RESPONSES TO TECHNICAL PANEL QUESTIONS ON CONTRIBUTION OF DEMOGRAPHIC CHANGE TO SPENDING GROWTH

Question 1: *Should the ratio of spending per enrollee by age cohort vary over the projection? Assumption of constant ratio of spending per enrollee by age cohort appears to be inconsistent with data that shows spending per enrollee growing faster for the oldest cohort (85+ years) as compared to the younger cohorts.*

Ellen Meara and Austin Frakt submitted a memo (12/19/2016) that addressed the relatively rapid growth in spending per enrollee for the oldest age cohort. The current methodology for estimating the contribution to spending growth based on shifts in the demographic composition of Medicare enrollment assumes that the ratio of spending per enrollee across age cohorts will remain constant over the projection. If these ratios change over historical data, this raises the question of whether the assumption of constant spending ratios should be relaxed over the projection.

This issue can be broken down into three relevant questions:

1. What causal factors are driving the differing rates of spending growth by age cohort in the historical data?
2. Will those factors continue to influence relative spending growth over the projection (and if so, for how long?)
3. How could the current methodology be adjusted the effects of changing spending ratios?

Our analysis of the patterns in spending growth by age cohort breaks down the data into more detailed categories by types of service and by time-to-death (TTD). We find that there are two causal factors that when combined, fully account for the increase in the ratio of spending per enrollee for the 85+ years age cohorts relative to the 65-69 years age cohort. These factors are, first, rapid growth in utilization of skilled nursing facilities (SNF) and hospice care. The distribution of spending on SNF and Hospice services is highly skewed towards older age cohorts in comparison with other types of medical care. Thus, rapid growth in these areas drives relatively faster growth for older cohorts. A second factor is the change in the distribution of enrollment by TTD within age cohorts, which over the historical period had a less negative impact on the 85+ years cohort than for the 65-69 years cohort. Table 1 shows the contribution of these various factors.

Table 1
Ratio of spending per enrollee for 85+ years age cohort vs 65-69 years age cohort

	1991	2012	% growth 1991-2012
Ratio of 85+ to 65-69 PMPM spending, 2014$	2.13	2.60	23
Increase explained by TTD			7
Increase explained by SNF and hospice			19
Residual			-3

Over this period the growth in per beneficiary spending for an average 85+ outpaced the growth rate for 65-69 year old by about 23% (roughly 1% per year). However, when the TTD dimension is accounted for roughly one-third of the difference is accounted for. Additionally, if the very large spending increases associated with SNF and hospice care are excluded then the remaining two-thirds of the difference is explained.

Are these two factors likely to continue to influence relative spending by age cohort over the projection?

Changes in the distribution of enrollment by time-to-death will continue to be an issue over the 75-year projection. This suggests that it may be reasonable to take TTD into account in the demographic adjustment in order to build in the effect of this factor over the projection.

It is likely that the rapid growth in SNF and hospice care that is the largest factor in explaining the relatively faster growth in spending per enrollee for older age cohorts was a one-time effect that is largely limited to the historical period. This effect is effectively controlled for over the short-term projection under the current OACT assumption, which projects different rates of growth by type of service. The rapid growth in SNF and hospice care over the historical period is assumed to taper off in the early part of the projection and not require further adjustment over the 75-year projections horizon.

Question 2: *How do effects of controlling for shifts in enrollment by TTD vary across types of services?*

The OACT presentation on demographic methodology to the Technical Panel (12/6/2016) focused on the contribution of demographic change to spending growth at the level of all services covered by Medicare Parts A and B, and in particular, on the effects of controlling for TTD at this aggregate level. However, the calculation of the effects of demographic change actually occurs at a more detailed level; there is an index of demographic effects for each individual type of services. The aggregate effect is a weighted average of effects for each type of service. Members of the panel raised the question of how much variation exists in the estimated demographic contribution by type of service, and how controlling for variation by TTD would differentially effect the types of services.

There is indeed variation in the estimated effect of demographic change by type of service that is a function of the base-year distribution of spending per enrollee. The distribution of spending for some types of services tends to be more concentrated in older age cohorts (e.g. SNF, Hospice, Home Health) relative to others (professional and outpatient services). There is also considerable variation in the impact of controlling for TTD by type-of-service, since the distribution of spending for some types of services is relatively concentrated in the last years of life (inpatient, Hospice).

