Prevalence of Comorbid Conditions and Utilization Patterns Among Medicaid Expansion Enrollees

Introduction

The Affordable Care Act (ACA) of 2010 expanded Medicaid coverage to low-income childless adults, a group that was previously ineligible for Medicaid in most states. Since the ACA took effect in 2014, enrollment in 2016 among the newly eligible group was nearly 12 million in the 32 states that expanded Medicaid.[1]

This large number of new Expansion adults has created concerns for state budget. Although the federal government initially covers the full cost of expansion enrollees, the funds will drop to 90% in 2020 and beyond.[2] It was unknown how much the mostly low-income childless adults would cost state Medicaid programs. Historically, this group has been disproportionately uninsured due to ineligibility for public coverage and the lack of affordable private coverage options.[3] As a result, they may be sicker or have pent-up medical demands, possibly driving up costs to Medicaid programs significantly.[4] The influx of 12 million new enrollees may have significant budgetary implications for Medicaid programs, but the absolute dollar impact was difficult to predict, without a good understanding of the Expansion adults' medical needs or utilization trends. Thus, it is important to understand the medical needs and utilization trends of the new Expansion adults, in order for Medicaid programs to better manage state budgets, and for health professionals to better serve the Expansion adults.

Studies examining the impact of the ACA have found increased access to care and reduced financial burden due to high medical costs among the new Expansion adults, indicating that they have indeed been utilizing health services.[5–10] The literature on the Expansion adults' utilization patterns is limited. Existing studies mostly focus on self-reported access to care and spending of this population, and therefore may not accurately capture utilization.

Starting 2014, Rhode Island (RI) was among the 32 states that expanded its Medicaid program to non-elderly childless adults. Since then, the RI Medicaid program covers approximately 60,000 Expansion adults every year. This analysis used the administrative data from Rhode Island's Medicaid program from January 2014 to June 2016 to examine the utilization patterns of the Expansion adults, compared to the non-Expansion adults. The objectives of this study were to 1) examine the prevalence of comorbid conditions among Expansion adults, compared to non-Expansion adults, and 2) examine whether Expansion adults were more likely to utilize health care than the non-Expansion adults, since they were less likely to access affordable care before the ACA expansions and thus may have pent-up demands. Specifically, they would have higher office visit rates, ED visit rates, and prescription drug use.

Methods

Data source and study population

All analyses were conducted using Medicaid claims data provided by the Office of Human and Health Services of Rhode Island. The database contained the universe of all enrollees in Rhode Island's Medicaid program between January 2014 and June 2016, inclusive. It included enrollment files, medical claims, and prescription drug claims.

Individuals who were under 19 years old, above 65 years old, or disabled were excluded in the analyses, since they were not affected by the eligibility change. Individuals enrolled in both Medicaid and Medicare, i.e., the Dual Eligibles, were excluded, since some of their claims may have been paid for by Medicare, and thus may not appear in the Medicaid database.

Comparison groups: non-Expansion adults vs. Expansion adults

The non-Expansion adults included every enrollee who would have been eligible under the prior rules before 2014. Prior to 2014, non-elderly adults who may be eligible for Medicaid were parents, caretakers, and pregnant women. Due to the possible overlap of eligibility categories between parents, caretakers, and pregnant women in the RI Medicaid claims database, these categories were combined into one category, which would be referred to as the "non-Expansion adults" from here on. The Expansion adults included every enrollee who became eligible through the expansion rules of the new law, i.e., non-elderly, childless adults.

Statistical analysis

Prevalence of Comorbid Conditions

To compare the prevalence of comorbid conditions between non-Expansion adults versus Expansion adults, Pearson's chi-squared tests were used for the 31 Elixhauser comorbidity measures.

Regression Analyses for Utilization Outcomes

For the utilization analyses, Ordinary Least Square (OLS) regression models were used to estimate the difference in utilization outcomes. All covariates noted above, along of time fixed effects were included. Because it would take a few months for the expansion adults to become familiar with the health care system, or schedule doctor's appointments, a "transition period" of 6 months immediately after the expansion in January 2014 was excluded from the regression analyses (more detail on this later). The study time frame included for the regression analyses was July 2014 – June 2016.

