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Trends in Mortality, Morbidity and Healthcare Utilization: Does it Make Sense to Use Healthcare as a Proxy for Health?

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Trends in Mortality, Morbidity and Healthcare Utilization: Does it Make Sense to Use Healthcare as a Proxy for Health?

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Abstract

Medical utilization, such as a count of hospitalizations, is routinely used as a health proxy for both policy and research purposes. Over time, trends in how medicine is practiced has impacted this relationship, as technological improvements or policy changes have altered hospitalizations at the same level of health. In this work, we document how hospitalizations have evolved as a marker for subsequent health (mortality and morbidity) and subsequent utilization (hospitalizations, emergency department visits, physician visits, and others). We assess these trends in the DI population (both fee-for-service and managed care), the aged Medicare fee-for-service population, and a commercial managed care population. We find that hospitalizations continue to predict subsequent mortality well, but that the relationship is more nuanced for morbidity. We find that hospitalizations are declining over time, but that they decline less for those with a prior hospitalization. Other types of utilization are increasing with time, with mixed evidence of the relationship with prior hospitalizations. We conclude that the relationship between hospitalizations and health continues to evolve and that the utility of this proxy depends on what measures of health one is assessing.

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The Centers for Medicare and Medicaid datasets on drug and medical claims and enrollment data for Medicare beneficiaries. A 20% random sample of Medicare beneficiaries' claims are available through the National Bureau of Economic Research, including Parts A, B, and D claims.

Optum claims data are from De-identified Clinformatics® Data Mart (OptumInsight, Eden Prairie, MN)

Background and Introduction

Whether or not healthcare utilization predicts future health is an important question. Although it may seem obvious that those who are sicker are more likely to have a hospitalization, once trends in insurance, healthcare delivery, and economic factors are considered, this probability becomes less clear. The two outcomes have a complex relationship. For an initial illustration of the link between utilization and hospitalization, we used a nationally representative sample of Medicare enrollees to show age-adjusted trends over time for mortality, inpatient days, and a count of the number of chronic conditions

(*Figure 1*). A striking pattern is shown: while people in Medicare are becoming sicker over time, as measured by the number of chronic conditions for which they have been treated, they are also living longer and consuming less health care, as measured by the number of inpatient days. In fact, from 2002 to 2012, the average number of chronic conditions has increased by 14%, while the number of inpatient days has fallen by almost 25% and the mortality rate has experienced a general downward trend of about 4% between 2002 and 2012. As the likelihood of being hospitalized decreases, one might suspect that being hospitalized is a stronger measure of poor health than it was before, because it indicates a more serious health issue. However, we show that the relationship between previous hospitalizations and health has changed differently over time for different groups.

In this paper, we aim to answer three main questions related to the stark divergence in trends between chronic conditions and mortality/inpatient use described above.

1. How has health care utilization as a marker of disease severity changed over time?
2. What impact has this trend had on disease severity?
3. How well does utilization predict subsequent utilization?

Specifically, we are interested in the population of individuals who receive disability insurance (SSDI) and are enrolled in Medicare. This DI population is especially important because the process of qualifying for SSDI requires medical evidence, including hospitalizations. Better understanding the relationship between health care utilization and health motivates our study because it would clarify whether medical evidence standards requiring prior utilization remain good indicators of health status. We compare the SSDI population to two groups: those that are similar in age, 18-64, and those that have more complex healthcare needs, the aged (65+).

To approach this set of questions, we rely on two unique data sources. The first is a 20% sample of fee for service (FFS) Medicare claims. We include individuals who were enrolled in FFS Medicare plans- either because of disability or because of age. Second, we utilize claims data from Optum, which is a nationally available commercial insurance company. Optum provides private health insurance and Medicare Advantage (MA) plans. Similar to the FFS sample, we have detailed claim level data for this HMO population. Each data set is longitudinal, meaning that we are able to identify previous year health utilization, which is crucial to answering our questions. Previous work documenting trends in the SSDI population has noted the need for longitudinal data [1]. In summary, we have two samples: FFS and

Optum. Within each sample, we study four different populations: those who are/are not enrolled in their insurance plan through SSDI & those who did/did not have an inpatient visit in the previous year.

The dual data sets have several advantages. First, they allow us to study both the DI population enrolled in fee for service (FFS) and Medicare Advantage (MA). Rather than relying on a single year of data, the longitudinal structure allows us to account for the fact that there has been a substantial shift from FFS towards MA over the past fifteen years [2]. Second, it allows us to compare the DI population to individuals enrolled in commercial insurance who are of similar age (18-64) and to those who are enrolled in Medicare, who are on average sicker. Third, and most importantly, the longitudinal data of both the FFS claims and Optum allows us to study prior health care utilization. We use hospitalization in the previous year as a marker for health utilization.

Our analysis shows a complicated relationship between hospitalizations and health outcomes that has evolved over time differently depending on past healthcare utilization. Over time, patterns of utilization have not been stable across groups. In the following section, we show a simple model highlighting the challenges of using hospitalization as a proxy of health. We then give a more complete picture of the data used, present results, and discuss our findings.

Conceptual Framework

Here we describe a simple conceptual framework that highlights how changes in utilization patterns could affect the relationship between observed hospitalizations (or other types of healthcare utilization) and unobserved health. To set notation, suppose h^* represents true health, which is unobservable. We simplify by assuming that there are two possible health states, high (H) or low (L). Formally, $h^* \in [\theta_L, \theta_H]$ with $\theta_L < \theta_H$. The unconditional probability that a person is low health is given by λ.

Now suppose that y is an indicator variable representing whether a hospitalization occurred. Hospitalizations occur based on patient health and other characteristics as well as provider financial incentives, according to the relationship:

$$\Pr(y = 1) = \Pr(X\beta + \pi + \varepsilon > h^*)$$

where X represents other patient characteristics (e.g., demographics or insurance status), π represents the profitability of a hospitalization for the provider and ε is a random component with the distribution function $F(.)$. In this model, the probability of a hospitalization is increasing in provider financial incentives and decreasing in health.

While the unconditional probability that a person has low health is unknown, additional information about health can be inferred from the presence of a hospitalization.

When using y as a proxy for health, we are assuming that we can infer low health for a person based on the presence of a hospitalization. From Bayes' Theorem, the conditional probability that a person is hospitalized conditional on low health is equal to:

$$\Pr(y = 1|h^* = \theta_L) = \Pr(h^* = \theta_L|y = 1)\frac{\Pr(y = 1)}{\Pr(h^* = \theta_L)}$$

Using the fact that the unconditional probability of a hospitalization is the weighted average of the conditional probabilities with high or low health, this condition can be rearranged to:

$$\Pr(h^* = \theta_L|y = 1) = \lambda\left\{\frac{\Pr(y = 1|h^* = \theta_L)}{\lambda\Pr(y = 1|h^* = \theta_L) + (1-\lambda)\Pr(y = 1|h^* = \theta_H)}\right\}$$

Because lower health increases the probability of a hospitalization, the term in brackets on the right is greater than 1, so the conditional probability that a hospitalized person is low health is greater than the unconditional probability. Note that based on the assumptions above about the probability of a hospitalization, this expression can be further modified to:

$$\Pr(h^* = \theta_L|y = 1) = \lambda\left\{\frac{1 - \mathrm{F}(\theta_L - X\beta - \pi)}{(1 - \mathrm{F}(\theta_H - X\beta - \pi)) - \lambda(\mathrm{F}(\theta_L - X\beta - \pi) - \mathrm{F}(\theta_H - X\beta - \pi))}\right\}$$

This illustrates how the impact of a hospitalization on the conditional probability that a person is low health depends on other factors in the model, including individual characteristics and provider financial incentives.

Now, suppose that growing public concern over healthcare costs leads to growing pressure to reduce the number of hospitalizations, which manifests as a decline in π. The change in the unconditional probability of a hospitalization with respect to a change in π is given by:

$$\lambda f(\theta_L - X\beta - \pi) + (1-\lambda)f(\theta_H - X\beta - \pi) > 0$$

where $f(.)$ is the probability density function of ε. So, a decline in financial incentives unambiguously leads to a decline in the probability of a hospitalization, ceteris paribus.

A change in financial incentives for a hospitalization has no direct effect on the conditional probability that a person is low health (i.e., $\frac{d\lambda}{d\pi} = 0$). However, because hospitalizations are less likely with reduced financial incentives, this does change the information content of a hospitalization. In other words, a change in π will change the bracketed term in our expression for $\Pr(h^* = \theta_L | y = 1)$ above. While the full expression is cumbersome, we can simplify with some additional notation by letting $f(\theta_j)$ and $F(\theta_j)$ represent the pdf and cdf, respectively, of a person with health type θ_j. Using this simplified notation, we can express:

$$\frac{\mathrm{dPr}(h^* = \theta_L | y = 1)}{d\pi} = \lambda \left\{ \frac{f(\theta_L)\big((1 - \mathrm{F}(\theta_H)) - \lambda(\mathrm{F}(\theta_L) - \mathrm{F}(\theta_H))\big) - (1 - F(\theta_L))\big(\lambda f(\theta_L) + (1 - \lambda) f(\theta_H)\big)}{\big((1 - \mathrm{F}(\theta_H)) - \lambda(\mathrm{F}(\theta_L) - \mathrm{F}(\theta_H))\big)^2} \right\}$$

It can be shown that this term is negative as long as the share of sick people in the population is not too small,[1] which means that decreasing financial incentives for a hospitalization will make it more likely that a hospitalized person is sick.

This simple framework provides several insights into the challenge of using hospitalizations as a proxy for health. First, there is information provided in a hospitalization, so we do expect that someone who has a prior hospitalization will be less healthy on average. On the surface, we might expect that the recent trend towards fewer hospitalizations makes them more useful as a predictor of health, because only sicker patients will be hospitalized. Or, put another way, as the difference between healthy and sick patients grows – that is, as $\theta_H - \theta_L$ grows – the marginal impact of financial incentives on admission decisions falls.

Data

We briefly describe the data sources and measures used in the analysis. Data codebooks and programs are provided in the Appendix.

Medicare Fee For Service

Medicare claims data is a data resource offered by the Centers for Medicare and Medicaid Services (CMS), documenting claims for services that Medicare pays for. n this analysis, we use the Master Beneficiary Summary File (MBSF) of Medicare claims data from 2002 to 2013, which provides Medicare

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[1] The sufficient (but not necessary) condition for $\frac{\mathrm{dPr}(h^* = \theta_L | y = 1)}{d\pi} < 0$ is $1 - \lambda < (1 + \lambda)\mathrm{F}(\theta_H) + 2\lambda \mathrm{F}(\theta_L))$, which holds automatically as $\lambda \to 1$.

beneficiaries' enrollment and summary information. We only include the Medicare fee-for-service enrollees in our analysis. The sample size for regression analysis is 11 million observations. The MBSF Base file includes beneficiaries' demographic information (age, gender and death date) and plan enrollment information (enrollment for Part A/B/C/D). The MBSF Chronic Conditions Segment and Other Chronic or Potentially Disabling Conditions Segment provides each beneficiary's presence flag of a list of 27 chronic conditions and 35 chronic or potentially disabling conditions, we use these two files to derive our chronic conditions measure in this analysis. We also use the MBSF Cost and Utilization Segment to derive measures of utilization like inpatient service, emergency room services, prescription drug fills and Medicare payment.

Optum Claims

To be complementary to Medicare claims, we also analyze health claims data for members of a large national managed care company affiliated with Optum (Optum claims). Optum claims data is provided by the Clinformatics ® Data Mart (formerly called InVision Data Mart or "LabRx"). These claims have been verified, adjusted and de-identified before they were delivered to us. We use data from 2007 to 2014 and restrict the sample to include only enrollees aged between 18 and 64, with both medical and drug coverage and enrollment for the full year. The final sample includes 819,648 unique individuals covered by Medicare Advantage plans and 17,878,803 individuals covered by commercial health plans. By applying the age restriction, we believe the sampled individuals covered by Medicare Advantage plan are mainly on SSDI. The data tables used in the analysis include member eligibility data, medical claims, pharmacy claims, date of death file and inpatient confinements.

Measures

In Medicare and Optum, we analyze the same measures, including age, gender, mortality, CCW count, and health care utilization measures on inpatient, emergency room use, physician visit and health care costs. We rely on the Medicare MBSF file for the measures, as described in the last section. In Optum, we derive the same set of flags for chronic conditions as in Medicare, according to the algorithm by the Chronic Condition Data Warehouse. We identify emergency room visits and physician visits from the type of service variable in the medical claims. Number of drugs fills is derived from the pharmacy claims, with a standard 30-day supply defined as one fill. Number of inpatient days is counted from the inpatient confinements. Total medical cost is derived from standardized costs, which is a value assigned by Optum by applying standard pricing algorithms. Given data availability and difference in data structure, measures in Optum are not exactly the same as in Medicare. The major difference in the two data sources include: Medicare includes days in other years when counting inpatient days, while we exclude them in Optum. Medicare only counts physician office visits by applying a restriction using Berenson-Eggers Type of Service (BETOS) code, which is not available in Optum. Medicare provides actual costs while Optum only includes standardized costs.

Table 1 shows the number of observations in each year, and the mean and standard deviation of key measures, by group. In Medicare, compared with the aged group, the DI group is younger on average, and contains more females. The DI group has a lower mortality rate. However, they have a comparable number of chronic conditions with the aged, and they consume more medical care, in terms of inpatient days, emergency room visits and drug fills, resulting in higher medical expenditures. In Optum, the DI group is older than the commercial group. They have similar gender composition. The DI group has a higher mortality rate and more chronic conditions than the commercial group. They also use more medical care, reflected in all utilization measures.

Because of the differences in samples and measures we do not directly compare the DI group in Medicare and Optum data in any analysis.

Hospitalization as a predictor of subsequent health

We now turn to estimating trends in hospitalization on subsequent health outcomes for the groups of interest in the two samples.

Methods

The parsimonious model for subsequent health we explore is

$$Health_{t+1} = \alpha \cdot hosp_{i,t} + \gamma \cdot year_t + \delta \cdot hosp_{i,t} \cdot year_t + \boldsymbol{X\beta} + \epsilon_{i,t}$$

The key parameter of interest is δ, which indicates if hospitalizations in a particular year have a stronger or weaker impact on subsequent health relative to the base year. In this analysis, we consider two health outcomes: subsequent mortality and the count of chronic conditions in the next year, as measure of morbidity. We estimate the above regression separately for the SSDI population and the non-SSDI population in each sample.

Results

For each data source, FFS and Optum, we present a table that shows the predicted level of each outcome for 2013 and either 2002 (FFS) or 2007 (Optum) (Tables 2 and 3). We also show the log difference between the two years and the difference in the log differences between those with and without a prior year hospitalization. The log difference shows the approximate percent change in each outcome over time. The difference in difference is the difference in changes between those with and without a prior year hospitalization. For each outcome, we statistically test that this joint difference equals 0. We discuss the relative difference between the two groups below. Table 2 shows findings for the FFS sample and Table 3 shows findings for the Optum sample.

Mortality

We present mortality results measured as deaths per 100,000 (Tables 1, 2, and 3). For both populations enrolled in Medicare FFS, disabled and aged, mortality was substantially larger for those with a hospitalization in the previous year. Across utilization, the aged group had higher rates of mortality than the disabled population.

Between 2002 and 2013, there was a downward trend in mortality for three of the four FFS groups. The exception is that SSDI individuals who were hospitalized in the past year had a small increase in mortality of about 0.9%. Mortality for those who did not have a prior year hospitalization decreased by 7.2%, which amounts to a difference of 8.1 percentage points across healthcare utilization for the disabled population. Similar to the disabled population, the decrease in mortality was larger for those with a hospitalization in the previous year than for those without a hospitalization for the aged population (13.6% decrease vs 2.4% decrease, an 11.2 percentage point difference).

When we consider individuals carrying insurance through Optum, we also observe a downward trend in mortality for three of the four groups. However, in the Optum sample, the DI population that did not have a hospitalization in the previous year experienced the increase in mortality (3.7%). The DI sample that did have a hospitalization experienced a decrease in mortality of 11.1%. This amounts to a statistically significant difference across utilization for the disabled group of almost 15 percentage points. For the commercially insured sample, both individuals with and without a hospitalization in the previous year saw large decreases in mortality, but the decrease was larger for those without a hospitalization (54.6% and 71.4% respectively). It should be noted however that mortality is a very rare occurrence for this sample. In 2013, it was just 51 per 100,000 for those with no hospitalization the previous year and 598 per 100,000 for those with a hospitalization.

Morbidity

For both FFS and HMOs, as one would expect, those who were hospitalized in the previous year were treated for more chronic conditions than those who were not, regardless of their disability status. Within the FFS enrollees, conditional on prior healthcare utilization, the disabled and aged populations were quite similar in terms of chronic condition counts in both 2002 and 2013. For example, in 2013, disabled individuals with a prior hospitalization had 7.2 chronic conditions, while their aged counterparts had 6.6. However, within Optum, the disabled population had a substantially higher chronic condition count than their working aged counterparts.

Individuals who were enrolled in FFS, regardless if they were hospitalized in the previous year or if they were enrolled through SSDI, experienced an increase of about 35% in the number of chronic conditions for which they were treated. The increase was slightly larger for those without a hospitalization, although the difference is statistically significant. Those who were enrolled in Medicare because of their age also experienced an increase in the number of chronic conditions. However, in contrast to the DI population, the aged individuals experienced an increase in the number of chronic conditions of 29.8% and 24.6% for those with and without a hospitalization respectively, a difference of 5.2 percentage points.

In line with the FFS population, between 2007 and 2013, all four groups of Optum enrollees experienced an increase in the number of chronic conditions they were treated for. The increase in the number of chronic conditions was largest for those without a previous hospitalization for both the DI population as well as the commercially insured population. For the DI population, the increase was about 44.8% for those who were not hospitalized compared to 24.8% for those who were hospitalized the previous year, which amounts to a statistically significant difference of 20 percentage points. The commercially insured population also experienced large increases in the number of chronic conditions- 30.5% for those who were not hospitalized the previous year and 18.9% for those with a previous hospitalization, a difference of 11.5 percentage points.

Hospitalizations as a predictor of subsequent utilization

Now we turn to assessing the trend in hospitalizations as a predictor of subsequent utilization, examining subsequent hospitalizations, emergency department utilization, physician encounters, expenditures, and prescription drug fills.

Methods

The parsimonious model for subsequent utilization we explore is

$$Utilization_{t+1} = \alpha \cdot hosp_{i,t} + \gamma \cdot year_t + \delta \cdot hosp_{i,t} \cdot year_t + \boldsymbol{X\beta} + \epsilon_{i,t}$$

As in the previous model, the key parameter of interest is δ, which indicates if hospitalizations in a particular year have a stronger or weaker impact on subsequent utilization relative to the base year. In this analysis, we consider a broad set of claims-based utilization measures, as described in the Data section. Briefly, we assess inpatient hospitalizations (any, and how many), emergency department use (any and how many), physician visits, prescription drug fills, and an expenditure measure. This analysis is designed to help characterize the changing role of hospitalizations as a marker for health.

Results

Inpatient Utilization

Within the FFS sample, the probability of having any inpatient visit and the number of inpatient days fell for all four groups across time, consistent with our findings in *Figure 1*. Relatedly, hospitalization is persistent across time. Individuals who were hospitalized in year *t -1* were more likely to be hospitalized in year *t* for both the disabled and aged groups. Comparing the disabled to aged population in FFS, we see that the size and magnitude of differences between the two groups, in terms of both inpatient use and number of inpatient days, depends on prior year healthcare utilization. The aged population without previous year hospitalization was slightly more likely than their disabled counterparts to have an inpatient visit. However, for individuals with a previous year hospitalization, the opposite holds- disabled individuals were slightly more likely to have an inpatient visit. The number of inpatient visits was similar for the disabled and aged groups if they had a prior hospitalization, but if they did not, the disabled population had a higher number of inpatient visits.

For both measures, in both the DI and aged populations, the fall in inpatient visits was larger for individuals who did not have a prior year hospitalization. For the DI population, the fall in the probability of having an inpatient day was 4.9% and 14.2% or a 9.2 percentage point difference, for individuals with and without a hospitalization in the previous year respectively. For the number of inpatient days, the decrease was 7.2% and 19.9%, a 12.7 percentage point difference.