Chart 1
Contribution of demographic change to real Medicare spending growth by type of service: Age-Sex Index

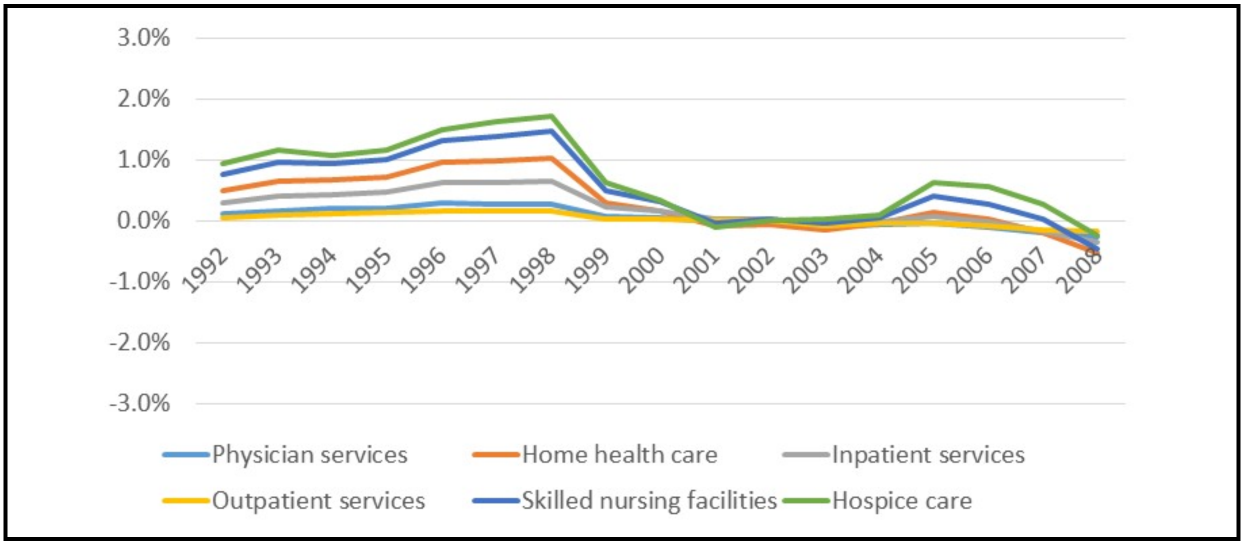

Chart 2
Contribution of demographic change to real Medicare spending growth by type of service: Age-Sex-TTD Index

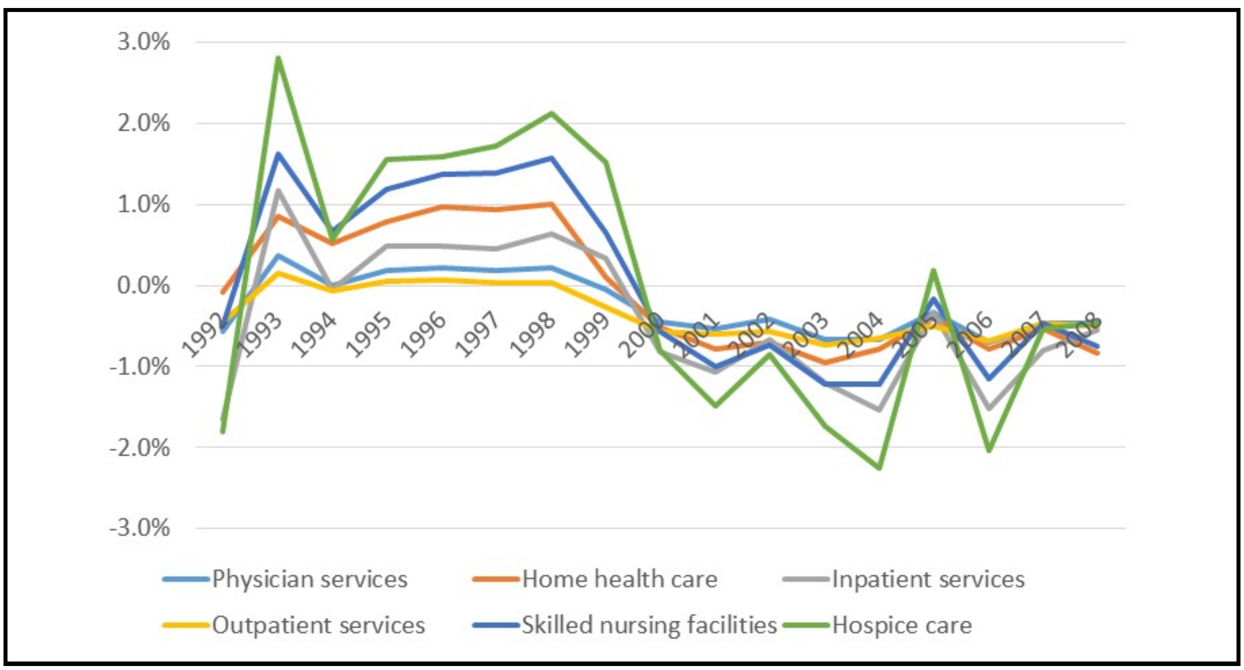

Table 2
Average annual contribution of demographic change to growth in Medicare spending PMPM based on Age-gender versus Age-gender-TTD methods

