risk.

**Wilhelmine Miller** (NORC at the University of Chicago) made a similar comment, stating that it seemed like the entire session addressed a range of factors that affect the likelihood of incurring high medical care economic risk, some of which are perhaps more appropriate for applying in a policy analytic sense, and others not. She said that although Ziliak treated them all as threshold issues, she was not sure, for example, that labor category is a threshold issue, even though job type has a lot to do with the ultimate risk of both expenses and debt. She wanted to hear from the presenters, who talked about everything from geographic variation to risk based on health condition, as to what is most salient.

Cunningham responded that although they were using different terminology, some of the issues are still the same in terms of what should be going into some kind of medical care risk index. For example, whether one uses chronic conditions or some other measure of people at risk for high spending, the issue is still the same. What the presenters are grappling with is whether there is something unique to people with chronic conditions or low-income people above and beyond what they spend or what their risk is for spending on an annual basis that should be considered.

In his talk, he said he pointed out that, for people with chronic conditions, their risk is not only for spending in any given year. It is also the risk for having the spending persist over a period of time, and that is qualitatively different from an annualized measure. He urged people not to get caught up in the differences in terminology, because the issues are still relevant to how should the index be computed, how one should do it, and whether there should be different considerations for different groups.

Garner questioned whether he was talking about a supplemental poverty threshold the way Ziliak was, when he said that people make spending decisions on health care based on their other spending needs. She said she thought that he is not just thinking about medical care economic risk, he is also saying that people have constraints in their household, which is exactly what the 1995 NRC report says and also what the Interagency Technical Working Group document says, that people make decisions interdependently. Medical expenditures are not independent from food, clothing, shelter, utilities, and the like. Or are they?

Garner continued the fact is that people with health insurance have greater flexibility when it comes to making those decisions. If they have health insurance, their decisions relative to food, clothing, shelter, and utilities are different than if they do not have health insurance. Cunningham responded that it is not an either/or situation; the distinction is between predictable and unexpected health care spending. With premiums, people are sharing the cost of health care with other people.

Employer-sponsored coverage comes out of one's paycheck. It is a regular expense that one gets used to and doesn't even notice. But because of the increases in cost-sharing that have been occurring, people may start to have unexpected expenses. This is true even for people with private insurance. Maybe they have a high deductible; maybe the expense is not covered by their plan. And that is when their decisions are affected by other spending in the household.

**Cathy Schoen** (Commonwealth Fund) raised the question of whether the work going forward on tracking reform progress should focus on prospective risk or look at what people did spend.

She asked what people want to do with this index. Tracking would show whether the reforms put on the books have converted more of the risk, moving it from risk into a premium, and making it more predictable.

In her view, a measure is needed to indicate whether policy is moving in the right direction, staying about the same, or getting worse over time. The current SPM just subtracts medical care spending and says who is poor now—that is already on the books. Did they become poor just because of medical care?

Claxton responded that depending on some of the health reform decisions and what packages people get—particularly in the nongroup insurance market, in which the risk is the largest because the policies are the shabbiest—one might be able to say something prospectively about the insurance if the essential benefit package does not have a lot of limits.

If the package has a lot of limits, then one wants to track what people actually spend in order to figure out where they are spending their money and why. There is supposed to be an out-of-pocket limit of \$5,000, \$6,000, or whatever is decided upon.

For people who do not get a lot of cost-sharing subsidies, the deductibles are going to be in the several-thousand-dollar range at least, the out-of-pocket maximums will be nontrivial, and there may be other limits. So people with chronic conditions are still going to spend out-of-pocket. One hope is that fewer people will be spending very large amounts because they are hospitalized.

Those out-of-pocket limits apply to in-network care, he continued. And for people who are hospitalized, finding their way to an in-network provider all the way through their hospitalization is very difficult. The hospital doesn't always wake you up from surgery to ask you about your network, for example.

**Pamela Short** mentioned two different takes on what represents a high burden of out-of-pocket expenses. One is an absolute standard of, say, 10 percent or 7.5 percent of income, which implies that, even at 400 or 500 percent of the poverty line, it is a bad thing, trying to avoid losing 10 percent of your consumption, basically on a much higher base. She said that

should be thoughtfully contrasted with a different approach, which would use a relative threshold or a relative burden as opposed to a more absolute standard, which would say that a high burden is when out-of-pocket spending on medical care and/or premiums drops you below that subsistence level. That approach is more embedded in the SPM.



## Issues in Defining Resources

This session focused on issues involved in defining resources, such as what is included in income in determining medical care economic risk in terms of ability to pay for insurance and for out-of-pocket medical expenses, how to treat assets in addition to income, what constitutes income for the self-employed, and how the elderly and other groups finance medical care.

The presentations covered three topics related to defining resources:

1. Incorporating data on assets into measures of financial burdens for health
2. Findings from the Health and Retirement Study on changes over time on how the elderly finance medical care
3. The financial burden of medical care among the elderly transitioning to long-term care

### **INCORPORATING DATA ON ASSETS INTO MEASURES OF FINANCIAL BURDENS FOR HEALTH: IMPLICATIONS FOR THE ELDERLY, THE NONELDERLY, AND THE SELF-EMPLOYED**

Jessica Banthin (Congressional Budget Office) provided an overview of the background paper she and Didem Bernard prepared for the workshop (see Part III of this volume). She stated that although the data she presents are based on tabulations for people ages 65 and older, a more precise analysis would focus on people who are retired versus nonretired. But their main objective, she said, was to think more carefully about how one would

combine the elderly and nonelderly into a single measure. All of the previous estimates with which she is familiar always look at them separately. In her previous work, different thresholds were applied for the nonelderly and the elderly populations; for the nonelderly, for example, cutoff points of 10 and 20 percent of income spent on medical care were applied (Banthin and Bernard, 2006). She has also done work in which cutoff points of 5 percent were applied to low-income people and 10 percent for others (Banthin, Cunningham, and Bernard, 2008). In a paper that looked at annual burdens for the elderly, she and a colleague actually applied different cutoff points of 20 and 40 percent to the nonelderly and the elderly, respectively because the elderly spend a lot more on health care (Selden and Banthin, 2003).

Why differentiate between the elderly and the nonelderly? Younger families clearly have higher incomes, because generally they are working. They have higher expenses, including work-related expenses and child care, than the Supplemental Poverty Measure recognizes. Also, they are expected to be saving for their future retirement. And of course generally they are in better health, so their medical care needs are lower.

For older families, if they are retired their incomes are lower, they have fewer competing expenses along the lines of work-related and childrearing expenses, and their health needs are generally higher and they are in generally worse health. At the point at which they retire, they have been building up their assets, and now they are expected to draw down their assets in some way or other. That is why the elderly and the nonelderly have always been separated.

Two questions need to be answered. First, how is a reasonable cutoff point or threshold defined for both the elderly and the nonelderly populations that would indicate high medical care risk or high burden? Second, how does one incorporate the accumulated savings of retired families into the measure of resources available for financing health care expenditures?

Banthin addressed the self-employed briefly. No one had really looked at them separately, or some people have but not in the context of financial burden, she said. The question is whether the self-employed have such high levels of assets (including business assets) that they warrant a separate approach in measuring health care burden.

### Data and Methods

The Medical Expenditure Panel Survey (MEPS) is used for this analysis, taking advantage of the asset data that it collects. MEPS is designed with 2-year panels that overlap one another, and Banthin and Bernard pooled three panels—panels 10-12, 2005-2008.

They used three panels as the sample size, that is, about 1.5 times an annual sample from MEPS, which most people use. MEPS is a unique



resource for studying these issues because it has information on income, assets, out-of-pocket medical expenditures on health care services, and also out-of-pocket spending on premiums, plus various demographics and family composition information. In working on this paper, they followed the methods of previous papers in constructing a measure of out-of-pocket financial burden. It is not necessarily a risk index; it is a family-level concept, because family members share resources. The numerator is the sum across all family members of out-of-pocket spending on health care services and premiums.

The denominator is family income. The burden is the share of family income spent on medical care, and the resulting values are not truncated. There are certainly cases, as seen in the data, in which people are spending more than 100 percent of income in a given year on health care. Those cases are few, and they are plausible in some circumstances. Banthin explained that because they were charged with thinking about assets, she did a variation on her traditional burden measure whereby she added 5 percent of the total net family assets value to family income for elderly families only. No adjustment was made for the nonelderly. The justification is that nonelderly families until retirement are expected to actually be saving toward retirement. Once they reach retirement, they are drawing down. It is at least an approximation of a way of addressing and incorporating the assets into burden measures.

## Results

### Elderly Versus Nonelderly

If the median is considered the norm for the elderly and nonelderly populations, then the percentile distribution of out-of-pocket burdens for the two groups might suggest that different thresholds are appropriate for defining high burden. Overall, the median financial burden for elderly persons is 10.7 percent of family income compared with 2.9 for the nonelderly. This means that the median individual age 65 or older lives in a family that spends almost 11 percent of family income on medical care. As expected, younger families devote a much smaller share of family income to medical care. These differences between the elderly and the nonelderly are similar across poverty groups at the median; however, they increase when examined at the higher points in the distribution. At the 75th percentile, the elderly are spending almost 21 percent of family income on out-of-pocket medical care, compared with 7 percent of family income for the nonelderly.

As one would expect, examining the distribution of total net assets by family age groups, at the overall median elderly individuals reported \$146,000 in family net wealth, and nonelderly individuals reported \$20,000. Thus, elderly individuals have about 7 times as much family net wealth as do

nonelderly individuals. Among families living below the poverty level, elderly individuals reported more than \$20,000 in family net wealth at the median, and the nonelderly reported zero. Among low-income families (between 100 and 199 percent of poverty), the median family net wealth for an elderly individual was about \$77,000 compared with \$2,300 for the nonelderly or about 33 percent times as much as that for a nonelderly individual.

Banthin emphasized that the MEPS asset data are comparable across various dimensions with which to assess data reported from the Survey of Income and Program Participation. Both surveys show underreporting of assets compared with the Survey of Consumer Finances, but as survey data go, these assets are reasonable. MEPS has data on both the elderly and the nonelderly and measures different categories of assets, so if there is underreporting, it is measured without bias across the two age groups.

### **Out-of-Pocket Burden**

Banthin next discussed high out-of-pocket burdens for the elderly and the nonelderly using the cutoffs of 10 percent or more of family income on medical care. Overall, about 52 percent of elderly and 17 percent of nonelderly individuals have high burdens according to this threshold. Using the 10 percent of family income cutoff would more than triple the number of elderly having high burdens, and this persists across different poverty status groups. About 26 percent of elderly and 7 percent of nonelderly individuals live in families spending 20 percent or more on medical care. Spending actually goes up among the low-income elderly: 70 percent of them are spending more than 10 percent out-of-pocket compared with only 22 percent of the nonelderly. The poor elderly may be eligible for various programs, such as Medicaid and Medicare, so they may have more coverage than the low-income elderly.

### **Self-Employment**

Banthin observed that the self-employed population under age 65 does not have substantially higher burdens than their non-self-employed counterparts. They have slightly higher burdens than the non-self-employed (median burden of 3.3 compared with 2.9), but this difference is not large. The self-employed do report higher net family assets, and they also have higher levels of average income. These are net business assets at the family level.

### **Conclusion**

Banthin concluded that further work is needed to refine the method of incorporating assets into income for elderly families. In her view, it is worth considering different thresholds for the elderly and the nonelderly

age groups. The self-employed, however, do not warrant special methods for assessing their medical care risk.

### FINDINGS FROM THE HEALTH AND RETIREMENT STUDY ON CHANGES OVER TIME ON HOW THE ELDERLY FINANCE MEDICAL CARE

**Michael Hurd** (RAND) introduced himself as a coprincipal investigator on the Health and Retirement Study (HRS), with overall charge of the income and asset sections. After a brief background on HRS, Hurd explained how the survey assesses out-of-pocket medical spending and how those data compare with data from MEPS and the Medical Care Beneficiaries Survey (MCBS). He illustrated the application of HRS data to explain economic preparation for retirement with and without health care spending risk.

#### Background on HRS

The HRS is a very large survey aimed at people over age 50. It has interviewed about 20,000 persons every 2 years in panel since 1992. So by now it has 10 waves of information on the original sample. New cohorts were added in 1998, 2004, and 2010, filling out the population age 51 and older plus spouses.

Although the initial sample was drawn from the community, respondents are followed into nursing homes. After a few years, it is representative of the entire population, including the nursing home population, depending on mortality, condition, and nursing home status.

The HRS goes to considerable effort to measure income and wealth, including pensions, and those techniques have been refined over time because at older ages wealth is more important than income. HRS data matches the Survey of Consumer Finances quite closely, except at the very top, and that is because of the oversamples of the Survey of Consumer Finances from the high income supplement. It also matches the Current Population Survey (CPS) income data very well, and it is linked to Social Security records.

Additional content in the HRS covers a wide range of topic areas. The main ones of relevance for this session are health conditions, including cognition, the use of health care services, out-of-pocket spending for health care services, and formal and informal care (who gives care, family member or paid help, and out-of-pocket cost if paid). These data are linked at the individual level to Medicare data.

#### Out-of-Pocket Spending

Out-of-pocket spending is assessed in the HRS core interview by first asking about the use of services and then if the costs were paid by insurance.

If the answer is no, the respondent is asked what were the out-of-pocket costs, proceeding through the list of services used. It should be noted that the HRS and the MCBS have considerably larger sample sizes than MEPS in this population group because they specialize in the older population.

Hurd showed how the HRS measure of out-of-pocket spending compared with the MCBS and MEPS. Data on annual per person out-of-pocket spending for health care services by the noninstitutionalized population ages 75-79 in the HRS compared with MEPS and the MCBS showed that the median lined up very closely for all three surveys. The HRS, however, had a higher mean than the other two surveys, and that is because of the large values in the HRS at the top of the distribution due to prescription drug costs. The measurement of prescription drug costs is difficult in any survey, and it is particularly difficult in a general social science survey like the HRS, because of the heterogeneity in spending across individuals, and even within an individual over time. This measurement has been improved in HRS 2006 and later, reducing the high values.

Data on annual per person nondrug out-of-pocket spending for health care by the noninstitutionalized population ages 75-79 in the three surveys showed that HRS and MEPS are comparable except at the very top.

However, examining out-of-pocket health care spending among the elderly population, one should also include the institutionalized population. MEPS obtains out-of-pocket spending data in its noninstitutionalized population survey that are to be excluded in the comparisons. Data comparing the annual per person total out-of-pocket spending for health services by both the institutionalized and noninstitutionalized populations ages 75-79 showed the HRS and the MCBS to be very close. Again, this is due to the much higher measurement or assessment of prescription drug cost in the HRS. If prescription drug costs are excluded, then the HRS and the MCBS once again differ, with the MCBS being considerably higher than the HRS.

Hurd's conclusions about measurement of out-of-pocket spending in health care are that HRS does very well, given its limited resources, compared with the 2003 MEPS and the 2003 MCBS. The higher total costs are due to higher drug care costs in the HRS. For nondrug out-of-pocket spending, the HRS and the MEPS are similar, and the MCBS is considerably higher. Comparing the 2004 HRS with the 2003 MCBS for the noninstitutionalized and institutionalized populations combined, total spending was similar, but nondrug out-of-pocket spending was considerably higher in the MCBS.

### **Persistence of Spending Over Time and Economic Preparation for Retirement**

Hurd explained that the HRS allows analysis of persistence of out-of-pocket spending over time. For example, combining 2-year panels, he found

a lot of stability in spending for single people and also older people. For married people, the stability was lower because they tend to be younger. Nonetheless, the conclusion is that there is a lot of cross-wave stability in spending, which needs to be taken into account in assessing health care spending risk.

Using results from a paper he coauthored on the economic preparation for retirement, Hurd showed how these data combining income wealth and out-of-pocket spending can be applied to see what difference risk makes in a common assessment of economic status. The objective was to ask whether people continue on a life-cycle spending path shortly after retirement, given the initial level of spending observed in the HRS. Will they be able to afford their life-cycle spending path, or will they run out of wealth? Starting with an initial population, ages 66-69, individuals and couples, their life-cycle spending paths estimated from spending data were followed over the years. Life-cycle spending path was anchored at the initial observed spending level. The paths differed by marital status and education level. The question is whether, as they progress through life and spend and receive income from assets and so on, they will run out of wealth before they die.

Although the focus is economic preparation for retirement, Hurd and his colleagues did stochastic simulations on mortality, which is a very important aspect of this. Poor elderly live substantially shorter lives than the well-to-do elderly, and so they need fewer resources to finance retirement. They account for mortality along the dimensions of taxes, returns to scale and consumption, and the level and risk of out-of-pocket spending for health care.

Hurd proceeded to explain the simulation. First, they estimated serial correlation using the MCBS, and the range was from 0.41 to 0.73, fairly high levels of serial correlation for spending one year apart. The lowest levels were for the youngest married people, and the highest levels were for the oldest single people, who had chronic conditions that caused their spending to be more persistent than younger people. They wanted to take the serial correlation into account, because they were looking at the lifetime risk of running out of money.

They simulated consumption and out-of-pocket spending. A couple or individual is considered adequately prepared if they die with 95 percent or more of their wealth at the time. The researchers simulated stochastic spending using the observed distributions from the HRS in out-of-pocket spending. They put in predictable spending, that is, spending for health care insurance, as part of normal expenditures. So the stochastic part is the part that deviates from average.

Hurd showed, as an example, simulations for couples ages 66-69 and their resources when they are 66-69. They had about 1,100 individuals who were in couples in the initial sample. Their initial wealth was \$742,000. On average, these people had \$1.2 million in rest-of-lifetime resources.

The distribution by education level was extreme, ranging in the total from \$564,000 among couples with less than a high school education, to more than \$2 million for those with college degrees and above. Both initial wealth, but also annuities, particularly Social Security, are important, depending on age group. For the less than high school group, wealth was about the same as annuities. For people with college education or more, wealth was substantially more than annuities.

Taxes need to be accounted for when considering spending. For people who have more than a college education, taxes were a very substantial and important part of the calculation. Part of that importance comes from the taxation of tax-advantaged savings. As these savings come out, they have to be taxed. The present value of consumption for some was over \$500,000, and total spending was \$681,000. If total spending is subtracted from resources, they had about \$500,000 left over. This is average and does not tell anything about the distribution.

The simulations showed the chances of people running out of wealth before they die. Average spending for health care was unchanged both with and without health care spending risk. It is the distribution that changes, so people have draws that push them out into the tails. Once they are out in a tail, because of the high serial correlation, they tend to stay out in the tail.

For single persons ages 66-69 with no health care spending risks, 61 percent were adequately prepared. A more interesting question for this group is what difference it makes to have stochastic variation in health care spending—that is, to have health care spending risk, rather than just assured level. If everybody were perfectly insured, the number would be 61.1. Because people are not perfectly insured, the number would be 54.5 percent, or about 7 percentage points lost in adequate preparation for retirement because of health care spending risk.

Hurd pointed out that it may be exaggerated at the population level, but there certainly are groups in the population that are very inadequately prepared for retirement and will have to reduce spending at some point. For example, just 29 percent of single women who lack a high school education are adequately prepared. Married persons show a much higher preparation for retirement. Also, there is much less effect of health care spending risk on economic preparation for retirement.

Based on his analysis of the data, Hurd concluded that health care spending risk has a noticeable effect, but possibly not as great as one might expect. One reason may be that the first-order serial correlation does not adequately capture persistence in spending over many time periods. There are now enough data in the HRS to nonparametrically estimate rest-of-lifetime spending risk. There are data for people age 61 in 1992, who will be 81 in the next wave. There are also data for people age 70 in 1993, who will soon be age 90. So one can map out what 70-year-old people actually

spend over the rest of their lifetime and see what that number actually is, rather than modeling it.

He emphasized that the HRS is a vehicle for assessing health care spending risk over time. First, it should be obvious that one needs panel data. A cross-section is not adequate because of serial correlation. How long a panel depends on the structure of the intertemporal correlation in spending risk. For the first-order mark-off only two waves are needed, but one probably wants more than that.

Hurd pointed out that if one is interested in relating spending to economic resources, one ought to spend as much effort assessing economic resources as health care spending. That is actually a harder job, as there is a lot of measurement error in income and wealth measurements in all data sets. He would not include the CPS in that, but would include the Survey of Consumer Finances and the HRS.

### FINANCIAL BURDEN OF MEDICAL CARE AMONG THE ELDERLY IN TRANSITIONING TO LONG-TERM CARE

Eric Stallard (Duke University) focused his presentation on the long-term care population and the financial burden of medical care among the elderly in transitioning to long-term care. Using data from the National Long-Term Care Survey (NLTC), he defined the chronically ill population, briefly described the survey and the population studied in the NLTC, and provided numerical results from that survey.

#### Definitions

Stallard pointed out that the Health Insurance Portability and Accountability Act (HIPAA) rules for tax-qualified long-term care services and insurance policies define a chronically ill individual as someone who meets either an activity of daily living (ADL) trigger or a cognitive impairment trigger (Internal Revenue Service, 1997). Although chronic illness is important, in terms of expenditures and costs, in his view they are not being represented in many of the measures that are being discussed today.

There are six ADLs that are fundamental to functioning on a daily basis: bathing, dressing, toileting, continence, eating, and transferring (i.e., getting into or out of a bed or a chair). In order to be certified as a chronically ill individual, the HIPAA ADL trigger requires that the individual be unable to perform without substantial assistance from another individual at least 2 out of the 6 ADLs for at least 90 days due to a loss of functional capacity (Internal Revenue Service, 1997).

The HIPAA cognitive impairment trigger requires that an individual needs substantial supervision to protect himself or herself from threats to

health and safety due to severe cognitive impairment, defined as a loss or deterioration in intellectual capacity that is

- (a) comparable to (and includes) Alzheimer's disease and similar forms of irreversible dementia and
- (b) measured by clinical evidence and standardized tests that reliably measure impairment in the individual's short-term or long-term memory; orientation as to people, places, or time; and deductive or abstract reasoning (Internal Revenue Service, 1997).

Individuals who are certified as chronically ill because they meet the ADL and/or cognitive impairment triggers are eligible for tax-free benefits under a long-term care insurance policy, and they can deduct the costs of qualified long-term care services and insurance premiums as itemized medical expenses, subject to certain limitations, when filing their federal income tax returns for that year (Internal Revenue Service, 1997).

### **The National Long-Term Care Survey**

The purpose of the National Long-Term Care Survey was to measure disability and use of long-term care among the noninsured elderly (ages 65+) at multiple points in time beginning in 1982 and every fifth year from 1984 to 2004 (Stallard, 2011). The survey was stopped after the last round of data collected in 2004. Stallard commented that there continues to be passive monitoring of Medicare and Medicaid services and expenditures, on which he has drawn for his presentation.

The total cumulative sample was about 49,000 people over all six surveys. In the 2004 survey, the total sample was nearly 16,000 people, with 6,171 detailed in-person interviews for persons who met various screening criteria and a shorter, mostly telephone interview for the 9,822 persons who screened out.

The disability definitions that were used include ADL and instrumental activities of daily living (IADLs) limitations for at least 90 days, cognitive impairment, and institutionalization. Although the IADLs differed from the ADLs, they are still daily activities and primarily focus on the maintenance of daily life and daily lifestyle, with a very strong cognitive component—doing laundry and light housework, getting around outdoors, going places beyond walking distance, making telephone calls, managing money, preparing meals, shopping for groceries, and taking medications (Stallard, 2011).

The first six ADLs in the NLTCS are the same as those listed in the HIPAA ADL trigger; the seventh one, inside mobility, is effectively equivalent to walking and is not included in the HIPAA trigger.



### The Survey Population

The key questions for the survey were two: Who are the elderly, and how homogeneous or heterogeneous are they with respect to these disability measures? The survey was statistically weighted up to match the elderly 2004 U.S. Medicare-enrolled population. The average age was approximately 76 years.

Stallard presented unpublished tabulations of the NLTCs which showed that the mean age by disability status for persons meeting only the HIPAA ADL trigger was 79.5 years for men and 82.0 years for women; for persons meeting only the HIPAA cognitive impairment trigger, the mean age was 82.5 for men and 84.1 for women, and for persons meeting both the ADL and the cognitive impairment triggers, the mean age was 81.7 for men and 86.0 for women. For those who met both triggers at the same time, the average age was actually slightly younger for men than for the cognitive impairment trigger, 81.7 versus 82.5, but older for women, 86.0 versus 84.1. The standard deviations for these measures ranged from 6.7 to 8.6 years.

Among people ages 65 and older, there was substantial variability by age in the proportion meeting either HIPAA trigger. Of the population ages 65 and older, 10.1 percent met at least one HIPAA trigger, but this ranged from just 2.8 percent at ages 65-69 all the way to 58.7 percent at ages 95 and older. When the data were analyzed by considering each trigger separately, the overall percentage meeting the ADL trigger was 8.2 percent, and the overall percentage meeting the cognitive impairment trigger was 6.7 percent. The modest drop from the 10.1 percent that met one or both of the triggers considered jointly indicates that there was substantial overlap between the two types of impairments.

### Long-Term Care Intensity and Costs

Stallard next presented data on costs (in 2010 dollars) for people with and without disability, according to their status on the HIPAA ADL and cognitive impairment triggers based on Stallard (2011). Persons with both ADL and cognitive impairments can expect to spend \$45,000 per capita annually for nursing home services. Their annual per capita cost of paid community care was estimated at \$5,050, of which \$1,360 would be paid out-of-pocket, with an average out-of-pocket cost of \$16,548 for the 8.2 percent of the group who actually make out-of-pocket payments.

