Impact of Obesity on Projected Hospital Utilization

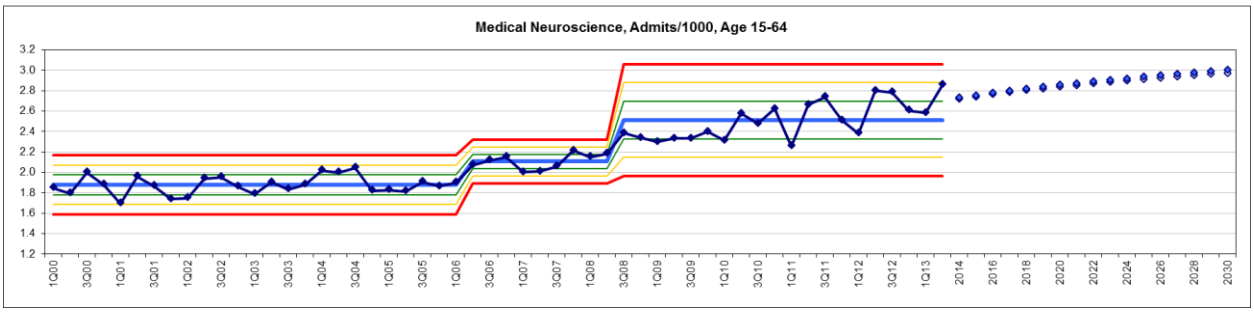
March 9, 2014

Introduction

Various efforts are underway to reduce hospital utilization, especially ambulatory sensitive admissions and 30-day any cause readmissions. The prevalence of obesity in the service area, however, threatens to offset those efforts. Obesity is a contributing factor, if not the root cause, for many health problems. Unless the trend of increasing obesity prevalence is reversed, this subset of the population will continue to affect hospital utilization trends for the service area as a whole.

Background

Back in Fall 2013, the following trend line for our service area caught our attention:



When we examined the diagnoses within neurosciences, the answer to the growth in this trend line was strokes. What was causing an increasing incidence of strokes in the 15-64 age group? The answer turns out to be that strokes are linked to obesity, hypertension and diabetes, all of which are increasing in our service area population.

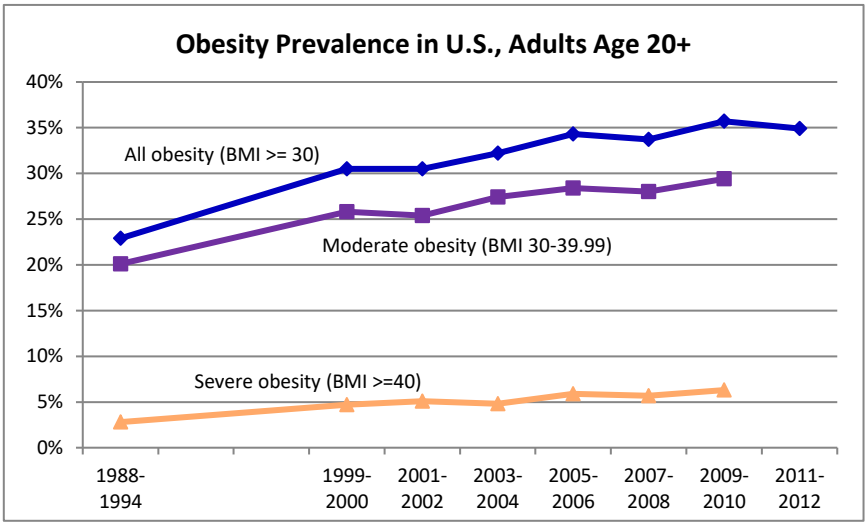
The following analysis looks at obesity as a systemic risk to our inpatient volume projections (base and Sg-2) for declining inpatient use rates within the service area population.

Definition of Obesity

The CDC's National Health and National Examination Survey (NHANES) and the Behavioral Risk Factor Surveillance System (BRFSS) both measure obesity at the national level. The BRFSS, which is jointly conducted by state health departments and the CDC, also has state and local data. In both of these surveys, obesity is defined using body mass index (BMI).

- Obesity: BMI >= 30, the equivalent being 5'10" and weighing 209 pounds.[1] [2]
- Severe obesity: BMI >= 40, the equivalent being 5'10" and weighing 278 pounds. This is also called Class III obesity or extreme obesity.[3] [4]

Nationally, the prevalence of both obesity and severe obesity has increased dramatically over the past 20 years, but recently growth has slowed.[5] [6]



