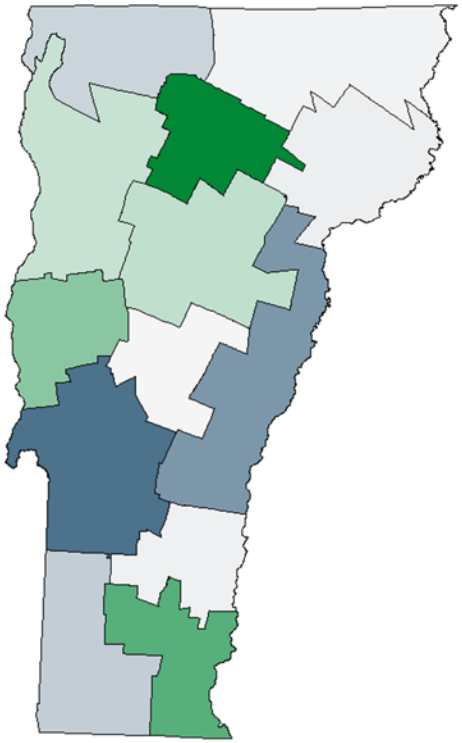


Changing Ages of Vermonters with Health Coverage

and its impact of the cost of health care

Zachary Sullivan
Senior Health Care Analyst
June 16, 2015

VERMONT
GREEN MOUNTAIN CARE BOARD

Motivating Questions

How is the insured population distributed?

How is that population changing?

Corollaries:

What are the cost implications of the current distribution?

What are the cost implications of the changes?

Context

Three Drivers of Utilization*

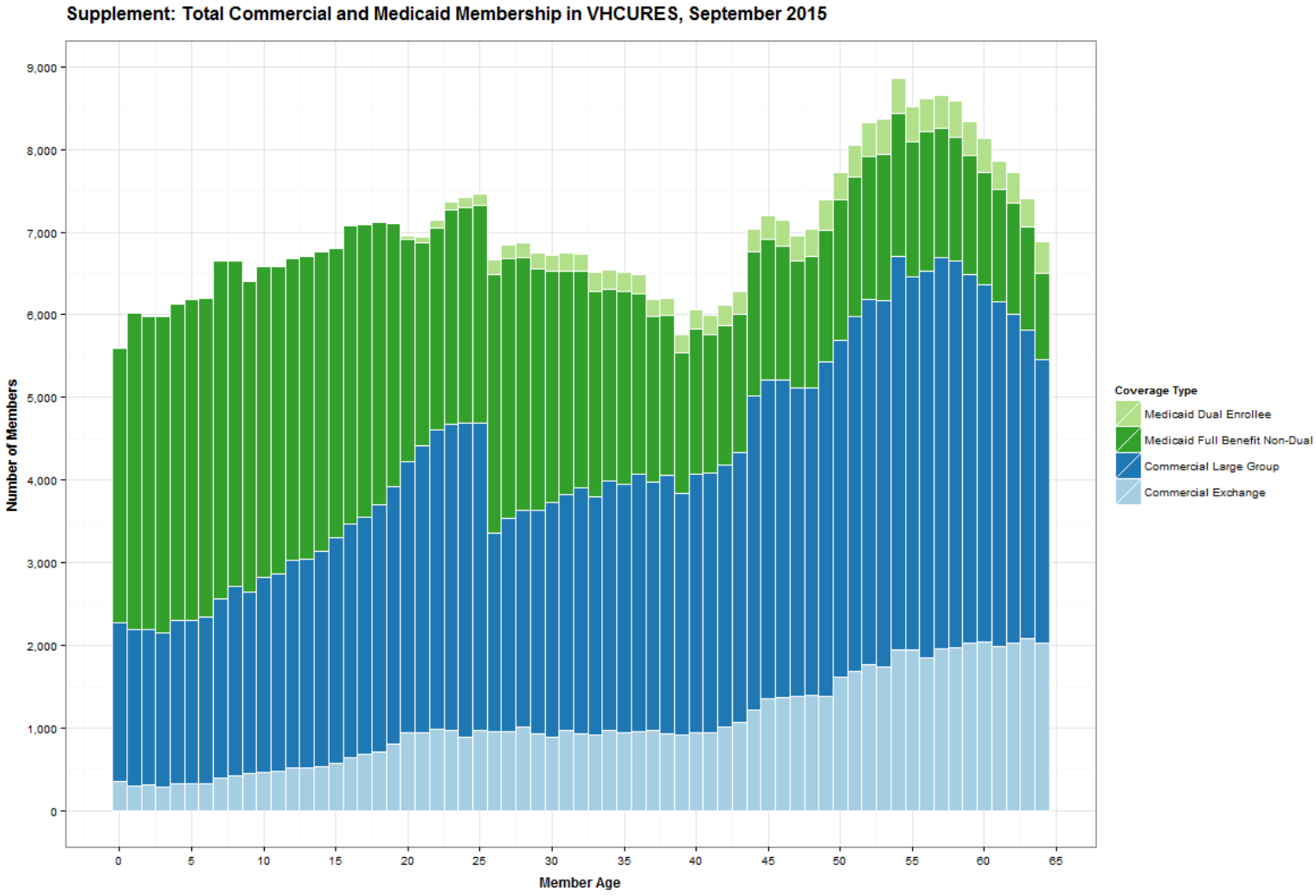
1. **Population**
2. **Prevalence of Disease**
3. **Treatment Patterns**