Estimated unisex lifetime costs of long-term care services at ages 65 and older were estimated to be \$89,000 (also in 2010 dollars). However, the sex differences were substantial: for men, the estimated cost was \$44,000, and for women, \$124,000. The overwhelming majority (92 percent for

both sexes combined) of long-term care costs was incurred during episodes of disability severe enough to meet at least one of the HIPAA triggers. The remaining costs (8 percent) were incurred during episodes of mild or moderate disability, which would not meet either of the HIPAA triggers.

He next looked at the Medicare program expenditures, excluding payments for persons with end stage renal disease, payments made while in long-term institutional status, and payments for hospice care based on his unpublished tabulations of the NLTCS. The retained payments included only the components that were used in setting capitation rates for managed care plans.

The average annual overall unisex Medicare program payment (in 2010 dollars) for ages 65 and older was estimated at \$9,071. For the “dual eligibles,” which include people who were enrolled in both Medicare and Medicaid, the average was \$11,954, and, for the Medicare-only participants (i.e., not enrolled in Medicaid), the average was \$8,761. For men, the average annual cost was \$9,787, and for women, \$8,550. Stratification by age, Medicaid status, and disability showed that the highest average annual unisex cost was \$31,940 for dual eligibles ages 75-84 who met both HIPAA triggers.

## DISCUSSION

**Marilyn Moon** (American Institutes for Research), session discussant, observed that she has been working on some of these issues for many years, and the discussion has changed over time to include two different concepts, risk and burden. The risk versus burden issue is important, because they measure different things. Also, they are aimed at different things, and probably should be applied in different ways. That does not mean that one is better than the other or that one excludes the other, just that it is important to think about what one wants to do and to whom to apply these things and in what circumstances.

Burden, she said, is the general ability to meet standard expenses over time, averaged out somehow, thinking about what one should be planning for, about how to measure what in public policy is reasonable for people to bear. That is particularly important for poverty and for poverty measures and has always been tough, because in fact nobody has the average burden, and everybody is either below or above it for the most part. That is one of the reasons why poverty discussions did not ever decide how to deal with medical expenditures very well; people were not fully satisfied that this was the measure that public policy was after.

Now, some 20 some years later, people are talking about this issue more in terms of the risk of dealing with the unusual or catastrophic expenses associated with health care and how to measure how well people are doing

with risk as a society. Risk affects both poor and nonpoor individuals and therefore needs to be thought of as something different from burden. Risk affects not only expenditures, but also resources.

If someone experiences some massive risk in the middle of life, chances are his or her resources going forward are going to be substantially lower. Data about the number of people who file for bankruptcy protection show this, for example, because of medical care expenses throughout their lifetime. Or, in the case of Medicaid, a person essentially spends down and then is poor for the rest of his or her life. If this problem was difficult 20 some years ago, when most of the focus was on burden, when risk is added fully into the discussion, it becomes even more complicated.

The situation is a researcher's dream because, as Michael Hurd pointed out, one has to get lots of things right to do all of this—the resources, the expenditures, and the risks. One has to think about things through time, as well as at one point in time. And all of this is very challenging to deal with. Both burden and risk are likely to be of interest, but one needs to think about when to use what, when, and whether or not one is doing the right things in terms of measuring them, and whether or not people are using the wrong measure.

In health reform, for example, the study panel will be dealing with both burden and risk. With respect to burden, what is reasonable to ask low- and moderate-income people to pay toward their own health care? That is a burden issue, to consider what kinds of general protections to offer to individuals, when all of the discussion focuses on 6 percent or 10 percent of income or whatever comes into play. That is an important issue, and one to be concerned about particularly around the issue of low income and poverty.

In terms of dealing with risk, the quality of health care coverage, of health insurance, is important. The goal is not only lowering the average burden on people, but also taking into account untoward risks and not just allowing one new sneaky way of cream skimming that is going on in the marketplace.

Moon cautioned that once a measure exists, it is irresistible not to use it for comparisons, and that can cause problems. She gave as an example her experience 25 years ago hearing people say that older Americans are not really poor because they have Medicare and Medicaid, so that problem is solved. But digging down below the surface and looking not only at the value of Medicare and Medicaid benefits on the resource side but also at out-of-pocket costs on the expenditure side, one recognized that the issue is more complex.

It also matters now, with respect to comparisons between the elderly and the nonelderly going forward and, in terms of health reform, what changes to make to Medicare compared with provisions in the ACA for

the population under age 65, and whether the policy is fair in the same way.

Another major comparison is across geography in terms of cost of living and the costs of health care. That area has a lot of unknowns: Is the average right, is the lowest level of spending right, is the top level of spending right, and what drives those differences in health care spending in many cases?

It is important to think about comparisons over time. If risk is to be used to measure the value of health reform in providing various protections, then measures need to capture changes through time. Comparing different kinds of health care needs is also important. Is risk really more important for people who have untoward, acute care consequences—a car accident, a surgery gone wrong—than for chronic conditions for which the burdens are high, increasing, and persistent?

In closing she had a question for Jessica Banthin: When talking about treating resources differently for the elderly and the nonelderly, what is the right age cutoff? Is age 75 the new 65? Also, there is the issue of when people spend down their assets. She gave as an example the case of some of her friends with children in college, who are not talking about spending down, but about working and accumulating assets.

#### FLOOR DISCUSSION AND COMMENTS

Banthin responded to Moon's question that she would have preferred to do the adjustment based on retirement status. That is the proper way, she said, because eventually the cutoff should be age 67, not 65. When people decide to stop working is when they have stopped saving and have moved into retirement, when they are presumably spending down. She thought that would be the most accurate cutoff point.

Hurd commented on Banthin's numbers about the different levels of spending on health care for the elderly and the nonelderly. One thing to keep in mind—and this shows up very clearly in the Consumer Expenditure Survey as well as in HRS spending data—is the budget shares that go to health care spending. Of course, the shares do increase with age, and that is quite reasonable, he said. There is no reason they should be the same for a 45-year-old as an 85-year-old; it is much more productive to spend on health care at age 85.

At the same time, other components of the budget correspondingly decline, which is also very reasonable. For example, spending on private transportation declines from around 15 percent of the budget down to 6 percent. So it is not *prima facie* a problem that the older population spends a greater fraction on health care; it is because it is more productive. Whether it should be more than 10 percent or more than 20 percent is not known.

Barbara Wolfe asked Hurd: If you compare the distribution of prime age individuals, say 25-45 years old, do you know what the distribution of the HRS looks like? What proportion, for example, in the lowest quintile, are actually in the HRS? Has anyone ever tried to do that kind of comparison? How useful would some of the numbers presented be, with respect to the entire age distribution? The HRS is a really rich data set, but if it misses the lowest tail, then it is less promising.

Hurd responded that the poverty rate in the HRS is very close to the CPS poverty rate, within half a percentage point. He explained that they reweight to CPS totals along a number of dimensions; and that has been studied a lot, and there is no known substantial bias in HRS recruitment. The baseline response rate was 80 percent. Very large differential nonresponse by some variable is therefore needed in order to get a lot of bias when the response rate is that high.

Wolfe wanted to emphasize that, in the work that she and colleagues have done at the University of Wisconsin, they looked at the risk of having income go below the poverty line or move into near poverty if someone has a health or cognitive effect. They found that the risk is strong for those who are very close to the poverty line, but it is not relevant for people who are at 400 times or even 300 times the poverty line. So the risk is important for a small group.

Although she is sure there is a lot of overlap between people with less than a high school education and those with low income, if he did that by initial level, maybe in the first year they are in the survey, or some average, he will probably find higher risk for people with low income than he calculated using education.

Hurd explained that they thought about doing the analysis by income or wealth but decided not to because of the classification error on income and wealth. They do as much as they can, but they have to admit that it is inaccurate. As a number of the presentations today have shown, people with low incomes have a high ratio of spending to income.

**Michael O'Grady** (NORC at the University of Chicago) asked Jessica Banthin when she moved to adjusted income and used 5 percent of assets, was there anything special about 5 percent or she just needed to pick something to move forward? Also, because part of what has been discussed or at least implied is that different assets are more or less fungible or available, or even originally planned to be used for things like health care spending, what are the options in terms of thinking about different kinds of assets using MEPS?

Banthin explained that, regarding the adjusted income and 5 percent of assets, that was just a rough approximation. She wanted to move forward and give a simple approach to provoke this conversation. She repeated that a more careful analysis would have separated by retirement status, not age.

She picked 5 percent, however, because she talked to some people about what is reasonable. Some financial planners would tell people to draw down 4 percent a year, so 5 percent is close to that. They probably would not tell people to liquidate their investment in their house. So she used total net assets to make it easy. But a more refined analysis might separate pension assets from other types of assets and might account for having a spouse and so forth, leading to a much more complex projection. Also, there are different ways one might expect people to spend down. There is also significant underreporting here in both income and assets.

**James Ziliak** asked both Hurd and Banthin if they included Social Security wealth in their definition of assets. He questioned Hurd's statement that 61 percent of people ages 66-69 are adequately prepared for retirement. The number he recalls is more like 80 percent, based on analysis by Shultz and Sheshardi, who are using the full HRS. He asked whether this 20 percentage point difference of adequacy is a different calculation, or whether it is something that is happening with using a smaller subset of the HRS.

Hurd responded that neither he nor Banthin included Social Security as a wealth measure. Both included Social Security as an income measure, which is the proper way to do it, in his view. The 61 percent figure for adequacy is for single persons only. The figure for married persons is in the 80s. Adding the two together, one gets about 72 percent. Schultz and Sheshardi have come down somewhat in their number; they are a little bit higher, but not that much higher.

## Implementation Issues

The previous two sessions focused on the research and issues related to the concepts of thresholds and resources in a measure of medical care economic risk (MCER). This session addresses issues related to data needs associated with the implementation of such a measure: what data are available now, what relevant data will become available under health care reform, data quality and timeliness concerns, and whether the measure of MCER could be released at the same time as the Supplemental Poverty Measure (SPM).

### MEASURING MCER: AN ASSESSMENT OF DATA SOURCES

**John Czajka** (Mathematica Policy Research) presented an overview of the background paper he prepared for the workshop (see Part III of this volume), explaining that he restricted himself to using federal data sets, because it is the federal agencies that are going to produce the estimates. Although the design of a measure of MCER need not be constrained by currently available data, any such measure produced in the next few years will need to be based almost exclusively on data collected currently. It may be possible to add a modest number of new items to an existing survey, but funding to support significant revisions or additions is not available.

The sponsor of the study panel, the Office of the Assistant Secretary for Planning and Evaluation (ASPE), has asked for the development and implementation of a new measure of medical risk as a companion measure to the new supplemental income poverty measure. With regard to data, the Medical Expenditure Panel Survey (MEPS), which became continuous in

1996, will presumably be the bedrock source for estimating the parameters of a medical care risk index. However, that estimation should use variables on risk factors and insurance coverage that are available in the Current Population Survey Annual Social and Economic Supplement (CPS ASEC), so that a family's poverty status can be compared with its medical care risk.

Czajka said that he thought that any new measure, if it is intended to be a companion to the SPM, should be estimated from the same data as the SPM for at least a few years, so that users can see how the two measures work together. After that one can think about whether there is some good reason to separate them.

### **Factors Affecting Data Requirements**

Alternative design choices have a big impact on the data requirements for a medical care economic risk measure. There are two main choices. The first is between a retrospective and a prospective measurement of risk. The first workshop session focused on prospective measures. Retrospective measures got attention in the second session. The second choice is whether resources should include assets or be limited to only income.

It is also important to distinguish between data used to develop a measure and data used to produce the measure that is disseminated to the public. Development of a measure requires data that, ideally, will support alternative measures and enable evaluation. Longitudinal data would be valuable for evaluation and validation—especially with a prospective measure. Production of a measure requires data to support only one, not multiple measures; however, timeliness, representativeness, and statistical precision become more important.

### **Measures of Resources**

Regarding measures of resources, the CPS ASEC is the official source of estimates of income and poverty for the United States. It is also being used to construct the SPM, as it has been used to construct a number of experimental measures over the years. It includes the official measure of money income, which is what is used to estimate poverty. And it also does or will provide the measure of disposable income that goes into the SPM.

It is notable that some of the components of the SPM, and even in the CPS, have to be imputed. Not all items are collected, and taxes are the big item that has to be modeled and applied through the model or through imputation. Information on taxes is not really collected in any of these surveys.

The CPS added the measure of medical out-of-pocket expenditures and a few other components in 2010, to help support the new SPM. The



assessment of the out-of-pocket medical expenditures data was surprisingly good, considering that this survey has had trouble measuring health insurance coverage.

With regard to resources, the CPS does not include everything that one may think of as income. It does not include capital gains, which are picked up in taxes and which MEPS picks up. It does not include a lot of what people withdraw from their retirement accounts, which again is something that is reported on the tax return and taxed, and MEPS picks up some of those items. These are differences that can be important, especially for the elderly, who have a lot of these types of resources.

A critical consideration with regard to the CPS ASEC is that it collects no asset data of any kind and never has. To deal with that deficiency, Czajka thought that, rather than trying to impute assets, it would be better to add a small number of items to the survey. But quality of data cannot be ensured without careful testing. The difficulty with imputation for financial assets is that, in including assets, one is really interested in what people have that is not reflected in their income. But the likelihood is that the imputations will be driven heavily by income. And that does not get the orthogonal piece that is needed. At the same time, it is very challenging to collect asset data, and the idea that one could write a question and get the answer wanted is optimistic. That is a particular problem with the CPS.

MEPS collects sources of income that correspond reasonably closely to the CPS concept of money income. MEPS income questions follow the federal tax form and include capital gains and state tax refunds, which are not counted in CPS money income. Respondents who refer to their tax returns would omit portions of earnings and possibly Social Security benefits excluded from taxation. MEPS collects fewer of the expenses that differentiate money income from disposable income. Like the CPS, however, MEPS does not capture taxes paid (or earned income tax credit received). Unlike the CPS, MEPS collects data on assets. Assets are divided into six broad categories, and amounts are collected for all six types.

One potential concern about MEPS is that, in following the tax return, if people really do pull out their returns, they would be reporting items that do not correspond conceptually to what is picked up in the CPS, which looks at gross income.

### Measures of MCER

The CPS ASEC contains a fairly small set of items relating to measuring medical care risk. It added medical out-of-pocket expenditures in 2010. Data compare favorably to MEPS and the Survey of Income and Program Participation (SIPP), despite the more detailed measurement in these other surveys. The CPS ASEC collects sources of health insurance coverage in the

“past year” but no additional information on what expenditures are covered. It also collects basic work and activity limitations and general health status—potentially useful in defining risk groups and matching to MEPS.

MEPS, in contrast, collects very extensive data on health conditions, health status, the use of medical services, charges and payments, access to care, and health insurance coverage over time. What it lacks is information on what is actually covered by each sample member’s health insurance. Nevertheless, MEPS can support both prospective and retrospective measures of medical care risk.

### Data Quality

Limited information on data quality for these various components suggests some areas in which improvements would be desirable.

With respect to income, CPS is the official measure and comparisons show that it does collect more total income than the other major surveys. Despite its overall strength, CPS ASEC income data have notable weaknesses. Reporting of all components of retirement income other than Social Security is well below SIPP, which falls short of the CPS ASEC on most other income sources. This suggests that a data area on which one would rely heavily in evaluating the MCER of the elderly is one in which the CPS would need to be improved.

Supplemental Nutrition Assistance Program (SNAP, formerly the Food Stamp Program) benefits are currently received by 15 percent of the population. The latest estimates comparing what CPS captures with what is actually paid out suggest that the CPS is missing nearly half of total SNAP benefits. Because SNAP benefits are part of what gets added to disposable income to create the SPM, the new measure will not reflect the status of low-income persons as accurately as it would if SNAP benefits were measured more effectively.

Nonresponse to income questions is high; 30 percent of total income is imputed to respondents. A note of caution with the imputation methods is that the medical care risk index is a new measure, and the CPS imputation procedures may not take account of a lot of the components that may be part of this new measure and that may introduce certain kinds of error into the resulting index. If imputation procedures do not account for covariates of medical care risk, the index is weakened. Finally, limitations of CPS ASEC health insurance measures are well known.

Data collected in MEPS on measures of medical service use and medical out-of-pocket expenditures are unique in their detail. MEPS data set the standard, but there is little out there to compare to them. Because of the MEPS panel design, attrition may be the principal concern. The first MEPS interview is actually the second interview with the MEPS sample, because

the sample is drawn from National Health Interview Survey (NHIS) respondents. Are persons with high MCER overrepresented among attriters?

One of the strengths of MEPS is that it does have overlapping panels, so that there is consistent representativeness over time. This is a very important feature for a measure that will be used to track change over time.

Czajka noted that, after tracking the estimates from the NHIS and the CPS ASEC for most of the past decade, MEPS uninsured rates for adults and children rose sharply in 2007 and 2008, when the other major surveys showed stable or declining rates.

### Other Surveys

Czajka then discussed briefly three other surveys.

### Survey of Income and Program Participation

The Panel on Poverty and Family Assistance, authors of the 1995 National Research Council (NRC) report *Measuring Poverty: A New Approach*, viewed SIPP as the survey of choice for a new poverty measure. It had the advantage that it was designed expressly to support policy analysis; it collected more detailed income data than any other federal survey, and the quality of these data was almost uniformly high. SIPP's design, with collection of substantial core data in every wave and supplemental topical modules with varying content, was ideally suited to a new poverty measure that would require new data but not in every wave.

A decade later, the view was different. Some of the reasons were that the 1996 redesign replaced overlapping panels, critical to consistent cross-sectional representativeness; evidence of deterioration in income and asset data emerged; and timeliness issues and repeated budget/sample cuts detracted from the stability needed to support a key national indicator.

SIPP was terminated in 2006 but then restored in response to objections from users. A new panel started in 2008 will continue until replaced by a reengineered SIPP to be fielded in early 2014. Under the reengineered SIPP, annual interviews will replace the 4-month interviews; event history calendar methods will be used to collect monthly data with 12-month recall; most of SIPP core content will be retained; and key items from annual topical modules—such as assets and medical and work-related expenditures—will be added to annual interviews.

There are other issues, however, in using SIPP for development or initial production of the medical care risk index. To monitor implementation of health care reform, the index must be in place before the first new SIPP data will be available. Initial, small sample tests of the new design are encouraging, but it is not possible to fully assess the survey yet. SIPP's

funding history and current budget climate raise concerns about sustained funding.

However, the current SIPP, with panels longer than the MEPS panel, could play a role in evaluating a prospective medical care risk index. Does the subsequent experience of subpopulations match their estimated risk? Where and why do deviations occur?

### **American Community Survey**

The American Community Survey (ACS) has also been mentioned as a potential source of data for an MCER measure. The ACS is attractive because of its large sample size; 2 million households interviewed each year would offer unmatched geographic detail. It captures similar content to the CPS ASEC but is more limited in depth. The areas in which ACS data are richer than the CPS ASEC tend not to be relevant to MCER. Another problem is that the ACS questionnaire tends to be fixed for long periods of time because the survey is designed to allow estimates to be cumulated over periods of 3 to 5 years, to produce very small geographic detail. Also, much of the content of the ACS is mandated by law. The bottom line: ACS does not provide a viable option for developing or producing a medical care risk index.

### **NHIS**

The NHIS provides the sampling frame for MEPS. It is larger, and most of the content is released on a more timely basis. It collects detailed information on health status, which could enrich a prospective measure of risk. But on most of the other potential components of the MCER measure, the NHIS data are more limited than MEPS or nonexistent. In addition, because NHIS provides the sampling frame for MEPS, NHIS data can be linked to MEPS sample records; thus NHIS would add no new content. NHIS by itself is therefore not an option for developing or producing a medical care risk index.

### **Conclusion**

In conclusion, Czajka reiterated that questions about data source are reduced to what is collected in two surveys: the CPS and MEPS. MEPS collects essentially all data elements needed to construct alternative versions of the medical care risk index, whereas the CPS is missing critical variables for certain variants on these measures. Yet the CPS ASEC will be used to produce the new SPM to which MCER is intended to be a companion measure. Having both measures in the same survey would allow researchers

to compare and contrast how families and individuals are classified by the two measures. Such comparisons may be helpful in establishing the value added by a measure of MCER.

Czajka noted other advantages of the CPS ASEC. A CPS-based index could be released concurrently or shortly after the SPM or 10-11 months after the end of the survey reference period, which is the prior calendar year; MEPS would require an additional year. The CPS ASEC sample size is five times the largest recent MEPS samples. In addition to its size, the CPS ASEC sample combines independent, representative samples of the 50 states and DC. State estimates, although lacking in precision for individual years, could be important for state comparisons in monitoring implementation of the Affordable Care Act.

However, a prospective index would depend on data collected in MEPS; these data would have to lag a year, or release of the index would have to be delayed a year.

Finally, whatever survey is chosen, it is important to reassess both data and methodology within a few years of implementation.

## FLOOR DISCUSSION

Participants expressed their views on the various issues flowing from the presentation. **Kenneth Finegold** suggested that the study panel should consider using the Transfer Income Model, version 3 (TRIM3) as part of the discussion about developing the medical care risk index. TRIM3 is ASPE's model based on the CPS, but it has modules that do a lot of different things, including aligning Medicaid participation to match administrative totals in response to underreporting.

Given the limitations of the data sources that Czajka suggested, he said, one way to go would be to match TRIM3 to MEPS. Finegold was not sure that has been done, but TRIM3 was matched to NHIS for a number of years. Matching with MEPS would help to get at assets and medical conditions, information that is not in the CPS. The TRIM3 model has been used, he thought, under contract to the NRC, in development of the SPM over the years.

In response to a question about the currency of TRIM3, **Laura Wheaton** (Urban Institute), who is on the TRIM3 microsimulation project, responded. The work on this project is conducted for ASPE. When the analysts get each year's CPS data, over the course probably of the following year, they do the corrections for underreporting that Finegold was talking about. Depending on different project priorities, that schedule sometimes slips. So it is certainly not as timely as the CPS, she said. Various things often delay the baselines. For example, the project incorporates imputations of immigrant status to identify undocumented aliens, an important issue

for modeling eligibility for these various programs that adds some delay. If TRIM3 were to be used, it would certainly take more time than the release of the CPS. It would be at least 4 months after the release of the CPS before anything would be available.

**Barbara Wolfe** had two questions: first, is there any way of knowing more about the underreporting of income and assets by quintile? The relevance of the underreporting of SNAP clearly applies to the low-income population, but her impression had been that some of the assets are really underreported at the highest levels. She asked whether, for this particular population group, if it is possible to think more narrowly about the underreporting, particularly in the CPS, but in both data sets.

Second, is there any way that MEPS could in fact be available earlier, so that there would not be a year's delay for outside people to work with it? Maybe there is some way that in fact that could be speeded up so it would not be that long a delay.

**Steven Cohen** explained the method by which MEPS produces its expenditure estimates. After the household interview, the team conducts a Medical Provider Survey to get detail on all sources of payment. For this type of analysis, it actually produces an annual file on utilization and insurance coverage about 5 to 6 months after the period from the CPS turnaround. If the Agency for Healthcare Research and Quality (AHRQ) was just getting the out-of-pocket information to add to the file rather than depending on the Medical Provider Survey, which includes all the different aspects of expenditures, and it is also getting income data, there could be a way of accelerating that sort of a component of MEPS that would then be updated with purer estimates from the medical provider survey.

If one is depending just on the out-of-pocket information, perhaps the premium information that is paid out-of-pocket and the income information that is available before the Medical Provider Survey is conducted would be sufficient. The out-of-pocket information does get corrected, but it is not much of a departure. So there are some options in moving forward with these potential data resource needs for AHRQ to consider.

Czajka responded to the question about asset and income data. High-end assets are a big problem for all surveys. But the Survey of Consumer Finances (SCF) has a sample of tax returns, high income, and the ability to poststratify those people because it has data on who had what income. Comparisons between SIPP and the SCF show, however, that below the really high end there are big differences by type of asset. People do a very good job consistently across surveys in reporting the value of their home and the debt on their home, so there is a good estimate of home equity. That may be because people get a statement every month that tells them what they owe on their house. But that is not true of most of the other types of assets. Information on business assets is really bad in SIPP. It is not some-

thing that is evident from looking at the question. There are differences across different components, so that is why he hesitates to say one can just pop in some questions and get the results that one wants.

With respect to income, it is not really possible to look at comparisons with administrative records by quintile in quite the same way because the focus is family income, and one cannot put together those pieces. He reported working a few years ago on comparing several federal surveys and comparing by quintile across the surveys. For example, although the CPS did much better on earnings than the other surveys for the most part, if one looked at the low end, SIPP was getting more earnings. Also, the ACS was getting more earnings. With SIPP one can expect that a lot of the problem at the low end is that people are changing jobs. They may have a number of jobs, and if asked about this at the end of a year, they are likely to forget. With SIPP they are asked every 4 months about this employment. Although a survey may be the best income survey, it can still have some serious deficiencies.