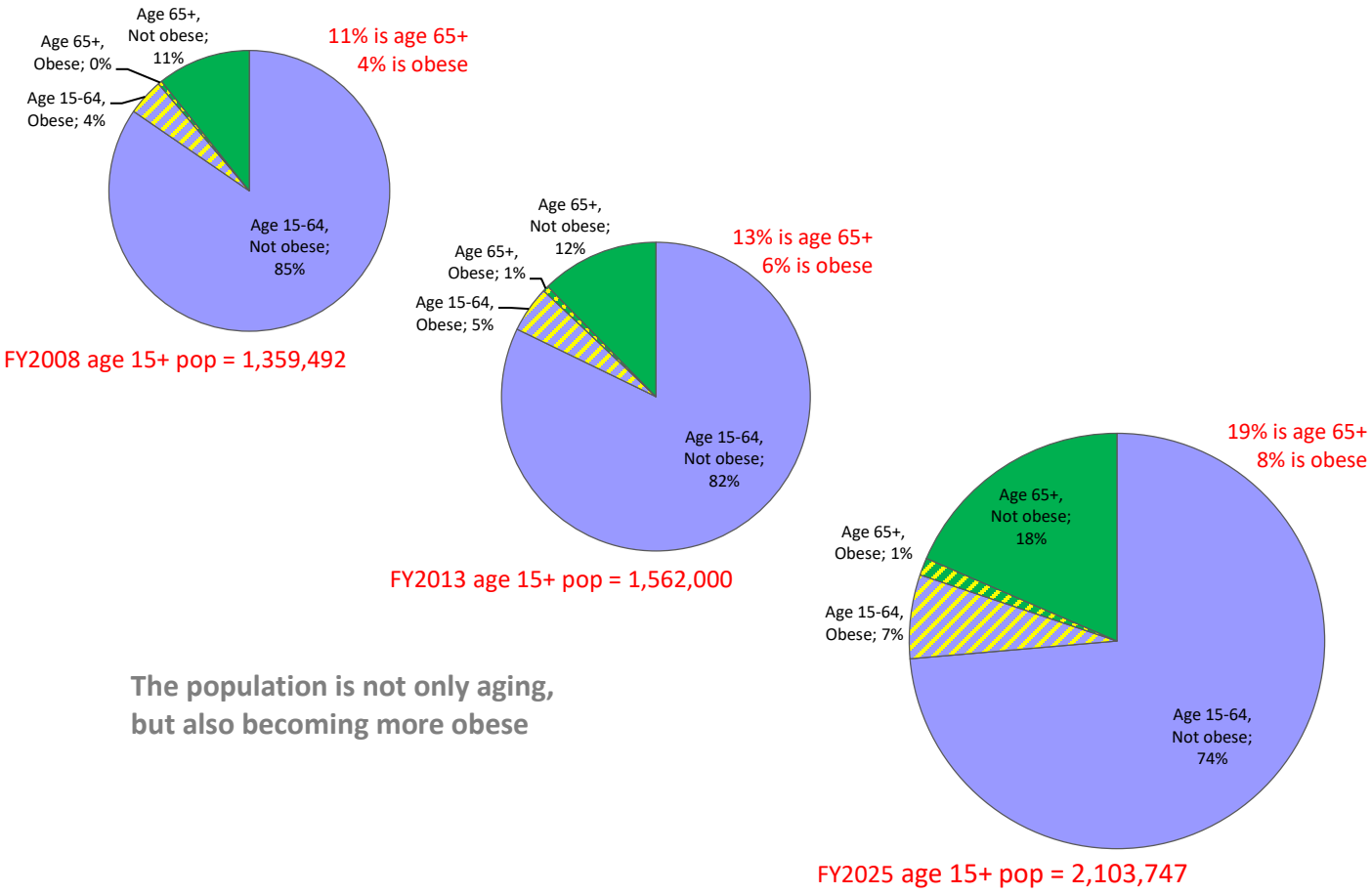
Service Area Demographics

Population projections by age group are provided by Harner and Associates. Harner expects almost 20% of the service area population to be age 65+ by 2025, up from 13% in 2013.

BRFSS data is used as the basis for calculating service area obesity prevalence. Data is readily available for the state and service area for obesity prevalence, but not severe obesity. Local rates for severe obesity were estimated using a combination of local rates for obesity and national rates for severe obesity.

Studies projecting the prevalence of obesity use the BRFSS as a base, but there are different opinions on how much the obese population will increase in the future. *F is for Fat*, a report by Trust for America's Health and the Robert Johnson Wood Foundation uses a linear approach and expects the prevalence of obesity to around 50% by 2030.[7] Another study that appeared in the American Journal of Preventive Medicine used BRFSS data, along with other variables such as food prices, to project national rates for obesity and severe obesity through 2030. This study expects the prevalence of obesity and severe obesity to 42% and 11%, respectively.[8] The AJPM study's more conservative results are used to calculate the projected prevalence of obesity and severe obesity for the service area.

Health problems associated with obesity are much more pronounced among the severely obese than those who are at a lower level of obesity.[9] Therefore, this analysis focuses on severe obesity. ***Obese in the remainder of this analysis refers to those who are severely obese (BMI >= 40).***