This analysis deals with population.

This is a factor that we can't control, but that we need to understand to set a baseline.

* Utilization driver model from Steve Kappel

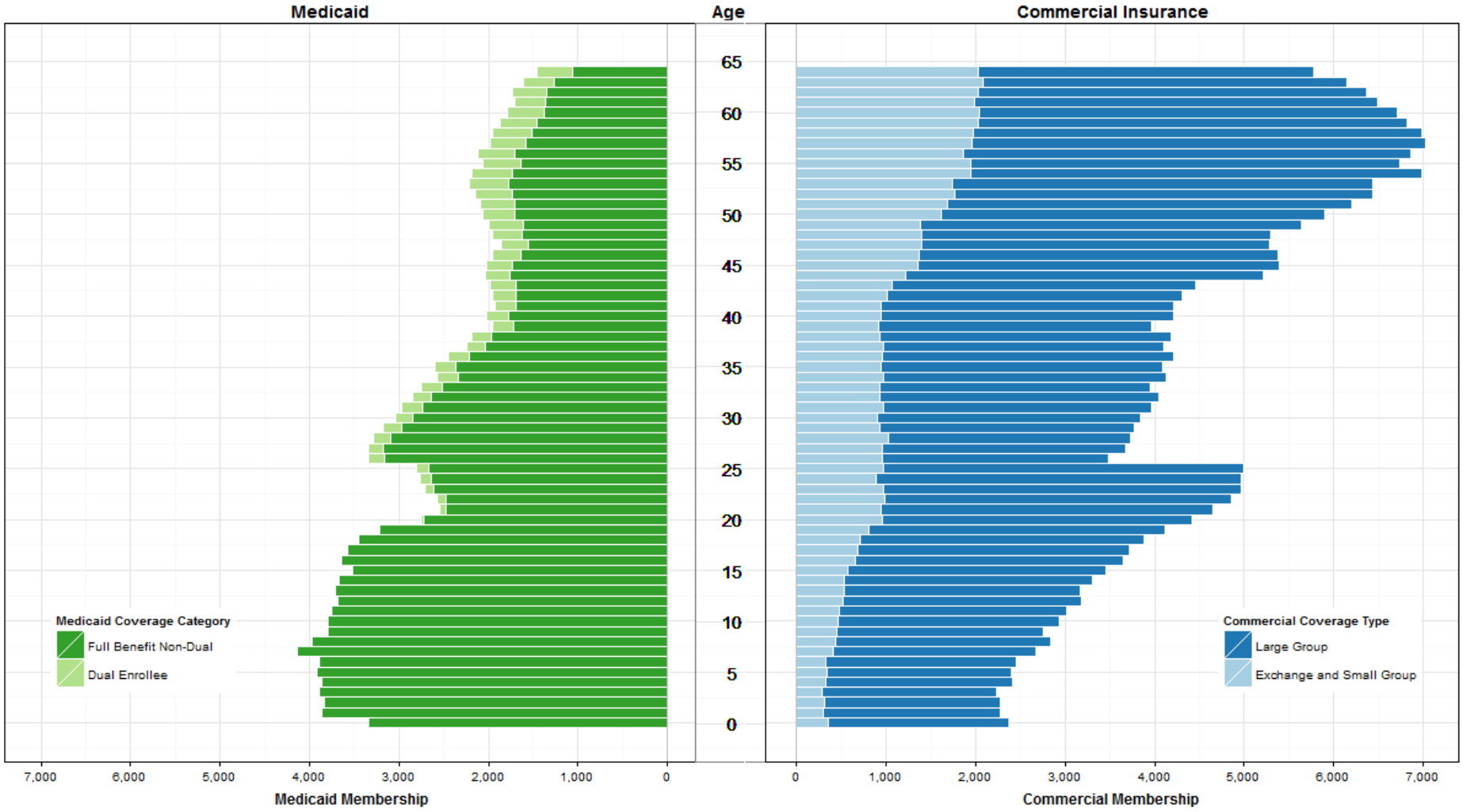
Total Age Distribution



VERMONT
GREEN MOUNTAIN CARE BOARD

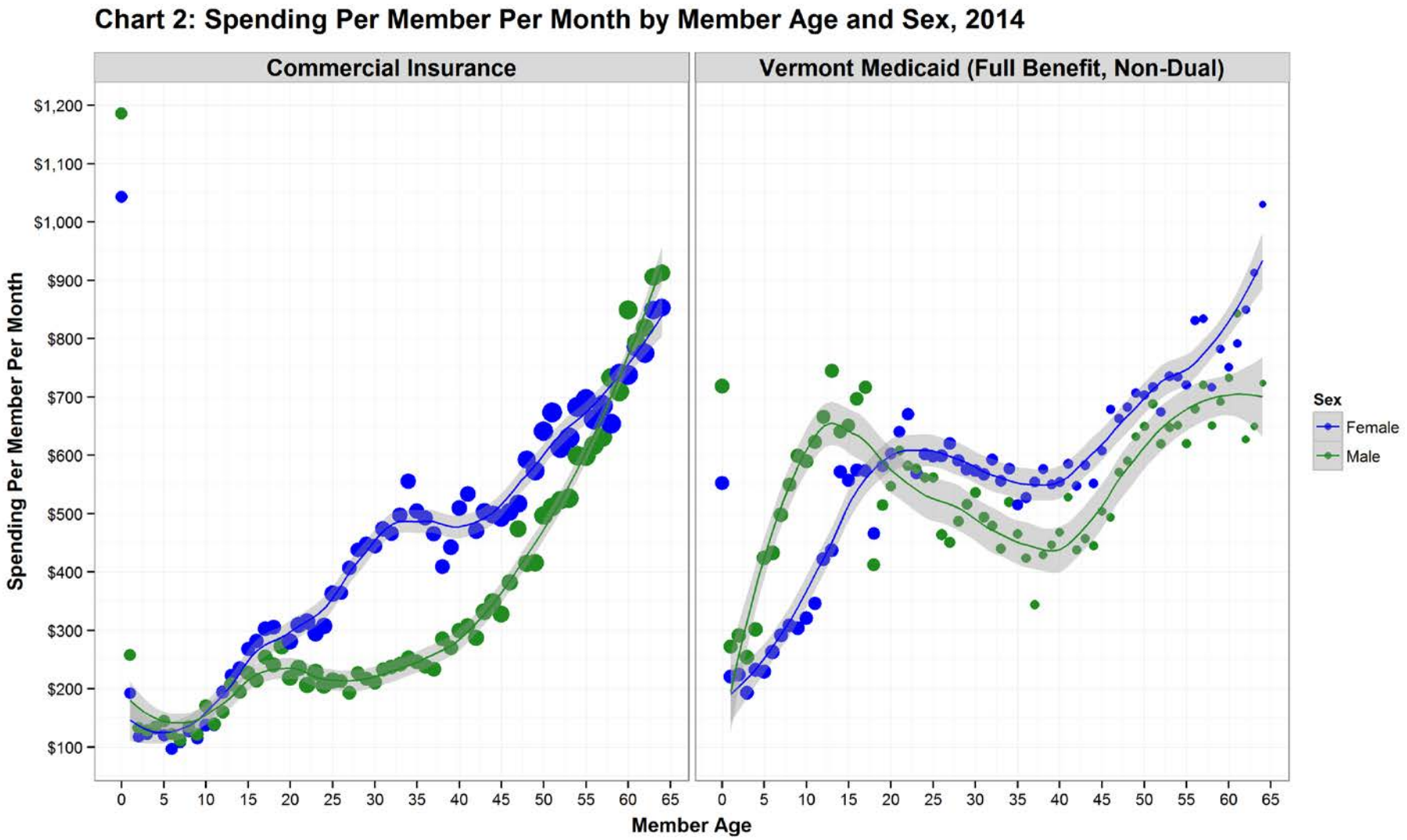
Age Distribution By Payer

Chart 1: Commercial and Medicaid Membership by Age, September 2015



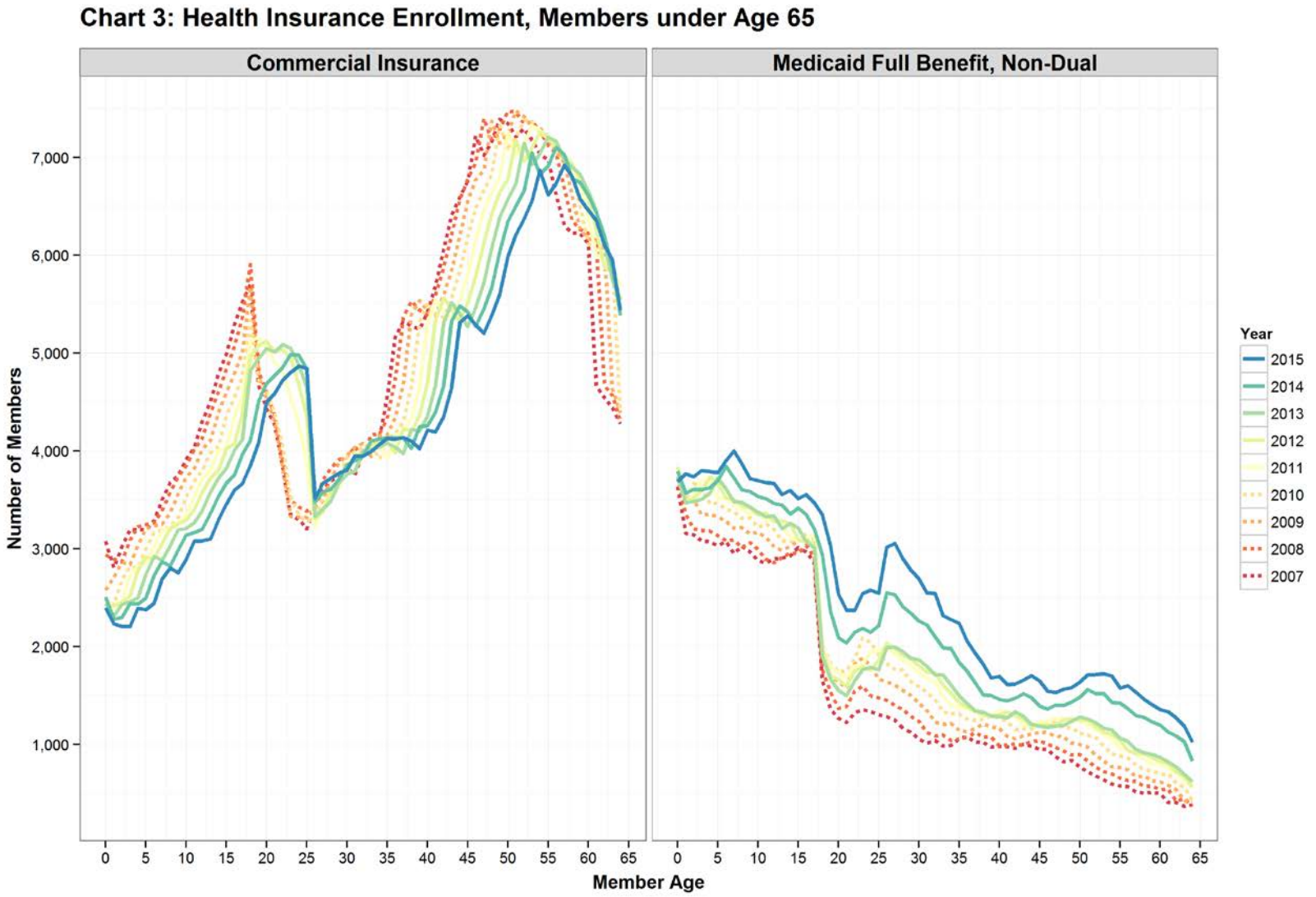
VERMONT
GREEN MOUNTAIN CARE BOARD

Spending by Member Age



VERMONT
GREEN MOUNTAIN CARE BOARD

Changing Age Distribution



VERMONT
GREEN MOUNTAIN CARE BOARD

Impact of Changing Age Distribution on Commercial Spending