**Peter Cunningham** commented that he was pleasantly surprised about the CPS out-of-pocket estimates. But not having seen a comparison, he was still somewhat skeptical. He wanted to know if the CPS asked about both out-of-pocket expenditures on premiums as well as on services, and how much detail there is.

**Kyle Caswell** responded that on the 2010 survey there are just two summary questions, and basically the same questions that they took from SIPP. One question asks people retrospectively how much did they spend in the last 12 months on health insurance premiums, at the individual level. The second question asks about nonpremium medical out-of-pocket expenses. It is very simple. But the comparison across the most available data at the time—MEPS, SIPP, and the CPS—did look good. The main issue with the CPS data is that it had a lot of people who reported a zero amount for either premium or nonpremium out-of-pocket expenditures compared with the other sources. Other components of the data, or different percentiles, looked surprisingly good, considering how much less effort was made than with MEPS.

Cunningham asked if they had looked separately at people with high expenditures, the tails of the distribution, as well, because he thought that when people are reporting from recall without any referring back to records, the underreporting tends to be severe. Caswell responded that different points of the distribution were not wildly different. That is the main story, he said, especially compared with the differences in data collection across the surveys.

Caswell commented that, given the conceptual model that was presented and thinking about risk in a prospective way, he thought that modeling health status and particular health conditions would be very important. She asked what the study panel would think about using a data source that



does not collect that information. For example, to use MEPS and then glue that health information onto the CPS, what is involved?

Czajka responded that this general approach is what is used for the SPM and the experimental measures, and recently only the CPS has started collecting these other components. The approach has relied on these kinds of methods, imputing for the expenditures largely from MEPS and also maybe SIPP. It is done in microsimulation models and clearly has risks. One is trying to match, and making assumptions that the variables that one is not matching on are lining up with the variables that one is matching. It is not perfect. He said he thought that, down the road, they would probably have to think about expanding the CPS, if that is the source, to add other measures, and hope for the same success that the Bureau has had with the medical out-of-pocket expenditures.

**Pamela Short** asked if the CPS has a scale for excellent, very good, good, fair, and poor health. Bringing that into the statistical matching would generate a lot more confidence than without that variable.

**Sarah Meier** commented that, with respect to the conceptual model, the risk adjustment models explain only a relatively small amount of the variation in health expenditures. So working with a very complex model that includes ICD-9 diagnosis codes and all sorts of other information, is actually not going to be a big improvement from working with just a scale of poor, good, and very good health status. Stepping back from the idealized version of what one might want to do if there were no data limitations, the types of variables in terms of health status that are available in the CPS would be a reasonable base for the health characteristic cells of interest here.

The bigger issue would be the expenditure information, how strong and solid that is in modeling of the actual expenditure distributions. So one could think of modeling those in MEPS and then attaching that to the CPS. The big issue with implementing the full type of model is the lack of insurance characteristics in the CPS.

Banthin cautioned that she would be concerned about matching MEPS to the CPS. The out-of-pocket spending measure is just out-of-pocket, it is not total, she said. And there are those extra zeros. It involves the entire distribution.

And just like the orthogonality of assets to income, it is important to preserve the orthogonality of expenditures, even the distribution of medical expenditures to income or to out-of-pocket. It is a different dimension.

Also, a scale for excellent, very good, fair, and poor health is a great predictor, but additional data are needed. Although she has built many a simulation model in which expenditures are matched to others, that was for simulating changes in policy. This is for the construction of a medical care risk index. So it does concern her that one of the key variables would be imputed with only a limited set of matching covariates.



**Jennifer Madans** (National Center for Health Statistics) stated that a scale of excellent, good, fair, and poor health is good at the extremes, but it is not very good in the middle. To know if someone is going to go into long-term care or die or will have a lot of expenditures, it is probably good at one end, and excellent is really good. But it is really bad about differentiating that big group of people in the middle. She has never been a big proponent of counting conditions either, because of the big variability in what that means. So there needs to be something else added. She said that some of the disability work is going in that direction, to really get a better composite measure of health that will be a better predictor of the use of resources. She did not think any of the surveys have that yet, but they are moving toward it, and some composite of that is going to be needed.



## Recap of Issues and Next Steps

The workshop brought together participants from different disciplines and interests who heard and commented on issues and ideas for moving forward with developing a measure of medical care economic risk (MCER). The final session highlighted their perceptions of some of the major areas and priorities that surfaced during the day.

After opening remarks by Michael O’Grady, three workshop presenters—Pamela Short, Sara Collins, and James Ziliak—led off the discussion, briefly highlighting some of their ideas. A general discussion followed of participants’ views and concerns.

### OPENING REMARKS

**Michael O’Grady** (NORC at the University of Chicago) observed that a number of methodological data concerns surfaced during the day’s discussions. There are also issues of practicality in developing the measure of MCER to avoid having it derailed by the desire for ideal data that are not there. He then highlighted some of the key methodological issues that the study panel will have to wrestle with.

He started with the concept paper by Meier and Wolfe, which lays out a set of decision models. The study panel will need to make some decisions about the key methodological issue of risk, a prospective measure, and burden, a retrospective measure. There are pros and cons to the two approaches, whether to take an experimental path, try to do both and compare early results, or go in one direction or the other.

The discussion about having different thresholds was interesting. Should there be different thresholds for the poor, the near poor, and the elderly or for the chronically ill? Will the study panel be comfortable coming to a consensus on that? Is it something the study panel can explain to a broad audience compellingly? The question of income versus assets is also an important issue.

He next addressed the realities and the quality of the data, getting to the question of using data from the Current Population Survey Annual Social and Economic Supplement (CPS ASEC), the Medical Expenditure Panel Survey (MEPS), or both. What are the options in terms of imputation, collecting new information, or some other way?

O'Grady said he found the discussion of TRIM3 interesting, bringing to mind that this measure has to go out to a broad audience. He observed that once the talk moves away from a survey or an imputation of a survey toward modeling, it is viewed much more as a black box.

#### PANEL REMARKS

**Pamela Short** repeated the question Michael Hurd asked earlier, why a measure of MCER is being developed. From the day's discussion, she came to realize that the problem of evaluating the effects of the Affordable Care Act (ACA) was probably front and center, at least from the sponsor's point of view. That's why the workshop participants spent so much time talking about prospective measures and insurance and not so much about burden.

People are indeed going to be spending more on insurance because it will be required, she said. The fact that the ACA requires everyone to be insured presumes that there are benefits, so there is a need for a good and convincing way of quantifying those benefits. But a lot of people who spend more on insurance will not benefit, because they will not get sick and so will not spend a lot out-of-pocket. To add up the benefits of having insurance, there is a real conceptual problem if one only looks after the fact at out-of-pocket expenses, because that does not attribute any benefit from having insurance to people who do not use it.

The situation is similar to buying life insurance. Why buy life insurance, since one does not want to use it? The benefit of health insurance is that some people who did not have insurance are going to be freed of the risk of major out-of-pocket medical expenses, and some people who have insurance are going to get much better insurance, at an affordable price. Consequently, Short observed, this issue of showing the value of insurance or measuring the value of insurance is central in evaluating the ACA. A closely related issue is defining adequate insurance (or "minimum essential benefits" in the ACA).

There will be before-and-after comparisons of family spending, in which this measure gets used as a tool for describing winners and losers from the implementation of health care reforms. With that as the driving force, at least in the near term, Short observed that the issue of state variation is really important. The framework for reform leaves a lot to the states, and the numbers that Sara Collins showed emphasized how much variation there is among the states.

In a way, she said, the train has already left the station with the release of the Supplemental Poverty Measure (SPM). It seems to be moving in the direction of looking retrospectively at high out-of-pocket expenses relative to resources, however they are measured and whether or not assets are included with income. In terms of work for the study panel to encourage in the short run, Short thought that there is probably time to bring together the needs standards for other consumption that are in the SPM, to try to give more empirical basis to the idea that people under 200 percent of the poverty line should not spend more than 5 percent of family income on health care. The idea would be to figure out how much room there is for premiums and out-of-pocket expenses, beyond the SPM need standards, rather than arbitrarily picking a threshold of 5 percent of income, 7.5 percent of income, or whatever—numbers that mostly seem to appear out of the air. A measure grounded more in a model of real consumption needs, probably drawn heavily from the SPM, could provide an empirical basis for picking a threshold percentage.

In terms of trying to measure the adequacy of insurance, Short favored the collection and use of information about people's insurance policies. Gary Claxton's presentation underscored the importance of detailed information about plans and variation among plans. The distinction between nongroup insurance and employment-based insurance is important and is collected in some surveys.

There also is need for data about employers, as there are important differences in the plans offered by small employers and large employers. At one time, MEPS got copies of people's policies and abstracted them. There was some discussion during the workshop about actuarial value, which is one way of comparing policies, as are out-of-pocket limits, deductibles, limits in scope and duration, and covered services.

On the issue of assets, Short said she is not sure why the question of counting in assets has been linked to measuring medical care economic risk. Basically, one expects elderly people to use their assets for all kinds of regular consumption.

**Sara Collins** highlighted a couple of items from the range of issues identified by Short. On the threshold issue, she thought it is probably important to think in terms of income. She did not necessarily agree with Short's idea about making a stronger empirical basis for picking a percentage. There

is some historical experience of this with the Children's Health Insurance Program; she asked why one would move away from it at this point to a different or higher income cutoff.

On the asset issue, Collins was struck by Jessica Banthin's zero asset level for working-age people who are poor, and not much higher than that in some of the upper income categories in that group. There just isn't much for people to draw on at lower income levels if they do have high out-of-pocket spending.

She also emphasized the importance of being able to disentangle the premiums from the out-of-pocket medical costs. She agreed with Short's point about premiums being a required price to pay with the individual mandate and the question of whether they buy a sufficient amount of coverage. In the law, the affordability of the premiums is clear; they are on sliding income-related scales for that purpose. Separate from the affordability of the out-of-pocket costs, exposure is a gray issue as a share of income, on an actuarial value level and translating into what it means for families. The measures do different things, premium as a price of health care, and exposure to out-of-pocket costs, in terms of tracking health reform, not only as an economic burden but also as a way to enable people to get the health care that they need.

Collins remarked that Schoen's work on the underinsured over the past several years shows that people who are underinsured exhibit somewhat similar behaviors to people who are completely without coverage, not getting the health care that they need because of costs and having lots of medical bills. This access issue is very striking in those data.

She echoed Short's point about needing to examine differences across states. The ACA is implemented at the state level, with a lot of federal guidance. But once it goes to the states, they are in a position not only to implement their exchanges but also to enforce their new market rules. So a state-by-state measure on out-of-pocket exposure is going to be extremely important. The point about vastly different rates of health care cost growth across states also speaks to the need to track by state.

Finally, taking off on what Michael O'Grady said about policy makers, that these measures should be simple for both federal and state policy makers to understand, Collins emphasized that the simplicity of the measure should also include being able to see and understand things that are going in different ways: out-of-pocket costs going in one way and income going in the other way, and being able to disentangle those effects.

**James Ziliak** observed that, going back to the Wolfe and Meier presentation, he was very sympathetic to the notion that risk is a prospective concept.

At least part of the motivation he detected from the sponsor in developing a measure of MCER is to figure out how to improve well-being. So

it does not seem inconceivable to construct an *ex post* index, much like the SPM, which could be used to assess different programs, such as the Supplemental Nutrition Assistance Program and Temporary Assistance for Needy Families.

Clarification is needed on what is of most interest: a measure that indicates the policy's effectiveness contemporaneously or one that indicates the risk of individuals facing a large out-of-pocket expense or medical emergency in the future. The latter is more the intellectual exercise that one associates with risk, insuring against uncertain events.

Short mentioned in her presentation that one of the problems with the SPM is that, if one assigns the uninsured to be insured, it makes them look worse off economically because the SPM records just spending. She said that what is needed is an MCER measure to show that the insured are better off.

If these measures are constructed as separate indices, there is no obvious way to capture that any one individual is better off or, in some aggregate sense, that all are better off. He said he actually likes the idea of two separate indices.

Ziliak pointed out the literature on multidimensional measures of poverty and deprivation. The United Kingdom has a measure of deprivation with something like 70 different items, and they are added up into a single index. So surely in the United States it is possible to add two measures together to come up with some index. There is recent work on multidimensional measures of well-being that could be aggregated into a single index (i.e., Alkire and Foster, 2011; Bourguignon and Chakravarty, 2003).

He commented that measuring poverty appears a lot easier, perhaps because it has been going on for a lot longer. One draws a line based on some measure of needs and then counts resources and compares one with the other. It seems straightforward.

But with the concept of MCER, the notion of the thresholds is still not well defined at this point in time, because what people need has not been well defined. But if one were to use different thresholds, he said he thought that it would be important to capture employment status. Part of the reason is that a lot of money is spent in this country on work-related injuries and illness. He noted that coverage and type of coverage seem critical in thinking about thresholds. Geographic adjustment is also important, as indicated by cross-state variation.

Finally, in terms of data, Ziliak said he leans heavily toward moving forward using the CPS ASEC as the data set of choice, in part because of the need to go forward; there is a mandate in the ACA about constructing measures reflecting state differences and medical need. The CPS ASEC has large sample sizes, and it has introduced medical out-of-pocket spending,

so there is progress in that dimension. Income data collection in the CPS is not as detailed, especially the transfers going forward. But it seems that the CPS ASEC does have most of what is needed to move forward in developing the new measure.

### GENERAL DISCUSSION AND COMMENTS

Most of the discussion centered on the benefits, or lack thereof, of requiring everyone to purchase health insurance, as called for in the ACA. Many views were expressed.

**Emmett Keeler** (RAND) opened the discussion with the observation that one of the main purposes of the measure of MCER is to evaluate the ACA. But he wanted to make sure that it is an honest evaluation.

Although it is clear to him that giving people insurance is a good deal for them, it is not clear that forcing people to buy insurance is a good deal for them. It depends on the price and what the benefits are. Somehow this measure has to take account of that. To the extent that making people buy insurance is a burden, something in this measure needs to show that economic reality. In the current context, if it were a good deal for uninsured people to have insurance, they would have it. Basically uninsured people are saying they would rather have the money to spend on food or shelter, than to have the money to spend on an insurance premium, and the markets do not work very well for them. There are many reasons why uninsured people do not have insurance; it is a choice that they make. Subsidies can make it a good deal for them. Somehow the measure must include an honest evaluation of the value of that insurance.

**Constance Citro** (National Research Council) commented that it is very important to compare apples with apples, which is why one would like to compare not only the SPM pre- and post-ACA, but whatever this measure of MCER is pre- and post-ACA. The SPM may show that some people are worse off, in the sense that the money they have available for the basics that are in that measure, but the MCER may show that on that dimension they are benefiting from the insurance. Of course it is a judgment as to what people think of the different values of the different costs—the higher out-of-pocket costs on one hand and the greater insurance against risk on the other hand. But it would be really too bad if all there was at the time that the ACA is implemented is a measure comparing the effects of health care reform on just the SPM.

Keeler commented that he was trying to think of benefits of reducing risks that do not apply to reducing burden. After people have been sick and have had to pay a lot of money for it, they are in a bad situation. But why would they want to reduce risk? He thought of two reasons: one is peace of mind—maybe buying insurance also buys peace of mind. The other reason



is that people like to buy out of unpleasant decisions. So, for example, a good thing about having insurance is that one does not have to say, my kid is sick but I am not sure that I can afford to take him to a doctor. That is a very unpleasant situation. Other than that, it seemed to him that one simply wants to look at people who have had big medical expenditures and been disadvantaged by them.

**Pamela Short** commented that the theory of insurance is that, with something like medical care, only a very small percentage of people will get sick, but it costs a lot of money when that happens. So the idea is to pool that risk, to average it out. Everybody pays the average, and nobody faces the extreme tail. Because the extreme tail drives consumption way down, risk-averse people would prefer the average over the risky possibility. Those expenses do not go away, but for individuals they are pooled. She certainly was not trying to say in her presentation that the study panel needed to propose a measure that would be sure to show that the ACA is a good thing. This is important is because it is a way of quantifying the value of insurance to people who do not use it. Again, she said, think about life insurance or car insurance, which people do not want to use. People spend quite a bit on insurance of different sorts, and this workshop is just trying to give medical care insurance its due.

**Sarah Meier** raised the question of the value of insurance. Insurance is a mechanism that results in an income transfer in the event of illness that people would not be able to afford in the first place, she said. If the next thing they would buy if their income were expanded were health care, then that is the value in the insurance. She also commented that people will be mandated to buy insurance premiums that are not necessarily affordable. The reform structure is that premium rating can vary by age categories. It also limits the subsidy structure at 400 percent of the family poverty level. So it is feasible that people who fall just above this level, who are also pre-Medicare age, will actually be paying a surprisingly large percentage of their income for the premium.

Referring to an earlier comment regarding the regression-based model, Meier agreed that it is the better approach. She pointed out that families are made up of individuals. She and Wolfe suggest in their paper classifying health risk at the individual level, so the suggestion is that these predictive variables are individual risk characteristics. Not only are they thinking about health risk as an individual aspect, but also insurance policies within a family may vary. Some family members may have a Medicaid-covered individual, and some a privately insured individual. So figuring out how to model a family's likelihood of exceeding a certain value, when everyone in the family could contribute a different amount of money to that value, under different scenarios, and on top of that everyone in the family has perhaps a different insurance dynamic, is something they could not pull

together in the paper. Hence they put forward the idea of modeling a probability distribution and then simply applying insurance characteristics and aggregating them.

Ziliak commented that one approach is weighting by family size, taking whatever family concept is selected and putting it at the individual level. But the CPS has individual-level data on earnings and income, and the insurance status is at the individual level, not the family level. So, he said, one can go fairly far with the individual level and then weight it up to the family.

Meier said that one is not trying to assign an individual a risk score or an expected value in the next year but instead recognizing that an individual at the start of a year has an entire spectrum of outcomes that could happen. The shape of that distribution and where it is centered is going to depend on initial health status. If someone has diabetes, one can be reasonably certain that it will increase expenditures. But the actual shape that falls around the mean value is what she meant in talking about modeling—looking at that shape, seeing what insurance does to the shape. Ideally, if there is an out-of-pocket maximum, it should just slice off the tail. And aggregating that upward to the family, instead of having an expected value of expenditures for a family in the next year, her vision is that a family actually has a risk distribution. From that distribution, one could come up with some understanding of how likely they are to be placed in poverty or to experience expenditures at 10 percent of their income. Tacking on the premium would show whether the premium itself put the family in poverty, before out-of-pocket expenditures are even factored in.

A participant commented about the discussion of the value of insurance in the context of a person who does not value the insurance, who has low income, and who now is forced to pay a premium and has therefore a lower amount of money available for everything else. That must be captured, he said, but there are also the benefits to other people of that person's being insured. People who are insured have an opportunity for more efficiently provided health care. They can actually get their relatively minor issue treated much sooner and so skip the emergency room later on, when the situation is far worse. There is also the opportunity for the health system in general to be more efficient if more people are insured. It is not just the person who gets insurance who gains from having coverage or having better insurance. In terms of explaining the overall effect of some changes in health care policy, leaving that out very much understates the benefits of changes that add or improve the quality of insurance.

Collins commented that the protectiveness of the coverage is not just about getting sick or not. It is also the first dollar, coverage for kids, getting better health screening, and improvements for people with currently bad coverage.

In Schoen's underinsured study, she said, the drivers are not the high, out-of-pocket catastrophic costs, but increasing rates of people with high deductibles and high out-of-pocket spending because of their low first-dollar coverage on their policies.

Short remarked that at some point it might be important to look at routine recommended medical expenditures. It is not so much a matter of risk, as to see whether the allowance in the SPM for a little bit more would adequately cover routine kinds of care for people at lower income levels. She questioned if the little bit more is actually enough; there might be an argument for increasing it.

**Barbara Wolfe** made the point that everyone, if they have value, could buy health insurance. The problem is that one cannot buy a decent policy in the individual market; the policies are not available or are very limited. In addition to being all there is, they are quite expensive relative to policies in the group market, even the small-group market.

Her second point is that, before the ACA, many individuals with pre-existing conditions could not buy coverage. They certainly could not buy coverage for their existing condition, at least for a fixed period of time. She gave as an example one of her students with a preexisting condition that could not be covered even though she was part of very large group, the state government sector, at the time.

If part of the purpose is to evaluate the ACA, then a good starting point is probably 2009 or earlier. To have a benchmark of some of the gains, then some of the work should use an earlier starting point, before any of those preexisting conditions, including ones for children, which were among the first to go into effect.

In talking about these matrixes and groups, the closer one gets to a narrowly defined group, the further one moves away from risk, because eventually, there is a cell of one. She said she thought that the study panel will have to think about how narrowly defined those cells should be. When people buy insurance for their home or their auto, they are getting a rate that depends on some kind of group; they are not getting their own individual rate.

People do face a risk. Some of that risk is just based on age, and it should not depend on an individual's already-diagnosed preexisting condition. Some people, particularly individuals with limited access, won't know that they have a condition because they have not received the medical care that would put them into the risk index. So it is important to think through how narrowly defined those matrixes should be.

Many other aspects of medical care, such as oral health, have not traditionally been included in most health care policies. These are components that have important potential for poverty in the future, so they are important in thinking about how to define this benefit plan.

**Laura Wheaton**, referring to O'Grady's comment about staying away from the black box and developing something straightforward, asked what sort of additional level of complexity he was thinking about. Is taking some information from MEPS and then transporting that onto the CPS the kind of a layer of complexity that people might find objectionable? Would it be better just to stick with MEPS for this medical risk index? She has done statistical matching and imputation, which adds some time to the analysis. If MEPS seems to be clearly better in many ways in terms of the data elements, perhaps one should just stick with it.

The advantage of the CPS in having the large sample size in the states has been pointed out. MEPS has information that varies by state but is not the underlying sample size to support state analysis. Is there too much, then, when one imputes that onto the CPS, saying there is enough sample size in the CPS?

O'Grady responded that there are trade-offs. As the study panel members discuss this issue, they will consider the pros and cons of using MEPS and using the CPS. It may take a number of test runs. Utilization data and some other items are really strong on MEPS, but the priority may be to make state-level estimates. The study panel will consider that both have their strengths and weaknesses.

Citro agreed with the idea of going back a couple of years to the totally pre-ACA environment. The ACA is the law now, and various provisions will go forward; she is sure that the study panel is not interested in prejudging the outcome of the measurement but just how to appropriately measure, given all the complexities.

She also commented on the frustration in this measurement area. The country spends lots of money on health, including on Medicaid and Medicare, and it has been great. But getting credit for it in the economic measure of poverty has been a problem. Short made the comment that the purpose of medical care in some sense is to restore people to some state of health rather than get them to a higher level. Before Medicare and Medicaid, what could be done for people? They could have a broken bone set. They could be given digitalis for congestive heart failure. There were a few antibiotics and a few vaccines, but that was about it. There was no cholesterol medicine, no decent antidepressants, nor many other treatments that are now available. It is definitely a benefit that those treatments are here, but they cost money. As a comparative example, what food stamps provide is food to meet basic calorie requirements, and food intake requirements have not changed over the millennia. What medical care can provide has changed, and it is a benefit, but it is very hard to measure. Trying to put it into the same framework as food, clothing, utility bills, and the list is part of the frustration that lies behind developing this measure. That was a major motivation for the 1995 NRC panel to say yes, medical care must

be looked at, somehow keeping it related but separate because it is so different conceptually.

Wheaton remarked that the group has talked about the individual level and the family level, but there are also different definitions of family. Is the appropriate unit of analysis for the ACA the tax unit with dependents? That could be quite different from a broad definition of family in the SPM, which includes all related persons plus cohabiters.

O'Grady responded that the study panel could defer to the SPM methodology and use whatever it called a family. The ACA cutoff for dependent children is age 25. But even with that age cutoff, family resources are still being spent, for example, for a 27-year-old child who has aged out of family coverage. If fully uninsured at that point, the family still is on the hook for that person's finances. In closing, Michael O'Grady thanked everybody for coming. He has expressed his thoughts, concerns and comments throughout the discussions and really got a lot out of it. He has appreciated everything, especially the presenters. They did a great job.

Connie Citro added her appreciation for a productive day and gave everyone a round of applause.



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# Appendix

## Workshop Agenda and Presenters

### AGENDA

Workshop on Developing a Measure of Medical Care Economic Risk

September 8, 2011

8:30–9:15 am

#### OPENING SESSION

Welcome and Call to Order

Michael O’Grady, NORC Chair

Welcoming Remarks on Behalf of the National Academies

Constance Citro, CNSTAT, DBASSE

Sponsor’s Perspectives

Don Oellerich, ASPE

Context for the Workshop—The New Supplemental  
Poverty Measure

Kathleen Short, Census Bureau

9:15–10:45 am

#### SESSION ONE

*Moderator*

David Betson, University of Notre Dame

*Measuring Medical Care Economic Risk—What is the  
concept? Why do we need it? What are the criteria for a*

*useful measure? How do we measure adverse medical event risk? How do we measure subsequent economic hardship? Pros and cons of retrospective and prospective measures.*

Overview of the background paper by Sarah Meier and Barbara Wolfe—A conceptual framework for measuring medical care economic risk.