Turning to the aged population enrolled in FFS plans, we find that the decrease in the probability of an inpatient visit was 20.3% for those without a prior hospitalization and 9.2% for those with a prior hospitalization, for a difference of 11.1 percentage points. The decrease in the number of inpatient visits was 15.8% and 33.5% for those with/without a hospitalization in the previous year, a difference of 17.7 percentage points.

For individuals enrolled in Optum managed care plans we find that the disabled population was both more likely to have an inpatient visit and had a higher number of inpatient visits compared to their working-age counterparts, regardless of prior year hospitalizations. Similar to the FFS population, hospitalization is persistent. However, counter to what we see in the FFS population and *Figure 1*, we find that inpatient use and the number of inpatient days increased between 2007 and 2013 for the disabled population, regardless of prior healthcare utilization. For both outcomes, the difference in increases was not statistically significant between those with and without a previous year hospitalization. For the working-aged commercially insured individuals, we find that the probability of having an inpatient visit decreased by 17.7% for those without a prior hospitalization and 3.9% for those with, a statistically significant difference of 13.7 percentage points. Commercially insured individuals with a hospitalization the previous year experienced an increase in the number of inpatient visits of 10.9%, while those without a prior hospitalization saw a decrease of 14.3%, a difference of 25.3 percentage points.

Other Measurers of Utilization

For those enrolled in a FFS plan, all alternative healthcare utilization measures increased between 2002 and 2013 for both the disabled and aged population. This includes any ER visits, the number of ER visits, physician visits, drug fills, and costs.

Within the disabled FFS population there is not a clear pattern with respect to which group utilization increased for more, those with a prior hospitalization or those without. However, with the exception of costs, the differences in growth between those with and without a hospitalization the prior year are substantially smaller than the differences in inpatient utilization and days. For example, although the probability of an emergency department visit increased for those with and without a prior hospitalization by 13.9% and 17.3% respectively, a 3.4 percentage point difference, the number of emergency department visits increased by 29.8% and 26.6% respectively, a 3.2 percentage point difference. Physician visits increased by about 20% both for those with and without a prior hospitalization (21% and 18.6% respectively, a difference of 2.4 percentage points.) Costs increased by 51.1% for those without a prior hospitalization, but by 29.7% for those with, a difference of 21.4 percentage points.

Turning to the aged FFS population, a similar finding emerges: increases occurred between 2002 and 2013 for all measures but no clear patterns with regards to whether the increase was larger for those with or without a hospitalization in the previous year. Also similar to the disabled population, we find that the differences between the two groups were substantially smaller than the differences in inpatient care for the two groups, although for the aged population this holds for all alternative utilization outcomes. The probability of an emergency room visit increased by 16.7% for those without a hospitalization in the previous year and 18.2% for those with a prior hospitalization, a difference of 1.5 percentage points. During the same time, the number of emergency visits increased by 13.2% and 12.3%

for those with and without a hospitalization in the previous year. The only measure for which those without a hospitalization the previous year increased less than for those with a hospitalization for the aged group was drug fills, 7.1% vs 8.2% or a 1.1 percentage point difference. Contrary to the large increase in costs experienced by the SSDI population, costs increased by 13.5% for the aged without a hospitalization in the previous year and 16.7% for those with, a difference of 3.1 percentage points.

Like FFS, the disabled population enrolled in a HMO saw increases in all alternative measures of healthcare utilization. The largest increase was in the number of drug fills, 29.6% for those without a prior hospitalization and 17.6% for those with a prior hospitalization, a difference of 12 percentage points. The probability of an emergency department visit increased by 9.4% without hospitalization the previous year and 8.0% for those with, a 1.5 percentage point difference. The number of ED visits increased by 28.2% for those with a prior hospitalization and just 8.4% for those without a prior hospitalization, a difference of almost 20 percentage points. Costs increased by a relatively small amount compared to the FFS disabled population- just 5.9% for those without a prior hospitalization and 3.7% for those with, a difference of 2.2 percentage points.

Working aged adults enrolled in an HMO did not experience the universal increase in alternative healthcare utilization measures experienced by the disabled population. In fact, all measures of utilization fell for this population. The largest decrease was in emergency department encounters, which fell by 20.8% for those with a previous hospitalization and 16.4% for those without, a difference of 4.4 percentage points. The probability of an ED visit decreased by 8.3% for those with a hospitalization the prior year and 7.4% for those without, a statistically significant 0.9 percentage point difference. Costs also fell- by 23.8% for those without a prior hospitalization and 12.3% for those with, an 11.5 percentage point difference.

Limitations

Administrative claims are an excellent resource for assessing health outcomes, but are not without limitations. The first set of limitations are related to enrollment. Over the last fifteen years there has been a marked shift from fee-for-service to managed care within the Medicare population, affecting both the aged and disabled populations. In 2004, 13% of Medicare enrollees were on Medicare Advantage plans, gradually increasing to 34% in 2018 [2]. The reasons for this migration are complex and beyond the scope of this paper, but all of the subsequent outcomes we assess (with the exception of mortality for those shifting from FFS to managed care) are estimated only on those who remained in either FFS or within the Optum plans.

Following individuals who seek to enroll in SSDI, qualify for SSDI, and then enroll in Medicare is challenging for a myriad of reasons. Since SSDI enrollment rules limit the amount of work an applicant can do, it is possible that individuals disenroll from their employer-based insurance plan. Once an individual qualifies for SSDI they typically are required to wait five months before receiving SSDI benefits and then an additional 24 months before qualifying for Medicare benefits. Thus, it can be up to 29 months before they enroll in a Medicare plan. Consequently, hospitalizations observed in the Medicare DI population are fairly distant from the time of qualifying for SSDI and should be interpreted accordingly.

We do not observe the qualifying reason in the Medicare DI populations we examine. As a result, we do not attempt to assess trends within particular qualifying conditions. With appropriate data linkage, this would be feasible, but was beyond the scope of this analysis.

Discussion

Although trends in mortality, morbidity, and healthcare utilization are complex, a few key patterns emerge. First, when studying those enrolled in fee for service plans, the disabled and aged populations generally moved in the same direction. For example, the number of chronic conditions, probability of an ER visit, number of ER visits, physician visits, and drug fills increased for all four groups. Mortality generally fell across the board; the exception being that disabled individuals with a prior hospitalization did experience a slight increase. The probability of having any inpatient visit and the number of inpatient visits decreased for all four groups. This suggests some substitution between inpatient visits and alternative ways to consume healthcare. This substitution came at higher costs for everyone except for the commercially insured working aged individuals.

The second pattern that emerges in the FFS population is that, for most outcomes, the change across time was larger in magnitude for those without a hospitalization in the previous year than it was for those who did have a prior hospitalization. This pattern holds for mortality, morbidity, inpatient utilization, and drug fills. It is only for the probability of having an emergency room visit and the number of ER visits that this does not hold.

The patterns in trends over time for mortality, morbidity, and healthcare utilization are even murkier when studying individuals enrolled in MA plans. For most outcomes, the exception being morbidity, the disabled population moved in a different direction than their working-aged counterparts.

Taken together, the evidence suggests that trends driving hospitalizations are not uniform. Although people getting hospitalized are sicker, as evidenced by the general decrease in hospitalizations and increase in morbidity, the quality of hospitalizations as a marker of health did not uniformly change over time.

Conclusions

This paper documents that hospitalization as a measure of health is complicated and trends in each outcome across time and utilization are not uniform. We find some evidence of substitution from hospitalizations towards other forms of healthcare utilization within the FFS population. We also show evidence that hospitalization is persistent. Individuals who were hospitalized in the prior year are more likely to be hospitalized in the current year. Further, changes in healthcare utilization were generally larger for those without prior year hospitalizations.

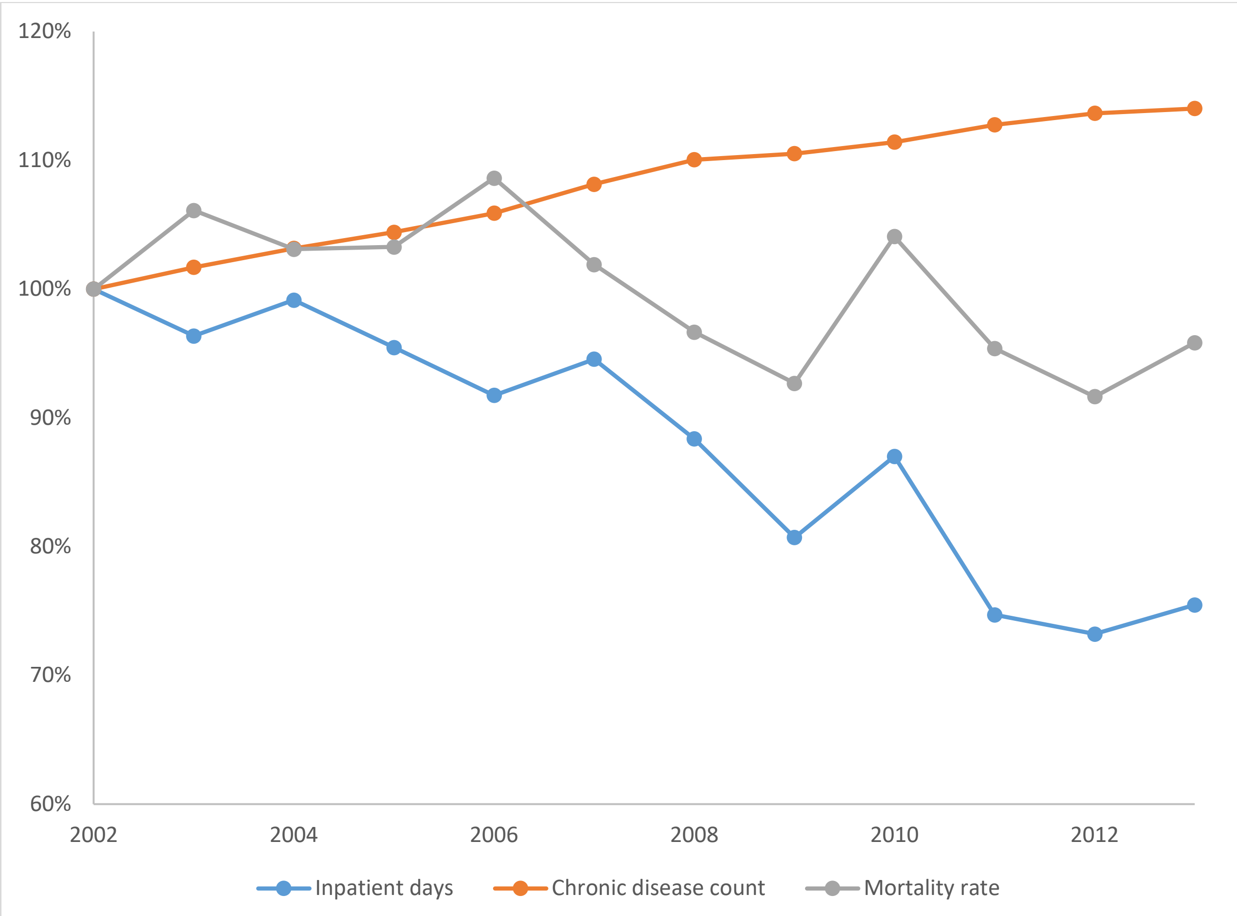
When considering SSDI eligibility, it is important to remember that part of the criteria is prior healthcare utilization. For example, consider eligibility due to a mental disorder, specifically neurocognitive disorders. One way to become eligible for SSDI requires medical documentation of a decline and a "medically documented history of the existence of the disorder over a period of at least 2 years". Because of the general downward trend in inpatient utilization over time, one might worry that hospitalizations as a marker of health would only be flagging the sickest patients, meaning that the population of SSDI recipients is also becoming sicker over time. While our analysis does not refute this, it does suggest that hospitalizations as a marker of health is complicated. Further expanding listing criteria to require or include more healthcare consumption may be unnecessary or even counterintuitive.

Finally, it is worth noting that changing hospitalization patterns are likely second order to changing economic conditions when considering enrollment in SSDI. For example, there is evidence that poor local labor market conditions contribute to higher receipt of SSDI and SSI [3]. Prior literature has also documented the importance of women entering the workforce [4].

Figures and Tables

Figures

Figure 1: Normalized rates of inpatient days, mortality rates, and count of chronic conditions



Notes: Authors calculations using the MCBS 2002-2013. Yearly predictions from a model adjusted for age and race*sex. Each year is shown as a relative change to 2002.

Tables

Table 1: Summary Statistics

	Medicare		Optum	
	DI	Aged	DI	Commercial (18-64)
All years	11255795	58472804	2382218	49500523
2002	835159	5068386		
2003	876079	5140648		
2004	906702	5122297		
2005	893074	4963123		
2006	907672	4830337		
2007	920413	4737309	265019	6702298
2008	933220	4710375	255536	6582789
2009	956433	4700604	272786	6398815
2010	991874	4770619	293546	5982947
2011	1011032	4789259	311818	6080616
2012	1021169	4820102	329308	6069210
2013	1002968	4819745	341667	6054123
2014			312538	5629725
Predictors				
Age	50.51	76.12	56.78	41.43
	(10.26)	(7.59)	(7.32)	(12.71)
Male	0.47	0.58	0.46	0.49
	(0.50)	(0.49)	(0.50)	(0.50)
Outcomes				
Mortality rate	0.023	0.052	0.014	0.003
	(0.15)	(0.22)	(0.12)	(0.06)
Chronic Conditions count	3.00	3.26	5.27	2.12
	(2.90)	(2.56)	(3.62)	(2.35)
Any inpatient	0.20	0.19	0.13	0.05
	(0.40)	(0.39)	(0.34)	(0.22)
Inpatient Days	11.83	8.66	1.22	0.24
	(17.86)	(11.77)	(6.45)	(2.25)
Any Emergency department	0.34	0.21	0.27	0.18
	(0.47)	(0.41)	(0.45)	(0.38)
ED visits	0.86	0.33	1.47	0.66
	(2.56)	(0.91)	(4.68)	(2.50)
Physician events	6.34	7.34	15.89	8.11
	(7.86)	(7.46)	(17.71)	(11.14)
Expenditures	11892.42	8492.78	15075.42	5065.78
	(25609.13)	(17193.85)	(39978.49)	(17930.55)
Rx drug fills	60.19	54.63	36.10	10.72
(30 day equivalents)	(48.68)	(39.46)	(38.61)	(17.97)

Table 2: Trends in Health and Healthcare Utilization for Individuals with FFS Medicare

Previous Year Hospitalization		FFS-DI 2002	FFS-DI 2013	FFS-DI Log difference	FFS-DI Diff in diff	FFS-DI p-value	FFS-Aged 2002	FFS-Aged 2013	FFS-Aged Log difference	FFS-Aged Diff in diff	FFS-Aged p-value
Panel A: Health Outcomes											
Mortality	No	1379	1283	-7.2			3180	2774	-13.6		
	Yes	5989	6041	0.9	8.1	0.00	11414	11140	-2.4	11.2	0.00
Morbidity	No	2.3	3.2	35.7			2.7	3.4	24.6		
	Yes	5.1	7.2	34.5	-1.1	0.00	4.9	6.5	29.8	5.2	0.00
Panel B: Utilization Outcomes											
Any inpatient	No	0.15	0.13	-14.2			0.18	0.15	-20.3		
	Yes	0.49	0.47	-4.9	9.2	0.00	0.42	0.39	-9.2	11.1	0.00
Inpatient days	No	1.42	1.16	-19.9			1.54	1.10	-33.5		
	Yes	8.37	7.79	-7.2	12.7	0.00	5.58	4.76	-15.8	17.7	0.00
Any emergency department	No	0.26	0.31	17.3			0.17	0.20	16.7		
	Yes	0.48	0.56	13.9	-3.4	0.00	0.30	0.37	18.2	1.5	0.00
Emergency encounters	No	0.50	0.65	26.6			0.24	0.30	22.7		
	Yes	1.42	1.91	29.8	3.2	0.00	0.53	0.70	27.9	5.3	0.00
Physician visits	No	5.15	6.35	21.0			6.29	7.11	12.3		
	Yes	8.63	10.40	18.6	-2.4	0.00	8.93	10.19	13.2	0.9	0.00
Drug fills	No	55.29	60.53	9.1			49.61	53.87	8.2		
	Yes	77.42	82.45	6.3	-2.8	0.00	68.29	73.31	7.1	-1.1	0.00
Costs	No	7508	12512	51.1			8380	9596	13.5		
	Yes	27175	36573	29.7	-21.4	0.00	20816	24590	16.7	3.1	0.00

Notes: Mortality is measured as deaths per 100,000. Morbidity is measured as the number of chronic conditions. The log difference is multiplied by 100.

Table 3: Trends in Health and Healthcare Utilization for Individuals Enrolled in Optum

		HMO-DI					HMO-Commercial				
	Previous Year Hospitalization	2007	2013	Log difference	Diff in diff	p-value	2007	2013	Log difference	Diff in diff	p-value
Panel A: Health Outcomes											
Mortality	No	621	644	3.7			104	51	-71.4		
	Yes	3723	3333	-11.1	-14.8	0.00	1033	598	-54.6	16.8	0.00
Morbidity	No	3.9	6.1	44.8			1.7	2.4	30.5		
	Yes	7.6	9.8	24.8	-20.0	0.00	3.5	4.3	18.9	-11.5	0.00
Panel B: Utilization Outcomes											
Any inpatient	No	0.08	0.11	25.4			0.05	0.04	-17.7		
	Yes	0.32	0.38	16.5	-8.9	0.21	0.15	0.14	-3.9	13.7	0.00
Inpatient days	No	0.51	0.88	54.0			0.19	0.16	-14.3		
	Yes	3.63	5.58	43.0	-11.0	0.13	1.18	1.32	10.9	25.3	0.00
Any emergency department	No	0.23	0.25	9.4			0.18	0.17	-7.4		
	Yes	0.47	0.51	8.0	-1.5	0.00	0.30	0.28	-8.3	-0.9	0.00
Emergency encounters	No	1.05	1.14	8.4			0.68	0.57	-16.4		
	Yes	3.15	4.17	28.2	19.8	0.00	1.39	1.13	-20.8	-4.4	0.00
Physician visits	No	13.70	15.07	9.5			8.04	7.48	-7.3		
	Yes	26.98	27.44	1.7	-7.8	0.00	15.66	14.89	-5.0	2.2	0.00
Drug fills	No	30.61	41.14	29.6			11.49	11.17	-2.8		
	Yes	51.90	61.86	17.6	-12.0	0.00	22.19	21.42	-3.5	-0.7	0.00
Costs	No	12252	12999	5.9			5432	4281	-23.8		
	Yes	39240	40734	3.7	-2.2	0.00	17007	15040	-12.3	11.5	0.00

Notes: Mortality is measured as deaths per 100,000. Morbidity is measured as the number of chronic conditions. The log difference is multiplied by 100.

Appendices

Appendix A – Comorbidities selection

Appendix B - Medicare FFS and Optum program descriptions

Appendix C1 – Medicare FFS codebook

Appendix C2 – Optum codebook

Appendix D1 – Medicare FFS regression results

Appendix D2 – Optum regression results

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2. Jacobson, G., A. Damico, and T. Neuman, *A dozen facts about Medicare Advantage*. 2018, Henry J. Kaiser Family Foundation San Francisco (CA).
3. Charles, K.K., Y. Li, and M. Stephens Jr, *Disability benefit take-up and local labor market conditions.* Review of Economics and Statistics, 2018. **100**(3): p. 416-423.
4. Liebman, J.B., *Understanding the increase in disability insurance benefit receipt in the United States.* Journal of Economic Perspectives, 2015. **29**(2): p. 123-50.

Appendix A: Chronic Condition Identification and Selection

We rely on algorithms from the Chronic Conditions Data Warehouse to identify chronic conditions in administrative claims data. These algorithms search the administrative claims data for specific ICD-9 diagnosis codes, Medicare Severity Diagnosis Related Groups (MS-DRG) codes, or procedure codes. The algorithms were developed to facilitate identifying cohorts of individuals with particular conditions in claims data. We implemented these algorithms on the Optum data and used the pre-populated codes in the Medicare FFS data. The code for generating these condition codes is included in a separate appendix.

Selected Conditions

We selected conditions from both the 27 CCW Chronic Conditions and the 39 Other Chronic or Potentially Disabling Conditions sets. Ultimately, we selected a set of 24 conditions from these 66, requiring that each condition have a prevalence over 5% for the 2014 Medicare FFS DI population and that a condition not be double-counted. This resulted in the set of conditions listed in the Table below. We then sum the total number of conditions for each individual, which can range from 0 to 24.

