THE MILBANK QUARTERLY
A MULTIDISCIPLINARY JOURNAL OF POPULATION HEALTH AND HEALTH POLICY

Original Investigation

How Might the Affordable Care Act's Coverage Expansion Provisions Influence Demand for Medical Care?

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Context: The Affordable Care Act (ACA) is predicted to expand health insurance to 25 million individuals. Since insurance reduces the price of medical care, the quantity of services demanded by these newly covered individuals is expected to rise. In this article I provide a comprehensive picture of the demographics, health status, and medical care utilization of the population targeted for the ACA's expansion of coverage, contrasted with that of other nonelderly, insured populations. In addition, I synthesize the current evidence regarding the causal impact of insurance on medical care demand, drawing heavily on recent evidence from Massachusetts and Oregon.

Methods: Using the 2008 to 2010 Medical Expenditure Panel Survey, I conducted bivariate and multivariate analyses to examine differences between the ACA target population and other insured groups. I used the results from the descriptive analysis and quasi-experimental literature to generate "back of the envelope" estimates of the potential impact of the coverage expansion on total medical care utilization by the noninstitutionalized US population.

Findings: Comparisons of the potential ACA target population with the privately and publicly insured reveal that the former is younger and more likely to be male. The ACA target population, and particularly the uninsured with incomes under 200% of the federal poverty line, reports lower rates of several medical conditions relative to those of the privately and publicly insured. Future changes in rates of inpatient hospitalization and ED use among the newly insured could vary widely, based on descriptive findings and inferences from the quasi-experimental literature. Results also suggest moderate increases

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The Milbank Quarterly, Vol. 92, No. 1, 2014 (pp. 63-87)
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in ambulatory care. Total increases in overall demand for medical care by the newly insured comprise a modest proportion of the aggregate utilization.

Conclusions: With the expected increases in utilization resulting from the coverage expansion, stakeholders will need to monitor local health care delivery system capacity and respond where needed with policy- and/or market-based innovations.

Keywords: Affordable Care Act, health insurance, demand for medical care, provider capacity.

On March 23, 2010, the Patient Protection and Affordable Care Act (ACA) was signed into law. Included in the legislation is an expansion of health insurance predicted to reduce the percentage of uninsured individuals by 45%, or approximately 25 million persons at full implementation.[1] The ACA has two mechanisms through which coverage will be expanded, beginning in 2014. The first is through an expansion of Medicaid eligibility, in which states have the option to offer coverage to all individuals with a family income of less than 138% of the federal poverty level (FPL). The second mechanism is through the introduction of subsidized, private insurance available from newly created exchanges. Persons with a family income of between 138% and 400% FPL who do not have access to an offer of affordable employer-sponsored insurance will be eligible for premium assistance credits based on a sliding scale. For exchange-based policyholders with an income of less than 250% FPL, cost-sharing subsidies for care also will be available to reduce out-of-pocket costs. The Congressional Budget Office estimates that by 2023, an additional 13 million individuals will obtain coverage through Medicaid and 24 million will have exchange-based plans.[1]

My article has three, complementary objectives. The first is to provide a relatively current, comprehensive picture of the demographics, health status, and medical care utilization of the population targeted for the ACA coverage expansion, contrasted with other nonelderly, insured populations. The second is to synthesize the current research evidence regarding the impact of insurance on medical care demand and to discuss the strengths and limitations of descriptive and causal evidence for predicting the demand response of the ACA's target population. The third objective is to provide "back of the envelope" calculations of changes in the overall demand for medical care based on these estimates and,

given this anticipated increase in demand for medical care, to identify strategies for addressing possible capacity concerns.

A Comprehensive Picture of the Potential ACA Coverage Expansion Population

One of the ACA's primary goals is expanding coverage to the uninsured, nonelderly US population. Whereas microsimulation models estimate the number of individuals most likely to obtain insurance as a result of the policy, less attention has been focused on their characteristics, including their demographics, health status, and medical care consumption, compared with those of insured populations.