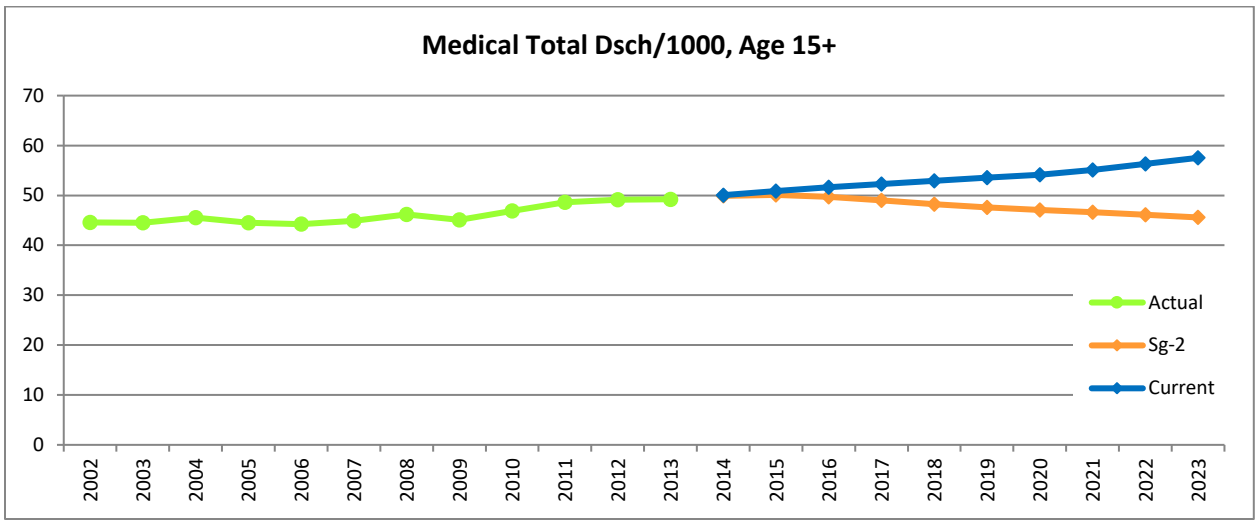
Service Area Inpatient Utilization

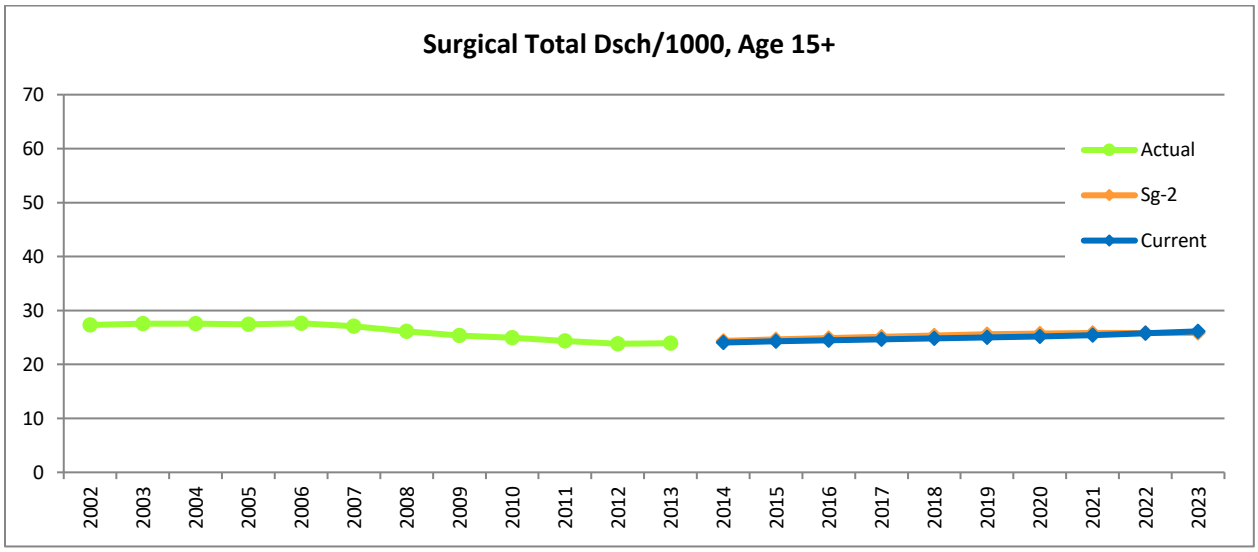
Service area utilization rates are based on data collected by the Patient Data System (PDS), a partnership between the Texas Hospital Association and Truven Health Analytics. Data collected by the state (Texas Health Care Information Collection) is used for the handful of small and/or rural hospitals that do not participate in PDS.

Base utilization rates, excluding obstetrics, are calculated by medical/surgical and age cohort (15-44, 45-64, 65-84, 85+). Historical trends are then used to project future rates. With the exception of medical discharges/1000 for age 15-44 and 45-64, all rates are declining. Much of the increase in base rates for age 15+ overall is due to aging in the population.

Sg-2 utilization projections are a benchmark for estimates of reducing inpatient utilization. Sg-2 expects inpatient utilization, especially medical, to decline due to not only technological advances,

but also better coordination of care and reductions in ambulatory sensitive admits and 30-day readmissions.[10] In the charts below, "Current" refers to base utilization rates.