Chronic Condition	Prevalence (DI)	Prevalence (Aged)
Acquired hypothyroidism	10.53%	16.01%
Anemia	19.66%	23.51%
Anxiety disorder	25.46%	11.57%
Asthma	8.02%	4.63%
Bipolar disorder	12.94%	1.50%
Cataract	5.95%	20.45%
Chronic kidney disease	13.92%	18.86%
Chronic obstructive pulmonary disease	11.72%	11.45%
Diabetes	26.63%	28.54%
Epilepsy	7.26%	1.71%
Fibromyalgia chronic pain and fatigue	23.56%	10.23%
Heart failure	10.12%	16.03%

Hyperlipidemia	31.58%	49.45%
Hypertension	41.41%	60.35%
Intellectual disabilities and related conditions	5.44%	0.26%
Ischemic heart disease	17.35%	31.69%
Liver disease cirrhosis and other liver conditions (excluding Hepatitis)	5.61%	3.21%
Major depressive affective disorder	28.40%	14.02%
Migraine and other chronic headache	5.85%	1.39%
Obesity	18.65%	9.56%
Peripheral vascular disease	7.28%	13.54%
Rheumatoid arthritis/osteoarthritis	25.38%	33.14%
Schizophrenia and other psychotic disorders	10.61%	2.84%
Tobacco use disorders	22.36%	5.42%

Appendix B: Program Descriptions

Code description

This appendix describes SAS and Stata programs for Medicare and Optum claims data analysis. The programs are sent in a separate package.

Medicare programs:

SAS programs for data cleaning:

- clean_raw_data.sas: this is the SAS code used to clean and select variables from the raw data
- partd.sas: this is the SAS code used to determine the beneficiaries' Part D enrollment status for each year
- analysis_dataset.sas: this is the SAS code used to generate analysis dataset, output in Excel format. This needs to run after clean_raw_data.sas and partd.sas

Stata programs for analysis, which need to run after the SAS programs:

- analysis_measure.do: this is the Stata code used to read in the Excel format analysis dataset into Stata format and also generate some measures used in analysis. The output is in Stata (.dta) format and ready for analysis
- model_di.do: this is the regression analysis Stata code for DI population
- model_aged.do: this is the regression analysis Stata code for AGED population

Optum programs:

master.sas is a master program to call all the other macros. This is the only program that needs to run.

Macros are recorded in the following SAS programs:

- select_vars.sas: this program contains macro to select variables needed to develop disease measures using CCW algorithm
- ccw.sas: this program contains macros to apply CCW algorithm for multiple chronic conditions
- enrollment.sas: this program contains macros to process Optum enrollment file and identify individuals who enrolled for the entire year
- cost_and_use.sas: this program contains macros to process Optum inpatient files, counting yearly number of inpatient stays, inpatient days and cost
- er_visit.sas: this program contains macros to process Optum medical files, counting yearly number of emergency room stays and cost
- physician_visit.sas: this program contains macros to process OPTUM medical files, counting yearly number of physician visits
- drug_cost.sas: this program contains macros to process Optum prescription drug files, counting yearly drug cost
- drug_fill.sas: this program contains macros to process Optum prescription drug files, counting yearly drug fills and standardize the fills to 30-day supply
- dod.sas: this program processes Optum date of death file, assigning flags for the deceased
- join.sas: this program joins different datasets together and creates a summary dataset

Stata code to run the models, which needs to run after the SAS programs:

- model_di.do: this is the regression analysis Stata code for DI population
- model_commercial.do: this is the regression analysis Stata code for commercial population

Appendix C1: Medicare Codebook

```
-------------------------------------------------------------------------------
bene_id                                                             (unlabeled)
-------------------------------------------------------------------------------

                  type:  string (str15)

         unique values:  12,262,531               missing "":  0/82,627,412

              examples:  "mmmmmmmDssaaaUm"
                         "mmmmmmmUGXWsJXJ"
                         "mmmmmmmWWaDmmfD"
                         "mmmmmmmmWDaJaGG"

-------------------------------------------------------------------------------
age65p                                                              (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [0,1]                        units:  1
         unique values:  2                        missing .:  0/82,627,412

            tabulation:  Freq.  Value
                    13,331,539  0
                    69,295,873  1

-------------------------------------------------------------------------------
age                                                                 (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (int)

                 range:  [0,199]                      units:  1
         unique values:  165                      missing .:  26/82,627,412

                  mean:   72.2117
              std. dev:   12.5536

           percentiles:        10%       25%       50%       75%       90%
                                56        67        73        80        87

-------------------------------------------------------------------------------
male                                                                (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [0,1]                        units:  1
         unique values:  2                        missing .:  29/82,627,412

            tabulation:  Freq.  Value
                    46,303,472  0
                    36,323,911  1
                            29  .

-------------------------------------------------------------------------------
race_bg                                                             (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [1,6]                        units:  1
         unique values:  6                        missing .:  188,951/82,627,41
> 2

            tabulation:  Freq.  Value
                    67,244,652  1
```

```
                     7,759,394  2
                       974,783  3
                     1,546,165  4
                     4,554,893  5
                       358,574  6
                       188,951  .

-------------------------------------------------------------------------------
dead_thisyear                                                       (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [0,1]                        units:  1
         unique values:  2                        missing .:  0/82,627,412

           tabulation:  Freq.  Value
                    78,684,144  0
                     3,943,268  1

-------------------------------------------------------------------------------
dead_ny                                                             (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [0,1]                        units:  1
         unique values:  2                        missing .:  0/82,627,412

           tabulation:  Freq.  Value
                    79,105,516  0
                     3,521,896  1

-------------------------------------------------------------------------------
enroll                                                              (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [1,1]                        units:  1
         unique values:  1                        missing .:  0/82,627,412

           tabulation:  Freq.  Value
                    82,627,412  1

-------------------------------------------------------------------------------
allcc_count                                                         (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [0,23]                       units:  1
         unique values:  24                       missing .:  0/82,627,412

                  mean:   3.32205
              std. dev:   2.69842

           percentiles:        10%       25%       50%       75%       90%
                                 0         1         3         5         7

-------------------------------------------------------------------------------
any_ip                                                              (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [0,1]                        units:  1
         unique values:  2                        missing .:  0/82,627,412

           tabulation:  Freq.  Value
                    65,198,482  0
```

```
                 17,428,930  1

-------------------------------------------------------------------------------
year                                                                (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (int)

                 range:  [2002,2014]                  units:  1
         unique values:  13                       missing .:  0/82,627,412

                  mean:      2008
              std. dev:   3.75648

           percentiles:        10%       25%       50%       75%       90%
                              2003      2005      2008      2011      2013

-------------------------------------------------------------------------------
ip_days                                                             (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (int)

                 range:  [0,1494]                     units:  1
         unique values:  399                      missing .:  0/82,627,412

                  mean:   2.15223
              std. dev:   7.75332

           percentiles:        10%       25%       50%       75%       90%
                                 0         0         0         0         6

-------------------------------------------------------------------------------
any_er                                                              (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [0,1]                        units:  1
         unique values:  2                        missing .:  0/82,627,412

            tabulation:  Freq.  Value
                 62,549,206  0
                 20,078,206  1

-------------------------------------------------------------------------------
er_visits                                                           (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (int)

                 range:  [0,422]                      units:  1
         unique values:  234                      missing .:  0/82,627,412

                  mean:   .447085
              std. dev:    1.3877

           percentiles:        10%       25%       50%       75%       90%
                                 0         0         0         0         1

-------------------------------------------------------------------------------
phys_events                                                         (unlabeled)
-------------------------------------------------------------------------------

                  type:  numeric (int)

                 range:  [0,400]                      units:  1
         unique values:  299                      missing .:  0/82,627,412

                  mean:      7.03
              std. dev:   7.53369
```

```
          percentiles:        10%       25%       50%       75%       90%
                                0         2         5        10        16

-------------------------------------------------------------------------------
mdcr_pmt                                                            (unlabeled)
-------------------------------------------------------------------------------

                 type:  numeric (float)

                range:  [0,16756456]                 units:  .01
        unique values:  7,285,615                missing .:  5,122,596/82,627,
> 412

                 mean:   10267.4
             std. dev:   21149.4

          percentiles:        10%       25%       50%       75%       90%
                           267.66    909.65   2943.87   9739.68   28495.7

-------------------------------------------------------------------------------
mdcr_pmt_ad                                                         (unlabeled)
-------------------------------------------------------------------------------

                 type:  numeric (float)

                range:  [0,19932866]                 units:  1.000e-10
        unique values:  21,763,345               missing .:  5,122,596/82,627,
> 412

                 mean:   12573.1
             std. dev:   25628.8

          percentiles:        10%       25%       50%       75%       90%
                          344.228   1154.11   3621.61   11943.3   35130.2

-------------------------------------------------------------------------------
ptd_mdcr_pmt                                                        (unlabeled)
-------------------------------------------------------------------------------

                 type:  numeric (float)

                range:  [0,5695328.5]                units:  .01
        unique values:  1,992,645                missing .:  53,082,183/82,627
> ,412

                 mean:   2653.19
             std. dev:   6339.71

          percentiles:        10%       25%       50%       75%       90%
                            25.13    344.75   1280.38   2315.47   6227.61

-------------------------------------------------------------------------------
ptd_fill_cnt                                                        (unlabeled)
-------------------------------------------------------------------------------

                 type:  numeric (int)

                range:  [0,1223]                     units:  1
        unique values:  799                      missing .:  53,082,183/82,627
> ,412

                 mean:   55.2928
             std. dev:   41.8256

          percentiles:        10%       25%       50%       75%       90%
                               11        25        47        76       109
```

Appendix C2: Optum Codebook

```
--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------
-------------------------------------------

      name:  <unnamed>

       log:  /schaeffer-a/sch-projects/dua-data-projects/OPTUM/SSA/pgm/codebook_optum.log

  log type:  text

 opened on:  14 May 2019, 15:16:47


.

. * DI

. use ../data/analytic0408, clear


. codebook age male dead ccw_count any_ip ip_days any_er n_er n_car fills total_cost


--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------
-------------------------------------------

age
(unlabeled)

--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------
-------------------------------------------


                  type:  numeric (byte)


                 range:  [18,64]                      units:  1

         unique values:  47                       missing .:  0/2,412,358


                  mean:   56.7794

              std. dev:   7.31446


           percentiles:        10%       25%       50%       75%       90%

                                47        54        59        62        64


--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------
-------------------------------------------

male
(unlabeled)
```

```
                  type:  numeric (byte)

                 range:  [0,1]                        units:  1
         unique values:  2                        missing .:  0/2,412,358

            tabulation:  Freq.  Value
                     1,299,222  0
                     1,113,136  1
```

----

dead
(unlabeled)

```
                  type:  numeric (byte)

                 range:  [0,1]                        units:  1
         unique values:  2                        missing .:  0/2,412,358

            tabulation:  Freq.  Value
                     2,378,853  0
                        33,505  1
```

----

ccw_count
(unlabeled)

```
                  type:  numeric (byte)
```

```
                  range:  [0,23]                       units:  1
         unique values:  24                        missing .:  874,626/2,412,358

                   mean:   5.27249
               std. dev:    3.6217

            percentiles:        10%       25%       50%       75%       90%
                                  1         3         5         8        10

-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------
any_ip
(unlabeled)
-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------

                   type:  numeric (byte)

                  range:  [0,1]                        units:  1
         unique values:  2                         missing .:  0/2,412,358

             tabulation:  Freq.  Value
                      2,079,229  0
                        333,129  1

-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------
ip_days
(unlabeled)
-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------

                   type:  numeric (int)

                  range:  [0,365]                      units:  1
         unique values:  280                       missing .:  0/2,412,358
```

```
                  mean:   1.30544
              std. dev:   6.72091

           percentiles:        10%       25%       50%       75%       90%
                                 0         0         0         0         2

-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
any_er
(unlabeled)
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [0,1]                        units:  1
         unique values:  2                        missing .:  0/2,412,358

            tabulation:  Freq.  Value
                     1,745,233  0
                       667,125  1

-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
n_er
(unlabeled)
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

                  type:  numeric (int)

                 range:  [0,508]                      units:  1
         unique values:  234                      missing .:  0/2,412,358

                  mean:   1.49711
              std. dev:   4.71532
```

```
         percentiles:        10%       25%       50%       75%       90%
                               0         0         0         1         4

-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------
n_car
(unlabeled)
-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------

                type:  numeric (int)

               range:  [0,1400]                     units:  1
       unique values:  360                      missing .:  0/2,412,358

                mean:   15.8834
           std. dev:     17.834

         percentiles:        10%       25%       50%       75%       90%
                               0         4        11        22        36

-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------
fills
(unlabeled)
-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------

                type:  numeric (double)

               range:  [-2.2666667,670.2]           units:  1.000e-10
       unique values:  53,207                   missing .:  0/2,412,358

                mean:   35.8881
           std. dev:    38.5487

         percentiles:        10%       25%       50%       75%       90%
```

```
                              0         4   25.8333   54.0333   86.3667

-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------

total_cost
(unlabeled)

-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------

                  type:  numeric (double)

                 range:  [-3066459.3,16811998]        units:  .00001
         unique values:  2,132,329                missing .:  0/2,412,358

                  mean:   15468.1
              std. dev:   41330.5

           percentiles:        10%       25%       50%       75%       90%
                            194.88   1423.27   4933.91   14127.3   36585.6

.
. * commercial
. use ../data/analytic0408_comm, clear

. codebook age male dead ccw_count any_ip ip_days any_er n_er n_car fills total_cost

-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------

age
(unlabeled)

-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------

                  type:  numeric (byte)

                 range:  [18,64]                      units:  1
         unique values:  47                       missing .:  0/49,652,115
```

```
                 mean:   41.4565
             std. dev:   12.7123

          percentiles:        10%       25%       50%       75%       90%
                               23        31        42        52        58

-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
male
(unlabeled)
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

                 type:  numeric (byte)

                range:  [0,1]                        units:  1
        unique values:  2                        missing .:  6,478/49,652,115

           tabulation:  Freq.  Value
                   25,217,669  0
                   24,427,968  1
                        6,478  .

-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
dead
(unlabeled)
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

                 type:  numeric (byte)

                range:  [0,1]                        units:  1
        unique values:  2                        missing .:  0/49,652,115

           tabulation:  Freq.  Value
```

```
                 49,487,638  0

                    164,477  1

--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------
------------------------------------------
ccw_count
(unlabeled)
--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------
------------------------------------------

                  type:  numeric (byte)

                 range:  [0,23]                       units:  1
         unique values:  24                       missing .:  18,264,256/49,652,115

                  mean:   2.12277
              std. dev:   2.34559

           percentiles:        10%       25%       50%       75%       90%
                                 0         0         1         3         5

--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------
------------------------------------------
any_ip
(unlabeled)
--------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------
------------------------------------------

                  type:  numeric (byte)

                 range:  [0,1]                        units:  1
         unique values:  2                        missing .:  0/49,652,115

            tabulation:  Freq.  Value
                 47,085,418  0
                  2,566,697  1
```

```
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------
ip_days
(unlabeled)
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------

                  type:  numeric (int)

                 range:  [0,365]                      units:  1
         unique values:  341                      missing .:  0/49,652,115

                  mean:   .251678
              std. dev:    2.4238

           percentiles:        10%       25%       50%       75%       90%
                                 0         0         0         0         0

-----------------------------------------------------------------------------------------------------------------------------------------------------------------------
any_er
(unlabeled)
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------

                  type:  numeric (byte)

                 range:  [0,1]                        units:  1
         unique values:  2                        missing .:  0/49,652,115

            tabulation:  Freq.  Value
                    40,743,805  0
                     8,908,310  1

-----------------------------------------------------------------------------------------------------------------------------------------------------------------------
```

```
n_er
(unlabeled)

-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------


                  type:  numeric (int)


                 range:  [0,472]                      units:  1

         unique values:  237                      missing .:  0/49,652,115


                  mean:    .66311

             std. dev:   2.50255


           percentiles:        10%       25%       50%       75%       90%

                                 0         0         0         0         2


-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------

n_car
(unlabeled)

-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------


                  type:  numeric (int)


                 range:  [0,1432]                     units:  1

         unique values:  484                      missing .:  0/49,652,115


                  mean:    8.1107

             std. dev:   11.1907


           percentiles:        10%       25%       50%       75%       90%

                                 0         1         5        11        20


-------------------------------------------------------------------------------------------------
-------------------------------------------------------------------------------------------------
------------------------------------------
```

```
fills
(unlabeled)
---------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------------
------------------------------------------

                  type:  numeric (double)

                 range:  [-5,531.33333]               units:  1.000e-10
         unique values:  56,466                   missing .:  0/49,652,115

                  mean:   10.7097
              std. dev:   17.9685

           percentiles:        10%       25%       50%       75%       90%
                                 0         0   2.53333   13.6333   31.8667

---------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------------
------------------------------------------
total_cost
(unlabeled)
---------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------------
------------------------------------------

                  type:  numeric (double)

                 range:  [-1175348.7,23172305]        units:  1.000e-21
         unique values:  31,474,275               missing .:  0/49,652,115

                  mean:   5152.61
              std. dev:   18673.6

           percentiles:        10%       25%       50%       75%       90%
                                 0   201.025   1128.64   4087.08   11822.7

.

. log close

      name:  <unnamed>
```

```
      log:  /schaeffer-a/sch-projects/dua-data-projects/OPTUM/SSA/pgm/codebook_optum.log
 log type:  text
closed on:  14 May 2019, 15:45:03
---------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------------
------------------------------------------
```