Table 1: Commercial Insurance: Changes Explainable by Demographic Shifts

Time Period	Baseline Total Spending	Original Calculation		Simulation		Smoothed Curve	
		Change	Increase	Change (± 0.2%)	Increase	Change	Increase
2007-2008	$ 1,224,952,186	$ 11,467,551	**0.94%**	$ 11,219,479	**0.92%**	$ 11,073,297	**0.90%**
2008-2009	$1,319,886,841	$ 19,148,209	**1.45%**	$ 18,944,934	**1.44%**	$ 18,043,562	**1.37%**
2009-2010	$1,386,455,019	$ 14,582,787	**1.05%**	$ 14,068,661	**1.01%**	$ 14,424,668	**1.04%**
2010-2011	$1,406,069,654	$ 3,354,973	**0.24%**	$ 3,082,689	**0.22%**	$ 3,376,988	**0.24%**
2011-2012	$1,455,148,805	$ 2,493,026	**0.17%**	$ 2,441,819	**0.17%**	$ 2,482,909	**0.17%**
2012-2013	$1,473,342,402	$ 6,150,989	**0.42%**	$ 5,651,418	**0.38%**	$ 6,282,753	**0.43%**
2013-2014	$1,537,391,108	$ 8,624,852	**0.56%**	$ 8,119,119	**0.53%**	$ 9,018,842	**0.59%**

Questions?

Documentation – Baseline Data

Data Source:

All data is from the Vermont Health Care Uniform Reporting and Evaluation System (VHCURES), 3rd Quarter 2015 Extract.

Enrollment Data:

- Enrollment data gives de-duplicated member months for major medical insurance. Behavioral health only coverage (typically for members with separate major medical coverage) is excluded.
- Total Age Distribution (Supplement) and Age Distribution by Payer (Chart 1) show enrollment for September 2015.
- Changing Age Distribution (Chart 3) shows average annual enrollment for each year. 2015 enrollment is based on January to September enrollment, weighted to give the average over those months.
- Member ages are attached to each individual member month: most individuals will contribute data to multiple are groups in a given year. A member who turns 42 on April 1st will contribute 3 months (January, February, and March) to the 41 year old group, and the remaining 9 months to the 42 year old group. Average annual enrollment is calculated as the total member months per group divided by 12 (9 in 2015).