**Presenters**

Barbara Wolfe and Sarah Meier,  
*University of Wisconsin–Madison*

**Discussants**

Pamela Short, *Penn State University*  
Gary Burtless, *Brookings Institution*  
Richard Bavier, *Retired from OMB*

**Floor Discussion and Comments**

10:45–11:00am                      *Coffee Break*

11:00am–12:30pm                **SESSION TWO**

**Moderator**

Wilhelmine Miller, *NORC*

**Issues in the Development of Thresholds**—*Should thresholds vary for different population groups? How to capture variability of risk across populations including geographic variations in exposure to medical care economic risk; and vulnerability of population groups by insurance status, age, income, chronic health conditions; how to update the thresholds?*

Tracking geographic variations in exposure to medical care economic risk—moving beyond one national estimate.

**Presenter**

Sara Collins, *The Commonwealth Fund*

Trends in persistent financial burden of medical out-of-pocket expenditures resulting from chronic health conditions.

**Presenter**

Peter Cunningham, *Center for Studying Health System Change*

Trends in insurance coverage—insured and uninsured—and their impact on medical out-of-pocket expenses, including insurance premiums.

**Presenter**

Gary Claxton, *Kaiser Family Foundation*

**Discussant**

James Ziliak, *Director, University of Kentucky Center for Poverty Research*

**Floor Discussion and Comments**

12:30–1:15pm

*Working Lunch*

1:15–2:45pm

**SESSION THREE****Moderator**

Cathy Schoen, *The Commonwealth Fund*

**Issues in Defining Resources**—*What is included in income in determining medical care economic risk in terms of ability to pay for insurance and for medical out-of-pocket expenses? How to treat assets in addition to income; what constitutes income for the self-employed? How do the elderly and other groups finance medical care?*

Overview of background paper by Jessica Banthin and Didem Bernard: Using Income and Asset Data from the Medical Expenditure Panel Survey, Assess the Distribution of Resources and Different Ways of Measuring Resources Available to Retired, Self-Employed, and Employed Families for Medical Expenses, Including Insurance Premiums.

**Presenter**

Jessica Banthin, *CBO*

Changes over time on how the elderly finance medical care—findings from the Health and Retirement Study.

*Presenter*

Michael Hurd, *RAND*

Financial burden of medical care among the elderly in transitioning to long-term care.

*Presenter*

Eric Stallard, *Duke University*

**Discussant**

Marilyn Moon, *AIR*

**Floor Discussion and Comments**

2:45–3:00pm

*Coffee Break*

3:00–4:00pm

**SESSION FOUR**

*Moderator*

Emmett Keeler, *UCLA*

**Implementation Issues**—*What data are available now? What relevant data will become available under health care reform? What data quality concerns are there? What about timeliness? Can the medical care risk index be released at the same time as the Supplemental Poverty Measure?*

Overview of background paper, *Measuring Medical Care Economic Risk: An Assessment of Data Sources*

*Presenter*

John L. Czajka, *Mathematica Policy Research*

**Floor Discussion and Comments**

4:00–5:00pm

## SESSION FIVE

*Moderator*

Michael O’Grady

**Recap of Issues, Needed Research, and Potential Solutions for Developing a Measure of Medical Care Economic Risk**

*Presenters*

Pamela Short

Sara Collins

James Ziliak

**Floor Discussion and Comments**

5:00–5:15pm

## CLOSING REMARKS

Constance Citro

Michael O’Grady

5:15pm

Adjourn

**Presenters**

**Jessica S. Banthin** is a senior advisor in the Health and Human Resources Division of the Congressional Budget Office.

**Richard Bavier** is retired from the U.S. Office of Management and Budget.

**Gary Burtless** is senior fellow, Economic Studies, The John C. and Nancy D. Whitehead Chair at the Brookings Institution.

**Constance F. Citro** is director of the Committee on National Statistics in the Division of Social and Behavioral Sciences and Education, National Research Council.

**Gary Claxton** is vice president and director, Health Care Marketplace Project at Henry J. Kaiser Family Foundation.

**Sara Collins** is vice president, Affordable Health Insurance at The Commonwealth Fund.

**Peter Cunningham** is senior fellow and director of quantitative research at the Center for Studying Health Systems Change.

**John L. Czajka** is senior fellow at Mathematica Policy Research in Washington, DC.

**Michael Hurd** is senior economist and director, RAND Center for the Study of Aging, RAND Corporation.

**Emmett Keeler** is senior mathematician and professor of health services, Pardee RAND Graduate School at the UCLA School of Public Health.

**Sara Meier** is a Ph.D. student, Department of Population Health Sciences at the University of Wisconsin–Madison.

**Wilhelmine Miller** is senior fellow at NORC at the University of Chicago.

**Marilyn Moon** is senior vice president and director, Health Programs at the American Institutes for Research.

**Donald T. Oellerich** is deputy chief economist, Office of the Assistant Secretary for Planning and Evaluation at the Department of Health and Human Services.

**Cathy Schoen** is senior vice president for Research, Policy and Evaluation at The Commonwealth Fund.

**Kathleen F. Short** is senior research economist in the Social, Economic, and Housing Statistics Division at the U.S. Census Bureau.

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## **PART III**

### **RESOURCES FOR THE STUDY: BACKGROUND PAPERS**





# Conceptual Framework for Measuring Medical Care Economic Risk<sup>1</sup>

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## INTRODUCTION AND BACKGROUND

This paper focuses on how to incorporate medical care economic risk (MCER) into a measure of poverty. We consider the advantages of a separate index versus incorporating medical risk into a single index of poverty; we address the appropriate unit of observation, arguing that medical risk is best measured at the individual level and then aggregated; we argue for the need to go beyond average expenditures, because risk at its core refers to expenditures in the tail; we discuss the issue of over- and underutilization and how to incorporate insurance coverage into resources. We briefly discuss data needs, focus on methodology and argue for a prospective measure. In the end, our goal is to improve the measurement of poverty, because, without the inclusion of medical care needs, poverty measurement will be increasingly inaccurate.

### Purpose of a Poverty Measure

Why a measure of poverty? It tells how the nation (or other unit of organization) is doing in terms of deprivation. It serves as a way to both measure success in avoiding deprivation and the effectiveness of public poli-

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<sup>1</sup>The views expressed in this paper are those of the authors and do not necessarily reflect the views or conclusions of the National Research Council, the Institute of Medicine, the study panel, or the sponsor.

cies (and private ones) in influencing deprivation. It provides one measure of economic well-being. A poverty measure can be absolute or relative. The United States uses an absolute standard that has not changed since originally designed. In most other developed countries, a relative measure is used, such as 40 to 60 percent of median income. Here we focus only on a measure that focuses on economic or material well-being. Some argue for a broader measure that encompasses other aspects of deprivation, such as exclusion. This might be particularly useful when focusing on health, as persons with certain chronic conditions or disabilities might in fact face more isolation. Nevertheless, that is not the focus of this paper. Our task here is to address an already complex issue: how to capture medical risk for purposes of more accurately capturing deprivation.

A measure of poverty serves to identify those in need of assistance by helping set up eligibility standards for programs targeted at those with insufficient resources. It serves as motivation to design policies to reduce deprivation. And it serves as a potential measure of the effectiveness of public policies in alleviating deprivation. It allows comparison across groups in the population defined by age, family structure, race/ethnicity, health or disability status, and geography; and it can provide information on the dynamics of deprivation or poverty by providing trends over time.

### **Review of Current Poverty Measure and Related Core Issues**

The current poverty measure has two components: a set of poverty thresholds or lines specific to family size and a definition of family income to be compared with the thresholds. These thresholds have been the federal government's official statistical measure of poverty since 1969. They originated with the work of Mollie Orshansky, who based her thresholds on multiplying the cost of a minimum adequate diet for families of various sizes and then multiplying this value by a factor of three. The minimum adequate diet is based on the U.S. Department of Agriculture's Economy Food Plan; the factor of three was based on a 1955 survey by that department. The thresholds are updated annually, so that the real value of the thresholds has remained unchanged since 1963.<sup>2</sup> A family's before-tax money income is compared with these thresholds to calculate whether or not its income is above or below the poverty threshold. The official poverty rate is calculated using the March Current Population Survey (CPS). It is calculated for the nation as a whole, for subgroups of the population, and for geographical areas. It is used to determine eligibility for needs-based public-sector programs.

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<sup>2</sup>Although the real value has remained the same, relative to median family income, the threshold has fallen from 48 percent of family income in 1963 to 28 percent in 2005 (Smeeding, 2006).

In 1992, the National Research Council (NRC) convened a study panel at the request of Congress to conduct a comprehensive examination of poverty measurement in this country. The study panel released its report, *Measuring Poverty: A New Approach*, in 1995. In 2004, the NRC's Committee on National Statistics held a follow-up workshop to review the panel's recommendations and to consider alternative poverty measures that would be regularly reported. The issue of how to handle health care needs and expenditures was one of the issues addressed by both efforts.

*Both the 1995 consensus report and the 2004 workshop participants came to the following conclusion: The core problem with the official poverty measure is that it does not provide an accurate picture of the extent of economic poverty, the trend in economic poverty, or differences among population subgroups or geographic areas.*

The current measure does not reflect core consumption needs (food, clothing, shelter, health care) in the threshold or adequately capture economic resources, because it measures only pretax monetary income. Nor does it capture true differences in costs by different family sizes and composition—so-called economies of scale or equivalence scale issues. It does not take geographic differences in prices into account (e.g., heating and cooling needs). With respect to medical care needs and insurance coverage, the current measure does not take into account

- The extent of medical care costs and the variation in these costs across the population that reflect real differences in rates of illness and disability,
- Differences in medical care coverage (health insurance),
- Rising costs of that insurance and required copayments, nor
- Rising health care costs as a share of both family budgets and the economy more generally.

Together, these deficiencies mean that important public policies, such as the Supplemental Nutrition Assistance Program (SNAP), housing vouchers, publicly provided health insurance, and changes in taxes, are not captured. Beyond these deficiencies, the official measure does not reflect the changing standard of living of most Americans. Thus, rather than a comprehensive measure of economic well-being, the official poverty measure is a very narrow concept that is not influenced by real changes in public policy or changes in the relative prices of core consumption items.

### 2011 Release of Supplemental Poverty Measure

The Supplemental Poverty Measure (SPM) is designed to provide an improved understanding of economic well-being in the United States and to measure the influence of public policies on the low-income population.

It is not expected to replace the official poverty line. (Replacing the official poverty line raises issues of equity across groups currently eligible for federal needs-based programs as well as issues of a politically sensitive nature, such as official responsibility for an increase in measured poverty that might occur with an improvement in measurement.)

The SPM is still in a research stage, even though it was initially included in the president's fiscal year 2011 budget, which would have allowed the measure to become operational. The resource side of this measure is to include not only money income but also in-kind benefits (e.g., SNAP; the Special Supplemental Nutrition Program for Women, Infants, and Children [WIC]; free and reduced-price school lunches; housing subsidies; home energy assistance) minus taxes (or adding tax credits), and subtracting out work expenses and out-of-pocket medical expenses. It uses the three-parameter equivalence scale proposed by the 1995 NRC panel<sup>3</sup> and is to adjust for differences in the cost of shelter across geographical areas. The threshold is to be set at the 33rd percentile of the food, clothing, shelter, and utility needs for all families with two children.<sup>4</sup>

The medical out-of-pocket (MOOP) expenditures are to be based on questions added to the CPS Annual Social and Economic Supplement (ASEC). In these questions respondents are to report expenditures on medical care insurance premiums and fees that the family paid out-of-pocket, including prescription drugs and provider copayments. According to Short (2011:8), these expenditures are particularly large for children and the elderly: there is preliminary evidence that subtracting MOOP from income increases the SPM poverty rate for the elderly by approximately 7 percentage points. This increase is an indication of the (increasing) importance of medical expenditures in this country and their importance in a correct calculation of poverty.

### INCORPORATING MEDICAL CARE NEED INTO THE MEASUREMENT OF POVERTY

Insufficient treatment of medical care need (and resulting expenditures) in the poverty measure has increasingly challenged its validity over time. Although the poverty measure arguably did not capture the full importance of the relationship between medical need and poverty in the early decades of its use, the sheer growth of medical care expenditures as a proportion of domestic spending has probably exacerbated the real effect of this prob-

<sup>3</sup>The three-parameter scale is equal to  $(adults + \alpha * children)^\beta$  where  $\alpha$  varies between 0.5 and 0.8 and  $\beta$  varies between 0.6 and 0.7; in the SPM,  $\beta$  is set equal to 0.7, and  $\alpha = 0.5$  for two-parent families but 0.8 for the first child in a single-parent family.

<sup>4</sup>This description of the SPM is from Short (2011).

lem on the measurement of poverty outcomes. Spending on medical care increased from 5 percent of gross domestic product in 1965 to roughly 17.6 percent in 2010; moreover, it is projected to increase to 19.8 percent of gross domestic product by 2020.<sup>5</sup>

In the section that follows, we review recent changes in methodology that strengthen the capacity of measurement to capture the real effect of medical expenditures on poverty. Although change in the treatment of medical expenditures under the SPM is an important component of this process, it is not the only relevant step. We suggest that recognition of the need for an index that captures the extent of medical care economic risk faced by members of society is an important step forward in documenting the full relationship between medical care need and poverty.

### Treatment of Medical Care Need in the Supplemental Poverty Measure

The challenge in poverty measurement with respect to medical care need has not been to identify the problem, but rather to determine the best methods to resolve it. Experts have long recognized the need to improve measures of medical need and (medical) resource availability (Smeeding, 1982); however, the actual assignment of an individual's poverty status on the basis of these measures introduces a number of conceptual and technical considerations that are not easily resolved. These include<sup>6</sup>

- The nonfungible nature of medical benefits: incorporating a non-fungible benefit into the resource component of the poverty measure poses a technical challenge. Specifically, assignment of benefit values for insurance holding to the resource component of the measure would incorrectly treat unused benefits as disposable income.
- Large variation in medical need: given the large variation in medical need across the U.S. population, a large number of thresholds would be required to adequately capture that variation and the subsequent poverty effects for those with insufficient resources.
- Sufficiency of resources: whether an individual has sufficient insurance against the risk of medical care need, and whether an individ-

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<sup>5</sup>The 1965 estimate is reported by the Congressional Budget Office (2008:3); the forecast for 2010 and projections to 2020 are from the CMS, Office of the Actuary (2011:1).

<sup>6</sup>We summarize these issues briefly; the reader is directed to Moon (1993) and National Research Council (1995) for detailed review of these and other measurement considerations. As well, we wish to credit participants in the study panel's September 2011 workshop for drawing greater attention to the conceptualization of both the medical care burden and medical care risk constructs. The distinction between these two constructs and the treatment of their relationship to poverty have important conceptual and methodological implications for the development of the MCER index.

ual had sufficient resources to provide for observed medical need (ex post) are two different questions. Similarly, a retrospective measure of medical care need is different from a measure of medical care need that an individual *might* experience over a future period. A measure taken retrospectively is a measure of experienced burden, whereas the latter measure must necessarily incorporate some consideration of the uncertainty surrounding future consumption needs. Thus, methodology aside, one must resolve the question of whether it is conceptually correct to assign poverty in the case of an uncertain outcome (e.g., medical risk).

The 1995 NRC study panel served an important role in moving poverty research from recognition of these problems toward identification of actionable solutions. Specifically, in its 1995 report, the panel advocated the development of a two-index approach to poverty measurement. The first index would exclude medical care needs from the thresholds and medical care benefits from resources. Meanwhile, subtraction of medical care expenditures (premiums and out-of-pocket spending) from the measure of family resources would, to some degree, capture the influence of medical circumstances on a family's available resources (Recommendation 4.2). In its current form, the SPM adopts this recommendation.

In addition, the 1995 panel's Recommendation 4.3 called for formation of a new measure (the second index) to quantify the economic impact of medical care risk (National Research Council, 1995:225):

Appropriate agencies should work to develop one or more "medical care risk" indexes that measure the economic risk to families and individuals of having no or inadequate health insurance coverage. However, such indexes should be kept separate from the measure of economic poverty.

The effect of this two-index approach on resolving these technical and conceptual challenges can be understood as follows:

- The fungibility problem is resolved by considering the value of medical benefits in a separate index.
- Observed expenditures are a proxy for the economic burden a family experiences because of medical need (notably, variability of this measure is not limited by technical considerations).
- Under the first index, poverty is not assigned on this basis of a risk-based, or uncertain, outcome. The conceptual treatment of medical risk is left to the second index.

Although this paper focuses on the conceptual and practical development of the second index, recognition of the contents and purpose of the

original and supplemental poverty measures is not inconsequential to this task. Specifically, we stress that a measure of medical care (economic) risk does not capture poverty as it is traditionally defined. In both the original and the supplemental measures, poverty is understood conceptually as a static outcome. Rather, a measure of MCER is rooted in the conceptual understanding that the relationship between poverty and health is in fact dynamic.

### WHY IS A MEASURE OF MCER NEEDED?

In the section that follows, we address the value of designing a formal measure to document the relationship between medical care risk and poverty. Four arguments are presented below.

#### Four Arguments

*Reducing Health Expenditure Risk Is an Important Component of Eliminating Poverty:* The suggestion that poverty and health are dynamically related alludes to the old question: Does poor health cause poverty, or does poverty cause poor health? Irrespective of the assignment of cause and effect in this relationship, research in the field of poverty suggests that breaking this cycle is crucial to moving individuals and communities out of poverty. In practice, the consideration of medical care out-of-pocket expenditures under the SPM reflects the measurement of medical care economic burden and its point-in-time impact on poverty. We suggest that an important aspect of poverty policy is not only to minimize the number of individuals in poverty, but also to minimize the risk of transitioning into poverty. The SPM is a static measure that cannot capture this effect. In contrast, a measure of MCER can assess the effectiveness of policies designed to meet this objective.

*Prospective Assessment of Health Need Results in Misclassification of Poverty Status:* There is an important difference between medical care need and most other basic needs considered under the poverty measure. In most cases, the core consumption needs of similarly structured families do not exhibit substantial variability. When this is the case, it is reasonable to estimate the amount of resources a family might require to maintain a basic standard of living. In the case of medical care, a high degree of variability in actual need over the course of a year and across years occurs. Thus, although one might be able to assign an estimate of expected expenditure to members of a given group (e.g., risk class), this value can be a very poor representation of the actual experience of any one individual in the group.

As previous researchers have noted (e.g., Moon, 1993; National Research Council, 1995), this can lead to misclassification if the poverty measure relies on this estimate as a valid (prospective or retrospective) indicator of health need. A particular example is the use of poverty guidelines to determine eligibility for means-tested programs. If program eligibility is assessed annually or even monthly and one applies a prospective estimate of medical need, then real variability in need (relative to the predicted value assigned at the beginning of the assessment period) will result in misclassification.

Importantly, in the case of medical expenditures, the difference between expected and observed need can be quite large if an individual does not have insurance. In the case of prospective assessment, a measure of medical care economic risk can help to identify those who might end up in poverty due to medical expenses. Recognition of this risk might be a relevant determinant in how to structure and apply programmatic interventions under poverty policy.

***Reduction of Health Care Need Is a Public Objective and the Design of Public Policy in the United States:*** The presence and scope of U.S. public insurance programs, as well as the tax treatment of employer-sponsored health benefits, demonstrate an existing public interest in supporting the well-being of those who experience medical need. Subsidies directed at eliminating health care need might take the form of a prospective arrangement (e.g., premium subsidies) or they might take the form of direct payment for services. Although safety net mechanisms serve a crucial role in the U.S. health system, the dominant U.S. policy model is to promote prospective arrangements.

If U.S. policy views subsidized risk protection (e.g., insurance) as a “first best” solution to tackling the health and financial consequences of medical need, then absence of a formal method to quantify MCER and to assess the effectiveness of subsidies directed toward reducing this risk is problematic. In the absence of such a measure, it is difficult to objectively evaluate the effectiveness of current policies or to evaluate the need for and potential impact of policy change.

***Public Insurance Programs and Subsidies Toward Purchasing Coverage Have an Economic Cost and an Economic Benefit:*** We consider two sources of value arising from health insurance.<sup>7</sup> First, we note the traditional argument that a risk-averse individual purchases insurance because

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<sup>7</sup>Insurance may have an additional value that we do not explicitly consider here: insurance coverage may increase consumption of preventive services that may decrease the risk of high medical expenditures. An example would be early detection of certain cancers or treatable heart conditions.



of the utility gain resulting from movement out of uncertainty and into a state of certainty (or reduced uncertainty) with respect to wealth. Second, we highlight the work of Nyman (2004), who argues that, in part, the value of health insurance arises from its transfer of “income” from the healthy to the ill.

Moral hazard occurs if the benefits of insurance enable a sick individual to consume more services than he or she would have consumed in the absence of insurance. However, Nyman suggests that, in some instances, it is possible for this moral hazard to be efficient. It is welfare-increasing if, with a direct transfer of money to cover the cost of the service (instead of service coverage), the individual (whose resource set is expanded by the transfer) is now willing to pay more for this service than the dollars transferred to cover the actual cost. Given this argument, Nyman suggests that the provision of premium subsidies may increase social welfare, particularly if society is altruistic (and benefits when individuals in medical need receive access to services).

Applying these concepts to our context, let us take the case of two individuals, each living at 101 percent of the family poverty level, both of whom incurred no medical care expenditures over the past year. At the start of the previous year, before the outcome of no health expenditures is realized, one of these individuals is handed insurance coverage for which the premium is fully subsidized. All other things equal, were these two individuals equally well off over the past year? We suggest that the answer to this question is no.

First, if both individuals were risk-averse, then the individual holding the insurance policy experienced a gain in utility from the reduction of uncertainty. Second, in the event of illness, this insurance policy essentially extends the (medical care specific) resources available to the covered individual. Thus, the individual holding the insurance policy has not only gained protection against the risk of losing present wealth but also gained protection against the risk of incurring an expense (or forgoing a needed service) that he or she cannot reasonably afford or repay in the first place.

Finally, we note that, in the case of Medicare and Medicaid (and even employer-sponsored insurance), public dollars subsidize the cost of coverage. In the case that an individual with subsidized coverage becomes ill, these dollars have partially financed the pool that extends the availability of resources (perhaps beyond his or her current wealth) to cover medical care expenses. We suggest that it is relevant to consider the cost of these public subsidies, as well as the value of this insurance holding when evaluating poverty (and health) policy.

The 1995 NRC study panel considered multiple approaches to incorporating medical care need into the measurement of poverty (see, e.g., Moon, 1993; National Research Council, 1995). Although the panel considered

the merits of designing a single measure of poverty that could reflect the importance of medical care needs, it ultimately advocated a two-index approach to achieving this objective. We argue that this split approach is superior to a combined approach; it allows the capture of both the medical care burden and medical care risk perspectives in poverty measurement. In making this argument, we note the loss of simplicity offered by a single measure and recognize that, for policy purposes, the need for simplicity may dominate the wish for greater accuracy. Even in this view, we still favor the calculation of a separate medical care economic risk index to capture current and changing medical risk as a separate and important indicator of well-being and deprivation.

### **The Importance of Moving Forward in the Design of an MCER Index**

Throughout this paper, we argue that current methodologies fall short of sufficiently recognizing the relationship between medical need and poverty. Although the SPM makes important strides in this direction, capturing the full dynamic of this relationship requires a measure of MCER. Although MCER is distinct from a measure of realized economic burden, it is an important (and we believe necessary) complement to the information captured in the SPM. The renewed focus on this topic coincides with a number of important public policy actions that demonstrate the relevance of the issues addressed in the current study panel's workshop.

Specifically, the use of measures of affordability and medical risk under the Affordable Care Act (ACA) demonstrates the relevance of these concepts in popular policy dialogue, calling attention to the need for standardized conceptualization and measurement of these constructs. The impending release of the SPM similarly demonstrates policy interest in expanding the robustness of poverty assessment.

Entitlement reform, beyond that instituted in the ACA, is increasingly a focal point of policy debate. The potential for substantive reform of the Medicare and Medicaid programs introduces new uncertainties regarding access to and the extensiveness of medical risk protection in the United States. Growth in national medical spending and changing trends in underlying population morbidity will inevitably require difficult policy choices. As it moves forward, the United States is in great need of open and informed dialogue concerning the value of medical spending and the public role in medical risk protection. The creation of a standardized MCER measure can provide the general population and policy makers with a baseline from which to understand and engage in difficult policy choices.

Although the most basic application of the suggested risk index includes descriptive reporting of population burden and distribution of

MCER, valuable extensions of this application are possible. Examples of feasible applications include (1) assessing and monitoring the effectiveness of public programs at achieving medical risk protection and (2) directing policies to reduce and prevent poverty and its health consequences. A well-formed measure should reflect the importance of coverage access, coverage take-up, and coverage structure in mitigating the economic effects of medical circumstances.

In the sections that follow, we identify considerations that are central in the development of this measure, review previous measurement suggestions, and outline a basic framework for moving forward. There is no very simple way to capture medical risk: insurance coverage differs, new treatments and hence expenditures continuously change, there is both under- and overusage, and there is a trade-off between detail and accuracy and feasibility of approach.

### CRITERIA FOR DEVELOPMENT OF AN MCER INDEX

This section identifies a number of primary design factors that must be addressed during the development of the MCER index. In addressing each of these issues, we suggest criteria that developers might introduce as they contemplate the appropriate structure of the index. We begin with a review of relevant design criteria outlined in the 1995 NRC panel report, followed by an overview of Doyle's (1997) criteria for index development. In the final section, we expand on some of these previous discussions, highlighting additional design components that require substantive panel focus.

