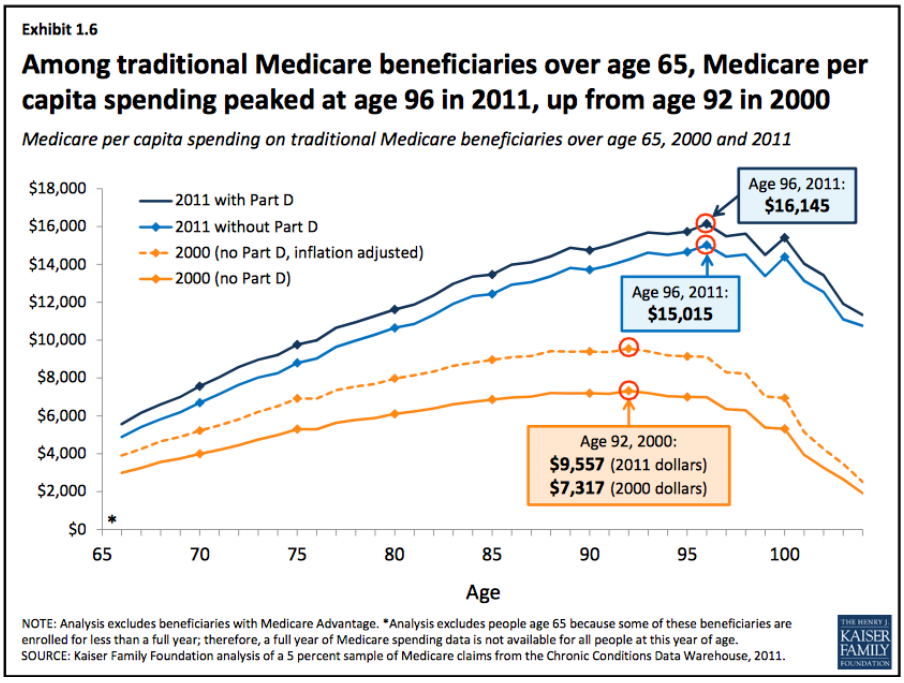
Assignment: What are the changes in spending by age and sex over time and how do these changes need to be incorporated into the long range projection assumptions?

Background

Medicare spending rises with age up to a peak, followed by a slow decline. Over time, the peak age of Medicare spending has shifted to older ages as life expectancy has increased. Life expectancy in the U.S. has grown steadily, about .17 year annually, over the prior half century. Because end of life spending tends to be high regardless of age, (about 25% of Medicare spending stems from patients in the last year of life) rising life expectancy tends to push this expensive period to later ages. This postponed end of life spending could be expected to lead to lower average spending at younger ages with higher spending at older ages. Over a longer horizon, some worry that spending projections could be too high for younger cohorts who are still years from an expensive last year of life. In addition to life expectancy trends, several papers show a steeper age profile in spending at older ages. Figure 1 below shows the outward shift in the Medicare spending peak by age comparing 2011 with 2000, and an increase in the steepness of the spending by age profile. Changes in the age profile in spending may impact long range projections of Medicare spending, depending on how differences in spending growth by age are handled.

Figure 1.
The age profile of spending has become steeper over time



Source: Neuman et al., The Rising Cost of Living Longer: Analysis of Medicare Spending by Age for Beneficiaries in Traditional Medicare, Kaiser Family Foundation, July 2016 Issue Brief

What is the assumption being discussed?

Any long range projection must explicitly or implicitly make an assumption regarding age and sex effects on medical spending and how these grow (at a constant rate for different ages, or differently by age) or change in relation to life expectancy changes. One consideration in such projections, especially for long range projections where small differences matter more, is whether spending should in some way adjust to address changes in life expectancy and or other changes to relative spending by age. In other words, is the implicit assumption of a constant growth rate at different ages reasonable?

Why is it potentially relevant?

Throughout several periods in the last few decades, spending growth has varied dramatically by age. Over the full 2000 to 2011 period, spending grew faster for those 85 and older compared with beneficiaries aged 65 to 84. As life expectancy changes, the age at which spending peaks also changes, shifting to older ages. In other words, adjusting for the postponed end of life spending as life expectancy rises will tend to lower estimated spending on younger beneficiaries while increasing spending estimated for older ages. Aside from changes in life expectancy, recent decades have included dramatically faster spending growth for older ages, attributed to increased spending on post-acute care like skilled nursing facilities and hospice at older ages (Niu et al. 2015). As a population ages, assuming a constant profile of spending by age could understate the effects of aging on spending. Together the impact on spending projections is unclear.

How is this dealt with in the current TR?