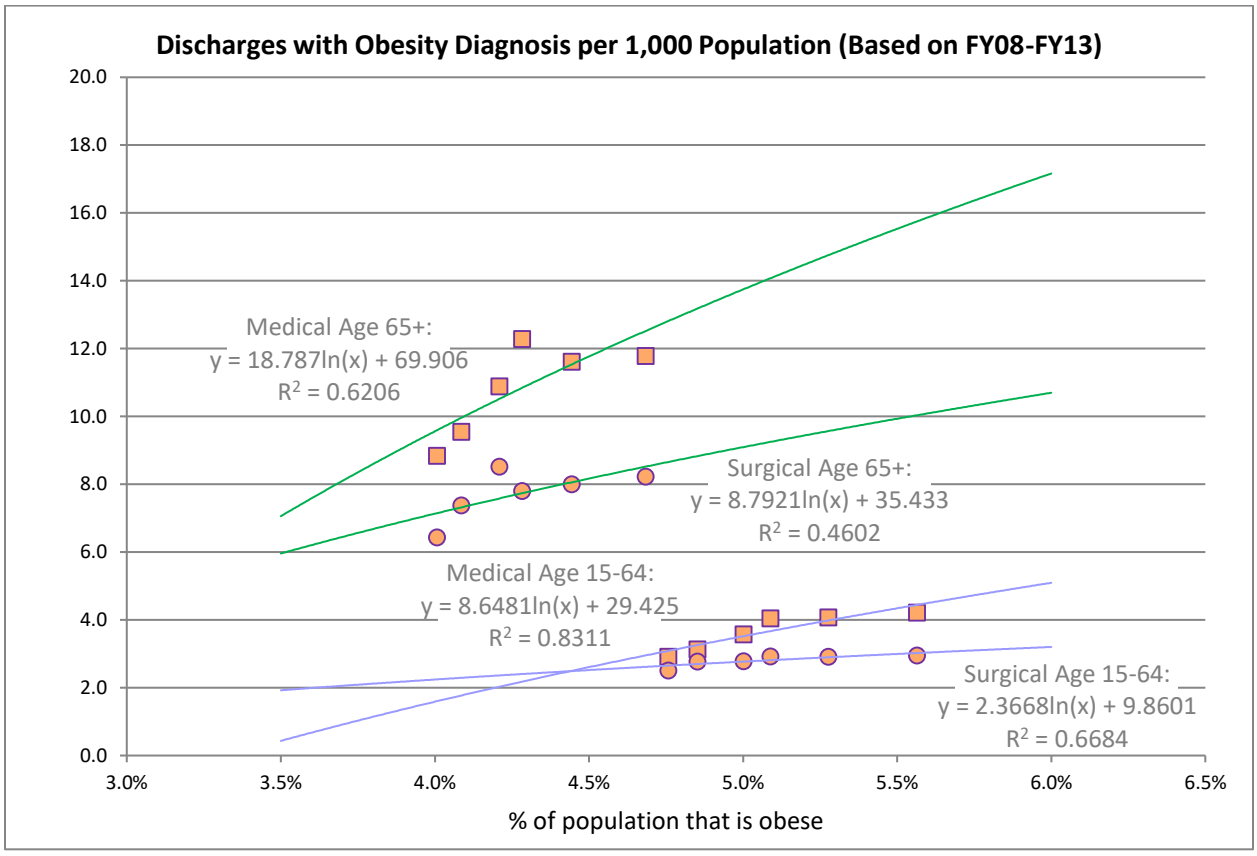




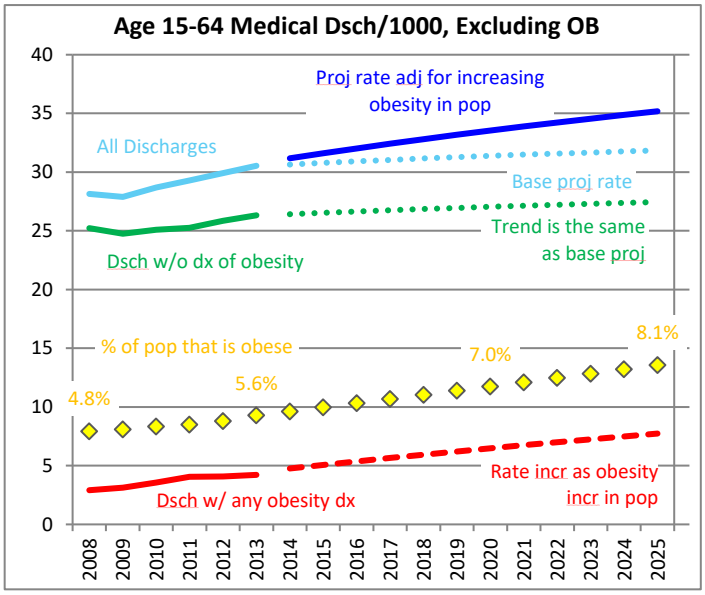
Calculating the Impact of Obesity on Projected Utilization Rates

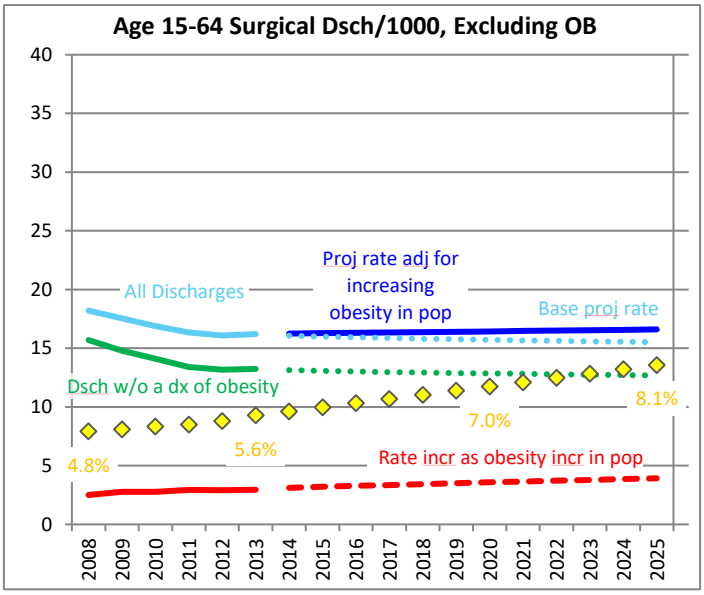
Obesity is associated with higher rates of many diseases and chronic conditions including type 2 diabetes, hypertension, stroke, heart disease, arthritis and some types of cancer.[11] Additionally, obese individuals are at greater risk for septicemia and pulmonary disease.[12] [13]

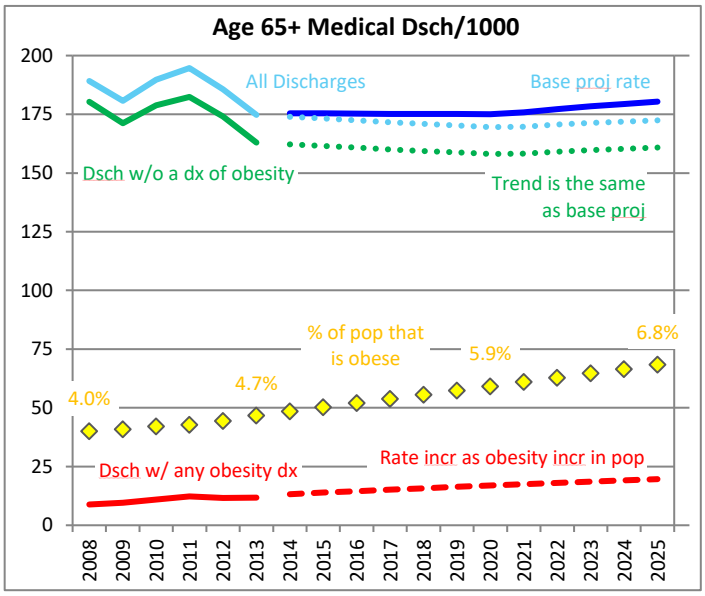
Not all obese patients, however, receive an obesity diagnosis (primary or secondary) during an inpatient stay. Therefore, any inpatient rate calculated for the obese population dramatically understates hospital utilization for that population. Instead, an inpatient