#### Design Recommendations from the 1995 NRC Panel

Criteria specified in the 1995 NRC panel report include that the index reflect prospective assessment of medical risk and that the index produce a family-level measure of MCER.<sup>8</sup> Given that risk is a notion typically quantified and applied in an *ex ante* or prospective context, we suggest that the MCER index be designed as a risk-based assessment of the potential economic impact of medical need.

To clarify this assertion, we address the concept of risk as it relates to health. Dror and Vaté (2002:125) define health risk as "any situation in which the health status of an individual—or group of individuals—is exposed to possible deterioration." Notably, this delineates a circumstance in which the eventual outcome experienced by an individual or group is not known with certainty. We interpret the call for a risk-based index to imply that MCER development should focus on the possible health-related

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<sup>8</sup>See Doyle (1997:Section A) for an overview of the panel's treatment of these issues.

expenditures (outcomes) that a family might experience, rather than an emphasis on evaluating known expenditures.

Applying an actuarial framework to this context, it is appropriate to think of an individual's (family's) potential annual claim amount (e.g., total "loss") as a random variable, tied only to a limited set of members' characteristics. As such, the quantification of medical expenditure risk might entail fitting probability distributions at the cell level to the empirical distribution of losses observed in the base data source.<sup>9</sup> Risk assessment would occur at the cell level, at which all cell members are assigned the same probability distribution as a representation of potential (and uncertain) future outcomes.<sup>10</sup> Operationally, this assessment might occur prospectively (before the outcome is known) or retrospectively (e.g., what might have occurred, despite the known outcome).

We suggest a family-level unit of analysis, in which the definition of family unit conforms to the definition applied under the official poverty measure or the definition introduced under the SPM.<sup>11</sup> The Interagency Technical Working Group on Developing a Supplemental Poverty Measure recommended that the family unit include "all related individuals who live at the same address, any co-resident unrelated children who are cared for by the family (such as foster children), and any cohabiters and their children" (U.S. Census Bureau, 2010:4). In its current form, the official poverty measure also adopts a family unit of analysis; however, the definition of family is restricted to birth-, marriage-, or adoption-based relationships with a reference person (Provencher, 2011).

Selection of a family unit of analysis is not without precedent. For example, Banthin and Bernard (2006) design a family unit measure for underinsurance; similarly poverty measures examined by Doyle, Beauregard, and Lamas (1993) and Handel (2010) in his cost model are specified at the family level. We highlight two criteria we see as important for the selection of analytic unit: (1) ease of comparability with the official or supplemental poverty measure and (2) alignment with medical insurance and service-purchasing decisions. We believe either of these measures is reasonably sufficient in meeting these criteria. A detailed review and comparative assessment of these and alternative unit definitions is found in Provencher (2011).

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<sup>9</sup>As defined by Klugman, Panjer, and Willmot (2008:9): "An actuarial model is an attempt to represent an uncertain stream of future payments"; the reader is directed to Chapter 2 for further clarification on the application of probability models in actuarial exercises.

<sup>10</sup>This approach is adopted in Handel (2010).

<sup>11</sup>We address aggregation of the risk measure from the individual level to the family unit in a later section.

### Criteria from Doyle (1997)

A brief overview of each Doyle criterion appears below. Many of these topics are addressed in greater depth under Additional Recommendations:

**The Index Must Reflect Risk:** The index should capture the risk of incident health events as well as current health status in measurement.

**The Index Must Reflect Resource and Medical Need:** The index should include sufficient treatment and measurement of insurance adequacy, access to subsidized care, and affordability. Specifically, this criterion requires the specification of some “benefit standard against which a person’s insurance plan could be compared to determine its adequacy.” As well, Doyle suggests that determination of insurance adequacy reflect individual need characteristics. In the absence of adequate insurance, access to subsidized care should “be viewed as a substitute for insurance.” Finally, consideration of affordability requires some decision on the “acceptable level of risk” in which “being above it classifies someone as inadequately insured.” Three guidelines are given for defining this level: the level of acceptable risk should be income sensitive, it should also reflect “the amount of nonmonetary resources at the disposal of the individual,” and it should reflect “necessary nonmedical or uncovered costs incurred” (such as travel or relocation expenses necessary to access needed care, etc.).

**The Index Must Be Quantifiable:** The final index must include some method of quantifying the risk threshold, the prospective value of an insurance plan, the cost of an insurance offer, and the value of the plan benefits.

**The Index Requires a Well-Defined Accounting Period:** A prospective or retrospective assessment period, including its length, should be clearly defined.

**The Index Is Defined by Available Data:** The index should be based on available data sources or “modest extensions of current data collections.” The data source should include “determinants of medical utilization and expenditures,” information on income and assets, and sufficient information to infer access to subsidized coverage or care. As well, data should be “timely, comprehensive, routinely available and accessible.” In the selection of the data source, it also relevant to consider how the medical care risk index might be coordinated with economic poverty measures.

### Additional Recommendations

In this section, we evaluate in greater depth a number of core design elements, including the measurement of medical risk, valuation of medical resources, and the definition of affordability.

## Measuring Medical Expenditure Risk

We divide the measurement of medical care risk into three phases: selecting a set of explanatory health risk factors, defining appropriate medical coverage, and modeling the relationship between risk characteristics and expenditure outcomes.

*Classifying Health Risk.* An important early step in index development should include the introduction of a standard method of classifying individual health risk, based on the presence (or absence) of risk factors.<sup>12</sup> The World Health Organization's description of this term clarifies its conceptualization in our own context (World Health Organization, 2011): "A risk factor is any attribute, characteristic or exposure of an individual that increases the likelihood of developing a disease or injury." Although it is possible to conceptualize economic risk and utilization decision making at the family level, health itself is traditionally an attribute of the individual. Similarly, one might expect the measurement of health risk to be most informative at the individual level. Accordingly, we suggest that developers begin by specifying a measure of individual medical expenditure risk that is ultimately aggregated to form a family-level measure of expenditure risk. In addition, we suggest that index developers either rely on an existing risk adjustment model to form an appropriate system of risk classification or develop a simplified risk model that is informed by the current state of knowledge in this field.

Over recent decades, research in the area of predictive modeling and risk adjustment has contributed substantially to the measurement of individual-level (prospective and retrospective) risk. Numerous risk adjustment packages designed at research institutions or through private entities are currently marketed or available for public use. A comparative analysis of the predictive accuracy of these packages is found in Winkelman and Mehmud (2007). Each of these models introduces a unique approach to classifying health risk, which typically entails identifying a base set of clinically meaningful risk variables (adjusters) or defining a set of mutually exclusive actuarial cells.

Procedurally, under an individual-level approach to adjustment, weights developed in an underlying risk model are combined with risk factor information to form an individual measure of expenditure risk.<sup>13</sup> Each cell or

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<sup>12</sup>Throughout this paper, we use the term "risk characteristic" interchangeably with the term "risk factor."

<sup>13</sup>Typically weights are developed using an external base sample to specify an appropriate risk model; however, users of software products are often given the option to calibrate these weights to their specific population or sample. For further discussion of model calibration, see Winkelman and Mehmud (2007). For further discussion of model development, see Kronick et

combination of adjusters should capture individuals with similar expected cost experience, whereby one adjustment category might reflect a range of ages, a grouping of diagnosis codes, or a particular diagnosis combination. All models evaluated in Winkelman and Mehmud (2007), for example, rely on a minimum of demographic and diagnosis code information to form adjusters or actuarial cells.<sup>14</sup>

The adjustment literature also evaluates the predictive strength of numerous other risk factors, including survey collected variables, such as perceived health (simple single measure, SF36, etc.), functional health status (activities of daily living, ADLs, instrumental activities of daily living, IADLs), self-reporting of chronic conditions, lifestyle, employment, education, driving ability, marriage circumstance, geographic and others; van de Ven and Ellis (2000) review the early development of this branch of literature. In recent literature, Ellis and McGuire (2007) examine the predictiveness of prior year charges, diagnosis cost group (DCG)/hierarchical condition categories (HCC) diagnoses, and “covered charges” by DCG/HCC, place of service, physician specialty, and type of services.

It is important to distinguish between two modeling objectives in this field. Much of the adjustment literature focuses on modeling individual risk, whereby models are designed exclusively to compute risk-related premium subsidies in a regulated market context.<sup>15</sup> Many models developed in light of this purpose exclude valuable predictive information from the explanatory side of a model if it is too difficult to collect or if linking subsidies to these factors reduces efficiency incentives in the marketplace. In the adjustment context, these considerations, such as appropriateness of incentives and feasibility, are central considerations in model selection (van de Ven and Ellis, 2000:780).<sup>16</sup> In contrast, some developers of modeling software offer a second type of model designed to identify high-risk cases that might benefit from care management. Models designed for this purpose are not limited by the same constraints introduced in the former circumstance;

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al. (2000) and Pope et al. (2004), which detail the development of the Chronic Disability and Illness Payment System and the Centers for Medicare and Medicaid Hierarchical Condition Categories model, respectively.

<sup>14</sup>Some models use additional inputs, such as pharmacy codes, procedure information, laboratory results, prior expenditures, and even information from health risk assessments—factors unlikely to be used for the medical care economic risk index tied to poverty, because the data requirements might limit the timeliness of the measure.

<sup>15</sup>van de Ven and Ellis (2000) conduct an extensive review of the early development of this field. Although the particular application of these models, namely to “set subsidies to consumers or health plans to improve efficiency and equity,” does not fit our objective, the core operational function of these models, namely to “calculate the expected health expenditures of individual consumers over a fixed interval of time,” does fit with our objective (p. 758).

<sup>16</sup>A third criterion is fairness (van de Ven and Ellis, 2000).

they may employ a broader set of predictors and achieve a greater level of predictive accuracy.

In developing the MCER index, we are most interested in the approach taken under this second type of model. Models designed to meet the first modeling objective traditionally include age, gender, diagnosis information, and enrollment information as risk variables. We suggest that the risk modeling adopted for the MCER index incorporate additional risk variables if these information types are currently available or reasonably collectable. For example, the MCER index might also incorporate information on self-reported health, ADLs, IADLs, socioeconomic information (educational attainment, race/ethnicity, income, etc.), and lifestyle (smoking, obesity, etc.). Although utilization and prior expenditure information are also available, these data are impacted by insurance status and should be excluded or introduced with great care.

The chosen classification system should reflect current best practices in prospective risk assessment, to the extent that data limitations (sample size and variable collection) and other feasibility considerations (e.g., cost, complexity, timeliness) permit the achievement of this objective. Limits in the types of data available may necessitate the exclusion of important predictor variables from a final model of health risk. In addition, feasibility considerations might limit the number of risk factors included in the classification of health risk. Developers might find it advantageous to rely on an existing model to define a universe of risk types if a high level of refinement is desired in the classification of risk. Finally, a feasible classification of health risk should also consider the difficulty introduced by moving from an individual measure of health risk to a family-level MCER index. Considering these criteria, we outline suggested classification structures in Annex A.

***The Definition of Appropriate Medical Care Coverage.*** It is highly recommended that the risk measure adopted in the index reflect expenditure risk under a standardized basket of medical care services. The use of a standardized basic benefits package is not unprecedented in the literature. Specifically, Short and Banthin (1995) adopted benefit standards from the Federal Employee Health Benefits (FEHB) plan and the Health Security Act proposed during the Clinton administration. As noted by Kahlinosky and Kohler (2004), Wolfe suggested computing medical care need against a “minimum bundle” of “health care services needs,”<sup>17</sup> and Banthin has

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<sup>17</sup>Wolfe’s (1998:29) proposed bundle includes “those services for which a well-informed person of moderate income would be willing to pay the full cost, in order to engage in the full range of daily activities permitted by the person’s underlying health status,” in which the bundle “may vary according to certain characteristics: health status, age, whether or not the individual lives alone.”



similarly suggested adjusting poverty thresholds to incorporate a “‘benchmark insurance plan’ that offers a minimum level of coverage” (Banthin in Kahlinsky and Kohler, 2005).

Although utilization beyond this basket would be likely to generate beneficial health effects, it is suggested that this approach highlight a minimum service set that all individuals should be able to access. In principle, this package should reflect some societal agreement on, and willingness to contribute toward, reasonable population-level access to a basic benefit or service set. An ideal package includes effective preventive services, enables reasonable management of ongoing health conditions, and ensures access to appropriate care for incident health events. The process of defining this minimum benefits set requires input from a broad spectrum of contributors. Such a process should include substantive contribution from knowledgeable experts, but it must also incorporate adequate consideration of public preference. Standards to be set under the ACA would be most appropriate to serve as this basket.

Barring release of the ACA benefits standards in the near future, we recommend that index developers rely on similar state-level initiatives to guide/inform the process of developing this benefits set. For example, Massachusetts’s health reform legislation formally institutes population-level participation in coverage purchasing. In effect, this reform law sets a minimum level of insurance benefits that population members are obligated to purchase. Currently, this policy model most directly addresses the normative challenge of defining a population-wide minimum benefit standard. As such, we recommend that developers learn from the Massachusetts process and product, in both its strengths and weakness, when addressing this challenging task.<sup>18</sup>

Finally, we note that operational application of the minimum benefits criterion while designing the index introduces two substantive data limitations: (1) individuals with generous insurance benefits or limited economic constraints might report utilization that exceeds the standardized service basket and (2) individuals with no insurance benefits, limited benefits, or economic constraints might report underutilization of appropriate services. We emphasize that a well-designed index includes sufficient adjustment for both of these factors.

***Quantitative Methods and Risk Measures.*** In the previous section, we suggested individual-level classification of health risk. Similarly, we recommended an individual unit of analysis for the purpose of modeling the relationship between expenditures and health risk. We address the process

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<sup>18</sup>See Annex B for a listing of the Massachusetts 2010 and 2011 Minimum Creditable Coverage Standards.

of aggregating from individual measures to the family unit following our review of alternative approaches to modeling expenditures.

Prior to development of an expenditure model, developers must identify an appropriate measure of risk. The depth of this challenge is easy to overlook; however, if we begin to examine its implications in the design of the index, it becomes an exceptionally challenging task. In the first place, we draw from Klugman, Panjer, and Willmot to clarify the terminology “risk measure”: “A risk measure is a mapping from the random variable representing the loss associated with the risks to the real line (the set of all real numbers). A risk measure gives a single number that is intended to quantify the risk exposure” (Klugman, Panjer, and Willmot, 2008:42).

A primary challenge in developing an index is determining how to move from a range of plausible outcomes to a singular measure of economic impact. Thinking back to the earlier discussion of health risk, losses, and loss distributions, it should become clear that this implies that developers must specify a single measure that captures the most important information from a family’s distribution of potential losses. It may be the case that this measure focuses exclusively on the probability of tail losses, or otherwise that the measure is based on some “meaningful” moment of the loss distribution.

Although developers might define other measures, we identify two (very different) potential summary measures of expenditure risk: (1) the probability of family expenditures exceeding a given expenditure threshold (exceeding a prospective minimum income threshold) or (2) a measure of expected expenditures per family unit (expected minimum income threshold). In either case, developers must identify appropriate methods, either actuarial (e.g., fitting loss distributions to a set of mutually exclusive risk cells) or econometric (e.g., specifying a regression-based adjustment model) to model the relationship between risk characteristics and expenditures.

Although both of these modeling approaches might be adapted to quantify these risk measures, developers may determine that a particular approach is best suited for the estimation of a particular risk measure. In the section that follows, we review a number of factors that developers might consider in the selection of an econometric or actuarial approach to risk assessment.

Finally, we note that it is possible to think of expenditure risk as the actuarially fair cost (plus some adjustment for risk load) of purchasing a fixed or specified benefit plan, whereby this benefit plan is comprehensive in terms of coverage of needed medical care. We do not believe it conceptually appropriate to think of expenditure risk as the market cost of purchasing insurance. This is because, in practice, we do not observe a market in which everyone is insurable, insurance companies offer (only) this fixed benefit

plan, and premiums are not subsidized or politically modified, but reflect the risk-rated premium cost of purchasing this coverage plan.

*Probability of Expenditures Exceeding a Given Threshold as a Measure of Risk.* One representation of medical care economic risk might entail estimating the family-level probability of incurring unaffordable medical care expenses. Notably, all families will experience some risk of tail (e.g., catastrophic) events. What will vary across the population is whether a family has an out-of-pocket maximum as a component of any insurance holding and also whether noncatastrophic medical expenditures are unaffordable. Thus, after accounting for the impact of insurance characteristics on economic risk, a measure reporting the risk of exceeding an “unaffordable” threshold would capture (1) whether a family’s stop-loss provision (if present) effectively kicks in before a family faces unaffordability and (2) how much a family is at risk of experiencing an unaffordable “loss” if, for example, there is no stop-loss, or the stop-loss provision kicks in after a family reaches unaffordability.

Risk assessment might rely on econometric methods or the fitting of loss distributions. In the case of an econometric methodology, the general approach might entail defining a family’s affordability threshold, determining the level of (unadjusted) expenditures that cause a family to meet this threshold upon insurance adjustment (premium costs and coverage benefit), and estimating the likelihood that a family’s annual expenditures exceeds this unadjusted expenditure value.

However, reflecting on our previous recommendations, we have advocated for individual-level risk classification and risk assessment. Thus, under this approach, developers would need to classify risk at the family level or develop a method of moving from an individual-level risk measure to a family-level model. In addition, we emphasize that any method developed using this approach should include careful consideration of model specification given the heavy-tailed nature of expenditure data (see, e.g., Mullahy, 2009).

Under the second methodological approach, loss distributions would be fit to each actuarial cell defined under the health risk classification scheme. Following this approach each individual could be assigned a probability distribution of annual expenditure loss based on cell membership. Finally, as demonstrated by Handel (2010), after adjusting for coverage characteristics, individual loss distributions could be aggregated to produce a family-level probability distribution of out-of-pocket expenses. A final estimate of family probability of exceeding an affordability threshold would combine information on premium costs, insurance coverage, and individual loss distributions.

In comparing these methods, we note that a loss distribution approach may limit the level of refinement that can be introduced in the classification of health risk. In contrast, a regression-based approach might allow developers to introduce greater complexity (accuracy) into the system of risk classification. Particular strengths of a loss distribution approach include the relative ease with which one could move from an individual-level to family-level measure of health risk and the relative clarity of the method and final measure.

*Expected Expenditures as a Measure of Risk.* Mullahy (2009) provides a substantive review of the econometric considerations implicit in the development of a well-formed adjustment model (e.g., the econometric approach). Adopting the notation of Mullahy (S105-S106), we summarize the most relevant points here. In this application of health econometrics, modeling is employed to produce estimates of the conditional mean,  $E[y|\mathbf{x}] = g(b_0 + b_1x_1 + b_2x_2 + \dots + b_kx_k)$  where  $y$  is (annual) health expenditures and  $\mathbf{x}$  represents a vector of risk characteristics. In the most basic circumstance,  $E[y|\mathbf{x}]$  is modeled using a linear specification, and the process of combining model parameter estimates with risk factor information to produce individual-level estimates of expected expenditures is straightforward.

Although this approach is observed most often in the adjustment literature, given the use of large samples in model development and a preference for ease of model interpretation in applied contexts, alternate econometric specifications might be warranted. Specifically, the heavy tailed nature of health expenditure data and the large number of zero observations are important considerations in model development. We do not review the topic of appropriate specification in great detail, but we note that considered alternative specifications (again, summarizing Mullahy) include the exponential conditional mean, e.g.,  $E[y|\mathbf{x}] = \exp(\mathbf{b}'\mathbf{x})$ , or two-part model, e.g.,  $E[y|\mathbf{x}] = \Pr \text{ ob } (y>0|\mathbf{x}) \times E[y|y>0, \mathbf{x}]$  specifications. The reader is directed to Mullahy (2009) for a review of supporting literature and the appropriate application of these models. Beyond econometric specification, Mullahy highlights a number of additional factors that we suggest MCER developers consider. These include appropriate transformation/retransformation methods (if necessary), approaches to testing model fit, the impact of heavy tailed data, and covariate specification (specifically, interaction/endogeneity considerations).<sup>19</sup>

As an alternative, developers may choose to directly model loss distributions at the cell level. Under this approach, sample members would be assigned to one actuarial cell from a set of mutually exclusive risk cells. An individual's measure of expected expenditures would be based on probabil-

<sup>19</sup>Again, we direct the reader to Mullahy (2009) for a review of this literature.

ity distributions fit to annual losses at the cell level. There are limitations to each of these methods. A sizeable proportion of the variation in health expenditures will remain unexplained in an econometric model. Under the loss distribution approach, feasibility constraints and data limitations might leave developers with a less than ideal level of refinement in risk categorization. Specifically, the need to ensure sufficient observations per risk cell and to limit the workload necessary to implement the index might limit the number of risk cells incorporated into this type of model.

Finally, we note that singular reporting of expected expenditures as a measure of risk does not effectively emphasize the range of potential outcomes that families face. The selected risk measure should recognize the distributional features of health expenditure outcomes, including the unlikely but real occurrence of catastrophic (tail) events. Accordingly, we suggest that developers adopt a risk measure that reflects a family's probability of experiencing unaffordable outcomes. If developers select expected expenditures as a measure of risk, this measure should be accompanied by consideration of standard deviations or other distributional moments as relevant indicators of risk.

**Examples: Operational Approaches to Health Classification and Risk Modeling.** We briefly identify alternative approaches that developers may consider:

1. Rely exclusively on available adjustment software to produce individual-level estimates of expected expenditures. Notably, panels 1-9 of the Medical Expenditure Panel Survey (MEPS) include relative risk scores developed using DCG models; relative risk scores can be used to compute these individual-level estimates.<sup>20</sup>
2. Develop a unique risk model using the MEPS data files; assign individuals a measure of expected expenditures based on the parameters from this model. Developers may wish to specify a risk model that requires a limited amount of individual information

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<sup>20</sup>The MEPS HC-092 documentation file from the Agency for Healthcare Research and Quality (2008) is a useful resource for understanding the development and applications of these scores. We outline some of the most relevant points here. A relative risk score is defined as "a summary of disease burden and expected annual health care resource use at the individual level," which "can be converted into a dollar predication by multiplying by an appropriate sample mean" (C-2). Relative risk scores are based on large sample DCG regression models, which include demographics (age and sex), DxCG's hierarchical condition categories, and appropriate interaction terms. HCCs represent a unique classification of ICD-9-CM diagnoses: "Each code is classified into one of 184 condition categories, and hierarchies are further imposed to make predictions more robust to variations in how disease codes are captured, to reward specific coding, and to increase model stability" (C-1-C-2).

that might be collectable in other contexts; this approach might be designed specifically to meet this objective.

3. Compute individual-level risk scores using an available software package. Following the approach of Handel (2010), create a set of mutually exclusive risk cells based on cutpoints in the risk score distribution and fit loss distributions to expenditures observed in each cell.
4. Use independent predictors or actuarial cells identified in an available software model to form a set of mutually exclusive risk cells; fit loss distributions to each of these cells.
5. In the case that developers wish to develop a loss distribution approach that requires a small set of (easily collectable) information, identify a set of actuarial cells based on this information set. Fit loss distributions as in alternatives three and four.

### Medical Resource Valuation and Defining Affordability

Thus far, we have dealt predominately with challenges introduced by the medical care needs component of the MCER index. Index developers are faced with similarly complex considerations when working with the resources component of the index. We begin with the treatment of insurance benefits in the index and subsequently examine the role of family characteristics and monetary resources in index development.

**Risk Protection.** In part, the MCER index should measure whether a family's insurance offers sufficient protection against medical expenditure risk. To meet this objective, we suggest that the index methodology first produce a measure of family-level risk protection and then assess separately whether this level is sufficient given family characteristics. Families of different size or economic circumstances might require different levels of risk protection to meet this sufficiency requirement. Separation of these steps can improve the transparency of the underlying methodology and might aid in the identification of feasible interventions and policy targets.

To assess a family's level of risk protection (e.g., postcoverage expenses), information on insurance characteristics could be applied to member loss distributions/expected expenditures prior to family-level aggregation. If a family does not have any insurance, there is no change in the original measure of risk/loss distribution, and this step is not relevant for them. At a minimum, this step should incorporate information on deductibles and stop-loss. In addition, it is preferable to incorporate information on coinsurance and copayments.

A simplified measure might apply information on a plan's actuarial value, family-level deductible and stop-loss to compute postcoverage ex-

penses. Copayment and coinsurance information specific to emergency department services, hospitalizations, primary care, prescription fills, and other services might be too complex for this index and are included to a reasonable degree through the actuarial value. For example, the detailed level of information might require service-specific modeling of expenditure risk. If this level of complexity is desirable, the cost model from Handel (2010) provides an operational example of an approach employing more extensive treatment of insurance characteristics.

*The Definition of Affordability.* The definition of acceptable level(s) of unprotected expenditure risk is not directly addressed in this technical document. This is a complex and value-laden task that is best left to a broader contributing body. Consideration of the affordability thresholds outlined in the ACA might inform this discussion. Relevant to this as well is the question of how to treat assets—by this we mean financial assets, including vested pensions, individual retirement accounts, etc. One approach, the one we suggest tied to the issue of affordability, is to take an annuitized value whereby a family receives the value of an annual flow of income from their financial assets based on the life expectancy of adults in the family using existing life tables. Alternative approaches might use some specific percentage of assets. Evidence suggests that a majority of individuals with very high expenditures in any one year are likely to face high expenditures in subsequent years. Hence we do not recommend using (or counting) a majority of assets in any one year. This annuitized value would be added to income and compared with unprotected expenditure risk. We note, as well, that postinsurance risk can be represented as a measure of expected expenditures or a distribution of potential expenditures. Developers will need to decide which scenario most adequately reflects the purpose of this index. In the case of the former approach, it is necessary to consider whether any risk of very large expenditures is “affordable.”