To obtain a comprehensive picture of the ACA's prospective coverage expansion population, I used the Medical Expenditure Panel Survey Household Component (MEPS-HC) for 2008 through 2010. The MEPS is a nationally representative federal survey of the noninstitutionalized US civilian population, conducted annually by the US Department of Health and Human Services' Agency for Healthcare Research and Quality. The study population is restricted to the approximately 184.7 million nondisabled persons aged 18 to 64. I chose this age range because 90% of children are currently covered under existing public or private insurance and almost all individuals 65 and older are eligible for Medicare.[2]

One strength of the MEPS is its comprehensive measurement of health insurance. Using monthly insurance indicators, I constructed annualized measures of health insurance and classified individuals into the following three, mutually exclusive, categories:

1. *Uninsured*: persons reporting not having insurance for *at least* three months during the year.
2. *Privately insured*: persons reporting having private insurance for the full year (eg, employer-sponsored, nongroup, or other group coverage) or a mixture of coverage sources during the year with a gap in coverage of no more than 2 months.
3. *Publicly insured*: persons reporting having public insurance (Medicaid, Medicare, or a state program) for more than 6 months during the year and with a gap in coverage of no more than 2 months.

In regard to these categories, I consider the uninsured as representing the ACA's coverage expansion target population. Approximately 68% of the uninsured has no coverage for the entire year, and the remainder has gaps in coverage of at least 3 months (data available on request). Of course, not all uninsured individuals are equally likely to enroll in coverage, since exchange-based subsidies for premiums and cost sharing are more generous for those with lower incomes. To account for this, I further distinguished the uninsured between those with a family income less than or equal to 200% FPL and those with a family income greater than 200% FPL. In addition, the comparison groups corresponding to the privately and publicly insured as just defined may include some persons with short coverage gaps or mixed sources of insurance. Tabulations (data available on request) indicate that 95% in the privately insured category reported having private coverage for the entire year and 89% in the public insurance category had public insurance for the entire year.

I used bivariate analyses, including chi-square tests and one-way analysis of variance, as well as multivariate regression, to test for differences in the demographics, health status, and medical care consumption of the ACA coverage expansion target population compared with the private and publicly insured populations. Individuals' demographic attributes are age (years), female, white race, Hispanic ethnicity, a binary indicator for married or not, education (years), employed or not, and annual family income (inflation adjusted to US$2013). I measured provider attachment using an indicator for whether the individual reported having a usual source of care. From the full-year consolidated and medical conditions files of the MEPS-HC, I constructed measures of health status and medical care consumption. I measured individuals' health status using the following variables: an indicator for a person reporting that he or she is in fair or poor health (reference is excellent, very good, or good health); whether the individual is obese (BMI $>$ 30); and a self-reported presence of each of the following medical conditions: cancer, diabetes, hypertension, heart-related conditions, asthma or COPD, neurological conditions related to back or disc, orthopedic conditions, skin-related conditions, anxiety or mood disorders, and alcohol or substance abuse. Measures of annual medical care consumption include total spending (US$2013), number of inpatient stays, number of emergency department (ED) visits, number of office-based visits, and number of prescribed medicines, as well as condition-specific consumption for the

aforementioned conditions. All estimates were generated using STATA 12.0/SE and weighted to account for the complex survey design of the MEPS.

Results and Discussion

The prospective ACA target population, including those uninsured for either a full or a partial year, is estimated to be 51.8 million individuals, far more than the 25 million expected to obtain coverage. Several factors help explain this difference. First, as a result of the US Supreme Court decision in June 2012, some states decided not to expand Medicaid eligibility in 2014 to cover those with an income of less than 138% FPL. Although some individuals with an income between 100% and 138% FPL qualify for subsidized coverage in the exchanges, if their state does not expand Medicaid, those earning below 100% FPL will not be eligible. Second, the ACA prohibits certain persons from obtaining Medicaid or subsidized exchange-based coverage, including an estimated 4.2 million low-income, undocumented immigrant adults.[3] Third, some people eligible for Medicaid may choose not to enroll because they do not want insurance or they can access care through the safety net. A significant proportion of those who are eligible for Medicaid also are exempt from the individual mandate because of their low income. Finally, persons earning between 100% and 400% FPL still face some out-of-pocket costs associated with obtaining exchange-based coverage. Uninsured individuals with higher incomes may not regard coverage as affordable or worth the cost, even after accounting for premium subsidies and the penalty imposed for not having coverage.

Table 1 summarizes the demographic attributes of the ACA target population compared with those of persons with private or public coverage. Compared with the privately insured, those in the ACA target population are younger, more likely to be male, less likely to be married, and less likely to be employed. However, the ACA target population has a stronger labor force attachment than do nonelderly adults receiving insurance through public programs. Notably, 90% of uninsured persons report a family income of 400% FPL or lower, suggesting that a high proportion may be eligible for Medicaid or subsidized exchange-based coverage in 2014.