Outcomes of interest: The main outcomes were office visit rates, emergency department (ED) visit rates, and prescription drug use rates, measured in number of utilizations per 100 persons. Office visits were identified using evaluation and management (E&M) Current Procedural Terminology (CPT) codes.[11] ED visits were identified using ED-associated E&M codes (99281-99285, 99291, 99292) or revenue center codes (0450-0459, 0981). Each unique drug prescribed on a given day was counted as one drug.

Covariates: Demographic characteristics such as age, gender, primary spoken language were included. To measure comorbidities, Elixhauser Comorbidity Index identified 31 comorbid conditions, using the Ninth Revision of International Classification of Diseases (ICD-9) diagnosis codes. To derive a proxy measure of socioeconomic status, five-digit ZIP Codes were linked to the publicly available Area Deprivation Index, a composite measure derived from a weighted combination of area-level indicators of socioeconomic disadvantage.[12] The main independent variable of interest was a binary indicator of whether an individual was a new Expansion adult.

All statistical analyses were performed using the statistical software STATA, version 14.

Results

Prevalence of Comorbid Conditions

Between January 2014 and June 2016, 93,675 Expansion adults and 80,208 non-Expansion adults were ever enrolled in the RI Medicaid program (**Table 1**). While the non-Expansion adults were largely women, at 72%, more than half (55%) of the Expansion adults were men.

Table 2 showed the prevalence of 31 Elixhasuer Comorbid Measures between non-Expansion adults versus Expansion adults. As hypothesized, non-Expansion adults had a higher prevalence on almost all comorbid conditions than the non-Expansion adults. For example, they were much more likely to have uncomplicated hypertension (14% vs. 9%), uncomplicated diabetes (7% vs. 5%), and alcohol abuse (7% vs. 4%), indicating that they may have different medical needs than the non-Expansion adults.

Utilization Trends and Regression Results

Figure 1 showed the unadjusted utilization rates for the comparison groups during the January 2014 – June 2016 period. Office visit rates (**Fig. 1a**) were not notably different between the two groups throughout the study period. The Expansion adults initially had higher ED visit rates, but it decreased to similar rates as among the non-Expansion adults (**Fig. 1b**). Prescription drug use rates were consistently higher among the Expansion adults (**Fig. 1c**). For all three types of utilizations, there seemed to be a transition period immediately after the expansion in January 2014, where the utilization rates increased drastically until it leveled after about 6 months. This sharp increase may be because it took the expansion adults some time to become familiar with the healthcare system, or book an appointment with a physician, among others.

Table 3 showed the regression results of office visit rates, ED visit rates, and prescription drug use rates, without the 6-month transition period noted above. The Expansion adults had significantly higher rates on all three utilizations – office visit rates were 2.0% (SE: 0.241) higher; ED visit rates were 0.449% (SE: 0.0845) higher; and prescription drug use rates were 13.2% higher (SE: 1.11).

For all three utilizations, enrollees with comorbid conditions had significantly higher rates than those without comorbid conditions. To visualize the effect of having comorbid conditions in trends, the unadjusted utilization trends were stratified by comorbid condition status (**Fig. 2**). The initial higher ED visit rates among the expansion adults seen in **Fig. 1b** seemed to be attributed to the Expansion adults with comorbid conditions (**Fig. 2b**). Similarly, for prescription drug use rates, the consistently higher rates among Expansion adults seen in **Fig. 1c**, may be attributed to Expansion adults with comorbid conditions (**Fig. 2c**). Office visit rates were similar between non-expansion adults and expansion adults, after stratifying by comorbid conditions (**Fig. 2a**).

Discussion

The analyses in this study showed that between July 2014 and June 2016, compared to the previously eligible Medicaid enrollees, the Expansion adults were more likely to be male and English speakers. They had higher prevalence on almost all comorbid conditions, as measured by the Elixhauser comorbidity measures. Office visit rates, ED visit rates, and prescription drug use rates were significantly higher among the Expansion adults. When

stratified by comorbid condition status, the higher utilization rates among Expansion adults may be attributed to the expansion adults with comorbid conditions.