#### PREVIOUS CONTRIBUTIONS TO THE MEASUREMENT OF MEDICAL CARE RISK AND NEED

In the section that follows, we briefly summarize a selection of measurement strategies that relate to the development of an MCER index. Although no single strategy reflects our ideal version of the index, each of the highlighted measures introduces some component method that we incorporate into our suggested framework. For each strategy, we highlight the primary measurement steps, review shortcomings of the strategy with respect to MCER development, and underscore the particular method that we incorporate under the final framework.

### Doyle, Beauregard, and Lamas (1993)

Doyle, Beauregard, and Lamas evaluate six different poverty measures based on the methods outlined by Moon (1993) and additional recommendations from the 1995 NRC study panel.<sup>21</sup> Given our focus on designing a separate index of MCER, we focus exclusively on the Two-Tiered Health Benefits Paid option, which is outlined below:

- A family is classified as poor if income falls below 96.4 percent of their respective threshold (e.g., the threshold less average out-of-pocket expenditures in 1987) after factoring in taxes and medical out-of-pocket expenditures.
- A family is classified as poor if the value of covered services received by the family falls below the level of coverage offered under a standardized benefit plan.

A primary critique of this measure is its reliance on observed utilization and expenditures. Although this measure does capture the burden of medical care expenditures experienced by a family, it does not reflect need in the event that a family underutilizes services, nor does it reflect the economic risk resulting from events that might have occurred. A lasting contribution of this method is its effective adaptation of the standardized benefits suggestion into an operational measurement strategy; our framework relies on the specification of a standardized benefits package to define appropriate medical coverage.

### Short and Banthin (1995)

The original work of Short and Banthin is designed to estimate the amount of underinsurance among privately insured population members under age 65. Their initial work identifies three measures of underinsurance: a first measure examines the actuarial value of current insurance coverage relative to values assigned to the Health Security Act (HSA, proposed during the Clinton Administration) and the Blue Cross and Blue Shield federal employee benefit offering (an alternative to the HSA proposed in 1994). Individuals are underinsured if their current coverage is not assessed as having equal or greater actuarial value, where actuarial value is a measure of “average claims paid per policy holder” (1303). In addition, they examine whether individual plans include a standardized set of cover-

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<sup>21</sup>The specific measures evaluated include (1) the official Poverty Measure, (2) Post-tax Measure, (3) Post-tax Post-OOP Measure, (4) Two-tiered Uninsurance Measure, (5) Single-tiered Health Benefits Paid Option, and (6) Two-Tiered Health Benefits Paid Option (see pp. 10-11 for measure descriptions).



age characteristics based on the HSA and FEHB plan offerings, forming a second definition of underinsurance.

The third measure examines the number of individuals who are underinsured in the specific circumstance that they experience a catastrophic event. Their measure, which draws extensively from the previous work of Farley (1985), includes the following components:

- Benefit standards are based on an individual's risk level and family income.
- Individuals are categorized as high or low risks based on an estimate of their expected expenditures; those with expected expenditures in the upper 25th percentile are considered high risks, the remaining individuals are considered low risks.
- Expected expenditures are computed from a linear regression model with age, race/ethnicity, sex, income, perceived health status, disability days, and limitation of usual activity as independent predictors.
- For each individual, the authors measure the level of financial protection provided by an individual's insurance coverage. The "simulated" catastrophic event is defined as "the average for people in the 99th percentile of actual expenses in 1987" per one's respective risk group.
- Finally, individuals who accrue expenditures above 10 percent of family income after accounting for coverage characteristics are considered underinsured.

The major contribution of the (third) Short and Banthin method is its focus on economic circumstance in the case of a catastrophic event. The objective of this approach is entirely different from a strategy designed to identify whether an expected expenditure outcome would cause economic hardship. As highlighted in this third measure, we feel strongly that the MCER must recognize the potential for catastrophic outcomes. This measure achieves this objective in part, but it is not a robust measure of all types of catastrophic or simply economically challenging scenarios (see, e.g., Banthin, 2011). A final strategy should introduce a greater degree of sensitivity in its identification of economic hardship. Finally, we note that a measure similar to the actuarial value measure from the first Short and Banthin method is adopted under our final framework.<sup>22</sup> This construct allows us to apply a summary measure of an insurance plan's coverage

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<sup>22</sup>Banthin and Bernard (2006) note that the benefits information utilized in the Short and Banthin method is not available beyond the 1996 MEPS panel. Thus, our suggested method calls for extended data collection.

benefit when adjusting a family's loss distribution for the effect of insurance coverage.

### Doyle (1997)

Doyle recommends adoption of the Short and Banthin method, with the following modifications:

- Incorporate income definitions applied under the traditional or proposed poverty measure revision.
- The measure should be designed for application across the population, with the exception of individuals residing in institutions.<sup>23</sup>
- Consider public insurance, public coverage combinations, and public-private coverage combinations.
- Include an affordability standard "consistent with ability to pay" and consider the impact of other forms of care or coverage subsidies.

The framework outlined in this document is designed to adhere with the second and third recommendations we outline here. We are less specific on the definition of income and affordability. In addition, we do not suggest a method to estimate family access to charity care or similar forms of subsidized coverage.

### Banthin and Bernard (2006)

Banthin and Bernard modify the Short and Banthin method to match the reduced collection of coverage characteristics after the 1996 MEPS panel. The unit of analysis is the family level, and estimates focus on identification of families with actual expenditures exceeding 10 and 20 percent of after-tax family income.<sup>24</sup> This measure falls short of the MCER objectives, because it does not reflect a family's risk of experiencing high-value (catastrophic) expenditures. In addition, Banthin and Bernard estimate the prevalence of financial burden by population subgroups, defined according to insurance type, poverty status, health status, health conditions, and various demographic factors. We rely on many of these same characteristics to form actuarial cells or adjustment factors under the MCER framework.

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<sup>23</sup>The original Short and Banthin method examines underinsurance among those who hold private insurance and are under age 65.

<sup>24</sup>Banthin and Bernard compute two measures of health expenditures: (1) premiums plus out-of-pocket expenditures and (2) out-of-pocket expenditures only.

### Handel (2010:Section 5.2) Cost Model

Although the Handel paper does not focus exclusively on the development of a medical risk index, its empirical framework includes the specification of an *ex ante* cost model at the family level. The model “predicts health risk at the individual level and then aggregates these predictions to the family level” (24). The model incorporates the following steps:

- Claims are organized into four separate categories: hospital and physician claims, pharmacy claims, mental health–related claims, and physician office claims.
- The Johns Hopkins adjusted clinical group (ACG) software is used with individual demographic and prior use (claims) diagnosis information to estimate total and pharmacy specific utilization in the next year.
- Per claim category, sample members are assigned to a risk cell. Each risk cell is comprised of a collection of individuals with similar risk as determined using the ACG software.
- Using the actual claims experience of risk cell members, the model fits an expenditure distribution for each risk cell/claim type combination.
- Next, each individual is assigned a joint claims distribution based on his or her specific risk profile (e.g., risk cell membership for each claim type) and the respective estimated distributions.
- Applying coverage characteristics, this joint claims distribution can be “mapped” to a distribution of out-of-pocket expenditures; individual distributions and coverage characteristics are combined to form family-level distributions of out-of-pocket expenditures.

Although we develop an MCER framework that can be adapted under alternative measurement approaches, the suggested measure of family-level expenditure risk is a simplified version of the Handel model. We suggest a number of simplifications so that the application of this cost model is feasible using MEPS data and stylized to fit the objectives of the MCER measure.

## HOW TO MEASURE ADVERSE MEDICAL EVENT RISK AND SUBSEQUENT ECONOMIC HARDSHIP?

### General Approach

We suggest the following multistage approach to the development of the MCER measure:

- Baseline measurement of medical expenditure risk at the individual level.
- Adjustment of individual expenditure risk for the level of risk protection guaranteed by an individual's insurance benefit, followed by aggregation of individual risk measures to form a family-level measure of medical care expenditure risk.
- Measurement of family economic resources, preferably including the annuitized value of financial assets (excluding insurance benefit), followed by examination of the relative acceptability/affordability of a family's premium costs and medical expenditure risk given this economic baseline.

It is suggested that developers consider the merits of reporting the first two measurement stages alongside the release of an indexed affordability assessment. It is recommended that developers of the measure balance complexity (e.g., refinement), feasibility, and interpretability/applicability in designing the final measure. The usefulness of an index will depend on both the transparency of its construction and the extent to which selected methodologies reflect expert knowledge and public values.

### Selecting a Data Source

A number of options are available to developers as they determine the best source of data for constructing the MCER index. Data set options include

- the MEPS,
- the Survey of Income and Program Participation (SIPP),
- the Annual Social and Economic Supplement of the Current Population Survey, and
- the American Community Survey (ACS).

The paper prepared for the workshop by John Czajka reviews the relative strengths and weaknesses of each data source. Although we do not review these data sources, we do highlight a number of key points that developers may wish to consider when selecting the data source. The relative availability of key variables should be a primary consideration in data set selection. Three categories of variables are necessary to construct an adequate index: health characteristics and related medical risk variables, insurance coverage and coverage design characteristics, and family-level economic resource information.

Expenditure risk models should be developed using a data set that collects detailed and reliable expenditure data, such as the MEPS data. The

strength of MEPS lies in its collection of health and medical expenditure data, whereas the collection of economic resource data is one of this data set's relative weaknesses. Developers may wish to look to Bantlin and Bernard (2006), who apply an after-tax income simulation model to MEPS data when analyzing medical expenditure burden. Other factors that developers may wish to consider include lag time to data release, alignment (if desirable) with the data set used for the poverty measure or the SPM, and the ability to produce stable population estimates of MCER distribution/outcome at the state level.

The MEPS data currently do not include sufficient information on insurance characteristics to construct the MCER index as it is conceptualized in this paper. We suggest that deductible, stop-loss, and an estimated proportion of (postdeductible/pre-stop-loss) expenditures covered are necessary for the construction of an index. We are not convinced that an MCER index would be sufficiently meaningful without these measures, although perhaps there are reasonable arguments otherwise.

Although collection of this information might be burdensome, we do not believe them unreasonable. Provisions under the ACA rely on the actuarial value of a coverage offer to determine (in part) whether an employer-sponsored plan meets minimum coverage requirements and also whether an insurer's particular coverage offering meets the requirements of insurance exchange participation. We do not know the details of how this actuarial value will be defined, but we suggest that collection of coverage information for the MCER might be coordinated with the collection of the information required under the ACA.

Finally, we note that the design of the measure must also reflect its expected purpose. For example, we can envision a detailed measure that requires information from claims data and health surveys to compute a family's MCER measure. In an alternative scenario, the health component of the measure might require answers to only one or two health-related questions per family member and each individual's age and gender. If developers select the former case, the MCER index might be limited to the MEPS data in development and subsequent use. In the latter case, the introduction of the MCER index into other data sets is reasonable and the use of the index in other (nondata set) contexts would become feasible. For example, an MCER developed for use in the determination of public program eligibility might require this second approach due to its limited data burden.

### **Framework for MCER Development**

Next, we outline a generalized framework for the development of the MCER index. Core considerations in index construction are identified for each stage of MCER development.

### Stage One: Measuring Individual Medical Expenditure Risk

In the initial stage of development, it is necessary to specify a risk cell/factor-based approach to individual risk assessment. Core considerations when selecting risk characteristics include

- Developers must determine the appropriate balance between maximizing the predictive capacity of the risk model versus reducing complexity and reporting burden in the selection of risk cells/factors.
- Risk cells/factors should incorporate characteristics that are already available or otherwise reasonable to collect in the survey set selected for MCER development.
- Selection of the risk model should consider other relevant data limitations, such as that well-formed expenditure models will require sufficient observations per risk cell.
- Risk cell/factor classifications should reflect characteristics highly explanatory of health expenditure outcomes. Selections might include demographic characteristics (age/gender), chronic conditions, disability, or other health or functional status measures (see Annex A for detailed examples).

Core considerations when developing expenditure risk models include

- Expenditures should reflect only expenditures covered under the specified “minimum” benefits package.
- Expenditure models should adjust for underutilization by the uninsured/underinsured relative to medical need.
- Developers should use MEPS for expenditure model development, which could take various forms. Developers might select a cell-based loss model approach; alternatively, developers might adopt econometric methods to model risk factor expenditure effects.
- In the latter scenario, careful attention must be given to zero expenditures and tail expenditures when specifying functional form of an expenditure model.
- Developers must determine whether it is necessary to model expenditure risk separately across service types.

Finally, developers must identify an appropriate operational definition of medical expenditure risk;<sup>25</sup> some alternatives include

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<sup>25</sup>Although we separate the measurement of expenditure risk from considerations of premium costs, the definition of affordability should consider a family’s premium costs and expenditure risk. Consistent with other suggestions, the premium cost should be limited to the cost of the recommended basket of coverage. The process of combining these two measures under the index is addressed in stage three of the framework.

- **Risk Measure I:** An individual's "medical expenditure risk" is defined as the probability of exceeding a given expenditure threshold per his or her respective risk cell or given his or her particular combination of risk characteristics. This is our recommended approach. We suggest that this measure is identified by fitting a parametric probability distribution to the annual claims experience (e.g., annual losses) of risk cell members.
- **Risk Measure II:** Expected expenditures (based either on estimated risk factor effects or a risk-cell measure of expected expenditures) and one standard deviation above and below this value.

Importantly, we recognize that this section incorporates a number of suggestions that require methodological solutions that remain unanswered here. Among the insured, expenditure models will most certainly reflect some degree of unnecessary utilization. This is partially resolved by suggesting that expenditure models exclude all expenditures from services that are not included under the standard benefits package. Nonetheless, even with these parameters, the models will still capture some overutilization of the benefits available in this standard package.

In contrast, the claims experience of the uninsured or underinsured will most certainly reflect underutilization of necessary services. A straightforward method that might resolve this limitation is to model losses/expected expenditures only on those with insurance that meets the standard benefits package. This approach might be insufficient if few in the sample have such coverage, or if certain groups of risks are less likely to have such coverage due to existing denial of coverage or limited capacity of certain groups (e.g., those with severe mental illness) to understand coverage. As well, this approach assumes that the uninsured/underinsured in a given risk cell have the same underlying health risk as the members of the same cell who have sufficient insurance (e.g., the same expected expenditures or same probability of tail expenditures). If this is not the case, then the model would misrepresent the true risk of the uninsured by adopting this assumption.

### **Stage Two: Aggregation to the Family Level and Adjustment for Insurance**

In the next section, the outlined methods assume the use of Risk Measure I in the development of the MCER index. Developers may wish to design the MCER index using alternative measurement and/or aggregation strategies. Given the use of Risk Measure I, the process of aggregating individual risk measures to the family level and assessing the effects of existing insurance coverage might include one of the following two scenarios.

*Assuming Independence of Family Member Claims:*

- As is done by Handel, for each individual, simulate draws from his or her assigned distribution of losses. Apply his or her unique insurance characteristics to form an insurance-adjusted distribution of out-of-pocket expenditures.
- Identify the family unit and (assuming independence) aggregate individual distributions of out-of-pocket losses to the family level. In the case in which members of the family unit hold a group coverage offering with group-level provisions (family out-of-pocket maximum), apply these provisions in the process of aggregating to the family level.

*Assuming Correlation of Family Member Claims:*

- Identify the family unit and aggregate the parametric loss distributions of unit members to create a multivariate distribution of family-level losses. If possible, incorporate correlation of family member claims when forming this distribution (see below for further discussion).
- Simulate multivariate draws from the joint distribution of family losses and apply individual and family-level coverage characteristics to generate out-of-pocket payments for each draw.
- Once this process is completed, focus only on the overall probability of family-level out-of-pocket expenses for stage three of the model (once estimated properly, the multivariate properties of this distribution do not affect the outcomes).

If the correlation coefficient is known in advance and does not vary with family unit characteristics, then forming the aggregate loss distribution may be rather straightforward. However, introducing family-level correlations into the model may prove to be a rather complex task: specifically, correlation of family member claims might depend on the characteristics of each family unit (e.g., member risk types, number of members).

Estimating these correlations with MEPS data (as Handel has done at the individual level across claim types) may be infeasible due to the number of possible member number/risk type combinations and the small number of observations per family unit type. At best, this may require limiting the number of risk types (and perhaps family sizes) represented in the model. With respect to the accuracy of the index, we are not sure that the gains from introducing correlation of family member claims in this manner would outweigh the losses from reducing the capacity of the model to distinguish between different types of family units and individual risks.



We expect correlation of family member claims for such reasons as shared physical and social environments, similar genetics, and perhaps similar behaviors. Assuming independence is certainly problematic for medical events that are random and occur across the family simultaneously (e.g., an accident affecting all members). We are less certain that this independence assumption is problematic in the case of expenditures that result from managing a chronic condition.

Family members may share a particular factor (genetic/environment) that results in the presence of a particular chronic condition among members, but presence of these conditions is reflected in risk cell assignment. Acute events related to a condition occur at the individual level and not across a family. These cells will not reflect base severity or the likelihood and frequency of acute events, which might be similar within families.

Accidents and genetic diseases are likely to be the main causes of positive covariance. Noting that covariance resulting from these (and other) factors is already likely in studies by insurers; we suggest further consultation with insurers on this issue and perhaps empirical testing to determine the best route forward.<sup>26</sup> The likelihood of these (and other) types of positive covariance might be adjusted in the risk index after these informed discussions.

### **Stage Three: Indexing Economic Resources to Family-Level Risk**

Under the remaining component of index development, developers must identify a standard definition of unaffordable premium and out-of-pocket expenditures, which we refer to as an unaffordability threshold. Previously suggested by Doyle (1997), we advocate the development of an “inverted threshold” that reflects “the amount of out-of-pocket expenses you should be able to afford for medical care,” whereby the threshold “can be established for a group as a function of the poverty threshold itself or can be computed for an individual or family as a function of income or assets.”

Specifically, we suggest that the threshold identify the maximum percentage of family income allocated toward medical care expenses that can be considered affordable.<sup>27</sup> In determining a family’s ability to pay

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<sup>26</sup>A straightforward empirical test for covariance is to compare the difference between expenditures summed across members of a (fully insured) family and expenditures summed across a collection of individuals whose combined risk profile is equivalent to that of the comparator family.

<sup>27</sup>Doyle (1997) recommends that income definitions utilized under a medical risk index reflect those adopted under one of the poverty measures. Alternatively, developers may wish to consider both income and assets when defining appropriate thresholds. Our suggestion regarding assets is to use an annuitized flow concept to the extent it is feasible to measure financial assets. Ultimately, however, determining which approach is most appropriate is left to the study panel.

for medical care services, the threshold should consider the amount of family resources required to cover base needs identified in the SPM or the original poverty measure. As such, a well-formed index should include the development of multiple thresholds to reflect other relevant factors, such as family size and family income.<sup>28</sup> As one example, this approach might be drawn from the poverty categories and income percentages introduced under the ACA to distribute premium and out-of-pocket expenditure subsidies.<sup>29</sup>

The procedure of applying affordability thresholds to family-level resource and risk information might entail the following steps:

- Assign the appropriate threshold to a family based on family resources and characteristics.
- Combine threshold and family-level income information to determine the amount of medical expenditures that meets this threshold.

The remaining steps depend on the selected measurement methodology. In the case of the loss distribution Risk Measure I (probability of exceeding the affordability threshold) approach, the next steps include

- Subtract premium costs from the assigned threshold.<sup>30</sup>
- If premium costs exceed this threshold, the family is not “at risk” of accruing unaffordable expenses. Rather, the family experiences unaffordable medical care costs (e.g., probability of exceeding affordability threshold = 1).

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<sup>28</sup>We note that a large family with a lower level of income might be assigned a lower affordability threshold than a similarly low-income but smaller sized family. A larger family will “use up” a larger proportion of income on other relevant needs (e.g., housing, food, etc.), leaving fewer resources to allocate toward medical care.

<sup>29</sup>We caution that if these categories were adopted directly, any level of medical care expenditures for families above 400 percent of the family poverty level (even catastrophic expenses) would be considered affordable. Further attention should be directed to this issue if, in fact, these guidelines are considered for purposes of the MCER index.

<sup>30</sup>An alternative approach is to subtract premiums and any other (insurance-adjusted) family member expenditures that are “known” ahead of time (e.g., the costs of appropriate preventive care and disease management). In this respect, we assume there is no component of risk in the realization of these expenses during the next year. Following this approach, these expenditures should be excluded when loss distributions are fit to the claims experience observed in each risk cell. Although this approach correctly distinguishes between expenditures that are known with certainty and expenditure risk, we suggest that in practice it is difficult to assign a correct measure of known expenses prospectively. Nonetheless, in principle, we agree with commentary from the workshop advocating this type of approach. If developers are able to incorporate this method into the model, it would improve the accuracy of the MCER measure.

- If premium costs do not exceed the threshold, the next step is to determine the amount of out-of-pocket expenditures that (with these premium costs) would place a family at their respective affordability threshold.
- The final step is to determine the family's probability of exceeding this amount of out-of-pocket expenditures using the family-level adjusted loss distribution.

The method outlined above represents our preferred approach. We believe this method meets the objectives of MCER development while remaining feasible (assuming there is some capacity to invest in additional data collection). Using this approach, it is possible to report national-level (and perhaps state-level) estimates of the number of families at risk of exceeding an affordability threshold. As well, it is possible to estimate the number of families who exceed the threshold with premium purchases. This could also be calculated for subgroups by, for example, race/ethnicity, age, and region. Reporting might also include information on risk level, such as the number of families at low/medium/high risk of exceeding this threshold. It would also be possible to calculate the depth of expected unaffordable expenses similar to a poverty gap measure (e.g., if families are at risk of experiencing unaffordable expenses, how extreme are these prospects?). Finally, we note that a family could be assigned a threshold range if it is undesirable to define one specific level of "unaffordable" expenditures.

In the case that Risk Measure II (expected costs) is selected, the next steps entail subtracting premium costs from the affordability threshold and comparing this value with the family's insurance-adjusted expected expenditures. In addition, we suggest repeating this exercise using something akin to standard deviation values (if applying the loss model approach). This measure can be interpreted as the level of expenditures a family might expect to incur in the next year, with the standard deviations reflecting the type of expenditure outcomes observed by families who incur a high (and low) level of expenditures relative to their expected outcome. The easiest way to do this is to square the difference of the predicted value minus the actual value; however, this has an *ex post* aspect to it that is not consistent with a prospective risk concept.

Finally, in the case that econometric methods are used to estimate probability of unaffordable expenses, developers will need to identify an appropriate method of moving from an individual-level risk characterization to a family-level expenditure model. Alternatively, the initial set of risk characteristics might be defined only at the family level. Developers would need to consider when and how to best introduce coverage adjustments to expenditures and, similarly, how to treat mixed-coverage families.

### Treatment of the Uninsured Coverage Eligible

Although the measurement of MCER should reflect current coverage status, we suggest that developers also consider computing this measure in the hypothetical case of full take-up among those who are eligible for public coverage. This could also include private coverage if there were a data set that permitted one to know if the firm at which an individual worked offered employer-sponsored insurance (and the coverage characteristics of this offer). This secondary measure represents an upper bound on the potential impact of improved communication and targeted policy measures to increase take-up under current offerings.

### LIMITATIONS AND CONCLUDING POINTS

The choice of data set for MCER reporting introduces some important trade-offs for developer consideration. The ideal base data set includes family-level economic variables, insurance characteristics, and an appropriate level of health information. Although MEPS contains the largest proportion of these data, the sampling design does not enable release of basic statistics at the state level. Other surveys are designed to meet this reporting objective; however, selection of an alternative data set introduces greater need to add new questions during base data collection. At a minimum, any alternative data set should include insurance data and a subset of health characteristics sufficient to match these data at the cell or adjuster level to expenditure models developed in MEPS. Alterations to sample design and the addition of new variables introduce added costs that developers should consider. It is suggested that developers consider not only the relative benefits of these choices in the context of MCER development, but also the relative benefit of survey question additions or sampling expansions in complementary areas of research.

Although we identify a feasible approach to MCER development, a number of compromises are introduced throughout this framework. Development of an operationally feasible index may necessitate that developers introduce a relatively coarse system of risk classification. Similarly, the final index might reflect a simplified examination of the impact of insurance coverage characteristics on family expenditure risk. As a trade-off, this approach might reduce data collection burden and limit the complexity of risk modeling and associated challenges. Finally, developers face trade-offs in the selection of an appropriate method of representing risk. Reliance on estimates of expected expenditures in the underlying methodology does not capture the real occurrence of outlier events. In contrast, a measure that categorizes all families without a stop-loss provision as experiencing MCER might place too much weight on these tail events. Developers must carefully

consider the objectives of this index and its implications as they refine the definition and representation of medical care expenditure risk.