rate for patients with an obesity diagnosis was calculated against the total population. This rate was then compared to the prevalence of obesity in the population, and trend lines were calculated.

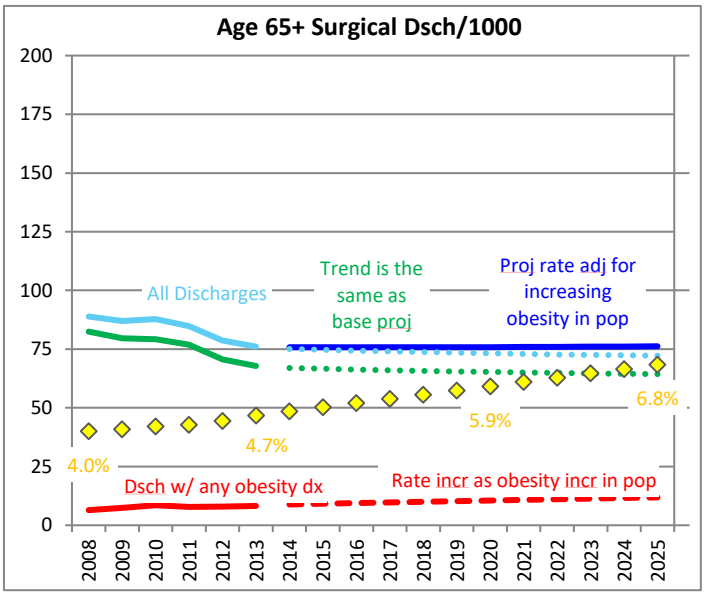


The trend lines were used to project how much rates for patients with an obesity diagnosis will change as obesity prevalence increases. A separate discharge rate, also calculated against the total population, was produced for patients without an obesity diagnosis. This non-obesity rate was assumed to follow the same pattern of change as the overall base rate. The rates for patients with an obesity diagnosis and patients without an obesity diagnosis were added together to obtain an overall obesity adjusted rate for the population.