The decreasing trends of ER rates among Expansion adults may mean that it took some time for the expansion adults to become familiar with the health care system. If it took time for the expansion adults to find a doctor, or book an appointment, expansion adults may have simply turned to the ER for immediate care. As the Expansion adults gained access to health providers, such medical needs were addressed, possibly resulting in decreased ED use over time. The decreasing trends of ER rates may also be partly explained by the steady prescription drug use over time, as shown in **Fig. 2c**. Previous studies have shown that increased prescription drug adherence for chronic conditions drastically decreases ED and hospital use, and reduces health care costs.[13–15] Since many of the Expansion adults had comorbid conditions, their conditions may have been properly managed as they gained access to prescription drugs, reducing the need for ED use.

This study has several limitations. First, due to the nature of medical claims databases, we were not able to observe an individual when he/she was not enrolled in Medicaid. As a result, we were not able to observe utilization trends of the Expansion adults prior to 2014, and thus unable to causally assess the role of Medicaid expansion on utilization patterns. Second, the Expansion adults and non-Expansion adults were systematically different, thus cautious interpretation is needed when assessing utilization trends. The systematic difference may also be complicated by our inability to distinguish parents, caretakers, and pregnant women among the non-Expansion adults, as there were overlaps between these three categories in the RI Medicaid claims database. Further studies are needed to examine how the demographic differences contributed to differences in utilization.

Despite these limitations, the analyses gave insights into the demographics and utilization patterns of the Expansion adults, whose health services needs were largely unknown. As this analysis showed, the new Expansion adults were more likely to have certain comorbid conditions, and had significantly higher use of prescription drugs. These findings provide the first steps in understanding the medical needs and utilization patterns of the new Expansion adults, a group whose medical needs and utilization patterns were largely unknown.

Table 1: Characteristics of the Expansion adults and non-Expansion adults in Medicaid, 2014

Factor	Non-Expansion Adults	Expansion Adults	p-value
N	80208	93675	
Age in 2014, mean (SD)	35 (10)	37 (15)	<0.001
Female	57729 (72%)	42493 (45%)	<0.001
Primary Spoken Language			<0.001
English	67425 (84%)	84764 (90%)	
Spanish	10092 (13%)	7005 (7%)	
Other	2691 (3%)	1906 (2%)	
Enrollment Pathway			<0.001
Parent/Caretaker	67178 (84%)	0 (0%)	
Pregnancy	3756 (5%)	0 (0%)	
Other Adults Pre-Expansion	9274 (12%)	0 (0%)	
Expansion Adults	0 (0%)	93675 (100%)	
Area Deprivation Index, mean (SD)	104 (8)	102 (9)	<0.001
Elixhauser Comorbidity Sum			<0.001
0	33015 (41%)	40108 (43%)	
1	14742 (18%)	17886 (19%)	
2+	32451 (40%)	35681 (38%)	

Table 2: Prevalence of 31 Elixhauser comorbid conditions, non-Expansion adults versus Expansion adults

Factor	Non-Expansion Adults	Expansion Adults	p-value
N	80,157	93,726	
Congested Heart Failure	<1%	1%	<0.001
Cardiac Arrhythmias	2%	2%	<0.001
Valvular Disease	<1%	1%	<0.001
Pulmonary Circulation Disorders	<1%	<1%	0.044
Peripheral Vascular Disorders	1%	1%	<0.001
Hypertension, Uncomplicated	9%	14%	<0.001
Paralysis	<1%	<1%	0.008
Other Neurological Disorders	1%	2%	<0.001
Chronic Pulmonary Disease	6%	7%	<0.001
Diabetes, Uncomplicated	5%	7%	<0.001
Diabetes, Complicated	1%	2%	<0.001
Hypothyroidism	4%	3%	<0.001
Renal Failure	<1%	1%	<0.001
Liver Disease	2%	3%	<0.001
Peptic Ulcer Disease Excluding Bleeding	<1%	<1%	0.29
AIDS/HIV	<1%	<1%	<0.001
Lymphoma	<1%	<1%	0.10
Metastatic Cancer	<1%	<1%	<0.001
Solid Tumor Without Metastasis	1%	2%	<0.001
Rheumatoid Arthritis/Collagen Vascular	1%	1%	0.41
Coagulopathy	1%	1%	0.98
Obesity	6%	4%	<0.001
Weight Loss	1%	1%	0.71
Fluid and Electrolyte Disorders	2%	2%	<0.001
Blood Loss Anemia	<1%	<1%	0.044
Deficiency Anemia	2%	1%	<0.001
Alcohol Abuse	2%	5%	<0.001
Drug Abuse	4%	7%	<0.001
Psychoses	1%	2%	<0.001
Depression	13%	14%	<0.001
Hypertension, Complicated	<1%	<1%	<0.001