TABLE 1
Demographic Attributes of the Nonelderly Adult Population by Insurance Status

Variable	Uninsured (51.8 million)		Privately Insured (116.6 million)	Nondisabled Publicly Insured (16.3 million)
	Less Than or Equal to 200% FPL (34.4 million)	Greater Than 200% FPL (17.4 million)		
Age	34.95[a,b,c] (.188)	39.59[b,c] (.312)	41.89 (.155)	42.06 (.369)
Education (years)	11.71[a,b,c] (.067)	13.02[b,c] (.064)	14.09 (.035)	12.26 (.065)
Female	.48[a,b,c]	.42[b,c]	.51	.62
White	.76[b,c]	.82	.83	.7
Hispanic	.32[a,b,c]	.20[b,c]	.094	.16
Married	.34[a,b,c]	.47[b,c]	.63	.43
Employed	.62[a,b,c]	.82[b,c]	.87	.39
Family income < 138% FPL	.74[b,c]	n/a	.097	.60
Family income 138%-400% FPL	.26[a,c]	.70	.45	.28
Have a usual source of care	.45[a,b,c]	.55[b,c]	.81	.84

Means and proportions reported; linearized standard errors in parentheses.
[a]Result for uninsured with family income ≤ 200% FPL is statistically different from that for uninsured with family income > 200% FPL at $p < .05$.
[b]Statistically different from privately insured at $p < .05$.
[c]Statistically different from publicly insured at $p < .05$.

Although not a demographic attribute per se, an important, albeit potentially endogenous, factor related to individuals' demand for medical care is whether they have a usual source of care. The uninsured groups are considerably less likely to have a usual source of care (45% to 55%). This contrasts with 81% and 85%, respectively, for the private and publicly insured.

The respondents in the MEPS data self-report their medical conditions, which are recorded as verbatim text, to which professional coders then assign both ICD-9-CM codes and broader clinical classification software (CCS) codes. Appendix 1 (available online) provides the set of CCS codes used to define the conditions. Table 2 gives both the unadjusted and the adjusted estimates of health status, taking into account observable differences in individuals' demographic, economic, and geographic attributes that could influence the presence or absence of health conditions. Full regression model specifications may be accessed online in Appendix 2.

Differences in health status between the ACA target population and the other insured populations also are evident. Adjusted estimates indicate that uninsured persons with incomes less than or equal to 200% FPL report being in fair or poor health at a much higher rate (16.2%) than privately insured persons (9.8%) but that there is no difference between uninsured persons with incomes of more than 200% FPL and those with private coverage. Across the groups, publicly insured persons have the highest rate, 31%, of fair or poor health status. Among the set medical conditions examined, uninsured persons have significantly lower rates of cancer, hypertension, neurological, and orthopedic conditions relative to those of either privately or publicly insured persons.

Overall, these patterns generally are consistent with recent work by Blumberg and Holahan,[4] who used the Urban Institute's Health Insurance Policy Simulation Model to examine the health status of the potential Medicaid expansion and exchange-based coverage population relative to those with employer-sponsored insurance.[4] Of course, when comparing individuals by insurance status, it is important to recognize that such patterns may reflect differences in care-seeking behavior. That is, uninsured individuals are less likely to obtain routine care and therefore are less likely to have been tested for and diagnosed with certain medical conditions. Empirical support for this hypothesis is well

TABLE 2
Health Status and Presence of Selected Medical Conditions in the Nonelderly Adult Population by Insurance Status

	Uninsured							
	Income ≤ 200% FPL		Income > 200% FPL		Privately Insured		Publicly Insured	
Variable	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Self-reported fair or poor health	.160[a,b,c]	.162[a,b,c]	.100[b,c]	.097[c]	.078	.098	.310	.178
Obese	.290[a,c]	.310[a,b,c]	.270[c]	.290[c]	.290	.290	.390	.330
Cancer	.018[b,c]	.024[a,b,c]	.022[b,c]	.038[b,c]	.050	.049	.070	.047
Diabetes	.051[b,c]	.062[c]	.051[b,c]	.061[c]	.063	.066	.150	.095
Hypertension	.120[a,b,c]	.144[a,b,c]	.150[b,c]	.172[b,c]	.190	.192	.320	.236
Heart-related condition	.027[b,c]	.037[c]	.026	.033[b,c]	.035	.040	.120	.063
Asthma or COPD	.073[b,c]	.088[c]	.063	.082[c]	.089	.090	.160	.107
Neurological (back/disc)	.070[a,b,c]	.084[a,b,c]	.084[b,c]	.095[c]	.100	.105	.160	.105
Orthopedic	.150[b,c]	.167[b,c]	.150[b,c]	.178[c]	.190	.201	.360	.237
Skin-related condition	.037[a,b,c]	.056	.054[b,c]	.078	.092	.087	.100	.073
Anxiety or mood disorder	.130[b,c]	.151[c]	.120[b,c]	.138[b,c]	.150	.153	.290	.181
Alcohol or substance abuse	.007	.008	.007	.005	.005	.005	.013	.008