Per Member Per Month Spending:

- Spending totals are allowed amounts from primary claims for Vermont residents. This takes spending from both medical and prescription drug claims. Member age is the age from the enrollment month that covered the claim. Spending by Member Age (Chart 2) uses claims with a first service date in 2014.
- Member months are total member months in 2014 for major medical insurance only. This assumes that any member with prescription drug coverage will also have medical coverage. Member months are assigned to age groups based on the age in the coverage month.

Documentation – Cost Impact Estimates

The cost impact of aging (Table 1) was estimated using 3 separate models. All three models used actual populations, but differed in how they estimated expected spending. The models were:

1. A calculation of the amount of spending that would have been expected if the population had maintained the same age distribution as the previous year, but used the current year's spending PMPM.
2. A simulation selecting repeated samples of the population to estimate the group PMPM. This method selected 10% samples of the population to calculate PMPMs, which was intended to limit the effects of high-cost patients.
3. A calculation using a smoothed curve in place of actual spending to predict spending per group. This used a Loess smoother with a span of 0.25 to estimate the expected spending for each group. The curve was fit to multiple years' data, which was normalized to a standard scale be defining each year's spending amounts as the ratio of the group's PMPM to the population PMPM.

All three models answer the same fundamental question: "What would the health care spending have been if the population's age distribution stayed constant?" They use the most recent spending rates to account for changes in prices, utilization patterns, and potential new technologies. This impact is calculated as follows:

Current Year Group Actual = Current Year PMPM * Current Year Total Population * Current Year Share in Age Group

Current Year Group Expected = Current Year PMPM * Current Year Total Population * Reference Year Share in Age Group

Difference due to age changes in that age group = Current Year Group Actual – Current Year Group Expected

The total change in spending due to changes in the age distribution is the sum of all of the changes due to age distribution in the specific age groups.

Members were grouped into 5 year age groups (ie 30-34, 35-40, etc), with the following exceptions:

- Newborns (age 0) were treated as their own group
- Ages 1-17 and 18-24 were grouped

Documentation – Cost Impact Assumptions

The estimates of the impact of spending changes assume that enrollment and spending would be the same in the counterfactual situation (the expected amount under a different population distribution). We do not actually make assumptions in the case of enrollment: because the total available population is used and we use the actual population distribution, there are no enrollment assumptions. We do make the following three assumptions about spending:

1. Members in the reference year and current year populations use similar services.
2. Population shifts do not change the services provided in a way that inflates new spending.
3. Population shifts do not change the level or quantity of services provided.

Assumption 1 likely holds for commercial insurance because changes appear to be largely driven by aging: if the members who are currently younger look like the older members did when they were at the same ages, we expect their needs to change in similar ways. This assumption is significantly less likely to hold for Medicaid, however. If changes in policy are driving changes, the newly added members likely will not need the same types of services as the existing members.

Assumption 2 is likely false, but in a way that we interpret to be a natural consequence of the changes in the population. The presence of the baby boom likely created new markets for services, so the services provided to them may have changed. This is a natural consequence of large national trends, however: it seems unlikely that such a significant demographic shift could occur without changing the demand for services, and without seeing the supply change to meet this demand. Because of this, we consider it appropriate to include the impact of these new services in the increased spending for older groups.

Assumption 3 is potentially the most problematic. As needs increase with an aging population, the relatively decreased pool of providers may lead to a decrease in supply-sensitive care. At the same time, services that are only available to the young, such as pediatrics, could potentially see an increase in supply-sensitive treatment. As the population ages, these effects will tend to decrease the impact of aging, as in Vermont effects of care for the elderly will likely overwhelm any opposite effects in younger populations. This impact will be incredibly difficult, if not impossible, to measure because it will occur within a health care system which is rapidly changing.