Table 3: Regression results for utilization rates

	Office Visits		ED Visits		Prescription Drug Use	
Expansion Adults	0.0201***	(0.00241)	0.00599***	(0.000845)	0.132***	(0.0111)
Age in 2014	0.00464***	(0.0000881)	-0.00134***	(0.0000339)	0.0379***	(0.000392)
Sex						
Male	ref	ref	ref	ref	ref	ref
Female	0.122***	(0.00232)	0.00148	(0.000910)	0.464***	(0.0102)
Primary Language Spoken						
English	ref	ref	ref	ref	ref	ref
Spanish	-0.00723*	(0.00360)	-0.0172***	(0.00122)	-0.291***	(0.0148)
Other	-0.0256***	(0.00656)	-0.0116***	(0.00291)	-0.275***	(0.0265)
Area Deprivation Index	-0.00105***	(0.000136)	0.000887***	(0.0000508)	-0.00708***	(0.000580)
Elixhauser Comorbidity Index						
0	ref	ref	ref	ref	ref	ref
1	0.227***	(0.00365)	0.0504***	(0.00149)	1.282***	(0.0169)
2+	0.478***	(0.00698)	0.0973***	(0.00329)	2.660***	(0.0362)
Observations	2408500		2408500		2408500	
Standard errors in parentheses						
* p<0.05 ** p<0.01 *** p<0.001"						

Figure 1: Trends of health services utilization between the Expansion adults and non-Expansion adults in Medicaid, 2014-2016

Figure 1a. Number of Office Visits Per 100 Persons, by Expansion Groups

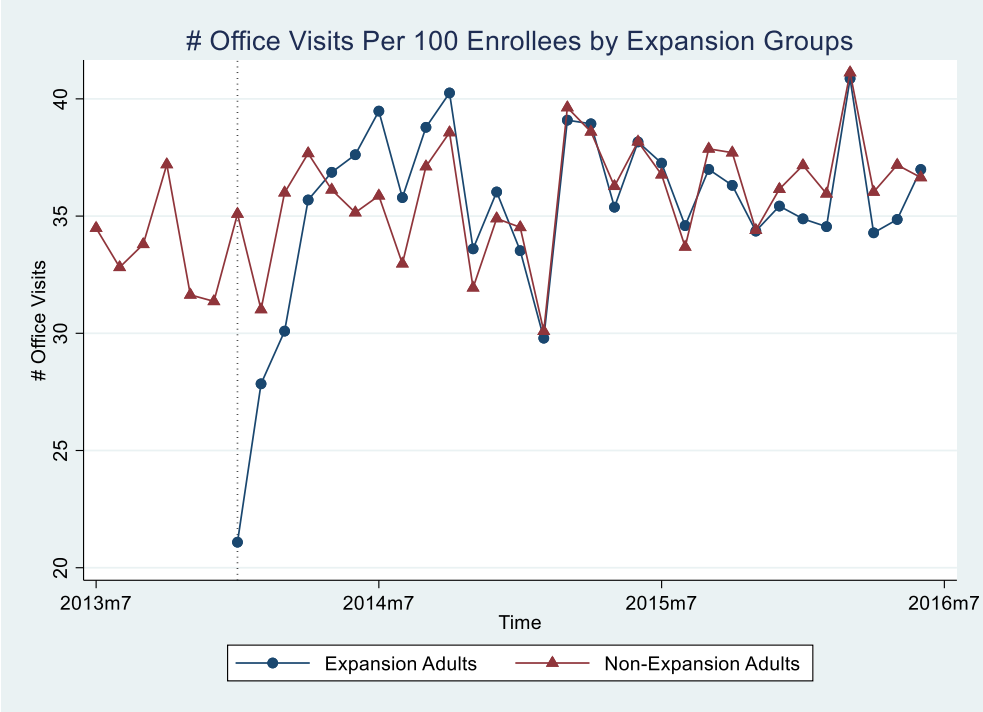


Figure 2b. Number of Emergency Department (ED) Visits Per 100 Persons, by Expansion Groups