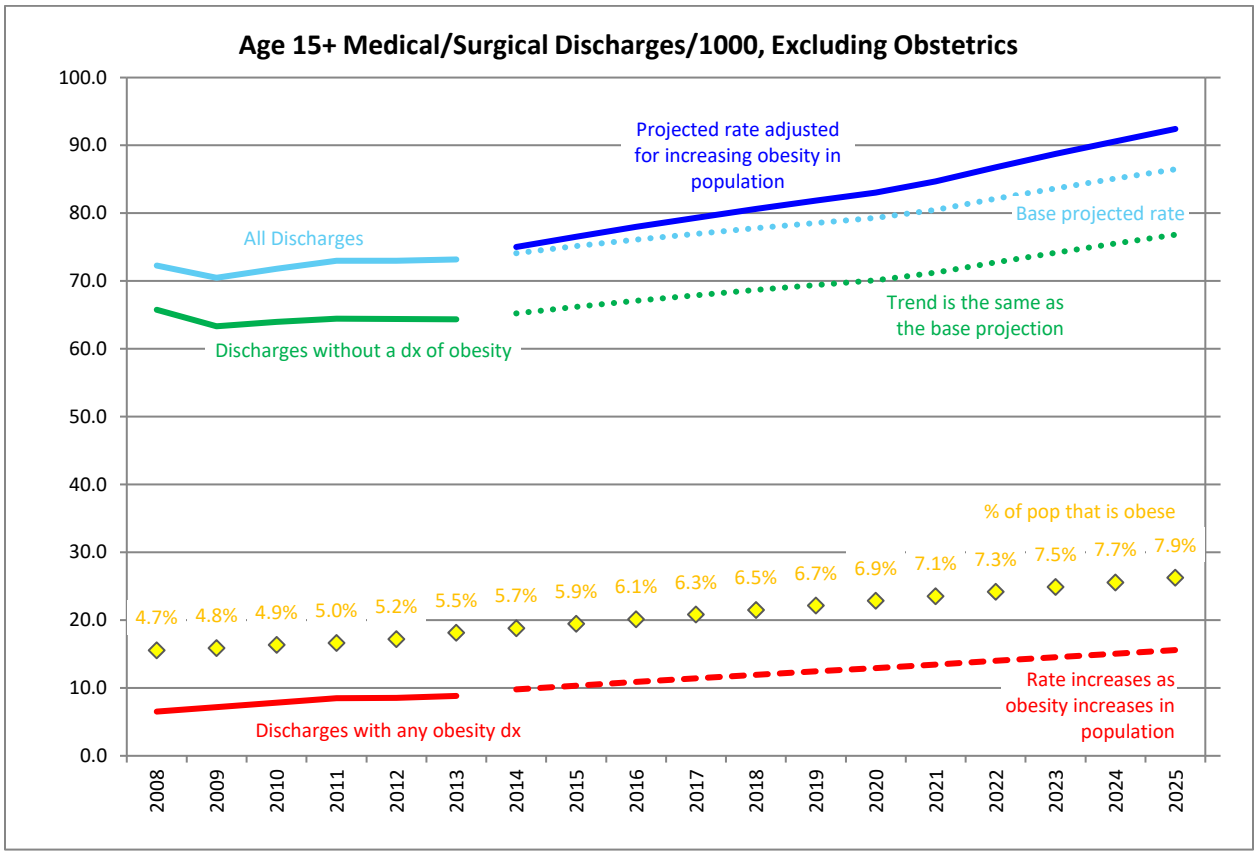




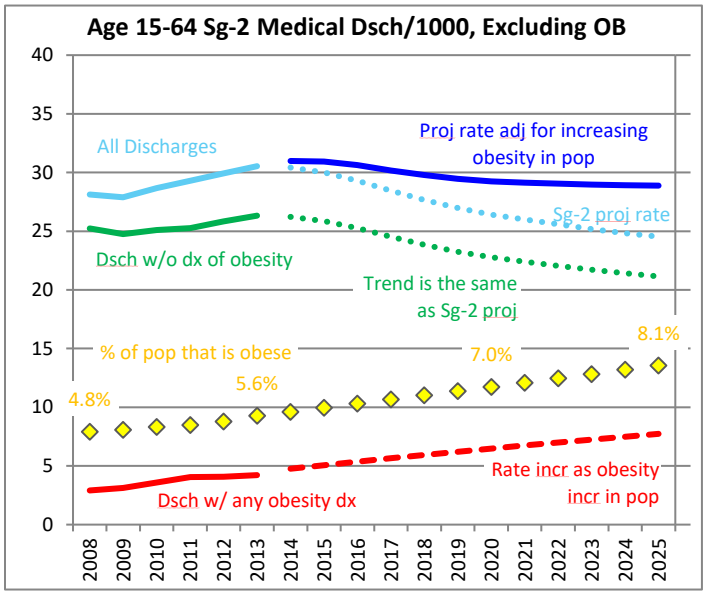


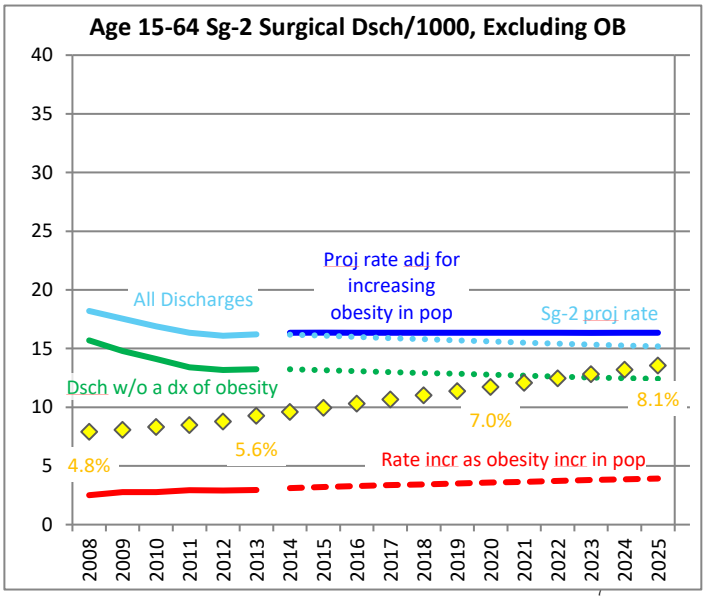


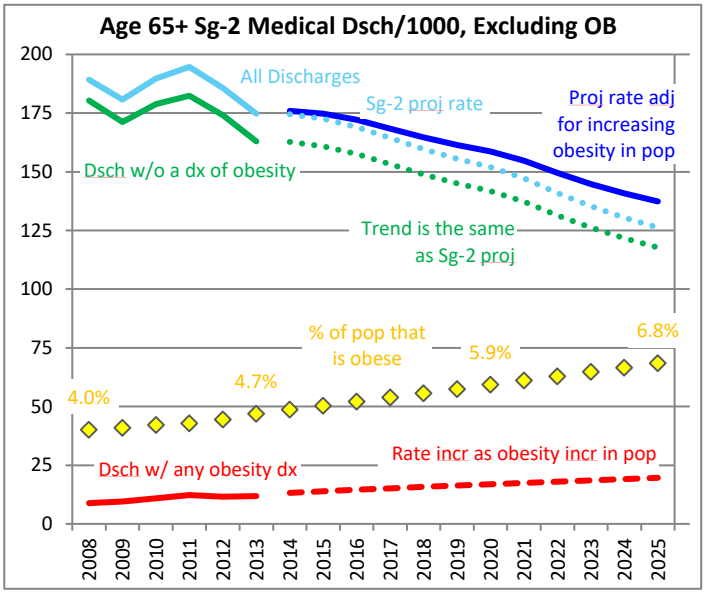
The rates for patients age 15-64 and 65+ are combined into an overall discharges per 1000 rate for the age 15+ population. The combined rate for age 15+ takes into account aging of the population and increasing obesity prevalence.

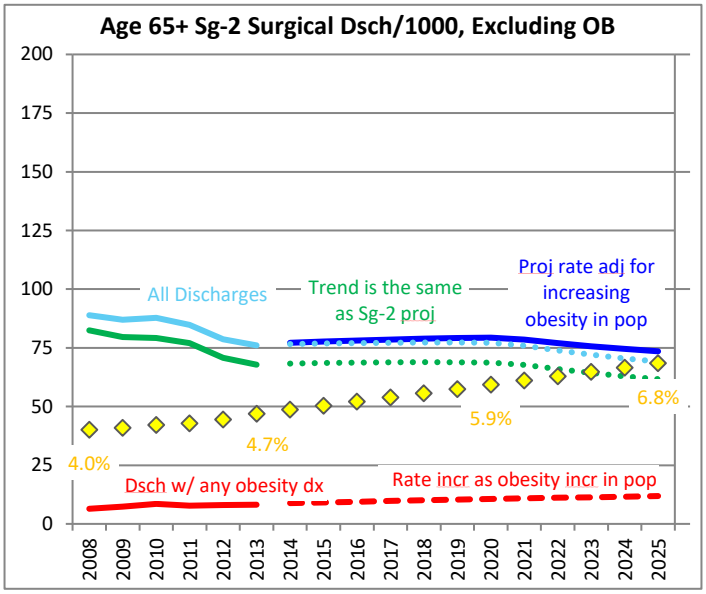


Sg-2 utilization projections were also adjusted for obesity prevalence using the same methodology described above.