Under the current TR, the intermediate assumptions do not project any change in relative spending by age. Age-sex factors are based on the most recent 3-year average per capita cost by 5-year age groups and 85+ by sex and type of service. These factors are used throughout the 75-year projection. In the 2016 TR high and low cost projections, there is an implicit assumption of +/- 2 percent variation that encompasses changes in mortality and how age profiles relate to mortality. OACT has done some modeling on health spending relative to time-to-death suggesting that long range projections would be lower if time to death were taken into account. OACT has offered to present this preliminary work at the December meeting.

Table 1.
What are potential alternatives to be considered and potential advantages and disadvantages of each?

Alternative	Pros	Cons	Needed data
The underlying potential recommendation would be to apply differential growth rates by age-sex (and service category).	An analysis would reveal whether dramatic differences in spending growth by age could have a meaningful impact on projections.	Diverts attention from possibly more important questions requiring analysis.	Annual growth rates in spending by age over rolling 10 year periods over past 20-30 years to consider whether differential rates of spending growth by age-sex are persistent.
OACT should complete its preliminary analysis of accounting for age and time to death. The potential recommendation would be to add adjustment for time to death to projections.	An adjustment for time to death would address any swings in life expectancy, and deals with possibility of drop in life expectancy.	The pure impact of life expectancy on projections appears to be relatively small. This approach does not address faster growth at older ages before end of life.	Presentation on work to date around age and time to death.

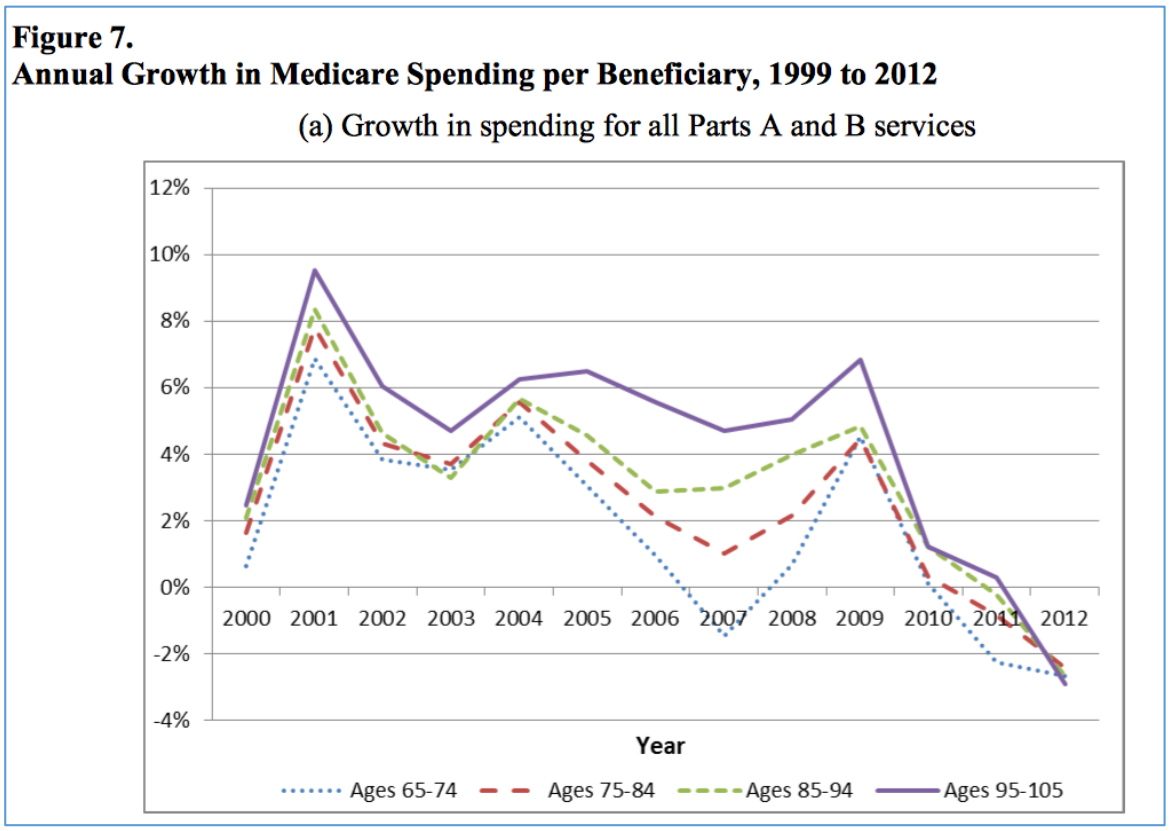
What studies or research exists to inform alternatives? (in progress)

There are two bodies of literature relative to the question of how age and sex might be handled over time. One strand of this literature relates explicitly or implicitly to the question of how spending by age shifts with growing life expectancy. It stems in part from the 1999 observation based on European spending data that age predicts spending only because it is a proxy for time to death, and spending is high at the end of life (Zweifel et al. 1999). For current purposes, however, analyses of Medicare spending seem most relevant. A second strand of literature considers how/whether spending grows more rapidly for some age groups than for others.