Appendix D1: Regression tables – Medicare FFS

DI

```
. * next year mortality - DI
. logit dead_ny age male any_ip##i.yr_after_2001 if (enroll_ny==1|dead_ny==1),
> nolog cluster(bene_id2)

Logistic regression                             Number of obs     = 11,255,795
                                                Wald chi2(25)     =  209169.83
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -1191465.4               Pseudo R2         =     0.0779

                       (Std. Err. adjusted for 2,130,226 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
     dead_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0470634    .000232   202.89   0.000     .0466087     .047518
        male |   .3639758   .0039234    92.77   0.000     .3562861    .3716656
    1.any_ip |   1.502641   .0140515   106.94   0.000       1.4751    1.530181
             |
yr_afte~2001 |
          2  |  -.0240976   .0141696    -1.70   0.089    -.0518695    .0036743
          3  |  -.0205777   .0140359    -1.47   0.143    -.0480875    .0069321
          4  |  -.0568303   .0141926    -4.00   0.000    -.0846472   -.0290134
          5  |  -.0559351   .0141131    -3.96   0.000    -.0835963   -.0282739
          6  |  -.0536991   .0140363    -3.83   0.000    -.0812099   -.0261884
          7  |  -.0850694   .0140846    -6.04   0.000    -.1126747   -.0574641
          8  |  -.1290985   .0141306    -9.14   0.000    -.1567939   -.1014031
          9  |  -.1030759   .0138925    -7.42   0.000    -.1303047    -.075847
         10  |   -.116475   .0138565    -8.41   0.000    -.1436331   -.0893168
         11  |   -.088694   .0137246    -6.46   0.000    -.1155937   -.0617943
         12  |   -.073249   .0136908    -5.35   0.000    -.1000826   -.0464155
             |
     any_ip#|
yr_afte~2001 |
       1  2  |  -.0237954    .019773    -1.20   0.229    -.0625497    .0149589
       1  3  |  -.0104036   .0195402    -0.53   0.594    -.0487018    .0278946
       1  4  |   .0174952   .0196759     0.89   0.374    -.0210689    .0560593
       1  5  |   .0268592   .0196048     1.37   0.171    -.0115654    .0652839
       1  6  |  -.0044873   .0196094    -0.23   0.819     -.042921    .0339465
       1  7  |   .0361133      .0196     1.84   0.065    -.0023019    .0745285
       1  8  |   .0638301   .0196013     3.26   0.001     .0254122    .1022479
       1  9  |   .0319264   .0193674     1.65   0.099     -.006033    .0698858
       1 10  |   .0675876   .0192873     3.50   0.000     .0297852      .10539
       1 11  |   .0453594   .0192045     2.36   0.018     .0077192    .0829997
       1 12  |   .0825965   .0191926     4.30   0.000     .0449797    .1202132
             |
       _cons |  -6.838013   .0162581  -420.59   0.000    -6.869879   -6.806148
```

```
. * next year CCW count - DI
. reg ccw_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, cluster(bene_id2
> )

Linear regression                               Number of obs     =   11255795
                                                F(25, 2130225)    =   54047.66
                                                Prob > F          =     0.0000
                                                R-squared         =     0.2602
                                                Root MSE          =     2.6428

                       (Std. Err. adjusted for 2,130,226 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
      ccw_ny |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0531197   .0001402   378.88   0.000     .0528449    .0533945
        male |  -.7576005   .0034073  -222.35   0.000    -.7642787   -.7509223
    1.any_ip |    2.73309   .0072745   375.71   0.000     2.718833    2.747348
```

```
             |
yr_afte~2001 |
          2  |   .1006878   .0026905    37.42   0.000     .0954145    .1059611
          3  |   .1844959   .0029169    63.25   0.000     .1787789     .190213
          4  |   .2553979   .0031389    81.36   0.000     .2492457    .2615501
          5  |   .3399516    .003283   103.55   0.000     .3335171    .3463862
          6  |   .4230878   .0034087   124.12   0.000     .4164068    .4297688
          7  |   .5394511   .0035202   153.24   0.000     .5325515    .5463506
          8  |   .6233156   .0036012   173.09   0.000     .6162574    .6303738
          9  |   .7418544   .0037037   200.30   0.000     .7345952    .7491135
         10  |   .8184053   .0037563   217.87   0.000     .8110431    .8257676
         11  |   .9104064     .00382   238.33   0.000     .9029193    .9178934
         12  |   .9731022   .0038994   249.55   0.000     .9654595     .980745
             |
      any_ip#|
yr_afte~2001 |
       1  2  |   .0823959   .0085415     9.65   0.000     .0656549    .0991369
       1  3  |   .1518033   .0091909    16.52   0.000     .1337895    .1698171
       1  4  |   .2184017   .0095587    22.85   0.000      .199667    .2371364
       1  5  |   .3221573   .0098515    32.70   0.000     .3028488    .3414659
       1  6  |   .4580183   .0100613    45.52   0.000     .4382984    .4777381
       1  7  |   .5636266   .0102445    55.02   0.000     .5435477    .5837055
       1  8  |   .6391949    .010339    61.82   0.000     .6189309    .6594589
       1  9  |   .8315281   .0106218    78.28   0.000     .8107097    .8523465
       1 10  |   1.043296   .0107907    96.68   0.000     1.022147    1.064446
       1 11  |   1.073233    .010904    98.43   0.000     1.051861    1.094604
       1 12  |   1.119957   .0111356   100.57   0.000     1.098132    1.141782
             |
       _cons |   .0059621   .0075351     0.79   0.429    -.0088064    .0207306
------------------------------------------------------------------------------

. * next year inpatient use - DI
. logit anyip_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, nolog cluste
> r(bene_id2)

Logistic regression                             Number of obs     = 11,255,795
                                                Wald chi2(25)     =  690216.54
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -5273733.5               Pseudo R2         =     0.0951

                       (Std. Err. adjusted for 2,130,226 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
    anyip_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0089253   .0000935    95.48   0.000     .0087421    .0091086
        male |   -.116415   .0018879   -61.67   0.000    -.1201151   -.1127149
    1.any_ip |   1.678461   .0059017   284.40   0.000     1.666894    1.690028
             |
yr_afte~2001 |
          2  |   .0026326   .0047484     0.55   0.579     -.006674    .0119393
          3  |   .0057168   .0045713     1.25   0.211    -.0032427    .0146764
          4  |  -.0107383   .0046422    -2.31   0.021    -.0198368   -.0016398
          5  |  -.0273195    .004653    -5.87   0.000    -.0364391   -.0181998
          6  |    -.04258   .0046659    -9.13   0.000     -.051725   -.0334349
          7  |  -.0455512   .0046719    -9.75   0.000    -.0547079   -.0363945
          8  |  -.0712526   .0046729   -15.25   0.000    -.0804112   -.0620939
          9  |  -.0881268   .0046555   -18.93   0.000    -.0972514   -.0790021
         10  |  -.1133656     .00466   -24.33   0.000     -.122499   -.1042323
         11  |  -.1495059    .004677   -31.97   0.000    -.1586727   -.1403391
         12  |   -.165037   .0047058   -35.07   0.000    -.1742601   -.1558139
             |
      any_ip#|
yr_afte~2001 |
       1  2  |   -.003789   .0074157    -0.51   0.609    -.0183235    .0107455
       1  3  |  -.0074395   .0079034    -0.94   0.347    -.0229299    .0080509
       1  4  |  -.0102704   .0080127    -1.28   0.200    -.0259749    .0054341
       1  5  |  -.0028298   .0080552    -0.35   0.725    -.0186177    .0129582
       1  6  |   .0063007   .0080822     0.78   0.436    -.0095402    .0221416
       1  7  |   .0096234   .0080902     1.19   0.234    -.0062332      .02548
       1  8  |   .0195851   .0080706     2.43   0.015      .003767    .0354033
       1  9  |   .0305413   .0080292     3.80   0.000     .0148044    .0462782
```

```
      1 10  |   .0488736   .0080322     6.08   0.000     .0331307    .0646165
      1 11  |   .0551366   .0080654     6.84   0.000     .0393288    .0709445
      1 12  |   .0703297   .0081594     8.62   0.000     .0543375    .0863219
            |
      _cons |  -2.110074   .0059025  -357.49   0.000    -2.121643   -2.098505
------------------------------------------------------------------------------

. * next year inpatient days - DI
. nbreg ipdays_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, nolog clust
> er(bene_id2)

Negative binomial regression                    Number of obs     = 11,255,795
                                                Wald chi2(25)     =  490932.99
Dispersion           = mean                     Prob > chi2       =     0.0000
Log pseudolikelihood =  -13367806               Pseudo R2         =     0.0184

                       (Std. Err. adjusted for 2,130,226 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
   ipdays_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0061202   .0001562    39.18   0.000      .005814    .0064264
        male |  -.0023178   .0031143    -0.74   0.457    -.0084217    .0037862
    1.any_ip |   1.770452   .0075849   233.42   0.000     1.755586    1.785318
             |
yr_afte~2001 |
          2  |   .0056507     .00795     0.71   0.477    -.0099311    .0212324
          3  |  -.0269469   .0077256    -3.49   0.000    -.0420888   -.0118051
          4  |   -.031888   .0078914    -4.04   0.000    -.0473549   -.0164211
          5  |  -.0528706   .0079616    -6.64   0.000     -.068475   -.0372662
          6  |  -.0726768   .0079196    -9.18   0.000     -.088199   -.0571546
          7  |  -.1019658   .0079172   -12.88   0.000    -.1174833   -.0864483
          8  |  -.1325195   .0079038   -16.77   0.000    -.1480107   -.1170283
          9  |  -.1336368   .0078574   -17.01   0.000    -.1490371   -.1182365
         10  |  -.1752447   .0078553   -22.31   0.000    -.1906409   -.1598485
         11  |  -.1937909   .0078921   -24.56   0.000    -.2092591   -.1783227
         12  |  -.1994271   .0079423   -25.11   0.000    -.2149938   -.1838604
             |
      any_ip#|
yr_afte~2001 |
      1  2   |  -.0025624   .0101148    -0.25   0.800     -.022387    .0172623
      1  3   |   .0212998   .0102503     2.08   0.038     .0012097      .04139
      1  4   |   .0128696   .0105077     1.22   0.221    -.0077252    .0334644
      1  5   |    .035048   .0106141     3.30   0.001     .0142448    .0558513
      1  6   |   .0383834   .0106068     3.62   0.000     .0175945    .0591723
      1  7   |   .0606545   .0106155     5.71   0.000     .0398485    .0814605
      1  8   |   .0758241   .0105876     7.16   0.000     .0550728    .0965753
      1  9   |   .0670143   .0105151     6.37   0.000     .0464052    .0876235
      1 10   |   .1086007   .0105203    10.32   0.000     .0879813    .1292202
      1 11   |   .1106855   .0106014    10.44   0.000     .0899072    .1314639
      1 12   |   .1271168   .0107045    11.88   0.000     .1061362    .1480973
             |
       _cons |   .0431301   .0099719     4.33   0.000     .0235856    .0626746
-------------+----------------------------------------------------------------
    /lnalpha |   2.658976   .0012505                      2.656525    2.661427
-------------+----------------------------------------------------------------
       alpha |   14.28166   .0178586                       14.2467    14.31671
------------------------------------------------------------------------------

. * next year ED encounters - DI
. logit anyer_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, nolog cluste
> r(bene_id2)

Logistic regression                             Number of obs     = 11,255,795
                                                Wald chi2(25)     =  408429.08
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -6947752.4               Pseudo R2         =     0.0456

                       (Std. Err. adjusted for 2,130,226 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
    anyer_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
         age |  -.0188388   .0000968  -194.52   0.000    -.0190286    -.018649
        male |  -.2908484   .0020846  -139.52   0.000    -.2949341   -.2867627
    1.any_ip |   .9789149   .0055658   175.88   0.000     .9680062    .9898236
             |
yr_afte~2001 |
          2  |   .0219591   .0035029     6.27   0.000     .0150935    .0288248
          3  |   .0752016   .0035302    21.30   0.000     .0682826    .0821207
          4  |   .0888671   .0036036    24.66   0.000     .0818042      .09593
          5  |   .1029481   .0036221    28.42   0.000     .0958489    .1100473
          6  |   .1171665   .0036312    32.27   0.000     .1100494    .1242835
          7  |   .1528466   .0036346    42.05   0.000     .1457229    .1599702
          8  |   .1673181   .0036359    46.02   0.000     .1601919    .1744443
          9  |   .1956566   .0036119    54.17   0.000     .1885774    .2027358
         10  |   .2419307   .0035976    67.25   0.000     .2348797    .2489818
         11  |   .4121134   .0035663   115.56   0.000     .4051236    .4191031
         12  |      .4362   .0035831   121.74   0.000     .4291772    .4432227
             |
     any_ip#|
yr_afte~2001 |
       1  2  |   .0122618   .0073724     1.66   0.096    -.0021879    .0267115
       1  3  |   .0023578   .0074252     0.32   0.751    -.0121952    .0169109
       1  4  |  -.0043417   .0075145    -0.58   0.563    -.0190699    .0103864
       1  5  |    .003143   .0075512     0.42   0.677    -.0116571     .017943
       1  6  |   .0213054   .0075729     2.81   0.005     .0064628     .036148
       1  7  |   .0291691     .00757     3.85   0.000      .014332    .0440061
       1  8  |   .0337414   .0075476     4.47   0.000     .0189483    .0485344
       1  9  |   .0390905    .007508     5.21   0.000     .0243751    .0538058
       1 10  |   .0482281   .0075038     6.43   0.000      .033521    .0629352
       1 11  |   .3308439   .0076521    43.24   0.000      .315846    .3458419
       1 12  |   .3387787   .0077671    43.62   0.000     .3235555    .3540018
             |
       _cons |   .0648907   .0056801    11.42   0.000      .053758    .0760234
```

```
. * next year ER visits - DI
. nbreg ervisits_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, nolog clu
> ster(bene_id2)

Negative binomial regression                    Number of obs     = 11,255,795
                                                Wald chi2(25)     =  246354.46
Dispersion           = mean                     Prob > chi2       =     0.0000
Log pseudolikelihood =  -13266755               Pseudo R2         =     0.0356

                        (Std. Err. adjusted for 2,130,226 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
 ervisits_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |  -.0261729   .0001353  -193.44   0.000    -.0264381   -.0259077
        male |  -.2313269    .003015   -76.73   0.000    -.2372362   -.2254176
    1.any_ip |   1.057355   .0071135   148.64   0.000     1.043413    1.071298
             |
yr_afte~2001 |
          2  |   .0235331   .0042569     5.53   0.000     .0151897    .0318765
          3  |   .0723176   .0042733    16.92   0.000     .0639421    .0806931
          4  |   .0967799   .0045181    21.42   0.000     .0879246    .1056352
          5  |   .1169048   .0045679    25.59   0.000     .1079519    .1258577
          6  |   .1318689   .0045566    28.94   0.000     .1229382    .1407997
          7  |   .1673667   .0045996    36.39   0.000     .1583517    .1763818
          8  |   .1917591   .0046308    41.41   0.000     .1826829    .2008353
          9  |   .2193858   .0046092    47.60   0.000     .2103519    .2284198
         10  |   .2661616   .0044741    59.49   0.000     .2573925    .2749306
         11  |   .4429187   .0044165   100.29   0.000     .4342625    .4515748
         12  |   .4730886    .004403   107.45   0.000     .4644589    .4817183
             |
     any_ip#|
yr_afte~2001 |
       1  2  |   .0093714   .0081963     1.14   0.253    -.0066931    .0254358
       1  3  |  -.0101848   .0084881    -1.20   0.230    -.0268212    .0064517
       1  4  |  -.0130298   .0088337    -1.48   0.140    -.0303436     .004284
       1  5  |  -.0085886   .0089514    -0.96   0.337    -.0261329    .0089558
       1  6  |   .0075201   .0091762     0.82   0.412    -.0104649    .0255051
```

```
      1  7  |   .0118953   .0091119     1.31   0.192    -.0059638    .0297543
      1  8  |   .0222813   .0091579     2.43   0.015     .0043321    .0402305
      1  9  |   .0309283   .0090563     3.42   0.001     .0131783    .0486783
      1 10  |   .0315334   .0089979     3.50   0.000     .0138979     .049169
      1 11  |   .2104036    .008541    24.63   0.000     .1936636    .2271436
      1 12  |   .2135686   .0086082    24.81   0.000     .1966969    .2304402
            |
      _cons |   .7408678   .0077078    96.12   0.000     .7257607    .7559749
-------------+----------------------------------------------------------------
    /lnalpha |   .9401553   .0022359                       .935773    .9445376
-------------+----------------------------------------------------------------
       alpha |   2.560379   .0057248                      2.549183    2.571624
------------------------------------------------------------------------------

. * next year physician visits - DI
. nbreg phys_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, nolog cluster
> (bene_id2)

Negative binomial regression                    Number of obs     = 11,255,795
                                                Wald chi2(25)     =  280764.21
Dispersion           = mean                     Prob > chi2       =     0.0000
Log pseudolikelihood =  -32479578               Pseudo R2         =     0.0115

                      (Std. Err. adjusted for 2,130,226 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
     phys_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0131253   .0000779   168.60   0.000     .0129727    .0132778
        male |  -.4002281   .0016027  -249.73   0.000    -.4033693   -.3970869
    1.any_ip |   .4889064   .0031167   156.87   0.000     .4827978    .4950151
             |
yr_afte~2001 |
          2  |   .0082604   .0015769     5.24   0.000     .0051697    .0113511
          3  |   .0194082   .0017303    11.22   0.000     .0160168    .0227996
          4  |    .020172   .0018599    10.85   0.000     .0165266    .0238173
          5  |   .0163637   .0019269     8.49   0.000     .0125871    .0201403
          6  |   .0228406   .0019775    11.55   0.000     .0189648    .0267164
          7  |   .0547468   .0019977    27.40   0.000     .0508313    .0586623
          8  |   .1158343   .0020081    57.68   0.000     .1118985    .1197701
          9  |   .1083391   .0020174    53.70   0.000     .1043851    .1122931
         10  |   .1106263    .002025    54.63   0.000     .1066574    .1145952
         11  |    .217451   .0020074   108.32   0.000     .2135165    .2213854
         12  |   .2101055   .0020299   103.51   0.000      .206127     .214084
             |
     any_ip#|
yr_afte~2001 |
      1  2  |  -.0091187   .0037695    -2.42   0.016    -.0165067   -.0017307
      1  3  |  -.0231682   .0039167    -5.92   0.000    -.0308447   -.0154917
      1  4  |  -.0199786   .0040465    -4.94   0.000    -.0279096   -.0120476
      1  5  |  -.0148238   .0040806    -3.63   0.000    -.0228216   -.0068261
      1  6  |   -.010061    .004109    -2.45   0.014    -.0181144   -.0020076
      1  7  |  -.0155218   .0040841    -3.80   0.000    -.0235265   -.0075171
      1  8  |  -.0055357   .0040499    -1.37   0.172    -.0134733    .0024019
      1  9  |  -.0076255   .0040437    -1.89   0.059    -.0155511    .0003001
      1 10  |  -.0088066   .0040378    -2.18   0.029    -.0167205   -.0008926
      1 11  |  -.0222319   .0040005    -5.56   0.000    -.0300727   -.0143911
      1 12  |  -.0237135    .004036    -5.88   0.000    -.0316238   -.0158031
            |
      _cons |   1.194777   .0043152   276.88   0.000     1.186319    1.203234
-------------+----------------------------------------------------------------
    /lnalpha |   .2992077   .0011538                      .2969463     .301469
-------------+----------------------------------------------------------------
       alpha |    1.34879   .0015562                      1.345743    1.351843
------------------------------------------------------------------------------

. * next year drug fills - DI
.
. reg ptdfillcnt_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, cluster(b
> ene_id2)

Linear regression                               Number of obs     =  5,787,001
                                                F(19, 1324027)    =   11294.37
```

```
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0877
                                                Root MSE          =     47.202

                       (Std. Err. adjusted for 1,324,028 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
ptdfillcnt~y |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .9110044   .0036171   251.86   0.000      .903915    .9180938
        male |   -9.44786   .0875201  -107.95   0.000    -9.619396   -9.276323
    1.any_ip |   19.63761   .1532166   128.17   0.000     19.33731    19.93791
             |
yr_afte~2001 |
          5  |   4.480461   .0595034    75.30   0.000     4.363836    4.597086
          6  |   6.531027   .0671795    97.22   0.000     6.399357    6.662696
          7  |   7.611227   .0716318   106.25   0.000     7.470831    7.751623
          8  |   8.359979   .0744775   112.25   0.000     8.214006    8.505953
          9  |   7.757071   .0750568   103.35   0.000     7.609963     7.90418
         10  |   8.368311   .0766994   109.11   0.000     8.217983     8.51864
         11  |   11.18641   .0795372   140.64   0.000     11.03051     11.3423
         12  |   11.77022   .0820686   143.42   0.000     11.60936    11.93107
             |
      any_ip#|
yr_afte~2001 |
       1  5  |   .9209665   .1898027     4.85   0.000     .5489596    1.292973
       1  6  |   1.579482   .2024136     7.80   0.000     1.182758    1.976205
       1  7  |   1.789406   .2066882     8.66   0.000     1.384304    2.194508
       1  8  |    1.46541   .2071723     7.07   0.000      1.05936    1.871461
       1  9  |   1.002543   .2044984     4.90   0.000      .601733    1.403353
       1 10  |   .5835842   .2045819     2.85   0.004     .1826107    .9845577
       1 11  |   1.720533    .210332     8.18   0.000     1.308289    2.132776
       1 12  |   1.372022   .2154595     6.37   0.000     .9497291    1.794316
             |
       _cons |   8.394619   .1901331    44.15   0.000     8.021965    8.767274
------------------------------------------------------------------------------

. * next year cost - DI
. reg mdcrpmt_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, cluster(bene
> _id2)

Linear regression                               Number of obs     =   10215191
                                                F(25, 2019273)    =   13147.65
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0930
                                                Root MSE          =      26877

                       (Std. Err. adjusted for 2,019,274 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
  mdcrpmt_ny |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   71.98303   1.583515    45.46   0.000      68.8794    75.08667
        male |  -137.3004    29.1472    -4.71   0.000    -194.4279   -80.17295
    1.any_ip |   13031.71   76.75746   169.78   0.000     12881.27    13182.16
             |
yr_afte~2001 |
          2  |   449.8524   25.41222    17.70   0.000     400.0454    499.6595
          3  |   740.6253   24.46039    30.28   0.000     692.6838    788.5668
          4  |   3350.751   25.63987   130.69   0.000     3300.498    3401.004
          5  |   3890.416   26.44827   147.10   0.000     3838.578    3942.253
          6  |   4552.358   28.37989   160.41   0.000     4496.734    4607.982
          7  |   5063.383   29.18098   173.52   0.000     5006.189    5120.577
          8  |   5303.022    29.8782   177.49   0.000     5244.462    5361.582
          9  |   5767.993   30.55704   188.76   0.000     5708.102    5827.883
         10  |   5957.745   30.31663   196.52   0.000     5898.326    6017.165
         11  |    6264.27   30.81694   203.27   0.000     6203.869     6324.67
         12  |    7195.86   34.73181   207.18   0.000     7127.787    7263.933
             |
      any_ip#|
yr_afte~2001 |
       1  2  |   898.9963   97.18437     9.25   0.000     708.5184    1089.474
```

```
      1  3  |   1795.036   103.6252    17.32   0.000     1591.934    1998.138
      1  4  |    4021.95   109.0945    36.87   0.000     3808.129    4235.771
      1  5  |     5021.8   113.9533    44.07   0.000     4798.456    5245.145
      1  6  |   6091.267    118.857    51.25   0.000     5858.311    6324.223
      1  7  |   7780.739   154.3917    50.40   0.000     7478.137    8083.342
      1  8  |   8301.914   135.0214    61.49   0.000     8037.277    8566.552
      1  9  |   8569.317   128.3089    66.79   0.000     8317.837    8820.798
      1 10  |   9052.838   136.4233    66.36   0.000     8785.453    9320.223
      1 11  |   9340.863   137.6041    67.88   0.000     9071.164    9610.563
      1 12  |   10364.25   143.5171    72.22   0.000     10082.96    10645.53
            |
      _cons |   1437.683   80.44225    17.87   0.000     1280.019    1595.347
```

```
Aged
. * next year mortality - AGED
. logit dead_ny age male any_ip##i.yr_after_2001 if (enroll_ny==1|dead_ny==1),
> nolog cluster(bene_id2)