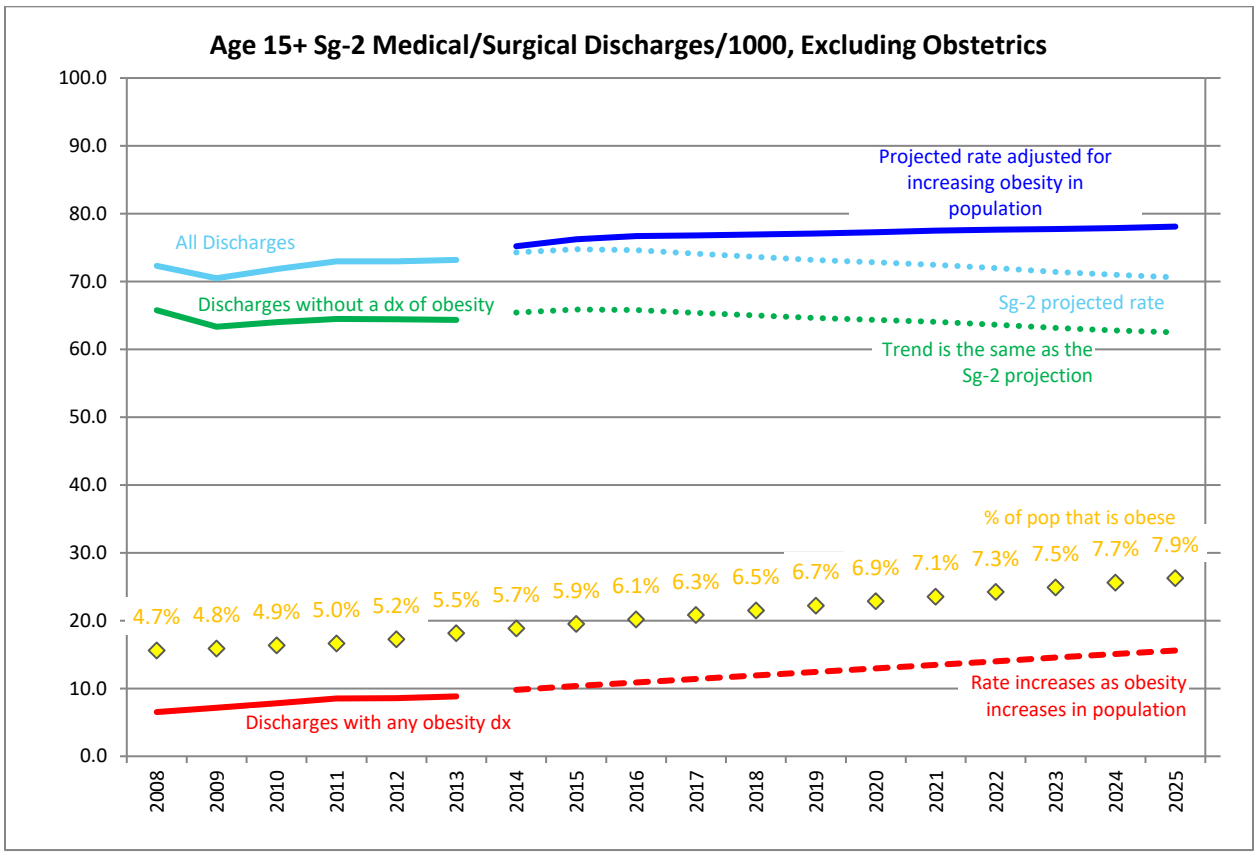




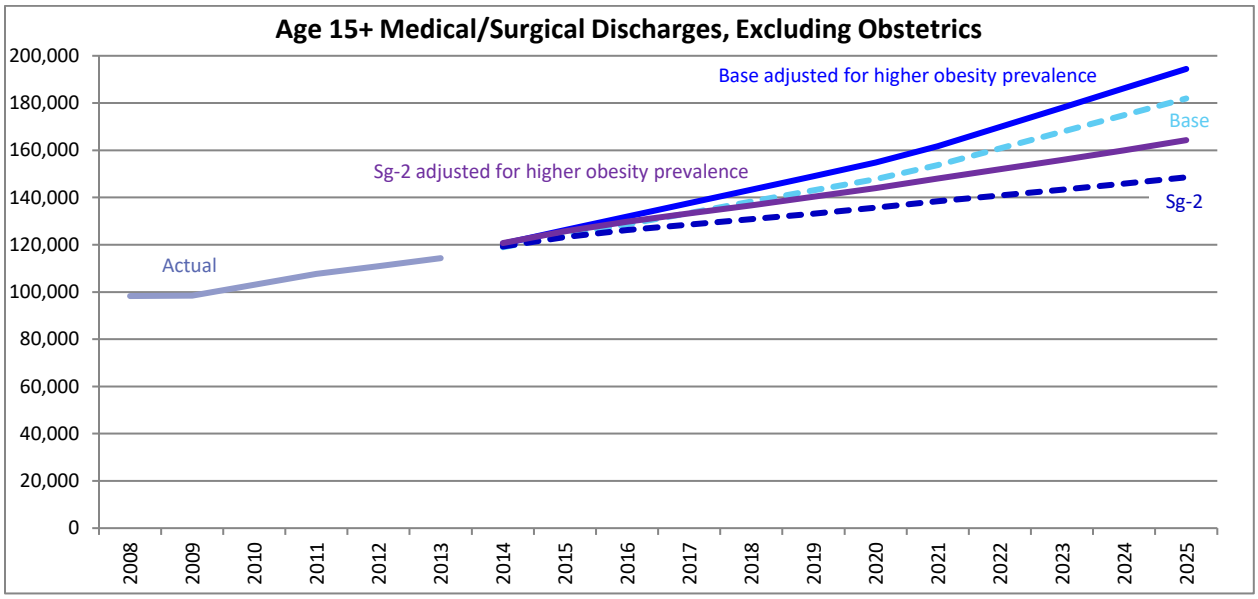




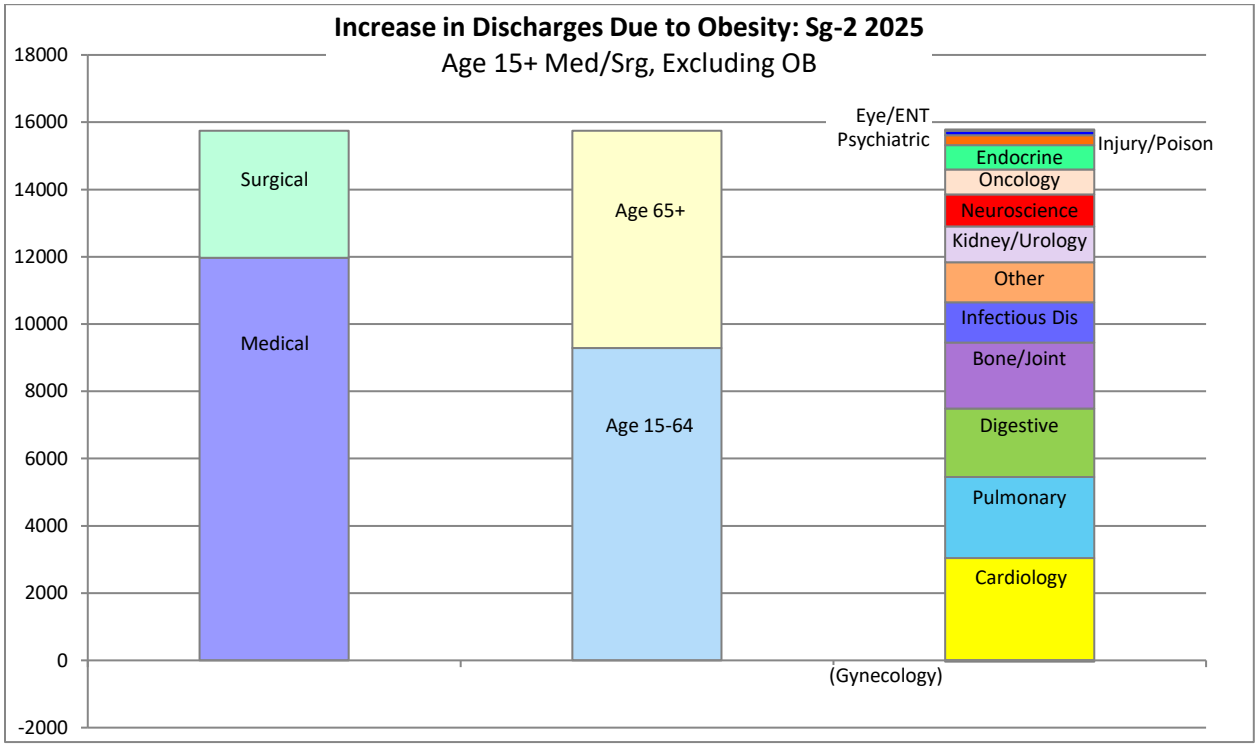
After being adjusted for obesity, the projected Sg-2 rate for 15+ medical/surgical discharges per 1,000 went from being a declining trend to a trend with a slight increase.