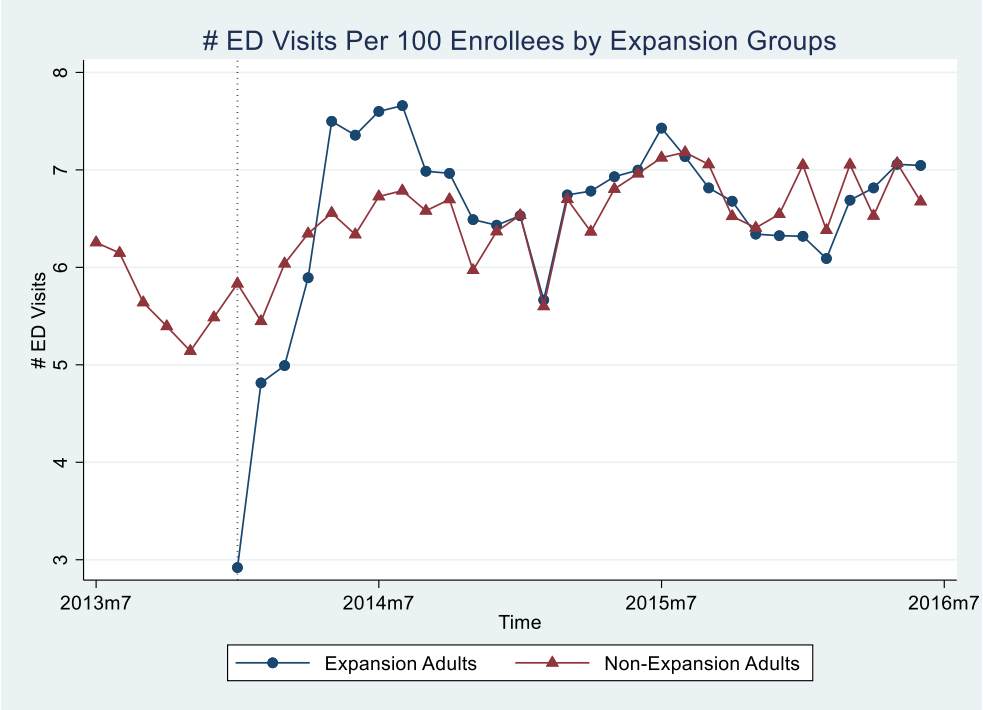


Figure 3c. Number of Prescription Drugs Per 100 Persons, by Expansion Groups

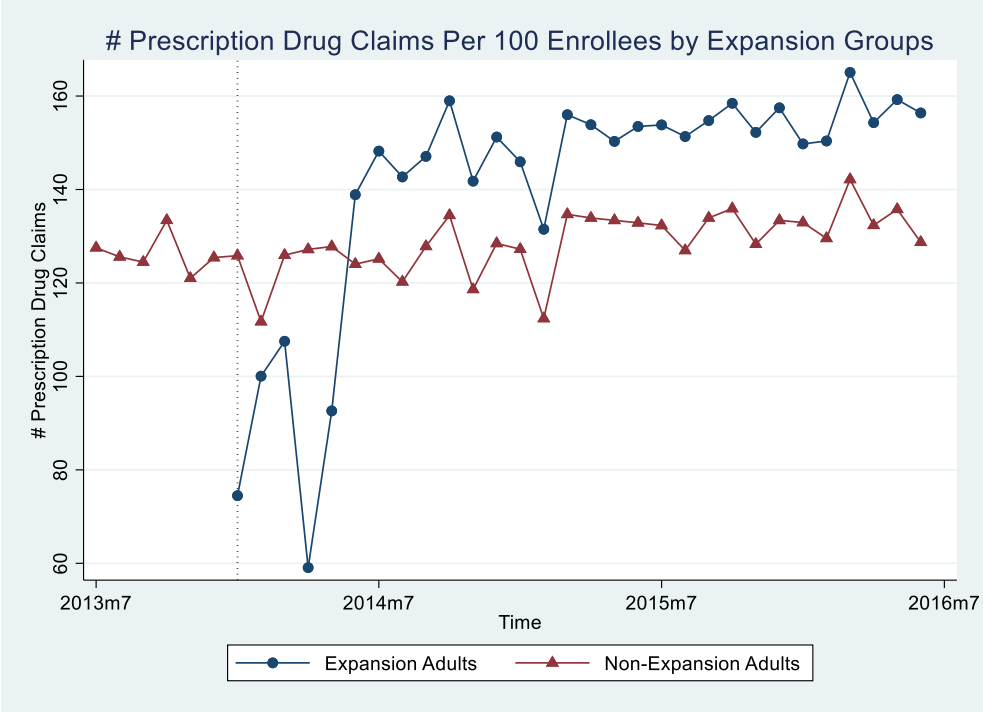


Figure 2: Trends of health services utilization by chronic disease status, between the Expansion adults