Logistic regression                             Number of obs     = 58,472,804
                                                Wald chi2(25)     = 2293846.95
                                                Prob > chi2       =     0.0000
Log pseudolikelihood =  -10910038               Pseudo R2         =     0.1165

                       (Std. Err. adjusted for 9,218,464 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
     dead_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0940804   .0001082   869.69   0.000     .0938684    .0942924
        male |   .3330522    .001196   278.48   0.000     .3307081    .3353962
    1.any_ip |   1.147033   .0040477   283.38   0.000       1.1391    1.154967
             |
yr_afte~2001 |
          2  |  -.0513964   .0036665   -14.02   0.000    -.0585826   -.0442102
          3  |  -.0427897   .0036574   -11.70   0.000    -.0499581   -.0356214
          4  |  -.0762279   .0037105   -20.54   0.000    -.0835004   -.0689555
          5  |  -.0990865   .0037473   -26.44   0.000     -.106431   -.0917419
          6  |  -.0918908   .0037516   -24.49   0.000    -.0992438   -.0845377
          7  |  -.1439427   .0038038   -37.84   0.000     -.151398   -.1364874
          8  |   -.133012   .0037846   -35.15   0.000    -.1404297   -.1255943
          9  |  -.1328379   .0037676   -35.26   0.000    -.1402223   -.1254536
         10  |   -.138489    .003765   -36.78   0.000    -.1458683   -.1311097
         11  |  -.1319973   .0037528   -35.17   0.000    -.1393526    -.124642
         12  |  -.1405417   .0037612   -37.37   0.000    -.1479136   -.1331699
             |
     any_ip#|
yr_afte~2001 |
      1  2  |   .0096105    .005735     1.68   0.094    -.0016298    .0208508
      1  3  |   .0107593   .0057164     1.88   0.060    -.0004447    .0219633
      1  4  |   .0218046   .0057739     3.78   0.000     .0104879    .0331213
      1  5  |   .0366378   .0058307     6.28   0.000     .0252098    .0480658
      1  6  |    .048286   .0058506     8.25   0.000      .036819     .059753
      1  7  |   .0603596   .0059215    10.19   0.000     .0487538    .0719655
      1  8  |   .0670965   .0059258    11.32   0.000     .0554821     .078711
      1  9  |   .0779982   .0059085    13.20   0.000     .0664178    .0895786
      1 10  |   .0943813    .005915    15.96   0.000     .0827881    .1059745
      1 11  |   .1008057   .0059346    16.99   0.000     .0891742    .1124372
      1 12  |   .1131398   .0059909    18.89   0.000     .1013978    .1248817
            |
      _cons |   -10.6754   .0090032 -1185.73   0.000    -10.69304   -10.65775
```

```
. * next year CCW count - AGED
. reg ccw_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, cluster(bene_id2
> )

Linear regression                               Number of obs     =   58472804
                                                F(25, 9218463)    >   99999.00
                                                Prob > F          =     0.0000
                                                R-squared         =     0.1688
                                                Root MSE          =     2.4339
```

```
                     (Std. Err. adjusted for 9,218,464 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
      ccw_ny |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0382131   .0000934   409.33   0.000     .0380301    .0383961
        male |  -.2307993   .0014271  -161.72   0.000    -.2335964   -.2280021
    1.any_ip |   2.084549   .0027671   753.33   0.000     2.079126    2.089973
             |
yr_afte~2001 |
          2  |   .0997575   .0010807    92.31   0.000     .0976394    .1018756
          3  |   .1746402    .001158   150.81   0.000     .1723705    .1769099
          4  |   .2583996   .0012409   208.24   0.000     .2559675    .2608316
          5  |   .3315605   .0013067   253.75   0.000     .3289995    .3341215
          6  |   .4049069   .0013637   296.92   0.000     .4022341    .4075797
          7  |   .4775188   .0014065   339.50   0.000     .4747621    .4802756
          8  |   .5374264   .0014437   372.27   0.000     .5345969    .5402559
          9  |   .6149147   .0014944   411.48   0.000     .6119857    .6178437
         10  |   .6487686   .0015227   426.06   0.000     .6457842     .651753
         11  |   .7292695   .0015498   470.56   0.000      .726232    .7323071
         12  |   .7464974   .0015705   475.33   0.000     .7434193    .7495754
             |
      any_ip#|
yr_afte~2001 |
       1  2  |   .0617971    .003489    17.71   0.000     .0549588    .0686354
       1  3  |   .1095684   .0036977    29.63   0.000      .102321    .1168158
       1  4  |   .1524826   .0038156    39.96   0.000     .1450041     .159961
       1  5  |   .2352696   .0039238    59.96   0.000     .2275791    .2429602
       1  6  |   .3114961   .0040314    77.27   0.000     .3035947    .3193974
       1  7  |   .3871949   .0041055    94.31   0.000     .3791483    .3952414
       1  8  |   .4566233   .0041926   108.91   0.000      .448406    .4648406
       1  9  |   .6277782   .0043431   144.55   0.000     .6192658    .6362905
       1 10  |   .8240434   .0044579   184.85   0.000      .815306    .8327809
       1 11  |   .8808824   .0045403   194.01   0.000     .8719835    .8897813
       1 12  |   .9387712   .0046345   202.56   0.000     .9296878    .9478547
             |
       _cons |  -.1117534   .0070514   -15.85   0.000    -.1255739   -.0979329
------------------------------------------------------------------------------

. * next year inpatient use - AGED
. logit anyip_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, nolog cluste
> r(bene_id2)

Logistic regression                             Number of obs     = 58,472,804
                                                Wald chi2(25)     = 2812835.75
                                                Prob > chi2       =     0.0000
Log pseudolikelihood =  -28572185               Pseudo R2         =     0.0613

                     (Std. Err. adjusted for 9,218,464 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
    anyip_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0402552   .0000538   748.59   0.000     .0401498    .0403606
        male |   .0674796   .0008012    84.22   0.000     .0659092    .0690499
    1.any_ip |   1.130984   .0024418   463.18   0.000     1.126198    1.135769
             |
yr_afte~2001 |
          2  |  -.0079804   .0018096    -4.41   0.000     -.011527   -.0044337
          3  |  -.0051159   .0017656    -2.90   0.004    -.0085765   -.0016554
          4  |  -.0227543   .0017954   -12.67   0.000    -.0262733   -.0192353
          5  |  -.0467006   .0018217   -25.64   0.000     -.050271   -.0431303
          6  |   -.057163   .0018371   -31.12   0.000    -.0607637   -.0535623
          7  |  -.0973546   .0018581   -52.40   0.000    -.1009963   -.0937129
          8  |  -.1084305   .0018634   -58.19   0.000    -.1120827   -.1047783
          9  |   -.134788   .0018669   -72.20   0.000     -.138447   -.1311291
         10  |  -.1673227   .0018783   -89.08   0.000    -.1710041   -.1636414
         11  |  -.2088576   .0018893  -110.55   0.000    -.2125605   -.2051547
         12  |   -.241985   .0019004  -127.33   0.000    -.2457098   -.2382602
             |
      any_ip#|
yr_afte~2001 |
```

```
      1  2  |   .0025627     .00321     0.80   0.425   -.0037288    .0088542
      1  3  |   .0013944   .0033806     0.41   0.680   -.0052314    .0080202
      1  4  |   .0024287   .0034273     0.71   0.479   -.0042886     .009146
      1  5  |   .0113946   .0034739     3.28   0.001    .0045858    .0182034
      1  6  |   .0206704   .0035107     5.89   0.000    .0137896    .0275513
      1  7  |   .0344871   .0035387     9.75   0.000    .0275514    .0414228
      1  8  |   .0402681   .0035667    11.29   0.000    .0332774    .0472588
      1  9  |   .0613625   .0035694    17.19   0.000    .0543666    .0683585
      1 10  |   .0667523   .0035914    18.59   0.000    .0597133    .0737913
      1 11  |   .0772039   .0036259    21.29   0.000    .0700973    .0843106
      1 12  |   .0865042     .00367    23.57   0.000    .0793112    .0936972
            |
      _cons |  -4.606121   .0043361 -1062.26   0.000   -4.614619   -4.597622
------------------------------------------------------------------------------

. * next year inpatient days - AGED
. nbreg ipdays_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, nolog clust
> er(bene_id2)

Negative binomial regression                    Number of obs     = 58,472,804
                                                Wald chi2(25)     = 1621487.91
Dispersion           = mean                     Prob > chi2       =     0.0000
Log pseudolikelihood =  -69791322               Pseudo R2         =     0.0122

                       (Std. Err. adjusted for 9,218,464 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
   ipdays_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0411077   .0000745   551.66   0.000     .0409617    .0412538
        male |   .0884501   .0012029    73.53   0.000     .0860924    .0908078
    1.any_ip |   1.192632   .0030788   387.37   0.000     1.186598    1.198667
             |
yr_afte~2001 |
          2  |  -.0201154    .002748    -7.32   0.000    -.0255014   -.0147295
          3  |  -.0392521   .0027231   -14.41   0.000    -.0445893   -.0339148
          4  |   -.075382   .0027767   -27.15   0.000    -.0808243   -.0699398
          5  |   -.101615   .0028268   -35.95   0.000    -.1071555   -.0960746
          6  |  -.1142518   .0028558   -40.01   0.000     -.119849   -.1086547
          7  |  -.1709079   .0028915   -59.11   0.000     -.176575   -.1652407
          8  |  -.1980008   .0029105   -68.03   0.000    -.2037053   -.1922964
          9  |  -.2257902   .0029176   -77.39   0.000    -.2315086   -.2200717
         10  |  -.2725821   .0029444   -92.58   0.000     -.278353   -.2668112
         11  |  -.3044596   .0029634  -102.74   0.000    -.3102677   -.2986515
         12  |  -.3346394   .0029759  -112.45   0.000    -.3404721   -.3288067
             |
     any_ip#|
yr_afte~2001 |
      1  2  |    .005675   .0041997     1.35   0.177    -.0025562    .0139063
      1  3  |   .0172319   .0043456     3.97   0.000     .0087147     .025749
      1  4  |   .0318573   .0044248     7.20   0.000      .023185    .0405297
      1  5  |   .0504906   .0045216    11.17   0.000     .0416284    .0593528
      1  6  |   .0629747   .0045499    13.84   0.000      .054057    .0718924
      1  7  |   .0846983   .0046041    18.40   0.000     .0756745    .0937221
      1  8  |   .1052504    .004662    22.58   0.000     .0961131    .1143877
      1  9  |   .1218023   .0046696    26.08   0.000     .1126501    .1309546
      1 10  |   .1408644   .0047206    29.84   0.000     .1316122    .1501165
      1 11  |   .1564782   .0047899    32.67   0.000     .1470902    .1658662
      1 12  |   .1771308   .0048688    36.38   0.000     .1675882    .1866734
            |
      _cons |   -2.71866   .0061987  -438.58   0.000    -2.730809   -2.706511
-------------+----------------------------------------------------------------
    /lnalpha |   2.543337   .0004802                      2.542396    2.544278
-------------+----------------------------------------------------------------
       alpha |   12.72205   .0061092                      12.71009    12.73403
------------------------------------------------------------------------------

. * next year ED encounters - AGED
. logit anyer_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, nolog cluste
> r(bene_id2)

Logistic regression                             Number of obs     = 58,472,804
                                                Wald chi2(25)     = 1855220.68
```

```
                                                  Prob > chi2       =     0.0000
Log pseudolikelihood =  -30393934                 Pseudo R2         =     0.0352

                        (Std. Err. adjusted for 9,218,464 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
    anyer_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |    .028249   .0000574   491.84   0.000     .0281365    .0283616
        male |  -.0982069   .0009129  -107.57   0.000    -.0999962   -.0964176
    1.any_ip |   .6934205   .0025692   269.89   0.000     .6883848    .6984561
             |
yr_afte~2001 |
          2  |   .0165761   .0017555     9.44   0.000     .0131353    .0200169
          3  |    .074635   .0017526    42.59   0.000        .0712      .07807
          4  |    .071756   .0017817    40.27   0.000      .068264    .0752481
          5  |   .0810108   .0017993    45.02   0.000     .0774843    .0845373
          6  |   .0969746   .0018103    53.57   0.000     .0934264    .1005227
          7  |   .1098622   .0018161    60.49   0.000     .1063028    .1134217
          8  |   .1361191   .0018118    75.13   0.000      .132568    .1396702
          9  |   .1556014   .0018047    86.22   0.000     .1520644    .1591385
         10  |   .2043893    .001793   113.99   0.000     .2008751    .2079036
         11  |   .5546597   .0017177   322.91   0.000      .551293    .5580264
         12  |   .5676553    .001716   330.81   0.000     .5642921    .5710185
             |
      any_ip#|
yr_afte~2001 |
       1  2  |   .0054437   .0035166     1.55   0.122    -.0014486    .0123361
       1  3  |   .0077236   .0035308     2.19   0.029     .0008034    .0146438
       1  4  |   .0132944   .0035681     3.73   0.000     .0063011    .0202877
       1  5  |   .0235314   .0036037     6.53   0.000     .0164682    .0305946
       1  6  |   .0297644   .0036318     8.20   0.000     .0226462    .0368826
       1  7  |   .0507591   .0036384    13.95   0.000     .0436279    .0578903
       1  8  |   .0608465   .0036528    16.66   0.000     .0536872    .0680058
       1  9  |    .058371    .003646    16.01   0.000     .0512249    .0655171
       1 10  |   .0688026   .0036417    18.89   0.000     .0616649    .0759403
       1 11  |    .349543   .0035666    98.00   0.000     .3425525    .3565335
       1 12  |   .3438973   .0035983    95.57   0.000     .3368447      .35095
             |
       _cons |  -3.684027   .0045951  -801.73   0.000    -3.693033   -3.675021
------------------------------------------------------------------------------

. * next year ER visits - AGED
. nbreg ervisits_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, nolog clu
> ster(bene_id2)

Negative binomial regression                      Number of obs     = 58,472,804
                                                  Wald chi2(25)     = 1707935.56
Dispersion           = mean                       Prob > chi2       =     0.0000
Log pseudolikelihood =  -44629926                 Pseudo R2         =     0.0279

                        (Std. Err. adjusted for 9,218,464 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
 ervisits_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0227009   .0000638   355.65   0.000     .0225758     .022826
        male |   -.077206   .0010886   -70.92   0.000    -.0793396   -.0750724
    1.any_ip |   .7399673   .0028965   255.47   0.000     .7342903    .7456444
             |
yr_afte~2001 |
          2  |    .019163   .0018444    10.39   0.000      .015548     .022778
          3  |   .0768672   .0018707    41.09   0.000     .0732007    .0805336
          4  |   .0755178   .0018992    39.76   0.000     .0717954    .0792403
          5  |   .0879807   .0019296    45.59   0.000     .0841987    .0917628
          6  |   .1056286   .0019234    54.92   0.000     .1018588    .1093984
          7  |   .1224445   .0019236    63.65   0.000     .1186742    .1262147
          8  |   .1529088   .0019289    79.27   0.000     .1491283    .1566893
          9  |   .1744009   .0019144    91.10   0.000     .1706488    .1781531
         10  |   .2265366   .0019064   118.83   0.000     .2228003     .230273
         11  |   .6097408    .001802   338.37   0.000     .6062089    .6132726
         12  |   .6300155   .0018075   348.56   0.000     .6264729    .6335581
```

```
             |
     any_ip#|
yr_afte~2001 |
       1  2  |   .0038096   .0037053     1.03   0.304    -.0034527    .0110719
       1  3  |   .0002801   .0038261     0.07   0.942     -.007219    .0077792
       1  4  |   .0059803   .0038611     1.55   0.121    -.0015873     .013548
       1  5  |   .0114799   .0038682     2.97   0.003     .0038983    .0190614
       1  6  |    .019179    .003943     4.86   0.000     .0114509    .0269071
       1  7  |   .0405529   .0039245    10.33   0.000     .0328611    .0482448
       1  8  |   .0507483   .0039724    12.78   0.000     .0429626     .058534
       1  9  |   .0528308   .0039482    13.38   0.000     .0450924    .0605692
       1 10  |   .0528248   .0039182    13.48   0.000     .0451454    .0605043
       1 11  |   .2513028   .0036234    69.35   0.000     .2442009    .2584046
       1 12  |    .248009   .0036478    67.99   0.000     .2408594    .2551585
             |
       _cons |  -3.122614   .0051484  -606.52   0.000    -3.132705   -3.112524
-------------+----------------------------------------------------------------
    /lnalpha |   .7680808   .0012898                      .7655528    .7706088
-------------+----------------------------------------------------------------
       alpha |   2.155625   .0027804                      2.150183    2.161082
------------------------------------------------------------------------------

. * next year physician visits - AGED
. nbreg phys_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, nolog cluster
> (bene_id2)

Negative binomial regression                    Number of obs     = 58,472,804
                                                Wald chi2(25)     =  784828.37
Dispersion           = mean                     Prob > chi2       =     0.0000
Log pseudolikelihood = -1.780e+08               Pseudo R2         =     0.0034

                       (Std. Err. adjusted for 9,218,464 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
     phys_ny |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |  -.0006696   .0000401   -16.69   0.000    -.0007483    -.000591
        male |  -.0403045   .0006189   -65.12   0.000    -.0415176   -.0390915
    1.any_ip |   .3520299   .0011173   315.07   0.000       .34984    .3542198
             |
yr_afte~2001 |
          2  |    .007557   .0005119    14.76   0.000     .0065538    .0085603
          3  |   .0208718   .0005518    37.82   0.000     .0197902    .0219534
          4  |   .0402579   .0005904    68.19   0.000     .0391009     .041415
          5  |   .0515439   .0006193    83.23   0.000     .0503302    .0527577
          6  |   .0637266   .0006415    99.34   0.000     .0624693    .0649839
          7  |    .081479   .0006569   124.04   0.000     .0801915    .0827664
          8  |   .1448651   .0006677   216.96   0.000     .1435564    .1461738
          9  |    .132496   .0006776   195.54   0.000      .131168    .1338241
         10  |   .1282387   .0006853   187.14   0.000     .1268956    .1295817
         11  |   .1341796    .000693   193.62   0.000     .1328214    .1355379
         12  |   .1229249   .0006994   175.76   0.000     .1215541    .1242957
             |
     any_ip#|
yr_afte~2001 |
       1  2  |  -.0020542   .0014306    -1.44   0.151     -.004858    .0007497
       1  3  |  -.0073187   .0014765    -4.96   0.000    -.0102126   -.0044248
       1  4  |    -.01139   .0015075    -7.56   0.000    -.0143446   -.0084354
       1  5  |  -.0111072   .0015349    -7.24   0.000    -.0141155    -.008099
       1  6  |  -.0125872   .0015561    -8.09   0.000     -.015637   -.0095373
       1  7  |  -.0119426   .0015661    -7.63   0.000    -.0150121    -.008873
       1  8  |   -.010607   .0015742    -6.74   0.000    -.0136923   -.0075217
       1  9  |  -.0046088    .001577    -2.92   0.003    -.0076996    -.001518
       1 10  |   .0014587    .001582     0.92   0.356     -.001642    .0045594
       1 11  |   .0059661   .0015952     3.74   0.000     .0028395    .0090926
       1 12  |   .0089241   .0016122     5.54   0.000     .0057643     .012084
             |
       _cons |   1.906007   .0030294   629.16   0.000      1.90007    1.911945
-------------+----------------------------------------------------------------
    /lnalpha |  -.0823118   .0005241                      -.083339   -.0812846
-------------+----------------------------------------------------------------
       alpha |   .9209847   .0004827                      .9200392    .9219313
------------------------------------------------------------------------------
```

```
. * next year drug fills - AGED
.
. reg ptdfillcnt_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, cluster(b
> ene_id2)

Linear regression                               Number of obs     =   21214772
                                                F(19, 4827262)    =   34159.93
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0490
                                                Root MSE          =     38.629

                       (Std. Err. adjusted for 4,827,263 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
ptdfillcnt~y |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .2442559   .0021316   114.59   0.000      .240078    .2484337
        male |  -4.186222    .036613  -114.34   0.000    -4.257982   -4.114462
    1.any_ip |   16.66565   .0672513   247.81   0.000     16.53384    16.79746
             |
yr_afte~2001 |
          5  |   6.197664   .0264552   234.27   0.000     6.145813    6.249516
          6  |   7.891274   .0294135   268.29   0.000     7.833624    7.948923
          7  |   8.819378   .0312067   282.61   0.000     8.758214    8.880542
          8  |   9.547243   .0324616   294.11   0.000      9.48362    9.610867
          9  |    9.61915   .0328135   293.15   0.000     9.554837    9.683463
         10  |    10.2606   .0332781   308.33   0.000     10.19538    10.32583
         11  |   12.06548   .0335063   360.10   0.000     11.99981    12.13115
         12  |   12.15066   .0337887   359.61   0.000     12.08444    12.21689
             |
     any_ip#|
yr_afte~2001 |
       1  5  |   .9882805   .0887483    11.14   0.000      .814337    1.162224
       1  6  |   1.472781   .0932084    15.80   0.000     1.290096    1.655466
       1  7  |   1.530985   .0947212    16.16   0.000     1.345335    1.716635
       1  8  |   1.698408   .0966422    17.57   0.000     1.508993    1.887824
       1  9  |   1.007702   .0949667    10.61   0.000     .8215704    1.193833
       1 10  |   1.221114   .0948879    12.87   0.000     1.035137     1.40709
       1 11  |   2.402554   .0956398    25.12   0.000     2.215103    2.590004
       1 12  |   2.232149   .0966995    23.08   0.000     2.042622    2.421677
             |
       _cons |   24.66124   .1642832   150.11   0.000     24.33925    24.98323
------------------------------------------------------------------------------

. * next year cost - AGED
. reg mdcrpmt_ny age male any_ip##i.yr_after_2001 if enroll_ny==1, cluster(bene
> _id2)

Linear regression                               Number of obs     =   55576903
                                                F(25, 8951401)    =   75402.15
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0694
                                                Root MSE          =      19349

                       (Std. Err. adjusted for 8,951,402 clusters in bene_id2)
------------------------------------------------------------------------------
             |               Robust
  mdcrpmt_ny |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   199.6369   .4780815   417.58   0.000     198.6998    200.5739
        male |   595.0367   7.656271    77.72   0.000     580.0306    610.0427
    1.any_ip |   7825.021   22.70292   344.67   0.000     7780.524    7869.518
             |
yr_afte~2001 |
          2  |   453.1335   8.937297    50.70   0.000     435.6167    470.6502
          3  |   834.7568   9.168538    91.05   0.000     816.7868    852.7268
          4  |   1745.307   9.634551   181.15   0.000     1726.423     1764.19
          5  |   2098.698   9.975417   210.39   0.000     2079.147     2118.25
          6  |   2533.445   10.42391   243.04   0.000     2513.014    2553.875
          7  |   2880.174    10.7757   267.28   0.000     2859.054    2901.294
          8  |     3128.7   10.95134   285.69   0.000     3107.236    3150.164
```

```
           9  |   3336.255   11.11974   300.03   0.000     3314.461    3358.049
          10  |   3387.947   11.11799   304.73   0.000     3366.156    3409.738
          11  |   3542.148   11.18359   316.73   0.000     3520.229    3564.068
          12  |   3766.637   11.31881   332.78   0.000     3744.453    3788.822
              |
      any_ip#|
yr_afte~2001 |
        1  2  |   659.2063   30.17713    21.84   0.000     600.0602    718.3524
        1  3  |   1282.853   32.82801    39.08   0.000     1218.512    1347.195
        1  4  |   2377.619   34.81851    68.29   0.000     2309.376    2445.862
        1  5  |   3122.634   36.62577    85.26   0.000     3050.848    3194.419
        1  6  |   3960.728   41.09402    96.38   0.000     3880.185    4041.271
        1  7  |   4812.255   40.61944   118.47   0.000     4732.642    4891.867
        1  8  |   5351.928   42.03404   127.32   0.000     5269.543    5434.313
        1  9  |   5761.906   42.67019   135.03   0.000     5678.274    5845.538
        1 10  |   5853.664   43.53563   134.46   0.000     5768.335    5938.992
        1 11  |   5985.646   44.03603   135.93   0.000     5899.336    6071.955
        1 12  |   6340.104   45.42086   139.59   0.000     6251.081    6429.127
              |
       _cons |  -9801.267   36.88437  -265.73   0.000     -9873.56   -9728.975
------------------------------------------------------------------------------
```