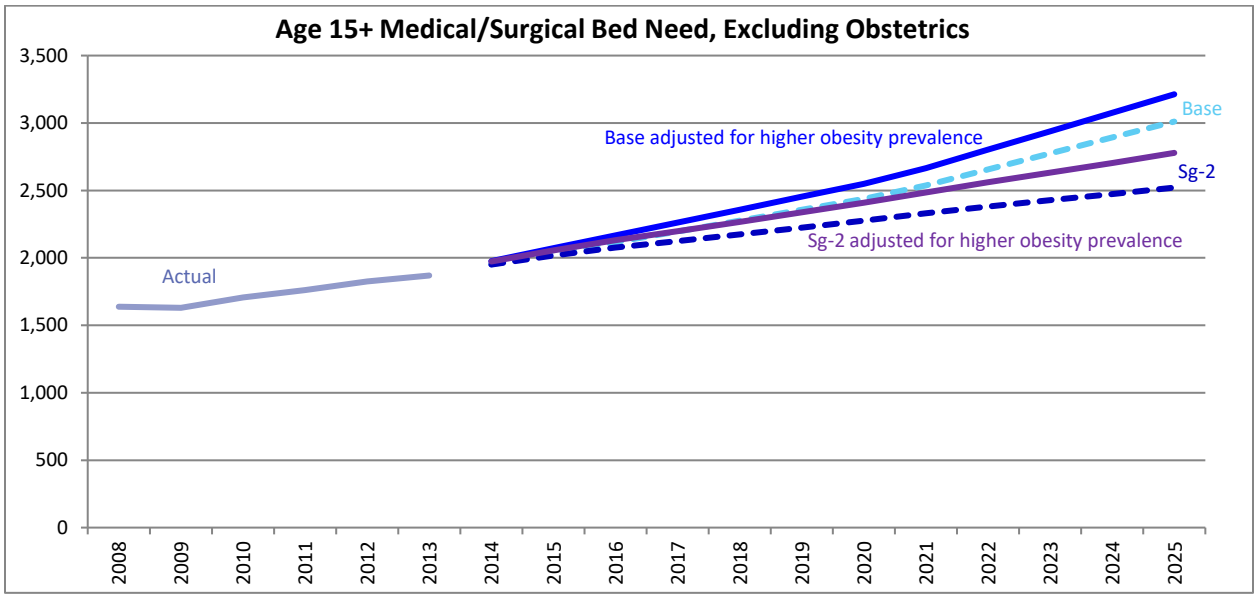
Higher obesity adjusted utilization rates result in more service area discharges. By 2025, higher obesity prevalence results in an additional 12,512 discharges using base rates and 15,746 more discharges with Sg-2 rates.



The chart below drills down into the increase in 2025 discharges between the unadjusted Sg-2 rate and the obesity-adjusted Sg-2 rate. Three quarters of the additional discharges due to obesity are medical and about 60% are patients age 15-64. The additional discharges are split among several clinical program areas.



Community bed need given the greater number of discharges driven by obesity is shown below. Bed need calculations assume occupancy of 75% and do not include beds needed for observation patients. Additionally, no adjustments were made to ALOS due to higher obesity prevalence. Higher obesity prevalence results in an additional 203 beds with base rates and 257 beds using Sg-2 rates in 2025.



[1] Borrud LG, Flegal KM, Looker AC, Everhart JE, et al. Body composition data for individuals 8 years of age and older: U.S. population, 1999–2004. National Center for Health Statistics. Vital Health Stat 11(250). 2010.

[2] http://www.nyc-personal-trainers.com/Diabetes-Personal-Training.html

[3] Borrud LG, Flegal KM, Looker AC, Everhart JE, et al. Body composition data for individuals 8 years of age and older: U.S. population, 1999–2004. National Center for Health Statistics. Vital Health Stat 11(250). 2010.

[4] http://www.nyc-personal-trainers.com/Diabetes-Personal-Training.html

[5] http://www.cdc.gov/nchs/data/hestat/obesity_adult_09_10/obesity_adult_09_10.pdf

[6] http://www.cdc.gov/nchs/data/databriefs/db131.pdf

[7] http://healthyamericans.org/assets/files/TFAH2012FasInFatFnlRv.pdf

[8] Finkelstein et al. Obesity and Severe Obesity Forecasts Through 2030. *American Journal Preventive Medicine* 2012; 42(6):563–570

[9] Tatiana Andreyeva, Roland Sturm, and Jeanne S. Ringel. Moderate and Severe Obesity Have Large Differences in Health Care Costs. *Obesity Research* Vol. 12 No. 12 December 2004.

[10] https://intel.sg2.com/resource-types/expert-insights/2013/6/Sg2%20Forecast%20Outpatient%20Volumes%20Swell%20and%20Inpatient%20Discharges%20Fall

[11] http://healthyamericans.org/assets/files/TFAH2012FasInFatFnlRv.pdf

[12] http://evolutionmedicine.com/2013/04/06/obesity-and-sepsis/

[13] Murugan AT and Sharma G. Obesity and respiratory diseases *Chronic Respiratory Disease* November 2008 5: 233-242.