and non-Expansion adults in Medicaid, 2014-2016

Figure 2a. Number of Office Visits Per 100 Persons, by Chronic Disease Status

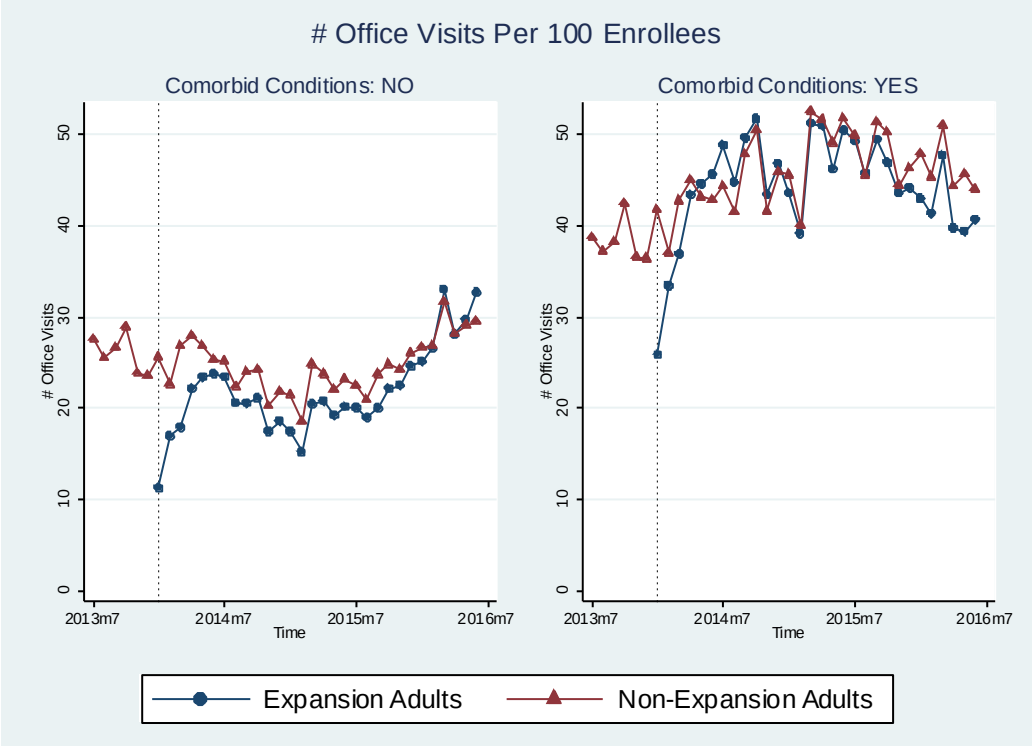


Figure 2b. Number of Emergency Department (ED) Visits Per 100 Persons, by Chronic Disease Status