	Age-Sex-TTD	Age-Sex	Differential: Age-Sex-TTD – Age-Sex
Total	-0.30%	0.16%	-0.45%
Professional services	-0.23%	0.05%	-0.28%
Home Health	-0.07%	0.29%	-0.36%
Inpatient Care	-0.37%	0.19%	-0.56%
Outpatient Care	-0.32%	0.03%	-0.34%
Skilled Nursing Facility	0.04%	0.50%	-0.46%
Hospice	0.00%	0.67%	-0.67%

The historical impact of controlling for TTD on the contribution of demographics to spending growth varies by type of service as shown in Table 2 above. The effect of adjusting for changes in the distribution by TTD is negative in all cases; however, the differential between an Age-Sex-based adjustment and an Age-Sex-TTD based adjustment is largest for hospice and for inpatient care, and smallest for professional and outpatient care. The implication is that controlling for the effects of shifts in TTD could be expected to reduce the contribution to spending growth attributable to demographics by a greater degree for Medicare Part A than for Part B.

Question 3: *Consider a simpler alternative to the proposed Age-Sex-TTD methodology that would control for variation in spending per enrollee for two categories (decedents and survivors) rather than multiple TTD categories.*

OACT has presented a possible alternative methodology for demographic adjustment of spending growth that would control for shifts in enrollment across TTD categories as mortality rates improve over time. Dale Yamamoto suggested consideration of a potential simplified version of this TTD methodology for estimating the contribution of demographic change.

The TTD methodology as proposed by OACT tracks shifts in the distribution of Medicare FFS enrollment across five TTD categories: TTD=0,1,2,3,4,5+ years. Projecting the distribution of enrollment across these five categories requires a simulation based on Monte Carlo methods to produce a simulated distribution that is consistent with SSA projections of mortality rates by age and sex. Dale suggested a simplified alternative method that would track only variation in two TTD categories: TTD=0,1+. This is equivalent to tracking shifts in enrollment between decedents and survivors in any projected year. Such a method would capture part of the variation attributable to projected improvements in mortality rates over time, but would not require a simulation of the distribution of enrollment by TTD, as the change in the distribution between survivors and decedents is a direct implication of the SSA mortality rate projections.

The key advantage offered by this simplified alternative method as compared to a richer representation of the distribution across five TTD categories would be greater simplicity of methodology, which would contribute to the objectives of transparency. It is fairly easy to understand the idea of estimating the effects on spending of a rising share of surviving enrollees (with lower spending per enrollee) and a declining share of decedents (with higher spending per enrollee). It is somewhat more complicated to understand a method that rests on the simulation of a more detailed distribution of enrollment across multiple TTD categories, with declining spending per enrollee as time-to-death increases. However, for implementation purposes, there is actually little practical difference in complexity, as the programming required to generate this simulated distribution over the 75-year projection has already been completed, and little additional work is required for maintenance.

To evaluate the proposed simplified TTD option, OACT generated estimates of the effects of controlling for shifts in enrollment by TTD for varying levels of detail, with the simplest option being the survivor/decedent model. Three alternatives were considered:

1. TTD=0,1,2,3,4,5+ years
2. TTD=0,1,2+ years
3. TTD=0,1+ years (survivor/decedent model)

As shown in Chart 3, the level of detail involved in tracking shifts across TTD categories makes a systematic difference in the estimated contribution of demographic change to spending growth in any period where mortality rates are changing. Enrollment shifts across the TTD categories from 1 to 5+ years account for an additional negative contribution to spending growth beyond the effect associated with changes in the distribution between decedents and survivors.

The extent of the difference in impact for varying levels of detail by TTD is related to the rate of improvement in the mortality rate. For the period 1991-98, there is little difference between the estimates, because there is little movement in the distribution of enrollment across TTD. However, for the period from 1999-2008, where mortality rates improved substantially, the difference is significant.

A negative differential resulting from controlling for TTD at a higher level of detail is implied for any period where improvements in mortality continue, which implies that a negative differential would persist over the 75-year projection. Given that the projected rate of mortality improvement over the 75-year projection is slower than was the case for the period from 1999-2008, the differential between these methods would be smaller than we see historically.

Chart 3
Estimated contribution of demographic change by Age, Sex, and TTD to growth in real per enrollee spending growth, 1992-2008

T=0,1+	-0.43 (blue)
T=0,1,2+	-0.57 (red)
T=0,1,2,3,4,5+	-0.70 (green)