A number of additional relevant yet challenging issues are left unresolved in this framework. Developers must reach consensus on standard definitions of a minimum benefits package and affordability. In addition, those involved in the development of risk models must identify an appropriate method of adjusting for underutilization of the uninsured or underinsured in the baseline data source. Finally, we note that the suggested framework does not distinguish between medical risk that is not modifiable and medical risk that can be prevented or reduced through the use of preventive services or good care management practices. Research in this direction might identify other important routes to reducing the medical care economic risk experienced by families.

Although this framework outlines alternative methods of modeling expenditure risk, developers may identify superior modeling approaches as they move forward with index design. There is much work to be done to complete the process of moving from a framework to an operational MCER index; this framework identifies a conceptual base to build on while completing this task.

## ANNEX A

## Risk Classification Examples

## Risk Cell Model I (survey collected data, claims data not necessary)

Characteristic	Categories
Gender × age (20-30 categories)	Female × age Male × age
High-cost morbidity (2 categories)	CMS-HCC age categories are <sup>a</sup> : 0-34, 45-44, 54-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, 90-94, 95+ (Pope et al., 2004) High number of ADLs or extreme obesity
Pregnancy (female, age appropriate only) (2 categories)	Neither Yes No

## Risk Cell Model II (survey collected data; claims data necessary)

Characteristic	Categories
Gender × age (20-30 categories)	Female × age Male × age
Diagnosis-based risk level (3 categories)	CMS-HCC age categories are: 0-34, 45-44, 54-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, 90-94, 95+ (Pope et al., 2004) Low-, moderate-, or high-risk score
High-cost morbidity (2 categories)	High number of ADLs or extreme obesity Neither

NOTE: ADLs = activities of daily living; CMS-HCC = Centers for Medicare & Medicaid Services-Hierarchical Condition Category.

<sup>a</sup>This model is developed for the Medicare population; additional categories for the 0-34 population (e.g., infant, child, and young adult) and perhaps fewer categories in older age ranges are suggested.

SOURCE: Developed by the authors.

## ANNEX B

THE MASSACHUSETTS 2010/2011 MINIMUM  
CREDITABLE COVERAGE STANDARDS

Coverage for a broad range of medical services. Specifically:

- Ambulatory patient services, including outpatient day surgery and related anesthesia
- Diagnostic imaging and screening procedures, including X-rays
- Emergency services
- Hospitalization, including at a minimum, inpatient acute care services, which are generally provided by an acute care hospital for covered benefits in accordance with the member's subscriber certificate or plan description
- Maternity and newborn care
- Medical/surgical care, including preventative and primary care
- Mental health and substance abuse services
- Prescription drugs
- Radiation therapy and chemotherapy
- Doctor visits for preventive care, without a deductible
- A cap on annual deductibles of \$2,000 for an individual and \$4,000 for a family for services received in-network
- For plans with up-front deductibles or coinsurance on core services, an annual maximum on out-of-pocket spending of no more than \$5,000 for an individual and \$10,000 for a family for services received in-network
- No caps on total benefits for a particular illness or for a single year
- No policy that covers only fixed dollar amount per day or stay in the hospital, with the patient responsible for all other charges
- For policies that have a separate prescription drug deductible, it cannot exceed \$250 for an individual or \$500 for a family for services received in-network

In 2011, the standards will also include

- No fixed-dollar cap on prescription drug benefits
- Core medical services and a broad range of medical services for any dependents, if dependents are covered

An exemption is available for people who have a firmly held religious belief that prevents them from enrolling in a health plan.

SOURCE: Health Connector (2010).

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# Incorporating Data on Assets into Measures of Financial Burdens of Health<sup>1</sup>

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## INTRODUCTION

In assessments of out-of-pocket burdens for health care, annual income is used to measure the available resources.<sup>2</sup> This approach is consistent with poverty measurement, which is also based on gross annual income as reported in the Current Population Survey of households. Assets, however, are counted only to the extent that asset income, such as interest and dividends, is included in the measure of total money income. Although asset holdings may be difficult to measure well in household surveys, it is likely that asset holdings serve as an important financial resource for families confronted by a temporary loss of income resulting from, for example, a spell of unemployment. Similarly, assets are likely to serve as an important financial resource for families with high out-of-pocket medical expenses, especially in the case of unexpected medical expenses.

If asset holdings are generally correlated with income, then ignoring assets in measures of poverty or out-of-pocket burdens for health care may not result in biased or misleading comparisons between population subgroups. That is, if one does not believe certain groups have systemati-

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<sup>1</sup>The views expressed in this paper are those of the authors and no official endorsement by the Congressional Budget Office, the Agency for Healthcare Research and Quality, or the Department of Health and Human Services is intended or should be inferred, and does not necessarily reflect the views or conclusions of the National Research Council, the Institute of Medicine, the study panel, or the sponsor.

<sup>2</sup>Some studies have computed annual disposable income net of taxes, whereas other studies have used gross annual income as reported by survey respondents.

cally higher levels of assets than other groups with similar income, then the current approach measures poverty or health care burdens consistently across policy-relevant subgroups. It is worth examining these assumptions, however, with respect to the elderly, who, simply by virtue of age, have had more time to accumulate assets than younger families with the same income.<sup>3</sup> If the elderly do have systematically higher levels of assets, all other things equal, then income-based measures of financial deprivation may be misleading. This issue may be particularly relevant to the measurement of medical care burdens, because health care expenses due to illness and disability are widely recognized as one of the major financial risks of old age for which to save. The question then becomes one of how to incorporate assets into an income-based measure.

A growing literature has examined out-of-pocket expenditures for medical care as a function of income. The literature typically defines one or more thresholds, such as 10 and 20 percent of family income, so that the distribution of the population according to the thresholds can be reported. As explained elsewhere, this approach reduces bias due to reporting error in income and provides an intuitive measure of the risk of incurring high medical burdens (Banthin and Bernard, 2006). This threshold approach mirrors the method used in measuring poverty, which is also based on thresholds.

As far as we are aware, however, the literature has always analyzed medical care financial burdens and risks separately for the elderly and nonelderly subpopulations. There are two main reasons for this distinction. First, the two groups differ in their primary sources of insurance coverage. Thus, the reasons for and the policy implications of high out-of-pocket medical care burdens also differ by subpopulation. Because almost all persons ages 65 and over are covered by Medicare, the policy implications of high burdens among the elderly center on the Medicare program. Individuals under age 65, in contrast, are covered primarily by employment-sponsored insurance, individually purchased policies, and Medicaid. Many are uninsured. The policy implications of high burdens among the nonelderly are related to the functioning of private insurance markets. A second and equally important reason for analyzing the two groups separately is methodological. Because elderly and nonelderly individuals and families spend very different proportions of their income on health care, it is difficult to define a single threshold for both age groups.

The elderly and nonelderly devote different proportions of their family income to health care because both parts of the equation—their expected health care needs and their resources to meet those needs—are very different. What is an appropriate threshold for a nonelderly individual or family

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<sup>3</sup>The self-employed population is another group that may have systematically higher levels of assets. It is treated in the annex.

compared with an elderly individual or family? If the thresholds are not the same, is there a way to develop a consistent threshold for elderly and nonelderly families that recognizes their very different resources and needs regarding medical care as a part of their overall household budget? In the work that follows, we show that the distributions of burdens for elderly and nonelderly families are quite different. We then investigate the distribution of assets in both groups. Finally, we compute burdens using different thresholds and different measures of resources to define high burdens. One approach incorporates 5 percent of total net assets into the resources available to elderly families to pay medical expenses as a simplified method for drawing down assets in retirement. We do not make this adjustment for nonelderly families, because they are expected to be saving for the future rather than drawing down on current savings.

### PRIOR LITERATURE ON HEALTH CARE BURDENS

In a previous study, we estimated changes in annual financial out-of-pocket burdens for medical care, for the population under age 65 (Banthin and Bernard, 2006). Our key estimate of total financial burden included out-of-pocket expenditures for health care services plus out-of-pocket expenditures for premiums as a function of family income. High financial burdens were defined using thresholds of 10 and 20 percent of family income. In another paper we applied a threshold of 5 percent of income to nonelderly families living below 200 percent of poverty (Banthin, Cunningham, and Bernard, 2008). Other studies apply 5 and 10 percent thresholds to indicate high burdens among nonelderly individuals and families (Schoen et al., 2011). Under the Patient Protection and Affordable Care Act, there are premium and cost-sharing subsidies broadly consistent with these thresholds that apply to the low-income population under age 65.

Researchers often take a broader approach in analyzing out-of-pocket medical care spending in the elderly population. Although some papers have looked at annual burdens for medical care, another vein of research has focused on the amount of money needed to pay for medical care, including long-term care, over a lifetime. Among papers that do examine annual burdens, Selden and Banthin assessed changes in annual out-of-pocket burdens for medical care for the elderly between 1987 and 1996 and applied thresholds of 20 and 40 percent of after-tax family income to indicate individuals living in families with high burdens (Selden and Banthin, 2003).

The methodological challenge of comparing the elderly and nonelderly arises because the two subpopulations differ in terms of health care spending as a function of income. Setting a common threshold for both groups against which to assess financial burden or risk is difficult. The reasons for their differences are worth reviewing. The nonelderly population is a

working-age population, and many live in families with children. Working-age families tend to be larger in size and have higher incomes than retired families, although their official poverty rates are higher compared with the elderly.<sup>4</sup> Working-age families have more competing demands on their resources. For example, they typically incur work-related and childrearing expenses and spend more on transportation compared with older families. In addition, working-age families should be saving from current income for future retirement or to invest in the education of their children. On average, their health needs are lower than those of the elderly.

In contrast, most individuals ages 65 and over are retired or close to retirement, and few in this age group are still raising children. Upon retirement, individuals and families typically begin drawing down on their assets rather than continuing to save. In addition, the need for medical care grows as people age. The implication of these different consumption and saving patterns is that elderly and nonelderly families would be expected to devote different shares of family income to out-of-pocket medical care and health insurance premiums.

## DATA AND METHODS

### Using the Medical Expenditure Panel Survey

The Medical Expenditure Panel Survey (MEPS) includes detailed information on medical expenditures by source of payment, including out-of-pocket payments. Information is also collected on out-of-pocket premiums, income, assets, and other individual and household data. Although data on income and expenditures support annual estimates, the information on assets is collected only once per panel, at the end of the last round of data collection. In this paper, we pool three panels together in order to increase sample sizes for the elderly and self-employed and to support analyses of the distribution of assets across different poverty groups. In MEPS, a new panel is started each year. Panels 10, 11, and 12 started in 2005, 2006, and 2007, respectively. Because asset information is collected in the second year of the panel, all measures of assets and income are adjusted for inflation to bring them to 2008 using the Consumer Price Index for Urban Areas.

Although the MEPS asset variables are not currently available on public use files, they are available to any researcher to use in the Agency for Healthcare Research and Quality Data Center. The asset section of MEPS collects information on financial and nonfinancial assets. Information on debt is also collected. Financial assets include checking and savings ac-

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<sup>4</sup>As of 2010, 9.0 percent of persons ages 65 or older lived in poverty compared with 22.0 percent of children and 13.7 percent of nonelderly adults.

counts, money market funds, stocks, bonds, mutual funds, certificates of deposit, and individual retirement accounts. The measure of net worth used in this study is the net value of nonfinancial assets, including residential property, other real estate, business equity, and transportation vehicles, as well as financial assets minus all debt. We have published other papers using these variables and have compared MEPS national estimates of various definitions of wealth to estimates from the Survey of Income and Program Participation (SIPP) and the Survey of Consumer Finances (SCF) (Bernard, Banthin, and Encinosa, 2009). The MEPS asset data compare well to asset information collected in SIPP; however, both surveys appear to underreport wealth holdings compared with information collected in the SCF. The value of the MEPS asset variables for this study is in the consistency of information collected across the entire population, including those both under and over age 65, along with information on income and out-of-pocket medical expenses. Regardless of underreporting, there is no indication of bias by age.

For this analysis, the family is defined as the health insurance eligibility unit (HIEU), which consists of all individuals related by blood or marriage that would typically be eligible for a family policy under most private insurance plans. Families with half or more of their members age 65 and over are designated as elderly families. The rest are designated as nonelderly families for purposes of examining family-level assets.

### **Construction of Measures of Out-of-Pocket Burden**

For this analysis, we rely on the same approach we have refined in several previous papers to calculate financial out-of-pocket burden for medical care. We define out-of-pocket burden for medical care as a family-level concept in the same way that poverty is a family-level concept, because in both measures it is assumed that family-level resources are shared among individual family members. Thus, we sum out-of-pocket expenditures on health care services and premiums across all members of the family to define the numerator. Gross reported family income is used to define the denominator. The measure of income is not adjusted for taxes.

In some variations of our estimates, we add 5 percent of total net assets to annual income in the denominator. We do this for elderly families, because they are expected to be drawing down their assets in retirement. We do not make this adjustment for nonelderly families because they are expected to be saving for their future retirement. We chose 5 percent of total net assets as the draw down percentage because this is very close to what some financial planners advise.

We then compute the share of family income used to cover all medical expenses and report statistics at the family level. The resulting distribution

is highly skewed, with a long tail of families that spend high proportions of income on medical care. After presenting the distribution, we analyze the risk of high burdens by counting families with burdens that exceed a certain threshold (e.g., 5, 10, or 20 percent). This approach provides an intuitive measure of the risk of incurring high burdens. We do not truncate the distribution of spending as a function of income as some other studies have done. It is theoretically possible for some families to spend more than 100 percent of income on medical care in a given year.

## RESULTS

Table A-1 shows the percentile distribution of out-of-pocket burdens for the elderly and nonelderly to illustrate the differences between the two groups. Overall, the median burden for elderly families was 10.7 percent compared with just 2.9 for nonelderly families. As expected, younger families devoted a much smaller share of family income to medical care. Among those living in poverty, the elderly spent about 13.5 percent of family income on medical care, whereas the nonelderly spent about 2.7 percent of family income.

These differences between elderly and nonelderly populations were similar across poverty groups at the median and increased at higher points in the distribution. At the 75th percentile, the burden for the elderly was about three times higher than the burden for the nonelderly at 20.7 percent versus 7.0 percent of family income. If we were to use the 75th percentile to suggest a cutoff point as the basis for measuring high burdens, then the thresholds would be quite different for the two age groups.

Table A-2 presents the distribution of total net assets by family age group. This measure includes the net value of all financial and nonfinancial assets.<sup>5</sup> In the overall section of the table, at the median, the elderly reported \$146,000 in family net wealth, and the nonelderly reported \$20,000. Thus, at the median, elderly families have about 7 times as much net wealth as do nonelderly families.

These large disparities in net assets can be seen along all points of the distribution. Overall, at the 20th percentile, elderly families reported about \$5,000 in net assets compared with zero reported by nonelderly families. At the 90th percentile, elderly families reported about \$797,000 in net assets compared with \$433,000 held by nonelderly families.

Table A-2 also presents the distribution of assets by poverty status. Among families living below poverty, elderly families reported more than

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<sup>5</sup>Not shown are tables that examined the distribution of financial assets and retirement assets. We chose to focus on total net assets, because this measure conveys the large differences between the two age groups.



**TABLE A-1** Percentiles (PCTs) of Out-of-Pocket Total Burden, Elderly and Nonelderly Health Insurance Eligibility Units, Pooled Panels 10-12 (2008 dollars)

Poverty	N	PCT50	PCT75	PCT90
Overall				
Elderly	3,970	10.65 (0.25)	20.67 (0.60)	37.64 (1.35)
Nonelderly	17,513	2.93 (0.05)	7.01 (0.11)	16.00 (0.41)
<100%				
Elderly	685	13.47 (2.14)	57.96 (20.06)	*
Nonelderly	3,260	2.74 (0.31)	19.09 (1.51)	*
100-199%				
Elderly	1,134	16.53 (0.56)	27.93 (1.27)	43.07 (2.01)
Nonelderly	3,849	2.58 (0.17)	9.04 (0.32)	20.36 (0.98)
200-399%				
Elderly	1,069	13.19 (0.45)	20.34 (0.77)	31.67 (1.77)
Nonelderly	5,190	3.74 (0.12)	8.05 (0.21)	14.78 (0.46)
400%+				
Elderly	1,082	6.44 (0.21)	10.53 (0.34)	17.21 (0.83)
Nonelderly	5,214	2.60 (0.05)	5.01 (0.10)	8.50 (0.20)

NOTE: Standard errors are in parentheses.

\*Sample size is too small to make reliable estimates.

SOURCE: Medical Expenditure Panel Survey—Household Component, Panels 10-12.

\$20,000 in net wealth at the median, and nonelderly families reported zero. Among low-income families (with family income between 100 and 199 percent of poverty), the median net assets for an elderly family was about 33 times as much as that for a nonelderly family (\$77,000 versus \$2,300).

Table A-3 presents four measures of burden. In the column labeled BURD10, we show the percentage of families who were spending 10 percent or more of family income on medical care. Overall, about 52 percent of elderly and 17 percent of nonelderly families had high burdens according to this threshold. In the next column, BURD20, we show that about 26 percent of elderly and 7 percent of nonelderly families spent 20 percent or more on medical care. In the final two columns, we use the same thresholds of 10 and 20 percent of family income, but we adjust the family income

**TABLE A-2** Distribution of Total Net Health Insurance Eligibility Unit-Level Assets by Family Age for Pooled Panel 10-12 Health Insurance Eligibility Units

Percentiles	Overall	<100% Poverty	100-199% Poverty	200-399% Poverty	400%+ Poverty
<b>Nonelderly Health Insurance Eligibility Units</b>					
10	-318 (203)	-4,113 (908)	-3,871 (799)	-961 (513)	-8 (6)
20	0 (0)	-43 (11)	-40 (11)	0 (0)	10,295 (1,092)
30	1,500 (204)	-28 (8)	-15 (5)	2,134 (302)	37,024 (2,909)
40	6,408 (446)	-14 (4)	501 (188)	6,500 (546)	79,230 (3,962)
50	20,151 (1,296)	0 (38)	2,341 (261)	15,518 (1,092)	133,838 (6,266)
60	53,843 (2,564)	1,023 (134)	5,515 (490)	34,967 (2,523)	207,507 (7,831)
70	111,069 (3,866)	3,115 (296)	14,137 (1,447)	72,021 (4,094)	307,964 (10,214)
80	210,245 (6,779)	7,840 (1,148)	39,498 (3,010)	129,015 (4,730)	460,008 (13,658)
90	432,096 (13,090)	45,923 (5,943)	105,752 (6,426)	242,669 (12,301)	788,162 (27,702)
95	729,088 (26,304)	119,340 (10,434)	198,769 (19,051)	404,244 (23,215)	1,236,414 (52,333)
N	17,513	3,260	3,849	5,190	5,214
<b>Elderly Health Insurance Eligibility Units</b>					
10	-8 (3)	-63 (18)	-18 (6)	17 (193)	7,788 (4,843)
20	4,997 (1,005)	-13 (41)	1,063 (435)	6,622 (2,323)	102,772 (14,466)
30	37,356 (4,433)	779 (313)	9,641 (2,342)	32,122 (7,436)	187,887 (13,612)
40	88,161 (6,051)	3,313 (2,698)	40,222 (5,447)	89,808 (9,805)	265,312 (11,498)
50	146,334 (6,515)	20,686 (6,095)	77,301 (6,073)	136,472 (7,924)	355,370 (21,152)
60	215,083 (8,927)	51,848 (9,929)	111,150 (6,733)	190,027 (10,334)	469,780 (27,918)
70	298,604 (9,729)	101,682 (13,996)	159,509 (12,221)	252,973 (11,908)	640,134 (32,898)
80	450,609 (17,681)	185,478 (24,155)	234,056 (12,678)	348,177 (18,702)	959,475 (47,838)
90	796,624 (38,581)	302,952 (17,667)	376,518 (30,868)	546,099 (39,165)	1,432,970 (64,339)
95	1,226,427 (66,078)	423,549 (60,816)	522,502 (39,722)	807,366 (58,823)	2,128,943 (143,601)
N	3,970	685	1,134	1,069	1,082

NOTE: Standard errors are in parentheses.

SOURCE: Medical Expenditure Panel Survey—Household Component, Panels 10-12.

**TABLE A-3** Alternative Income Measures and Percentage with High Burdens (5% of assets added to elderly) for Elderly and Nonelderly Health Insurance Eligibility Units, Pooled Panels 10-12

	N	TOTINC	ADJINC	BURD10	BURD20	BURD10ADJ	BURD20ADJ
Overall							
Elderly	3,970	41,592 (992)	57,644 (91,417)	52.53 (0.94)	26.06 (0.90)	40.01 (0.98)	16.54 (0.72)
Nonelderly	17,513	53,751 (682)	53,751 (682)	17.02 (0.36)	7.68 (0.27)	17.02 (0.36)	7.68 (0.27)
<100% poverty							
Elderly	685	6,550 (199)	11,962 (575)	54.09 (2.50)	43.52 (2.53)	43.48 (2.49)	28.64 (2.41)
Nonelderly	3,260	7,282 (141)	7,282 (141)	33.20 (1.19)	24.54 (1.04)	33.20 (1.19)	24.54 (1.04)
100-199% poverty							
Elderly	1,134	15,435 (162)	22,628 (461)	70.75 (1.55)	40.72 (1.88)	57.40 (1.72)	26.58 (1.57)
Nonelderly	3,849	20,516 (212)	20,516 (212)	22.43 (0.87)	10.23 (0.68)	22.43 (0.87)	10.23 (0.68)
200-399% poverty							
Elderly	1,069	30,295 (418)	41,772 (730)	63.51 (1.58)	26.01 (1.61)	48.48 (1.76)	15.37 (1.22)
Nonelderly	5,190	40,140 (339)	40,140 (339)	18.77 (0.70)	5.90 (0.42)	18.77 (0.70)	5.90 (0.42)
400%+ poverty							
Elderly	1,082	85,197 (2,050)	116,230 (2,981)	27.35 (1.50)	7.76 (0.89)	17.00 (1.39)	4.91 (0.74)
Nonelderly	5,214	96,085 (1,013)	96,085 (1,013)	7.46 (0.36)	2.05 (0.22)	7.46 (0.36)	2.05 (0.22)

NOTES: Standard errors are in parentheses. ADJINC = adjusted income (dollars); BURD10 = percentage of families who were spending 10 percent or more of family income on medical care; BURD20 = percentage of families who were spending 20 percent or more on medical care; BURD10ADJ = percentage of elderly families with high out-of-pocket burdens; BURD20ADJ = percentage of families with high burdens; TOTINC = total adjusted income (dollars).

SOURCE: Medical Expenditure Panel Survey—Household Component, Panels 10-12.

measure of elderly families to include 5 percent of the value of total net assets. We do not make this adjustment for the nonelderly, because they are supposed to be saving for the future rather than drawing down on their accumulated assets. Overall, the adjustment shifts average income up by about \$16,000 for elderly families. In the second-to-last column, under BURD10ADJ, we show that 40 percent of elderly families and 17 percent of nonelderly families had high out-of-pocket burdens according to this measure. In the last column, under BURD20ADJ, we show that about 16.5 percent of elderly families had high burdens according to this measure compared with about 7.7 percent of nonelderly families.

Among elderly families living below poverty (as classified by the original reported income), the adjustment increases average income from \$6,550 to almost \$12,000 while simultaneously shifting the percentage with medical burdens exceeding 20 percent of family income down from 44 percent to about 29 percent. Similar shifts are seen among the low-income elderly, for whom average income increases by about \$7,000 and the percentage with medical burdens exceeding 20 percent of family income shifts down from about 41 to about 27 percent.

## DISCUSSION

The preliminary analyses presented here suggest that further work is needed to develop consistent measures of medical risk that combine the elderly and nonelderly populations. It is clear from the data presented here, however, that ignoring assets in the measurement of economic deprivation has far-reaching implications in comparing the relative status of elderly and nonelderly subpopulations.

Drawing down assets or annuitizing wealth is one approach to take in measuring the resources of retired persons. It does not make sense to take this approach in measuring the resources of nonelderly families, which are supposed to be saving for future retirement. It could be argued that nonelderly family income should be reduced in order to account for such saving. Another difference worth mentioning is that working-age families face tax penalties if they use tax-sheltered assets, such as retirement accounts, for current health care expenses. It is beyond the scope of this paper to address the issues surrounding home equity as a potential resource for covering health care expenses and how this differs between elderly and nonelderly families. Home equity is a large asset for some families, but it may not be easily liquidated. Furthermore, it is likely that the probability of having paid off a home mortgage differs by age group.

Applying different thresholds to different subpopulations by age is another approach to take in developing a consistent measure of medical risk. For example, as mentioned above, using the 75th percentile of the

distribution of out-of-pocket medical burdens from Table A-1 as a guide, one could apply thresholds of 20 percent of income for elderly families and 10 percent (rounded up from 7 percent) of income for nonelderly families to indicate high burdens. Combining these approaches, we show in Table A-3 that about 16.5 percent of elderly families have medical care burdens exceeding 20 percent of *adjusted* income compared with about 17.0 percent of nonelderly families with medical care burdens exceeding 10 percent of reported income. Based on the very different distribution of burdens, this method is also worth considering.