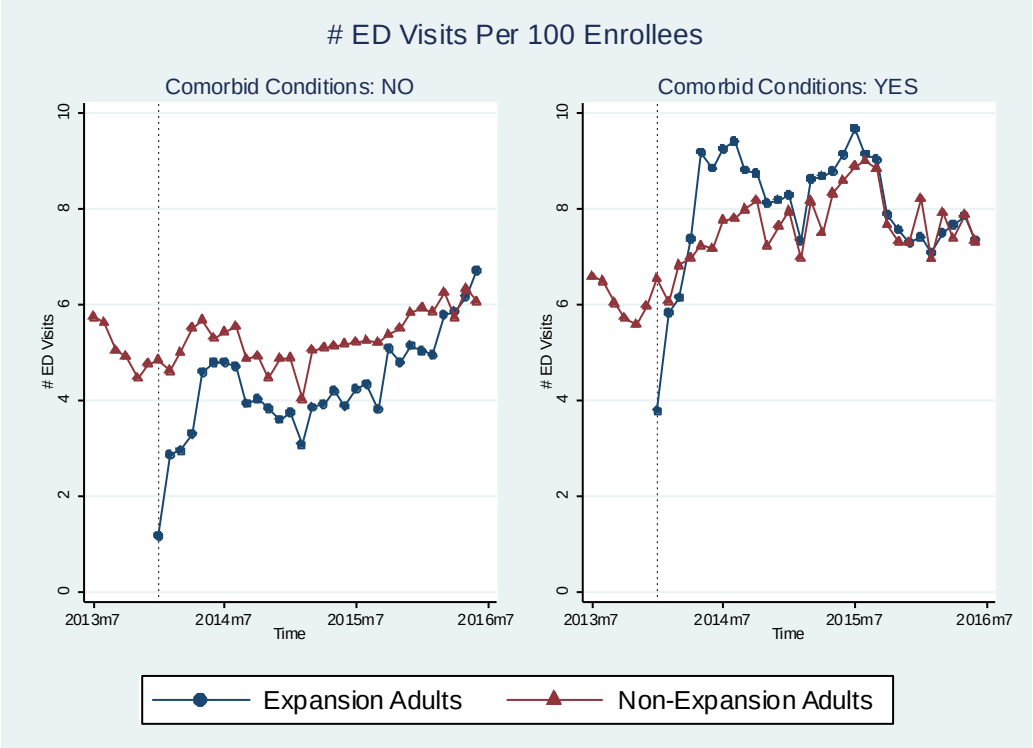
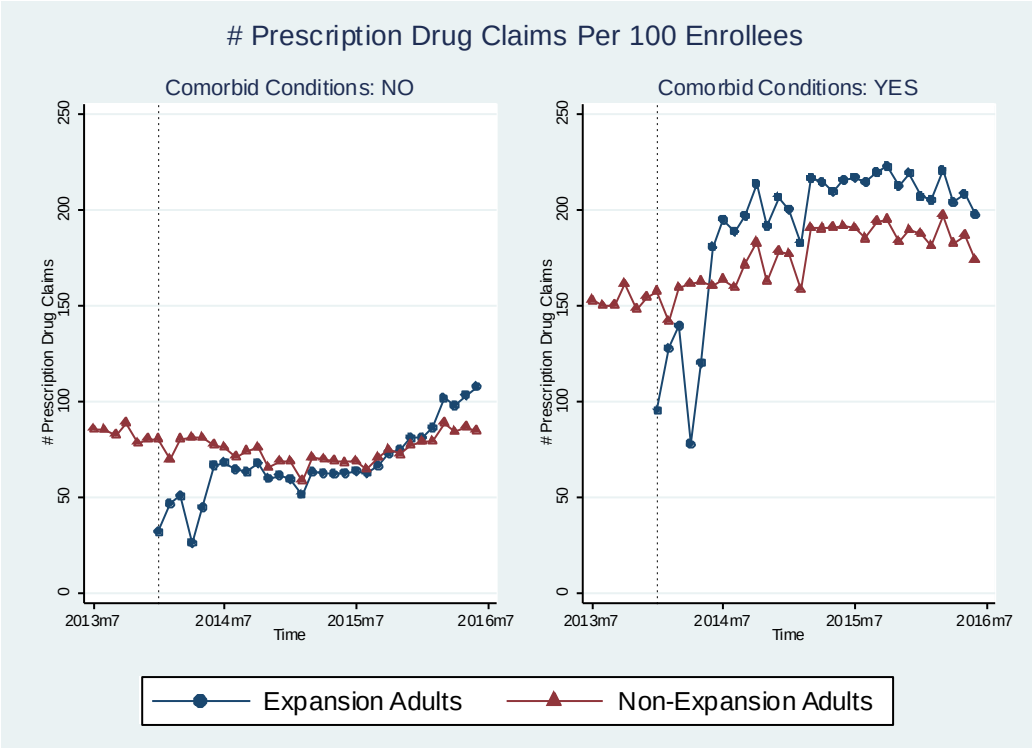


Figure 2c. Number of Prescription Drugs Per 100 Persons, by Chronic Disease Status



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