Appendix D2: Optum regressions

```
--------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /schaeffer-a/sch-projects/dua-data-projects/OPTUM/SSA/pgm/0419run/
> model_di.log
  log type:  text
 opened on:  19 Apr 2019, 15:48:08

.
. use ../../data/analytic0408, clear

. * this file contains DI only
.
. local title1 "mortality_DI_cluster"

. local title2 "CCW_DI_cluster"

. local title3 "anyIP_DI_cluster"

. local title4 "IPdays_DI_cluster"

. local title5 "anyER_DI_cluster"

. local title6 "ERencounters_DI_cluster"

. local title7 "physician_DI_cluster"

. local title8 "drug_DI_cluster"

. local title9 "cost_DI_cluster"

.
. local i=1

.
. * next year mortality
```

```
. logit dead_2yr age male any_ip##i.yr_after_2006 if (enroll_2yr==1|dead_2yr==1
> ), nolog cluster(Patid)

Logistic regression                             Number of obs     =  1,552,638
                                                Wald chi2(15)     =   14766.95
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -83390.289               Pseudo R2         =     0.0707

                            (Std. Err. adjusted for 551,908 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
    dead_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0059216    .001062     5.58   0.000     .0038402     .008003
        male |   .4830293   .0159774    30.23   0.000     .4517143    .5143444
    1.any_ip |    1.82538   .0466866    39.10   0.000     1.733876    1.916884
             |
yr_afte~2006 |
          2  |   -.066407   .0425766    -1.56   0.119    -.1498557    .0170417
          3  |   .1650918   .0399614     4.13   0.000     .0867688    .2434147
          4  |   .0625176   .0405582     1.54   0.123     -.016975    .1420103
          5  |  -.2090845   .0424628    -4.92   0.000    -.2923101   -.1258589
          6  |   -.122383   .0409254    -2.99   0.003    -.2025953   -.0421707
          7  |    .037496   .0407448     0.92   0.357    -.0423623    .1173543
             |
     any_ip#|
yr_afte~2006 |
        1 2  |   .1116649   .0654323     1.71   0.088      -.01658    .2399098
        1 3  |   .0396144   .0616433     0.64   0.520    -.0812042     .160433
        1 4  |   .1152493   .0613823     1.88   0.060    -.0050579    .2355565
        1 5  |   .0436985   .0639481     0.68   0.494    -.0816375    .1690344
        1 6  |  -.0027263   .0620282    -0.04   0.965    -.1242994    .1188468
        1 7  |  -.1520976   .0618423    -2.46   0.014    -.2733062    -.030889
             |
       _cons |   -5.63021   .0693849   -81.14   0.000    -5.766202   -5.494218
------------------------------------------------------------------------------
```

```
.         * save estimates

. estimates store m`i', title(`title`i'')


. estimates save `title`i'', replace

file mortality_DI_cluster.ster saved


.

. local i=`i'+1


.

. * next year CCW count

. reg ccw_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, cluster(Patid)


Linear regression                               Number of obs     =  1,537,672

                                                F(15, 546227)     =   19304.52

                                                Prob > F          =     0.0000

                                                R-squared         =     0.2089

                                                Root MSE          =     3.2212


                            (Std. Err. adjusted for 546,228 clusters in Patid)

------------------------------------------------------------------------------

             |               Robust

     ccw_2yr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]

-------------+----------------------------------------------------------------

         age |   .0048795   .0006585     7.41   0.000     .0035889    .0061701

        male |  -.6892644   .0096402   -71.50   0.000    -.7081589   -.6703698

    1.any_ip |   3.603372    .023146   155.68   0.000     3.558006    3.648737

             |

yr_afte~2006 |

          2  |   .8614766   .0058865   146.35   0.000     .8499393    .8730139

          3  |   1.436984   .0070353   204.25   0.000     1.423195    1.450772

          4  |   1.817177   .0079182   229.49   0.000     1.801657    1.832696

          5  |   2.168394   .0083534   259.58   0.000     2.152021    2.184766

          6  |    2.61529   .0085718   305.10   0.000     2.598489     2.63209

          7  |   3.054254    .009328   327.43   0.000     3.035972    3.072537
```

```
             |
      any_ip#|
yr_afte~2006 |
        1 2  |   .1340534   .0289015     4.64   0.000     .0774073    .1906994
        1 3  |   .2226163   .0308153     7.22   0.000     .1622193    .2830133
        1 4  |   .3303263   .0309729    10.67   0.000     .2696203    .3910322
        1 5  |   .3748588   .0306719    12.22   0.000     .3147429    .4349747
        1 6  |   .2871504    .030503     9.41   0.000     .2273655    .3469354
        1 7  |   .0838961   .0310382     2.70   0.007     .0230621      .14473
             |
       _cons |   3.062114   .0382324    80.09   0.000      2.98718    3.137049
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
file CCW_DI_cluster.ster saved

.
. local i=`i'+1

.
. * next year inpatient use
. logit any_ip_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, nolog clu
> ster(Patid)

Logistic regression                             Number of obs     =  1,538,772
                                                Wald chi2(15)     =   67879.45
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -553897.17               Pseudo R2         =     0.0689

                            (Std. Err. adjusted for 546,867 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
  any_ip_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

```
         age |  -.0101871   .0003435   -29.66   0.000    -.0108604   -.0095138
        male |   .0136474   .0052934     2.58   0.010     .0032725    .0240223
    1.any_ip |   1.636471   .0173179    94.50   0.000     1.602528    1.670413
             |
yr_afte~2006 |
          2  |   .0773987   .0118041     6.56   0.000      .054263    .1005344
          3  |   .1449345   .0113477    12.77   0.000     .1226934    .1671756
          4  |   .1377674   .0113166    12.17   0.000     .1155873    .1599476
          5  |   .1345901   .0111621    12.06   0.000     .1127128    .1564674
          6  |   .2519399   .0108564    23.21   0.000     .2306617    .2732182
          7  |   .2813687    .011148    25.24   0.000      .259519    .3032184
             |
      any_ip#|
yr_afte~2006 |
        1 2  |  -.0157711   .0220564    -0.72   0.475     -.059001    .0274587
        1 3  |  -.0011896   .0227438    -0.05   0.958    -.0457667    .0433875
        1 4  |   .0267138   .0225039     1.19   0.235    -.0173929    .0708206
        1 5  |   .0064459   .0220792     0.29   0.770    -.0368285    .0497203
        1 6  |   .0011443    .021599     0.05   0.958     -.041189    .0434775
        1 7  |  -.0267996   .0218271    -1.23   0.220      -.06958    .0159809
             |
       _cons |  -1.820044   .0214899   -84.69   0.000    -1.862163   -1.777924
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
file anyIP_DI_cluster.ster saved

.
. local i=`i'+1

.
. * next year inpatient days
. nbreg ip_days_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, nolog cl
> uster(Patid)
```

```
Negative binomial regression                     Number of obs     =  1,538,772
                                                 Wald chi2(15)     =   44563.17
Dispersion           = mean                      Prob > chi2       =     0.0000
Log pseudolikelihood = -1189145.4                Pseudo R2         =     0.0181

                            (Std. Err. adjusted for 546,867 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
 ip_days_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |  -.0133278   .0006981   -19.09   0.000    -.0146959   -.0119596
        male |   .0768116   .0100593     7.64   0.000     .0570958    .0965274
    1.any_ip |   1.947995   .0269552    72.27   0.000     1.895164    2.000826
             |
yr_afte~2006 |
          2  |   .1137016   .0217632     5.22   0.000     .0710466    .1563567
          3  |   .1837706    .020852     8.81   0.000     .1429014    .2246397
          4  |   .2115975   .0212861     9.94   0.000     .1698775    .2533175
          5  |   .3182014   .0206678    15.40   0.000     .2776932    .3587096
          6  |   .5187058   .0206958    25.06   0.000     .4781428    .5592689
          7  |   .5399521   .0204414    26.41   0.000     .4998878    .5800164
             |
      any_ip#|
yr_afte~2006 |
        1 2  |  -.0675977   .0343383    -1.97   0.049    -.1348996   -.0002958
        1 3  |  -.0126008   .0346974    -0.36   0.716    -.0806064    .0554048
        1 4  |  -.0339047   .0349264    -0.97   0.332    -.1023591    .0345497
        1 5  |  -.0544865    .034087    -1.60   0.110    -.1212959    .0123228
        1 6  |  -.0773588   .0339211    -2.28   0.023    -.1438428   -.0108747
        1 7  |  -.1103132   .0333002    -3.31   0.001    -.1755804    -.045046
             |
       _cons |    .043551   .0425974     1.02   0.307    -.0399383    .1270403
-------------+----------------------------------------------------------------
    /lnalpha |   3.035786   .0036126                      3.028705    3.042866
-------------+----------------------------------------------------------------
```

```
       alpha |   20.81733   .0752048                      20.67045    20.96525
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
file IPdays_DI_cluster.ster saved

.
. local i=`i'+1

.
. * next year ER visit
. logit any_er_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, nolog clu
> ster(Patid)

Logistic regression                             Number of obs     =  1,538,772
                                                Wald chi2(15)     =   51186.73
                                                Prob > chi2       =     0.0000
Log pseudolikelihood =  -870641.6               Pseudo R2         =     0.0365

                            (Std. Err. adjusted for 546,867 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
  any_er_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |  -.0276283   .0003204   -86.24   0.000    -.0282562   -.0270004
        male |  -.1927623   .0047643   -40.46   0.000    -.2021002   -.1834244
    1.any_ip |    1.08099   .0152516    70.88   0.000     1.051098    1.110883
             |
yr_afte~2006 |
          2  |   .1247472   .0071078    17.55   0.000     .1108162    .1386782
          3  |   .1621149   .0073107    22.18   0.000     .1477862    .1764435
          4  |     .10477   .0074209    14.12   0.000     .0902253    .1193148
          5  |   .0118978   .0074415     1.60   0.110    -.0026872    .0264829
          6  |  -.0338664   .0074473    -4.55   0.000    -.0484629   -.0192699
```

```
           7  |   .1240219   .0075954    16.33   0.000     .1091351    .1389086
              |
      any_ip#|
yr_afte~2006 |
         1 2  |  -.0101353   .0201518    -0.50   0.615    -.0496321    .0293616
         1 3  |   .0129627   .0202016     0.64   0.521    -.0266318    .0525572
         1 4  |    .047644   .0199467     2.39   0.017     .0085491    .0867389
         1 5  |   .0695074   .0195434     3.56   0.000      .031203    .1078118
         1 6  |   .0791477    .019284     4.10   0.000     .0413518    .1169436
         1 7  |   .0326229    .019433     1.68   0.093    -.0054651    .0707109
              |
        _cons |   .4209181   .0190829    22.06   0.000     .3835163    .4583199
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
file anyER_DI_cluster.ster saved

.
. local i=`i'+1

.
. * next year ED encounters
. nbreg n_er_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, nolog clust
> er(Patid)

Negative binomial regression                    Number of obs     =  1,538,772
                                                Wald chi2(15)     =   34676.87
Dispersion           = mean                     Prob > chi2       =     0.0000
Log pseudolikelihood = -1971959.4               Pseudo R2         =     0.0149

                            (Std. Err. adjusted for 546,867 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
    n_er_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
```

```
-------------+----------------------------------------------------------------
         age |   -.031994   .0004544   -70.41   0.000    -.0328845   -.0311035
        male |  -.1887403   .0071167   -26.52   0.000    -.2026888   -.1747919
    1.any_ip |   1.071538   .0188691    56.79   0.000     1.034555    1.108521
             |
yr_afte~2006 |
          2  |   .1059391    .009265    11.43   0.000     .0877801    .1240981
          3  |   .1081706   .0101898    10.62   0.000     .0881989    .1281422
          4  |   .0475578   .0103636     4.59   0.000     .0272456      .06787
          5  |  -.0485272    .010496    -4.62   0.000    -.0690989   -.0279555
          6  |  -.0679817   .0106825    -6.36   0.000     -.088919   -.0470444
          7  |   .0841887   .0109951     7.66   0.000     .0626387    .1057388
             |
      any_ip#|
yr_afte~2006 |
        1 2  |   .0691104   .0216919     3.19   0.001     .0265952    .1116257
        1 3  |   .1204599   .0225636     5.34   0.000     .0762362    .1646837
        1 4  |   .1605473   .0237388     6.76   0.000     .1140202    .2070745
        1 5  |   .2242774   .0237001     9.46   0.000     .1778262    .2707287
        1 6  |   .2283715   .0229541     9.95   0.000     .1833823    .2733607
        1 7  |   .1979701    .022975     8.62   0.000     .1529399    .2430003
             |
       _cons |   1.933777   .0267815    72.21   0.000     1.881286    1.986268
-------------+----------------------------------------------------------------
    /lnalpha |   1.916497   .0029767                      1.910663    1.922331
-------------+----------------------------------------------------------------
       alpha |   6.797109   .0202327                      6.757569     6.83688
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
file ERencounters_DI_cluster.ster saved

.
. local i=`i'+1
```

```
.
. * next year physician visits
. nbreg n_car_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, nolog clus
> ter(Patid)

Negative binomial regression                    Number of obs     =  1,538,772
                                                Wald chi2(15)     =   61051.32
Dispersion           = mean                     Prob > chi2       =     0.0000
Log pseudolikelihood = -5816926.1               Pseudo R2         =     0.0077

                                 (Std. Err. adjusted for 546,867 clusters in Patid)
-------------------------------------------------------------------------------------
                     |               Robust
           n_car_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
---------------------+---------------------------------------------------------------
                 age |  -.0000109   .0001976    -0.06   0.956    -.0003982    .0003764
                male |  -.2425199    .002722   -89.10   0.000    -.2478549   -.2371848
            1.any_ip |   .6783047   .0069413    97.72   0.000     .6647001    .6919093
                     |
       yr_after_2006 |
                  2  |   .0559313   .0029843    18.74   0.000     .0500823    .0617803
                  3  |   .1202415   .0031558    38.10   0.000     .1140563    .1264267
                  4  |   .0703519   .0032654    21.54   0.000     .0639518    .0767521
                  5  |   .0042243   .0033544     1.26   0.208    -.0023503    .0107988
                  6  |   .0242712   .0033684     7.21   0.000     .0176693    .0308732
                  7  |    .095226    .003562    26.73   0.000     .0882446    .1022074
                     |
any_ip#yr_after_2006 |
                1 2  |    -.05305   .0088711    -5.98   0.000     -.070437    -.035663
                1 3  |  -.0747493   .0089374    -8.36   0.000    -.0922664   -.0572323
                1 4  |  -.0649658   .0089202    -7.28   0.000    -.0824491   -.0474825
                1 5  |  -.0366158   .0088642    -4.13   0.000    -.0539894   -.0192422
                1 6  |  -.0429562   .0088226    -4.87   0.000    -.0602481   -.0256643
                1 7  |   -.078364   .0091446    -8.57   0.000     -.096287   -.0604409
                     |
```