### Annex Comparing Self-Employed and Non-Self-Employed Families in Terms of Burdens and Distribution of Assets

Another group that may have higher levels of assets relative to other groups with similar levels of income is the self-employed population. In this annex we also investigate the distribution of burdens and assets among non-elderly families in which at least one person is self-employed and compare them with nonelderly families in which no one is self-employed. The same data and methods described above are used to analyze the self-employed. Specifically, we identify self-employed families as nonelderly families with at least one person age 25 or older who reports being self-employed. Non-self-employed families are the rest of nonelderly families.

Annex Tables A-1 through A-3 present the same estimates for comparing the self-employed with the non-self-employed, restricting the comparison to those under age 65. The major concern regarding the self-employed is that they may have high burdens that are misleading because of high levels of assets. Unlike the elderly, however, the self-employed as defined in this analysis do not have substantially higher burdens than their non-self-employed counterparts. The median burden for the self-employed was 3.3 compared with 2.9 for the non-self-employed (Annex Table A-1).

As expected, self-employed families did report higher net assets across all deciles of the distribution (Annex Table A-2). Although the self-employed as a group reported higher net assets, they also reported higher levels of average income, as shown in Annex Table A-3 in the third column of figures. Unadjusted income-based measures of financial burden show that the self-employed had higher burdens when using the 10 percent threshold compared with the non-self-employed (20.1 versus 16.6). Using the 20 percent threshold, the two groups are not statistically significantly different in their level of burden (7.6 and 7.7). Although they have higher average incomes, self-employed families may have higher burdens at the 10 percent level than their non-self-employed counterparts because of higher out-of-pocket premium payments. Self-employed families are more likely to buy

insurance in the nongroup market, in which the tax treatment of premiums differs from the tax treatment in the employment-based market. There are other differences between the employed and the self-employed populations beyond the scope of this paper (Selden, 2008).

In conclusion, there does not appear to be any strong argument for incorporating the assets of self-employed families into their measure of resources. It is not clear that any special measurement procedures are needed to account for the health care burdens faced by this group, although a narrower definition of self-employment might reach different conclusions.

**ANNEX TABLE A-1** Percentiles (PCTs) of Burdens for Self-Employed, Employed Nonelderly Health Insurance Eligibility Units, Pooled Panels 10-12

	N	PCT50	PCT75	PCT90
Overall				
Self-employed	2,069	3.32 (0.16)	8.11 (0.33)	17.15 (0.80)
Employed	15,444	2.86 (0.06)	6.81 (0.11)	15.69 (0.45)
<100% Poverty				
Self-employed	213	2.44 (1.40)	22.64 (9.40)	*
Employed	3,047	2.74 (0.32)	19.00 (1.39)	*
100-199% Poverty				
Self-employed	406	3.34 (0.65)	12.62 (1.60)	27.23 (3.57)
Employed	3,443	2.49 (0.17)	8.59 (0.34)	19.67 (0.87)
200-399% Poverty				
Self-employed	606	4.23 (0.48)	9.93 (0.64)	17.91 (1.03)
Employed	4,584	3.69 (0.12)	7.85 (0.21)	14.37 (0.42)
400%+ Poverty				
Self-employed	844	3.03 (0.15)	6.55 (0.32)	11.01 (0.66)
Employed	4,370	2.51 (0.06)	4.80 (0.10)	8.01 (0.23)

NOTE: Standard errors are in parentheses.

\*Sample size is too small to make reliable estimates.

SOURCE: Medical Expenditure Panel Survey—Household Component, Panels 10-12.

**ANNEX TABLE A-2** Distribution of Health Insurance Eligibility Unit-Level Assets by Employment Type for Nonelderly Health Insurance Eligibility Units, Pooled Panels 10-12

Percentiles	Net Assets	
	Employed Nonelderly	Self-Employed Nonelderly
10	-626 (279)	-114 (49)
20	0 (0)	5,335 (1,419)
30	831 (131)	29,103 (4,146)
40	4,803 (308)	71,515 (6,381)
50	13,785 (950)	131,849 (7,310)
60	39,459 (2,278)	211,128 (14,943)
70	86,891 (3,774)	333,701 (19,810)
80	173,412 (6,339)	543,679 (29,910)
90	357,911 (10,413)	985,398 (54,411)
95	581,271 (18,430)	1,702,469 (151,266)
N	15,444	2,069

NOTE: Standard errors are in parentheses.

SOURCE: Medical Expenditure Panel Survey—Household Component, Panels 10-12.

**ANNEX TABLE A-3** Percentage with High Burdens for Nonelderly Health Insurance Eligibility Units, Pooled Panels 10-12 (2008 dollars)

	N	PREMOOPX	TOTINC	BURD10	BURD20
Overall					
Self-employed	2,069	3,993 (121)	76,803 (1,699)	20.07 (1.05)	7.56 (0.67)
Employed	15,444	2,196 (36)	50,304 (680)	16.57 (0.40)	7.69 (0.28)
<100% Poverty					
Self-employed	213	1,562 (253)	9,803 (633)	33.24 (4.24)	27.26 (4.12)
Employed	3,047	822 (65)	7,097 (143)	33.20 (1.23)	24.34 (1.06)
100-199% Poverty					
Self-employed	406	2,573 (264)	25,383 (766)	29.61 (2.89)	15.12 (2.37)
Employed	3,443	1,304 (49)	19,882 (207)	21.50 (0.91)	9.59 (0.67)
200-399% Poverty					
Self-employed	606	3,574 (204)	48,923 (1,051)	24.95 (2.10)	7.03 (1.23)
Employed	4,584	2,295 (55)	38,909 (337)	17.91 (0.74)	5.74 (0.41)
400%+ Poverty					
Self-employed	844	5,051 (192)	119,829 (2,396)	12.16 (1.18)	2.63 (0.62)
Employed	4,370	3,069 (66)	91,418 (1,073)	6.54 (0.38)	1.94 (0.23)

NOTES: Standard errors are in parentheses. PREMOOPX includes out-of-pocket expenditures for care and insurance premiums. See Table A-3 Notes for definitions of column headings.  
SOURCE: Medical Expenditure Panel Survey—Household Component, Panels 10-12.

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# An Assessment of Data Sources for Measuring Medical Care Economic Risk<sup>1</sup>

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## BACKGROUND

In its 1995 report, *Measuring Poverty: A New Approach*, the National Research Council (NRC) Panel on Poverty and Family Assistance recommended that the federal government revise its decades-old methodology for measuring poverty by updating the thresholds used to define basic needs; replacing money income with disposable income (which subtracts taxes and the costs incurred in going to work) as a measure of the resources available to meet these needs; recognizing the role of federal and state assistance programs in helping low-income families address basic needs by including the cash value of noncash benefits in these resources; and expanding the family unit over which these thresholds and income are calculated (National Research Council, 1995). The panel could not resolve how to handle the growing but widely varied expenditures for medical care and recommended the creation of a separate medical care risk index (MCRI) to be produced as a companion to a new measure of poverty.

Neither the proposed poverty measure nor the more vaguely defined MCRI could be estimated with data that were collected by any single survey, if at all, and data availability has continued to be an issue. Researchers at the Census Bureau, the Bureau of Labor Statistics, and other institutions have cobbled together a variety of experimental poverty measures over the years (see, e.g., Short, 2001, 2010), using imputation and statistical match-

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<sup>1</sup>The views expressed in this paper are those of the author and do not necessarily reflect the views or conclusions of the National Research Council, the Institute of Medicine, the study panel, or the sponsor.

ing to combine data from multiple sources, but no one has produced an experimental MCRI. Recently, an interagency working group was established by the U.S. Office of Management and Budget and charged with developing the guidelines under which the Census Bureau would cooperate with the Bureau of Labor Statistics to produce a Supplemental Poverty Measure (SPM) on an annual basis, beginning in 2011. This new measure would not replace the current, official poverty measure, but its release on a formal basis in conjunction with the official measure would ensure that it received greater attention—and use—than previous experimental measures. Also unlike the official measure, the methods used to create the SPM would be modified over time as researchers inside and outside government proposed improvements supported by research or developing consensus.

With the SPM about to become reality, attention has refocused on the MCRI, and the charge to the Panel on Measuring Medical Care Risk in Conjunction with the New Supplemental Income Poverty Measure is to examine the state of the science in developing a measure of medical care risk that is feasible to produce and can be used to track changes in medical care economic risk as the implementation of health care reform progresses.

Data issues loom large, compounded by complex conceptual issues. This paper examines the data sources that might be used to construct a measure of medical care economic risk. Although the design of an MCRI need not be constrained by the data that are available at present, the reality is that, if an MCRI is produced in the next few years, it will have to be based almost exclusively on data that are being collected currently. The addition of a modest number of new items to an existing survey is possible, and the Census Bureau has done exactly that for the SPM. However, none of the federal agencies likely to be involved in the development and production of an MCRI has the budgetary resources to support significant additions to any of the key surveys. The Census Bureau, in fact, has not received the funding that was included in the president's budget to support production of the SPM. Therefore, the existing data sources will largely define what is possible to include in an MCRI.

## TWO SURVEYS

Multiple surveys could be considered as candidates to host the MCRI, each of them offering some unique advantage, but the sponsor of the study panel, the Assistant Secretary for Planning and Evaluation (ASPE), has indicated that the MCRI should be constructed from variables that are available in the Census Bureau's Current Population Survey Annual Social and Economic Supplement (CPS ASEC). This will make it possible to compare a family's medical care risk with its poverty status as reflected in the new SPM, which is also based on the CPS ASEC. ASPE has also indicated that

a second survey, the Medical Expenditure Panel Survey (MEPS), which is designed and sponsored by the Agency for Healthcare Research and Quality (AHRQ)—also in HHS—should serve as the source of data for modeling medical care risk, with the results of that modeling to be translated to the CPS ASEC through variables that are common to the two surveys.

MEPS could in fact stand alone as home to the MCRI. Unlike the CPS ASEC, MEPS collects essentially all of the variables that are likely to be needed to construct the MCRI. Although the study panel can recommend a different approach using different data, the argument that the MCRI should be measured from the same data as the SPM is compelling—at least until the two measures are firmly established and their relationships to each other are thoroughly understood. Users will want to know how the two measures compare and how they differ for the same family or individual.

### Implications of Alternative Design Options

Two fundamental decisions regarding the design of an MCRI have important implications for its data requirements. The first is whether medical care risk is to be defined retrospectively or prospectively. With a retrospective definition, the principal data need is for out-of-pocket expenditures for medical care during a specified accounting period. For segments of the population that may have forgone care because of limited insurance coverage and an inability to pay for care out-of-pocket, actual expenditures are a poor measure of medical care risk and must be supplemented with other measures. For most of the population, however, actual expenditures may be sufficient to measure risk as a retrospective measure. With a prospective measure, which the 1995 NRC panel recommended, actual expenditures in the recent past, though not unimportant, become less important than measures of current health status on the one hand and the limits of insurance coverage on the other—both of which relate to the likelihood of incurring medical expenditures in excess of what an individual or family can afford to pay. In assessing data availability, I consider all of these characteristics.

The second decision is whether family resources will include only income or also assets. Doyle (1997), in a thoughtful discussion of issues related to defining and constructing an MCRI 2 years after the release of the 1995 NRC report, assumed that some component of assets would be included in the resources measure. She also considered ready access to loans as an alternative resource for covering unexpected medical costs, although she noted that access to such loans was generally restricted to families with significant assets as collateral. The inclusion of assets has important implications for the measurement of medical care risk among the elderly, whose income flows are diminished by retirement but who have had an entire

working life (and more) to accumulate assets. Again, I consider available measures of both income and assets.

### Development Versus Production

In addition to these design considerations, it is important to distinguish between the data that are available for developing and evaluating an MCRI and the data available for production of a measure, as the data needs are different. In addition to the variables needed to construct the measure, production requires timely data that are representative of the entire U.S. population. Neither trait is critical for development and evaluation of an index, but the data needs are more extensive. Furthermore, both development and evaluation would be enhanced by longitudinal data that would allow examination of the consequences for persons flagged as high risk.

### CPS ASEC and MEPS

#### Measures of Resources

The CPS ASEC is the official source for estimates of income and poverty for the U.S. population and will also be used to construct the SPM. The available data on income, then, include the official measure of *money* income—which is also used to estimate poverty—and the measure of *disposable* income that will be used for the SPM. This latter measure of income includes the cash value of noncash benefits (such as the Supplemental Nutrition Assistance Program, formerly the Food Stamp Program) while it subtracts taxes (which for some low-income families implies the addition of the refundable portion of a negative income tax), work-related expenses, and medical out-of-pocket expenditures (including premiums).

The potential inclusion of assets in the measure of resources is significant because the CPS collects no asset data. If, as expected, the CPS ASEC serves as the base data set for the MCRI, measures of liquid or near-liquid assets would have to be added to the survey or imputed from an external source. Imputation is a decidedly second-best option, because the point of including assets in the resource measure is that some people—particularly among the elderly—with relatively low income may nevertheless have sufficient assets to weather unexpected medical expenses. Income will not be a strong covariate of asset holdings among such persons, and it is not apparent that the CPS provides other strong covariates of asset accumulation. It should be assumed, therefore, that imputed assets will provide less value-added to an MCRI than directly measured assets. At the same time, adding new questions to the CPS to measure financial assets (property assets would probably not be needed for an MCRI as they are not very fungible, although a credit line based on home equity is a readily available resource

used by many consumers to cover needs for cash) is not necessarily straightforward. The Survey of Income and Program Participation (SIPP) collects a wide range of asset data in topical modules that are administered annually, but comparisons with the Federal Reserve Board's Survey of Consumer Finances (SCF), which focuses almost exclusively on the collection of income, assets, and debts, show serious weaknesses (Czajka, Jacobson, and Cody, 2003). For example, aggregate SIPP estimates of financial assets and total assets in 1998 were 55 percent of the assets measured by the SCF. Excluding the wealthiest families increased this fraction to 74 percent, but it is clear from this that adding measures of assets without field-testing, which the Census Bureau currently lacks the resources to support, is risky.

MEPS collects data on multiple sources of income that, in the aggregate, correspond closely to the CPS concept of money income. Potential differences exist because the MEPS income questions follow the federal tax form and include capital gains, state tax refunds, and lump sum (as opposed to regular) withdrawals from retirement accounts, which are not counted in CPS money income. In addition, respondents who refer to their tax returns—who may be only a small fraction of all MEPS respondents—would omit those portions of their earnings that are excluded from taxation (and not reported on the tax return). They might also report only taxable rather than total Social Security benefits. Like the CPS, MEPS would require imputation and modeling to convert this money income to the concept of disposable income used for the SPM. MEPS collects fewer of the expenses that differentiate money income from disposable income; specifically, MEPS does not collect work-related expenses, which were added to the CPS ASEC in 2010. Like the CPS, however, MEPS does not capture taxes paid (or earned income tax credits received), which must be modeled.

Unlike the CPS ASEC, however, MEPS collects data on assets. MEPS obtains balances for retirement accounts (collectively), bank accounts, and other financial assets and requests the estimated value and debt for the family home, all vehicles, and all other nonfinancial assets. MEPS also requests the total amount of all additional debt (for example, loans and credit card balances). To my knowledge, the MEPS asset data have not been subjected to the same, detailed evaluations as the asset data from SIPP, the Panel Study of Income Dynamics, and the Health and Retirement Study, which makes them something of an unknown. Evaluations of asset data collected in these other surveys have shown that asset questions are subject to high item nonresponse and significant reporting error. Nevertheless, MEPS is well ahead of the CPS in having asset data at all.

### **Variables to Measure Medical Care Economic Risk**

As part of its development of the SPM, the Census Bureau added a measure of medical out-of-pocket expenditures to the CPS ASEC in 2010

(this variable and the other new items are not included in the public use data for that year). Surprisingly, CPS ASEC estimates of medical out-of-pocket expenditures compare favorably to estimates from MEPS and SIPP, despite the more extensive measurement in these latter surveys (Caswell and O'Hara, 2010). The CPS ASEC also includes measures of health insurance coverage during the prior year, but the CPS does not collect any information on what was included in such coverage. This deficiency becomes critically important if medical care risk is defined prospectively.

The CPS ASEC identifies deafness or blindness and several types of activity limitations, including difficulty in concentrating, remembering, or making decisions; walking or climbing stairs; dressing or bathing; and doing errands. Separately, the survey identifies persons with work limitations and ascertains each household member's general health (excellent, very good, good, fair, or poor). These items together with the reported receipt of one or more sources of disability income provide the only indication that a person has health issues that increase the risk of excessive expenditures for medical care in the near future. I note, however, that the items collected in the CPS are similar to what Short and Banthin (1995) used to assign the privately insured to either of two risk groups as part of their work to identify the underinsured. Other variables that were instrumental to that work are not captured in the CPS ASEC, however.

MEPS collects extensive data on health conditions, health status, the use of medical services, charges and payments, access to care, and health insurance—all of which are important in constructing a prospective measure of medical risk. In its initial year, 1996, MEPS also collected and abstracted detailed information from the health insurance plan booklets for sample members covered by private insurance. Similar data collected as a supplement to the 1987 National Medical Expenditure Survey provided a critical input to Short and Banthin's (1995) estimates of the nonelderly underinsured. If such data were available today, they would very likely be the most central element in a prospective measure of medical risk.

### Data Quality

Limited information on the quality of selected sets of relevant variables in the CPS ASEC and MEPS is available—not enough to make an overall assessment but worth reviewing for the perspective it may provide. Although the CPS accounts for more income overall and for most sources than does the Census Bureau's nominal income survey, SIPP (Czajka and Denmead 2008; Roemer, 2000), the CPS falls short of SIPP in the measurement of retirement income (Czajka and Denmead, 2011). This limitation is notable because the elderly have disproportionately high medical expenditures and

would presumably account for a disproportionate share of those who are identified as at risk by the MCRI. Underreporting of retirement income will upwardly bias the MCRI among the elderly. In addition, recent research suggests that the CPS may understate annual SNAP benefits by close to one-half (Meyer, Mok, and Sullivan, 2009), which means that the SPM will overstate poverty and the MCRI will overstate medical risk among the nearly 15 percent of the population currently participating in SNAP.

The limitations of the CPS ASEC measure of health insurance coverage are well known and thoroughly documented. Briefly, the CPS ASEC asks respondents about their health insurance coverage in the past year, but the survey's estimates of the uninsured compare more closely to other surveys' estimates of people uninsured at a point in time (that is, at the time of the survey or in a particular month) rather than people uninsured for an entire year, which are about half as high. Consequently, users often reinterpret the CPS ASEC measure of health insurance coverage as indicating how many people have coverage (or a lack thereof) at a point in time. If respondents are in fact answering the health insurance questions as if they were asking about their coverage at the time of the survey, then this poses no problem. If, instead, respondents are doing a poor job of answering what they correctly hear as questions about their coverage in the prior year, then the resemblance to point-in-time coverage may be merely coincidental and the responses may not exhibit appropriate covariation with other variables in the survey—or do not do so consistently over time (Davern, 2010). Findings from research using Medicaid enrollment data linked to CPS ASEC data are more consistent with the latter interpretation (see Klerman et al., 2009). For present purposes, the implication is that, despite its widespread use, health insurance coverage as measured in the CPS ASEC may not be as good a predictor of medical care risk as measures of health insurance coverage collected in other major federal surveys.

The measures of private health plan content, medical service use and medical out-of-pocket expenditures collected in MEPS are unique in their detail. One could say that they provide the standard against which the data collected in other surveys are evaluated—if there were such data collected in other surveys. The strength of the MEPS measures of health insurance coverage is more ambiguous. At least in part by design, MEPS estimates of the uninsured tend to run higher than other surveys, but Davern (2010) identified divergent trends in health insurance coverage between MEPS and several other surveys in the middle of the past decade. Between 2006 and 2008, MEPS uninsured rates turned upward, whereas CPS and National Health Interview Survey (NHIS) uninsured rates remained flat or declined. The difference was especially pronounced among children. AHRQ staff reviewed the MEPS data in detail but found no clear cause.

## OTHER SURVEYS

Although this review of available data focuses on the two surveys that are preordained to play central roles in the development and production of an MCRI, other surveys have been mentioned as candidates in the past or more recently and, for this reason, merit brief discussion.

When the NRC Panel on Poverty and Family Assistance recommended major changes in the measurement of poverty in the United States, SIPP was the survey of choice. SIPP, after all, had been designed expressly as a vehicle to support policy analysis. SIPP collected far more detailed data on income than any other federal survey, and the quality of these data was almost uniformly high. Furthermore, SIPP's design, with the collection of substantial core data in every wave and supplemental topical modules whose content varied from wave to wave, was well suited to a new poverty measure that would require new data elements but not necessarily every wave. By the time the NRC convened a workshop to review and update the recommendations in the 1995 report, SIPP's star had fallen (National Research Council, 2005). With a redesign in 1996 that replaced annual, overlapping panels with abutted panels, SIPP could no longer provide consistently representative data. Compounding this problem, evidence began to emerge that the quality of SIPP's income and asset data had deteriorated. In addition, SIPP continued to use an antiquated processing system that contributed to a decline in timeliness, and an established pattern of budget cutbacks and unpredictable sample reductions had made it clear that SIPP lacked the stability desired to support a key national indicator.

As if to underscore this last point, SIPP was terminated in 2007 and then brought back to life, but only after scores of users voiced their dismay. Although the 2004 panel was extended—with a sample cut of about one-half—and a new panel was initiated in late 2008, the Census Bureau launched a new redesign—a reengineering of the survey to collect in one annual interview what was previously collected in three waves and thereby reduce the survey's rising costs by about two-thirds. To achieve this goal, the survey will use event history calendar methods to collect monthly data with a 12-month recall. Most of SIPP's core content is being retained, and key items from annual topical modules—such as assets and both medical and work-related expenditures—will be added to the annual interviews. The new survey is scheduled to be fielded with its first round of annual interviews in early 2014, collecting data on calendar year 2013 (Fields, 2011).

To monitor the implementation of health care reform, an MCRI must be in production before the first new SIPP data are available. Thus the timing of the new design presents a serious problem for its use in either the development or initial production of an MCRI. Furthermore, while initial, small sample tests of the new design are encouraging, one cannot fully assess



the new design as yet. Another drawback, independent of the quality of the data, is that the new survey's nonoverlapping panels, if maintained, do not address the declining representativeness of individual panels over time—a limitation present in the current design since 1996. On top of these considerations, SIPP's funding history and the current budget climate raise concerns about sustained funding for the survey over time. However, the current SIPP, with panels longer than MEPS, could play a role in evaluating a prospective MCRI. In particular, such data could be useful in determining whether or not the subsequent experience of subpopulations matches their estimated risk.

The American Community Survey (ACS), which has replaced the decennial census long form, is attractive because of its exceedingly large sample size. Data are collected from 2 million households each year, and the sample can support estimates for levels of geography well below the state. The ACS would add a dimension of geographic detail to an MCRI that no other survey could match. However, in most respects the data collected in the ACS are more limited than what is collected in the CPS ASEC. The areas in which ACS data are richer than the CPS ASEC are not relevant to an MCRI. Moreover, the ACS questionnaire will not be open to revision for several years, ruling out for the near term any addition of items that would improve the survey's ability to support an MCRI, and its mandatory nature severely restricts the content that can be included. Thus the ACS does not provide a viable option for either developing or producing an MCRI.

The NHIS, which serves as the sampling frame for MEPS, is larger than MEPS, and most of its content is released on a more timely basis. The NHIS collects more detailed information on health status, which could help to enrich a prospective measure of medical care risk. On most other components of an MCRI, however, NHIS data are more limited or non-existent. Furthermore, because the MEPS sample is drawn from the NHIS sample, the data collected in the NHIS can be linked to MEPS records. In this sense, then, NHIS would add nothing in the way of content to what MEPS already provides, although the health data collected in the NHIS would be more current if used directly from the survey rather than through a linkage to MEPS, where it is 1 to 3 years older than the items collected in MEPS. The NHIS, then, is off the table as a resource for developing or producing the MCRI.

## CONCLUSION

To summarize, questions about the data available to produce an MCRI come down to what data are collected in two surveys: MEPS and the CPS ASEC. MEPS collects essentially all of the data elements that would be needed to construct alternative versions of an MCRI whereas the CPS ASEC is missing critical variables for certain variants on an MCRI. However, the

CPS ASEC will be used to produce the new SPM, to which the MCRI is intended as a companion measure. Producing both measures from the same survey would enable researchers to compare and contrast how families and individuals are classified by the two measures. Such comparisons may be particularly helpful in establishing the value added to a poverty measure by the MCRI.

The CPS ASEC does have other advantages over the MEPS as the base for an MCRI. Depending on how it is defined and constructed, an MCRI based on the CPS ASEC could be released at the same time or shortly after the SPM, or 6-7 months after the completion of data collection (and 10-11 months after the end of the survey reference period). Given current production schedules, a MEPS-based measure would require an additional year.

There is a wrinkle in this assessment, however. A prospective MCRI would depend critically on data collected in MEPS, so releasing a CPS-based MCRI at the same time as the SPM would require using MEPS data from the previous year. The other significant advantage of the CPS ASEC is its sample size, which is five times that of the largest recent MEPS samples. The greater CPS ASEC sample size would support more precise estimates generally while allowing more extensive subgroup analysis. Finally, the CPS ASEC sample consists of independent, representative samples of the 50 states and the District of Columbia and, as such, can support state-level estimates, although not with satisfactory precision in every case. If the MCRI is to play an important role in monitoring the implementation of the Patient Protection and Affordable Care Act, this property of the CPS ASEC could be invaluable.

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