Spillman and Lubitz, 2000 simulated spending on Medicare covered services (in a pre-Part D period) accounting for changes in life expectancy. They first estimated cumulative spending from age 65 until death, separately by age at death, comparing spending on Medicare covered services based on a simulation of cohorts turning 65 in 2000 versus 2015 based on life tables for both cohorts. Despite an estimated 3 year rise in life expectancy over this period, Medicare covered services grew less than 1 percent.

A 2015 CBO paper compared spending by age from 1999 to 2012. It first demonstrated, much like the pattern in Figure 1, a shift outward in the age at which Medicare Part A and B spending peaked. The paper then computed the impact of life expectancy changes between 1999 and 2010 on spending using a time until death approach. Actual spending for a given age and year was compared to spending that held constant the spending for each sex and time until death group across years but allowed the composition across groups to change. The paper then reported the average annual percent difference in spending due to life expectancy, as well as the age profile of spending if life expectancy remained constant, seen in Figure 2. For most ages, growing life expectancy lowers spending. This paper concludes that life expectancy does not have a large impact on spending because the annual percent effect of rising life expectancy at each age was generally less than 1% over the 11-year time horizon studied.

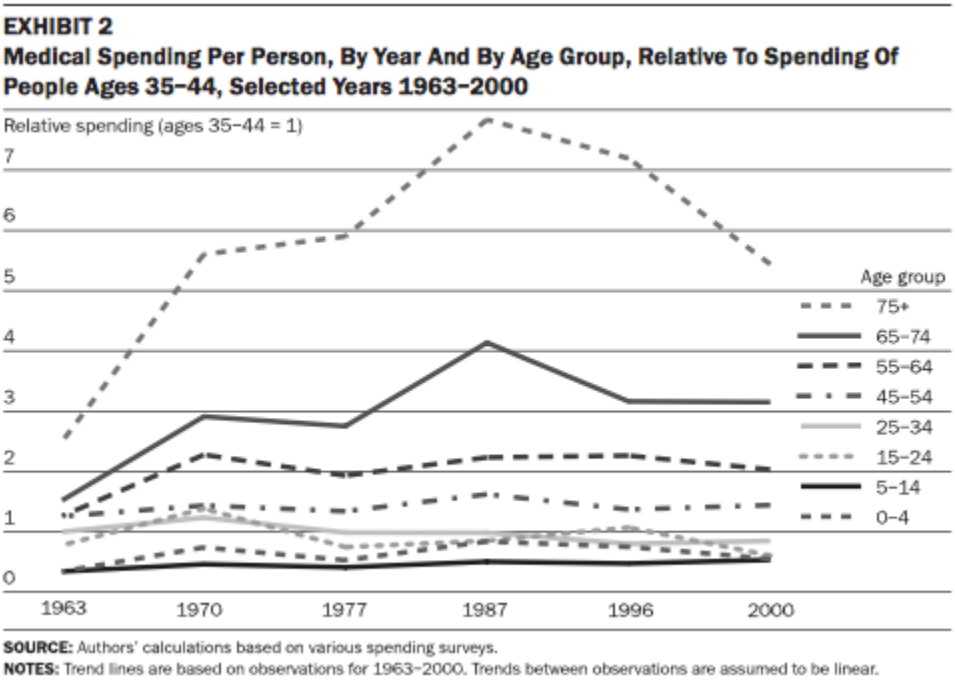
Figure 2.
Medicare spending grows at different rates by age



Source: Niu et al. 2015.

In what could offset effects of life expectancy on spending, over some long periods since Medicare began, spending growth has been more rapid for the oldest beneficiaries relative to the youngest beneficiaries. For example, spending among those aged 75 and older grew rapidly compared with younger age groups during the period from 1963 through 1987 (Figure 3 Meara, Cutler and White 2004). After a period of slower relative growth during the 1990s, spending on groups over age 85 grew more rapidly than for younger groups after 2000 (Lassman et al., 2014 and Niu et al. 2015).

Figure 3



In the literature that exists to date, the evidence is likely too course to guide decisions, since these were not focused on long time horizons, like those desired for the 75 year projection. A direct analysis of these points like that already under way and perhaps some additional data on spending by age will likely be most helpful to form panel recommendations.

References

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Zweifel, P., Felder, S., & Meiers, M. (1999). Ageing of population and health care expenditure: A red herring? *Health Economics*, *8*(6), 485–496. http://dx.doi.org/10.1002/(SICI)1099-1050(199909)8:6<485::AID-HEC461>3.0.CO;2-4