```
               _cons |   2.728907   .0116098   235.05   0.000     2.706152    2.751662
---------------------+----------------------------------------------------------------
            /lnalpha |   .0271527   .0020911                      .0230543    .0312512
---------------------+----------------------------------------------------------------
               alpha |   1.027525   .0021486                      1.023322    1.031745
--------------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
file physician_DI_cluster.ster saved

.
. local i=`i'+1

.
. * next year drug fills
.
. reg fills_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, cluster(Patid)

Linear regression                               Number of obs     =  1,538,772
                                                F(15, 546866)     =    2432.36
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0451
                                                Root MSE          =     38.888

                                 (Std. Err. adjusted for 546,867 clusters in Patid)
--------------------------------------------------------------------------------------
                     |               Robust
           fills_2yr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------------------+----------------------------------------------------------------
                 age |   .0722649    .007475     9.67   0.000     .0576141    .0869157
                male |  -5.942968   .1155851   -51.42   0.000    -6.169511   -5.716425
            1.any_ip |   21.37437   .3265882    65.45   0.000     20.73427    22.01448
                     |
       yr_after_2006 |
```

```
                  2  |   2.356849   .0698187    33.76   0.000     2.220006    2.493691
                  3  |   4.560327   .0883193    51.63   0.000     4.387224     4.73343
                  4  |   4.611357   .0949574    48.56   0.000     4.425244     4.79747
                  5  |   4.879216   .0991798    49.20   0.000     4.684827    5.073605
                  6  |   5.353207   .1007928    53.11   0.000     5.155656    5.550757
                  7  |   10.52661   .1160097    90.74   0.000     10.29923    10.75398
                     |
any_ip#yr_after_2006 |
                1 2  |   .6329786    .413339     1.53   0.126    -.1771528     1.44311
                1 3  |   1.700925   .4366242     3.90   0.000     .8451551    2.556694
                1 4  |   .5116992   .4328996     1.18   0.237    -.3367703    1.360169
                1 5  |   .7900928   .4235578     1.87   0.062     -.040067    1.620253
                1 6  |   .8259512   .4132874     2.00   0.046      .015921    1.635981
                1 7  |  -.5688175   .4387207    -1.30   0.195    -1.428696    .2910611
                     |
               _cons |   29.25924    .437423    66.89   0.000     28.40191    30.11658
--------------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
(note: file drug_DI_cluster.ster not found)
file drug_DI_cluster.ster saved

.
. local i=`i'+1

.
. * next year cost
. reg total_cost_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, cluster(Patid)

Linear regression                               Number of obs     =  1,538,772
                                                F(15, 546866)     =     969.74
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0443
                                                Root MSE          =      40942
```

```
                                  (Std. Err. adjusted for 546,867 clusters in Patid)
-------------------------------------------------------------------------------------
                     |               Robust
      total_cost_2yr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------------------+---------------------------------------------------------------
                 age |  -172.0905   7.718978   -22.29   0.000    -187.2195   -156.9616
                male |  -903.6148   94.29733    -9.58   0.000    -1088.435    -718.795
            1.any_ip |   26838.37   536.1541    50.06   0.000     25787.52    27889.21
                     |
       yr_after_2006 |
                  2  |  -353.7241   90.26181    -3.92   0.000    -530.6344   -176.8139
                  3  |  -108.2054   92.04729    -1.18   0.240    -288.6152    72.20434
                  4  |  -439.9933   93.30005    -4.72   0.000    -622.8585   -257.1282
                  5  |  -780.6948   93.16858    -8.38   0.000    -963.3023   -598.0874
                  6  |  -732.7653    93.8105    -7.81   0.000    -916.6309   -548.8997
                  7  |   747.8326   129.8764     5.76   0.000      493.279    1002.386
                     |
any_ip#yr_after_2006 |
                1 2  |  -1819.369   620.1172    -2.93   0.003    -3034.779   -603.9592
                1 3  |   -951.771   670.9866    -1.42   0.156    -2266.884    363.3415
                1 4  |  -1172.792   662.4456    -1.77   0.077    -2471.164    125.5807
                1 5  |  -1917.753   651.3843    -2.94   0.003    -3194.446   -641.0609
                1 6  |  -749.3726   675.6338    -1.11   0.267    -2073.593    574.8482
                1 7  |   746.4082   728.2576     1.02   0.305    -680.9535     2173.77
                     |
               _cons |   22348.04   444.9962    50.22   0.000     21475.86    23220.22
-------------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
(note: file cost_DI_cluster.ster not found)
file cost_DI_cluster.ster saved

.
```

```
. esttab m1 m2 m3 m4 m5 m6 m7 m8 m9, replace wide label title(regression table-DI)


regression table-DI

{hline 281}

                              (1)                          (2)                           (3)
(4)                          (5)                          (6)                           (7)
(8)

>                            (9)

                         dead_2yr                      ccw_2yr                   any_ip_2yr
ip_days_2yr                   any_er_2yr                      n_er_2yr
n_car_2yr                    fills_2yr

>                   total_cost~r

{hline 281}

main

>

age                        0.00592***       (5.58)      0.00488***       (7.41)      -0.0102***
(-29.66)      -0.0133***      (-19.09)      -0.0276***      (-86.24)      -0.0320***      (-70.41)
-0.0000109         (-0.06)       0.0723

> ***       (9.67)       -172.1***     (-22.29)

male                         0.483***      (30.23)       -0.689***     (-71.50)       0.0136**
(2.58)       0.0768***       (7.64)       -0.193***      (-40.46)       -0.189***     (-26.52)
-0.243***     (-89.10)       -5.943

> ***     (-51.42)       -903.6***      (-9.58)

any_ip=0                        0              (.)            0              (.)            0
(.)           0              (.)            0              (.)            0              (.)
0             (.)            0

>              (.)            0              (.)

any_ip=1                     1.825***      (39.10)        3.603***     (155.68)        1.636***
(94.50)        1.948***      (72.27)        1.081***      (70.88)        1.072***      (56.79)
0.678***      (97.72)        21.37

> ***      (65.45)      26838.4***      (50.06)

yr_after_2006=1                 0              (.)            0              (.)            0
(.)           0              (.)            0              (.)            0              (.)
0             (.)            0

>              (.)            0              (.)

yr_after_2006=2           -0.0664         (-1.56)        0.861***     (146.35)       0.0774***
(6.56)        0.114***       (5.22)        0.125***      (17.55)        0.106***      (11.43)
0.0559***      (18.74)        2.357

> ***      (33.76)       -353.7***      (-3.92)

yr_after_2006=3              0.165***       (4.13)        1.437***     (204.25)        0.145***
(12.77)        0.184***       (8.81)        0.162***      (22.18)        0.108***      (10.62)
0.120***      (38.10)        4.560

> ***      (51.63)       -108.2         (-1.18)
```

```
yr_after_2006=4            0.0625         (1.54)        1.817***     (229.49)        0.138***
(12.17)        0.212***       (9.94)       0.105***      (14.12)       0.0476***       (4.59)
0.0704***      (21.54)        4.611

> ***      (48.56)       -440.0***      (-4.72)

yr_after_2006=5            -0.209***      (-4.92)       2.168***     (259.58)        0.135***
(12.06)        0.318***      (15.40)      0.0119          (1.60)      -0.0485***      (-4.62)
0.00422          (1.26)       4.879

> ***      (49.20)       -780.7***      (-8.38)

yr_after_2006=6            -0.122**       (-2.99)       2.615***     (305.10)        0.252***
(23.21)        0.519***      (25.06)     -0.0339***      (-4.55)      -0.0680***      (-6.36)
0.0243***       (7.21)        5.353

> ***      (53.11)       -732.8***      (-7.81)

yr_after_2006=7            0.0375         (0.92)        3.054***     (327.43)        0.281***
(25.24)        0.540***      (26.41)       0.124***      (16.33)       0.0842***       (7.66)
0.0952***      (26.73)        10.53

> ***      (90.74)        747.8***       (5.76)

any_ip=0 # yr_afte~1          0              (.)            0              (.)            0
(.)            0             (.)            0             (.)            0             (.)
0             (.)            0

>              (.)            0             (.)

any_ip=0 # yr_afte~2          0              (.)            0              (.)            0
(.)            0             (.)            0             (.)            0             (.)
0             (.)            0

>              (.)            0             (.)

any_ip=0 # yr_afte~3          0              (.)            0              (.)            0
(.)            0             (.)            0             (.)            0             (.)
0             (.)            0

>              (.)            0             (.)

any_ip=0 # yr_afte~4          0              (.)            0              (.)            0
(.)            0             (.)            0             (.)            0             (.)
0             (.)            0

>              (.)            0             (.)

any_ip=0 # yr_afte~5          0              (.)            0              (.)            0
(.)            0             (.)            0             (.)            0             (.)
0             (.)            0

>              (.)            0             (.)

any_ip=0 # yr_afte~6          0              (.)            0              (.)            0
(.)            0             (.)            0             (.)            0             (.)
0             (.)            0

>              (.)            0             (.)

any_ip=0 # yr_afte~7          0              (.)            0              (.)            0
(.)            0             (.)            0             (.)            0             (.)
0             (.)            0

>              (.)            0             (.)

any_ip=1 # yr_afte~1          0              (.)            0              (.)            0
(.)            0             (.)            0             (.)            0             (.)
0             (.)            0
```

>   (.)   0   (.)

any_ip=1 # yr_afte~2   0.112   (1.71)   0.134***   (4.64)   -0.0158
(-0.72)   -0.0676*   (-1.97)   -0.0101   (-0.50)   0.0691**   (3.19)
-0.0531***   (-5.98)   0.633

>   (1.53)   -1819.4**   (-2.93)

any_ip=1 # yr_afte~3   0.0396   (0.64)   0.223***   (7.22)   -0.00119
(-0.05)   -0.0126   (-0.36)   0.0130   (0.64)   0.120***   (5.34)
-0.0747***   (-8.36)   1.701

> ***   (3.90)   -951.8   (-1.42)

any_ip=1 # yr_afte~4   0.115   (1.88)   0.330***   (10.67)   0.0267
(1.19)   -0.0339   (-0.97)   0.0476*   (2.39)   0.161***   (6.76)
-0.0650***   (-7.28)   0.512

>   (1.18)   -1172.8   (-1.77)

any_ip=1 # yr_afte~5   0.0437   (0.68)   0.375***   (12.22)   0.00645
(0.29)   -0.0545   (-1.60)   0.0695***   (3.56)   0.224***   (9.46)
-0.0366***   (-4.13)   0.790

>   (1.87)   -1917.8**   (-2.94)

any_ip=1 # yr_afte~6   -0.00273   (-0.04)   0.287***   (9.41)   0.00114
(0.05)   -0.0774*   (-2.28)   0.0791***   (4.10)   0.228***   (9.95)
-0.0430***   (-4.87)   0.826

> *   (2.00)   -749.4   (-1.11)

any_ip=1 # yr_afte~7   -0.152*   (-2.46)   0.0839**   (2.70)   -0.0268
(-1.23)   -0.110***   (-3.31)   0.0326   (1.68)   0.198***   (8.62)
-0.0784***   (-8.57)   -0.569

>   (-1.30)   746.4   (1.02)

Constant   -5.630***   (-81.14)   3.062***   (80.09)   -1.820***
(-84.69)   0.0436   (1.02)   0.421***   (22.06)   1.934***   (72.21)
2.729***   (235.05)   29.26

> ***   (66.89)   22348.0***   (50.22)

{hline 281}

/

>

lnalpha
3.036***   (840.33)   1.916***   (643.84)   0.0272***
(12.99)

>

{hline 281}

Observations   1552638   1537672   1538772
1538772   1538772   1538772   1538772
1538772

>   1538772

{hline 281}

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

```
.
. log close
      name:  <unnamed>
       log:  /schaeffer-a/sch-projects/dua-data-projects/OPTUM/SSA/pgm/0419run/model_di.log
  log type:  text
 closed on:  19 Apr 2019, 15:52:21
```

```
-------------------------------------------------------------------------------
      name:  <unnamed>
       log:  /schaeffer-a/sch-projects/dua-data-projects/OPTUM/SSA/pgm/0419run/
> model_comm.log
  log type:  text
 opened on:  19 Apr 2019, 15:48:21

.
. use ../../data/analytic0408_comm, clear

. xtset Patid year
       panel variable:  Patid (unbalanced)
        time variable:  year, 2007 to 2014, but with gaps
                delta:  1 unit

. gen ccw_2yr=f1.ccw_count
(18,947,739 missing values generated)

. gen any_er_2yr = f1.any_er
(18,898,255 missing values generated)

. gen fills_2yr = f1.fills
(18,898,255 missing values generated)

. gen total_cost_2yr=f1.total_cost
(18,898,255 missing values generated)

. gen yr_after_2006 = year-2006

. gen enroll_2yr=f1.enroll==2

. gen dead_2yr=f1.dead==1

. gen any_ip_2yr=f1.any_ip
(18,898,255 missing values generated)
```

```
. gen ip_days_2yr=f1.ip_days
(18,898,255 missing values generated)

. gen n_car_2yr=f1.n_car
(18,898,255 missing values generated)

. gen n_er_2yr=f1.n_er
(18,898,255 missing values generated)

.
. * non-DI only
. keep if medicare==0
(0 observations deleted)

.
. local title10 "mortality_comm_cluster"

. local title11 "CCW_comm_cluster"

. local title12 "anyIP_comm_cluster"

. local title13 "IPdays_comm_cluster"

. local title14 "anyER_comm_cluster"

. local title15 "ERencounters_comm_cluster"

. local title16 "physician_comm_cluster"

. local title17 "drug_comm_cluster"

. local title18 "cost_comm_cluster"

.
. local i=10
```

```
.

. * next year mortality

. logit dead_2yr age male any_ip##i.yr_after_2006 if (enroll_2yr==1|dead_2yr==1

> ), nolog cluster(Patid)


Logistic regression                             Number of obs     = 30,749,311

                                                Wald chi2(15)     =  117728.37

                                                Prob > chi2       =     0.0000

Log pseudolikelihood = -363040.97               Pseudo R2         =     0.1257


                         (Std. Err. adjusted for 11,088,908 clusters in Patid)

------------------------------------------------------------------------------

             |               Robust

    dead_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]

-------------+----------------------------------------------------------------

         age |   .0756759   .0004859   155.75   0.000     .0747236    .0766283

        male |   .5183338    .008642    59.98   0.000     .5013958    .5352718

    1.any_ip |   2.378903    .020191   117.82   0.000      2.33933    2.418477

             |

yr_afte~2006 |

          2  |   .0158466   .0172496     0.92   0.358     -.017962    .0496552

          3  |  -.0104196    .017395    -0.60   0.549    -.0445131    .0236739

          4  |  -.2027213   .0183252   -11.06   0.000     -.238638   -.1668045

          5  |  -.5996692   .0205671   -29.16   0.000    -.6399799   -.5593585

          6  |  -.6852453   .0210579   -32.54   0.000     -.726518   -.6439727

          7  |  -.7144046   .0221156   -32.30   0.000    -.7577504   -.6710587

             |

      any_ip#|

yr_afte~2006 |

        1 2  |    .033878   .0283912     1.19   0.233    -.0217678    .0895237

        1 3  |   .0140838   .0288396     0.49   0.625    -.0424408    .0706084

        1 4  |   .1315741   .0298553     4.41   0.000     .0730588    .1900894

        1 5  |   .1565894     .03349     4.68   0.000     .0909502    .2222287

        1 6  |   .1122072   .0348237     3.22   0.001      .043954    .1804605

        1 7  |   .1637813   .0365178     4.48   0.000     .0922077    .2353548

             |
```

```
       _cons |  -10.28771     .02713  -379.20   0.000    -10.34089   -10.23454
------------------------------------------------------------------------------

.         * save estimates
. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
(note: file mortality_comm_cluster.ster not found)
file mortality_comm_cluster.ster saved

.
. local i=`i'+1

.
. * next year CCW count
. reg ccw_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, cluster(Patid)

Linear regression                               Number of obs     =   30699837
                                                F(15, 11070611)   >   99999.00
                                                Prob > F          =     0.0000
                                                R-squared         =     0.1605
                                                Root MSE          =     2.1449

                         (Std. Err. adjusted for 11,070,612 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
     ccw_2yr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0608093   .0000612   993.47   0.000     .0606893    .0609293
        male |  -.4101459   .0015015  -273.15   0.000    -.4130889    -.407203
    1.any_ip |   1.657921   .0053074   312.38   0.000     1.647518    1.668323
             |
yr_afte~2006 |
          2  |   .3542356   .0008029   441.22   0.000     .3526621    .3558092
          3  |   .5749337   .0009832   584.74   0.000     .5730066    .5768608
          4  |   .7489971   .0011066   676.87   0.000     .7468283    .7511659
```

```
          5  |   .8625796   .0011835   728.83   0.000       .86026    .8648993
          6  |   .9589954   .0012406   773.00   0.000     .9565638    .9614269
          7  |   .9776318   .0013446   727.10   0.000     .9749965    .9802671
             |
      any_ip#|
yr_afte~2006 |
        1 2  |   .0689635   .0072317     9.54   0.000     .0547896    .0831374
        1 3  |   .1145919   .0077933    14.70   0.000     .0993173    .1298666
        1 4  |   .1607195   .0082245    19.54   0.000     .1445999    .1768392
        1 5  |   .1774571   .0084918    20.90   0.000     .1608134    .1941008
        1 6  |   .1935409   .0087345    22.16   0.000     .1764215    .2106602
        1 7  |   .1852743   .0093208    19.88   0.000     .1670058    .2035429
             |
       _cons |  -.9410492    .002581  -364.61   0.000    -.9461079   -.9359905
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
(note: file CCW_comm_cluster.ster not found)
file CCW_comm_cluster.ster saved

.
. local i=`i'+1

.
. * next year inpatient use
. logit any_ip_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, nolog clu
> ster(Patid)

Logistic regression                             Number of obs     = 30,700,196
                                                Wald chi2(15)     =  371770.39
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -5940512.2               Pseudo R2         =     0.0280

                         (Std. Err. adjusted for 11,070,770 clusters in Patid)
```

```
------------------------------------------------------------------------------
             |               Robust
  any_ip_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0021602    .000074    29.20   0.000     .0020152    .0023052
        male |  -.5973621   .0019239  -310.49   0.000    -.6011329   -.5935912
    1.any_ip |   1.154068   .0062584   184.40   0.000     1.141802    1.166334
             |
yr_afte~2006 |
          2  |  -.0188713   .0031954    -5.91   0.000    -.0251341   -.0126085
          3  |  -.0205417   .0031556    -6.51   0.000    -.0267265   -.0143569
          4  |  -.0533248    .003211   -16.61   0.000    -.0596183   -.0470312
          5  |  -.0875909   .0032428   -27.01   0.000    -.0939466   -.0812353
          6  |  -.1287557   .0032807   -39.25   0.000    -.1351858   -.1223257
          7  |  -.1843789   .0034482   -53.47   0.000    -.1911372   -.1776206
             |
      any_ip#|
yr_afte~2006 |
        1 2  |  -.0097708   .0083685    -1.17   0.243    -.0261729    .0066312
        1 3  |  -.0057814   .0088189    -0.66   0.512    -.0230661    .0115033
        1 4  |    .040588   .0089674     4.53   0.000     .0230122    .0581637
        1 5  |   .0493877   .0090882     5.43   0.000     .0315751    .0672003
        1 6  |   .1398686   .0091008    15.37   0.000     .1220314    .1577058
        1 7  |   .1387514     .00964    14.39   0.000     .1198572    .1576455
             |
       _cons |  -2.817212   .0040234  -700.20   0.000    -2.825098   -2.809327
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
(note: file anyIP_comm_cluster.ster not found)
file anyIP_comm_cluster.ster saved

.
. local i=`i'+1
```

```
.
. * next year inpatient days
. nbreg ip_days_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, nolog cl
> uster(Patid)

Negative binomial regression                    Number of obs     = 30,700,196
                                                Wald chi2(15)     =  115986.98
Dispersion           = mean                     Prob > chi2       =     0.0000
Log pseudolikelihood = -9673692.5               Pseudo R2         =     0.0115

                         (Std. Err. adjusted for 11,070,770 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
 ip_days_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0144822   .0001547    93.63   0.000      .014179    .0147853
        male |  -.4584438   .0038415  -119.34   0.000     -.465973   -.4509145
    1.any_ip |   1.761078   .0128721   136.81   0.000     1.735849    1.786307
             |
yr_afte~2006 |
          2  |   -.012337   .0064164    -1.92   0.055    -.0249129    .0002389
          3  |    .000287   .0064821     0.04   0.965    -.0124177    .0129916
          4  |  -.0311273   .0064322    -4.84   0.000    -.0437343   -.0185204
          5  |  -.0455074   .0066248    -6.87   0.000    -.0584917    -.032523
          6  |   -.083966   .0067116   -12.51   0.000    -.0971205   -.0708114
          7  |  -.1434359   .0069004   -20.79   0.000    -.1569604   -.1299114
             |
      any_ip#|
yr_afte~2006 |
        1 2  |  -.0034437   .0169886    -0.20   0.839    -.0367408    .0298534
        1 3  |   .0143282   .0181227     0.79   0.429    -.0211917    .0498481
        1 4  |   .0633557   .0181288     3.49   0.000     .0278239    .0988876
        1 5  |   .0867132   .0184656     4.70   0.000     .0505213    .1229052
        1 6  |   .2200772   .0193439    11.38   0.000     .1821637    .2579906
        1 7  |   .2525332   .0205172    12.31   0.000     .2123201    .2927462
```

```
             |
       _cons |  -2.047953   .0076046  -269.30   0.000    -2.062858   -2.033049
-------------+----------------------------------------------------------------
    /lnalpha |   3.791186   .0013702                        3.7885    3.793871
-------------+----------------------------------------------------------------
       alpha |    44.3089   .0607117                      44.19007    44.42805
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
(note: file IPdays_comm_cluster.ster not found)
file IPdays_comm_cluster.ster saved

.
. local i=`i'+1

.
. * next year ER visit
. logit any_er_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, nolog clu
> ster(Patid)

Logistic regression                             Number of obs     = 30,700,196
                                                Wald chi2(15)     =  199711.38
                                                Prob > chi2       =     0.0000
Log pseudolikelihood =  -14391944               Pseudo R2         =     0.0086

                         (Std. Err. adjusted for 11,070,770 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
  any_er_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0019565   .0000475    41.18   0.000     .0018634    .0020496
        male |  -.3024817   .0012119  -249.59   0.000     -.304857   -.3001064
    1.any_ip |   .6381619   .0046498   137.24   0.000     .6290484    .6472755
             |
```

```
yr_afte~2006 |
          2  |     .04138   .0016136    25.65   0.000     .0382175    .0445425
          3  |   .0617331   .0016847    36.64   0.000     .0584312     .065035
          4  |   .0333924   .0017289    19.31   0.000     .0300038     .036781
          5  |  -.1095725   .0017812   -61.52   0.000    -.1130636   -.1060815
          6  |  -.1450717   .0018002   -80.59   0.000    -.1485999   -.1415434
          7  |   -.088739   .0018499   -47.97   0.000    -.0923648   -.0851132
             |
      any_ip#|
yr_afte~2006 |
        1 2  |  -.0124291   .0064185    -1.94   0.053    -.0250091     .000151
        1 3  |  -.0333008   .0065588    -5.08   0.000    -.0461558   -.0204458
        1 4  |  -.0408107   .0066856    -6.10   0.000    -.0539143   -.0277071
        1 5  |  -.0291947   .0068394    -4.27   0.000    -.0425997   -.0157896
        1 6  |  -.0150621   .0069123    -2.18   0.029    -.0286101   -.0015142
        1 7  |  -.0275916   .0072028    -3.83   0.000    -.0417088   -.0134744
             |
       _cons |   -1.46144   .0023967  -609.76   0.000    -1.466138   -1.456743
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
(note: file anyER_comm_cluster.ster not found)
file anyER_comm_cluster.ster saved

.
. local i=`i'+1

.
. * next year ED encounters
. nbreg n_er_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, nolog clust
> er(Patid)

Negative binomial regression                    Number of obs     = 30,700,196
                                                Wald chi2(15)     =   88706.44
```

```
Dispersion           = mean                     Prob > chi2       =     0.0000
Log pseudolikelihood =  -26339517               Pseudo R2         =     0.0032

                         (Std. Err. adjusted for 11,070,770 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
    n_er_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0043684   .0000722    60.53   0.000      .004227    .0045098
        male |  -.3347408   .0019567  -171.08   0.000    -.3385758   -.3309058
    1.any_ip |   .6650478   .0065912   100.90   0.000     .6521293    .6779664
             |
yr_afte~2006 |
          2  |   .0262587   .0021598    12.16   0.000     .0220256    .0304919
          3  |    .013351   .0023815     5.61   0.000     .0086833    .0180187
          4  |  -.0349637   .0024774   -14.11   0.000    -.0398194    -.030108
          5  |  -.1594079   .0025702   -62.02   0.000    -.1644455   -.1543703
          6  |  -.1979515   .0026042   -76.01   0.000    -.2030558   -.1928473
          7  |   -.164165    .002652   -61.90   0.000    -.1693628   -.1589672
             |
     any_ip#|
yr_afte~2006 |
        1 2  |   -.026613   .0085474    -3.11   0.002    -.0433656   -.0098604
        1 3  |  -.0572037   .0090845    -6.30   0.000    -.0750089   -.0393985
        1 4  |  -.0659046   .0091659    -7.19   0.000    -.0838694   -.0479398
        1 5  |  -.0577144   .0095536    -6.04   0.000    -.0764392   -.0389896
        1 6  |  -.0460923   .0095737    -4.81   0.000    -.0648564   -.0273282
        1 7  |  -.0436227    .009719    -4.49   0.000    -.0626715   -.0245738
             |
       _cons |   -.407701   .0035243  -115.68   0.000    -.4146085   -.4007935
-------------+----------------------------------------------------------------
    /lnalpha |   2.305311   .0007919                      2.303758    2.306863
-------------+----------------------------------------------------------------
       alpha |   10.02729    .007941                      10.01174    10.04287
------------------------------------------------------------------------------
```

```
. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
(note: file ERencounters_comm_cluster.ster not found)
file ERencounters_comm_cluster.ster saved

.
. local i=`i'+1

.
. * next year physician visits
. nbreg n_car_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, nolog clus
> ter(Patid)

Negative binomial regression                    Number of obs     = 30,700,196
                                                Wald chi2(15)     = 1236825.85
Dispersion           = mean                     Prob > chi2       =     0.0000
Log pseudolikelihood =  -95490974               Pseudo R2         =     0.0152

                         (Std. Err. adjusted for 11,070,770 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
   n_car_2yr |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .0213766   .0000293   729.67   0.000     .0213192    .0214341
        male |  -.5226766   .0007481  -698.70   0.000    -.5241428   -.5212104
    1.any_ip |    .576603   .0025475   226.34   0.000       .57161    .5815959
             |
yr_afte~2006 |
          2  |   -.021228   .0007262   -29.23   0.000    -.0226513   -.0198047
          3  |   .0023247   .0007897     2.94   0.003     .0007769    .0038724
          4  |  -.0225216   .0008172   -27.56   0.000    -.0241234   -.0209199
          5  |  -.0951922   .0008531  -111.58   0.000    -.0968644   -.0935201
          6  |  -.1604099    .000881  -182.09   0.000    -.1621365   -.1586833
          7  |  -.0725132   .0009348   -77.57   0.000    -.0743453   -.0706811
             |
```

```
      any_ip#|
yr_afte~2006 |
        1 2  |  -.0282577   .0034134    -8.28   0.000    -.0349479   -.0215675
        1 3  |  -.0231757   .0035512    -6.53   0.000    -.0301359   -.0162156
        1 4  |  -.0189993   .0036601    -5.19   0.000    -.0261729   -.0118258
        1 5  |  -.0068065    .003787    -1.80   0.072    -.0142288    .0006159
        1 6  |   .0171679   .0040936     4.19   0.000     .0091447    .0251911
        1 7  |   .0221328    .004838     4.57   0.000     .0126505    .0316152
             |
       _cons |   1.451606   .0013749  1055.82   0.000     1.448911    1.454301
-------------+----------------------------------------------------------------
    /lnalpha |   .3172038   .0004764                        .31627    .3181376
-------------+----------------------------------------------------------------
       alpha |   1.373282   .0006543                      1.372001    1.374565
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
(note: file physician_comm_cluster.ster not found)
file physician_comm_cluster.ster saved

.
. local i=`i'+1

.
. * next year drug fills
.
. reg fills_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, cluster(Pati
> d)

Linear regression                               Number of obs     =   30700196
                                                F(15, 11070769)   =   71812.52
                                                Prob > F          =     0.0000
                                                R-squared         =     0.1279
                                                Root MSE          =     17.716
```

```
                         (Std. Err. adjusted for 11,070,770 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
   fills_2yr |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .4991594   .0005143   970.60   0.000     .4981515    .5001674
        male |  -3.042025   .0124339  -244.66   0.000    -3.066394   -3.017655
    1.any_ip |   10.16078   .0567383   179.08   0.000     10.04958    10.27199
             |
yr_afte~2006 |
          2  |    .181636   .0073428    24.74   0.000     .1672443    .1960276
          3  |   .2414705    .008925    27.06   0.000     .2239779    .2589631
          4  |  -.3089754   .0095175   -32.46   0.000    -.3276293   -.2903216
          5  |  -.5931539    .009923   -59.78   0.000    -.6126025   -.5737052
          6  |  -1.051908    .010079  -104.37   0.000    -1.071663   -1.032154
          7  |  -.3226251   .0112342   -28.72   0.000    -.3446437   -.3006066
             |
      any_ip#|
yr_afte~2006 |
        1 2  |   -.046076   .0738124    -0.62   0.532    -.1907457    .0985937
        1 3  |  -.0256296    .077743    -0.33   0.742    -.1780031    .1267439
        1 4  |  -.3409326   .0789378    -4.32   0.000     -.495648   -.1862173
        1 5  |  -.6888356   .0790179    -8.72   0.000    -.8437078   -.5339633
        1 6  |  -1.149623   .0783561   -14.67   0.000    -1.303198   -.9960479
        1 7  |  -.4473101   .0862978    -5.18   0.000    -.6164506   -.2781695
             |
       _cons |  -7.848581    .020466  -383.49   0.000    -7.888694   -7.808469
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
(note: file drug_comm_cluster.ster not found)
file drug_comm_cluster.ster saved
```

```
.
. local i=`i'+1

.
. * next year cost
. reg total_cost_2yr age male any_ip##i.yr_after_2006 if enroll_2yr==1, cluster
> (Patid)

Linear regression                               Number of obs     =   30700196
                                                F(15, 11070769)   =   15686.69
                                                Prob > F          =     0.0000
                                                R-squared         =     0.0288
                                                Root MSE          =      18206

                         (Std. Err. adjusted for 11,070,770 clusters in Patid)
------------------------------------------------------------------------------
             |               Robust
total_cost~r |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   156.1315   .3794795   411.44   0.000     155.3877    156.8752
        male |  -1116.178   9.440942  -118.23   0.000    -1134.682   -1097.674
    1.any_ip |   11379.53   92.53384   122.98   0.000     11198.17     11560.9
             |
yr_afte~2006 |
          2  |  -309.1103    9.70448   -31.85   0.000    -328.1308   -290.0899
          3  |  -364.3293   10.94715   -33.28   0.000    -385.7853   -342.8733
          4  |   -627.145   11.01272   -56.95   0.000    -648.7296   -605.5605
          5  |  -1101.174   10.61484  -103.74   0.000    -1121.979    -1080.37
          6  |   -1185.23    10.2305  -115.85   0.000    -1205.281   -1165.178
          7  |  -1151.388   10.72535  -107.35   0.000    -1172.409   -1130.367
             |
      any_ip#|
yr_afte~2006 |
        1 2  |   -705.661   115.6867    -6.10   0.000    -932.4029   -478.9192
        1 3  |  -464.4167   135.9446    -3.42   0.001    -730.8633   -197.9701
        1 4  |  -666.3258   131.1235    -5.08   0.000    -923.3231   -409.3285
```

```
        1 5  |  -1651.152   127.4631   -12.95   0.000    -1900.975   -1401.329
        1 6  |  -968.0793   130.4546    -7.42   0.000    -1223.766    -712.393
        1 7  |   -816.008   138.9571    -5.87   0.000    -1088.359    -543.657
             |
       _cons |  -536.0818   16.98503   -31.56   0.000    -569.3718   -502.7917
------------------------------------------------------------------------------

. estimates store m`i', title(`title`i'')

. estimates save `title`i'', replace
(note: file cost_comm_cluster.ster not found)
file cost_comm_cluster.ster saved

.
. esttab m10 m11 m12 m13 m14 m15 m16 m17 m18, replace wide label title(regressi
> on table-commercial)

regression table-commercial
{hline 281}
                              (1)                            (2)
>           (3)                            (4)                            (5)
>                     (6)                            (7)
> (8)                            (9)
                         dead_2yr                        ccw_2yr
>   any_ip_2yr                    ip_days_2yr                    any_er_2yr
>               n_er_2yr                     n_car_2yr                    fills_
> 2yr                 total_cost~r
{hline 281}
main
>
>
>
age                         0.0757***     (155.75)       0.0608***     (993.47)
>      0.00216***      (29.20)       0.0145***      (93.63)      0.00196***
>   (41.18)      0.00437***      (60.53)       0.0214***     (729.67)        0.
> 499***     (970.60)        156.1***     (411.44)
```

```
male                        0.518***      (59.98)       -0.410***    (-273.15)
>       -0.597***    (-310.49)       -0.458***    (-119.34)       -0.302***
> (-249.59)       -0.335***    (-171.08)       -0.523***    (-698.70)       -3.
> 042***    (-244.66)      -1116.2***    (-118.23)
any_ip=0                        0              (.)             0              (.)
>           0              (.)             0              (.)             0
>       (.)             0              (.)             0              (.)
>   0              (.)             0              (.)
any_ip=1                    2.379***     (117.82)        1.658***     (312.38)
>        1.154***     (184.40)        1.761***     (136.81)        0.638***
>  (137.24)        0.665***     (100.90)        0.577***     (226.34)        10
> .16***     (179.08)      11379.5***     (122.98)
yr_after_2006=1                 0              (.)             0              (.)
>           0              (.)             0              (.)             0
>       (.)             0              (.)             0              (.)
>   0              (.)             0              (.)
yr_after_2006=2            0.0158           (0.92)        0.354***     (441.22)
>      -0.0189***      (-5.91)      -0.0123          (-1.92)       0.0414***
>   (25.65)       0.0263***      (12.16)      -0.0212***     (-29.23)        0.
> 182***      (24.74)       -309.1***     (-31.85)
yr_after_2006=3           -0.0104          (-0.60)        0.575***     (584.74)
>      -0.0205***      (-6.51)     0.000287           (0.04)       0.0617***
>   (36.64)       0.0134***       (5.61)      0.00232**        (2.94)        0.
> 241***      (27.06)       -364.3***     (-33.28)
yr_after_2006=4            -0.203***     (-11.06)        0.749***     (676.87)
>      -0.0533***     (-16.61)      -0.0311***      (-4.84)       0.0334***
>   (19.31)      -0.0350***     (-14.11)      -0.0225***     (-27.56)       -0.
> 309***     (-32.46)       -627.1***     (-56.95)
yr_after_2006=5            -0.600***     (-29.16)        0.863***     (728.83)
>      -0.0876***     (-27.01)      -0.0455***      (-6.87)       -0.110***
>  (-61.52)       -0.159***      (-62.02)      -0.0952***    (-111.58)       -0.
> 593***     (-59.78)      -1101.2***    (-103.74)
yr_after_2006=6            -0.685***     (-32.54)        0.959***     (773.00)
>       -0.129***     (-39.25)      -0.0840***     (-12.51)       -0.145***
>  (-80.59)       -0.198***      (-76.01)       -0.160***    (-182.09)       -1.
> 052***    (-104.37)      -1185.2***    (-115.85)
```

```
yr_after_2006=7          -0.714***    (-32.30)       0.978***    (727.10)
>       -0.184***    (-53.47)      -0.143***    (-20.79)     -0.0887***
>  (-47.97)      -0.164***    (-61.90)     -0.0725***    (-77.57)      -0.
> 323***    (-28.72)     -1151.4***   (-107.35)
any_ip=0 # yr_afte~1            0             (.)            0            (.)
>            0             (.)            0            (.)            0
>       (.)            0             (.)            0            (.)
>   0             (.)            0             (.)
any_ip=0 # yr_afte~2            0             (.)            0            (.)
>            0             (.)            0            (.)            0
>       (.)            0             (.)            0            (.)
>   0             (.)            0             (.)
any_ip=0 # yr_afte~3            0             (.)            0            (.)
>            0             (.)            0            (.)            0
>       (.)            0             (.)            0            (.)
>   0             (.)            0             (.)
any_ip=0 # yr_afte~4            0             (.)            0            (.)
>            0             (.)            0            (.)            0
>       (.)            0             (.)            0            (.)
>   0             (.)            0             (.)
any_ip=0 # yr_afte~5            0             (.)            0            (.)
>            0             (.)            0            (.)            0
>       (.)            0             (.)            0            (.)
>   0             (.)            0             (.)
any_ip=0 # yr_afte~6            0             (.)            0            (.)
>            0             (.)            0            (.)            0
>       (.)            0             (.)            0            (.)
>   0             (.)            0             (.)
any_ip=0 # yr_afte~7            0             (.)            0            (.)
>            0             (.)            0            (.)            0
>       (.)            0             (.)            0            (.)
>   0             (.)            0             (.)
any_ip=1 # yr_afte~1            0             (.)            0            (.)
>            0             (.)            0            (.)            0
>       (.)            0             (.)            0            (.)
>   0             (.)            0             (.)
```

```
any_ip=1 # yr_afte~2       0.0339          (1.19)       0.0690***       (9.54)
>     -0.00977         (-1.17)     -0.00344         (-0.20)      -0.0124
>   (-1.94)      -0.0266**       (-3.11)      -0.0283***      (-8.28)      -0.0
> 461         (-0.62)       -705.7***      (-6.10)
any_ip=1 # yr_afte~3       0.0141          (0.49)        0.115***      (14.70)
>     -0.00578         (-0.66)       0.0143          (0.79)      -0.0333***
>   (-5.08)      -0.0572***      (-6.30)      -0.0232***      (-6.53)      -0.0
> 256         (-0.33)       -464.4***      (-3.42)
any_ip=1 # yr_afte~4        0.132***       (4.41)        0.161***      (19.54)
>       0.0406***       (4.53)       0.0634***       (3.49)      -0.0408***
>   (-6.10)      -0.0659***      (-7.19)      -0.0190***      (-5.19)       -0.
> 341***      (-4.32)       -666.3***      (-5.08)
any_ip=1 # yr_afte~5        0.157***       (4.68)        0.177***      (20.90)
>       0.0494***       (5.43)       0.0867***       (4.70)      -0.0292***
>   (-4.27)      -0.0577***      (-6.04)     -0.00681         (-1.80)       -0.
> 689***      (-8.72)      -1651.2***     (-12.95)
any_ip=1 # yr_afte~6        0.112**        (3.22)        0.194***      (22.16)
>        0.140***      (15.37)        0.220***      (11.38)      -0.0151*
>   (-2.18)      -0.0461***      (-4.81)       0.0172***       (4.19)       -1.
> 150***     (-14.67)       -968.1***      (-7.42)
any_ip=1 # yr_afte~7        0.164***       (4.48)        0.185***      (19.88)
>        0.139***      (14.39)        0.253***      (12.31)      -0.0276***
>   (-3.83)      -0.0436***      (-4.49)       0.0221***       (4.57)       -0.
> 447***      (-5.18)       -816.0***      (-5.87)
Constant                   -10.29***    (-379.20)       -0.941***    (-364.61)
>       -2.817***    (-700.20)       -2.048***    (-269.30)       -1.461***
> (-609.76)       -0.408***    (-115.68)        1.452***    (1055.82)       -7.
> 849***    (-383.49)       -536.1***     (-31.56)
{hline 281}
/
>
>
>
lnalpha
>                                  3.791***    (2766.90)
>                  2.305***    (2910.96)        0.317***     (665.80)
```

```
>
{hline 281}
Observations             30749311                      30699837
>     30700196                     30700196                     30700196
>               30700196                     30700196                     30700
> 196                     30700196
{hline 281}
t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

.
. log close
      name:  <unnamed>
       log:  /schaeffer-a/sch-projects/dua-data-projects/OPTUM/SSA/pgm/0419run/
> model_comm.log
  log type:  text
 closed on:  19 Apr 2019, 17:11:53
--------------------------------------------------------------------------------
```