[a]Uninsured with family income ≤ 200% FPL is statistically different from uninsured with family income > 200% FPL at $p <$ .05.
[b]Statistically different from privately insured at $p < .05$.
[c]Statistically different from publicly insured at $p < .05$.

documented in the literature review summarized in the Institute of Medicine's *Care Without Coverage—Too Little, Too Late*.[5]

As individuals transition from being uninsured to having insurance, the price of medical care falls at the point of utilizing services. In turn, such a price reduction is expected to increase the quantity of medical care demanded, particularly for types of care with a stronger sensitivity to price. This behavioral response can be characterized as the "causal effect of insurance" and can be estimated from randomized experiments or quasi-experimental study designs. In observational data such as the MEPS, unadjusted estimates of spending and service utilization by insurance status reflect not only the causal effect of insurance but also the differences in individuals' attributes correlated with their demand for medical care—some observed (eg, age and sex) and some not observed (eg, preferences for health investment, attitudes toward the value of insurance).

As we saw earlier, there are clear differences between individuals with private or public insurance and those without insurance with respect to their demographic and economic attributes as well as their health status. Using multivariate regression, I generated adjusted estimates of spending and utilization to account for these differences. With a comparison of unadjusted and adjusted estimates, we can better understand the importance of these observable factors to explaining differences in utilization by insurance status. Even after controlling for differences in observable factors, however, analysts may fail to observe other factors. Because a person's insurance status often reflects his or her *anticipated* demand for medical care, individuals with the highest anticipated demand may be the most likely to seek health insurance. The consequence of this selection bias is that descriptive analyses of medical care consumption by insurance status may yield more pronounced differences than would otherwise occur.

I estimated annual medical care spending and utilization regressions using generalized linear models (GLM) with appropriate testing to determine the link and family distributional assumptions. The full model specifications are available online in Appendix 3. Table 3 reports the unadjusted and adjusted estimates of average annual total spending by insurance category. I observed wide variation in the unadjusted estimates, with the average spending highest among the publicly insured ($7,475), followed by the privately insured ($4,150), the uninsured with incomes greater than 200% FPL ($1,980), and the uninsured with incomes less

TABLE 3
Annual Spending and Utilization for the Nonelderly Adult Population by Insurance Status

Unadjusted Estimates	Uninsured With Income ≤200% FPL	Uninsured With Income >200% FPL	Private	Public	Difference Between Private and Uninsured (≤200% FPL)	Difference Between Public and Uninsured (≤200% FPL)	Difference Between Private and Uninsured (>200% FPL)	Difference Between Public and Uninsured (>200% FPL)
Average annual total spending (US$[2013])	$1,701	$1,980	$4,150	$7,475	$2,449[a]	$5,774[a]	$2,170[a]	$5,495[a]
Average number of inpatient stays	.063	.046	.068	.207	.005	.144[a]	.022[a]	.161[a]
Average number of ED visits	.215	.140	.126	.352	−.089[a]	.137[a]	−.014[a]	.212[a]
Average number of office-based visits	2.14	2.91	5.25	8.32	3.11[a]	6.18[a]	2.34[a]	5.41[a]
Average number of prescribed medicines	5.04	5.89	9.26	23.23	4.22[a]	18.19[a]	3.37[a]	17.34[a]

Adjusted Estimates	Uninsured With Income ≤200% FPL	Uninsured With Income >200% FPL	Private	Public	Difference Between Private and Uninsured (≤200% FPL)	Difference Between Public and Uninsured (≤200% FPL)	Difference Between Private and Uninsured (>200% FPL)	Difference Between Public and Uninsured (>200% FPL)
Average annual total spending ($2013)	$2,983	$3,474	$3,935	$5,368	$952[a]	$2385[a]	$461[a]	$1894[a]
Average number of inpatient stays	.088	.062	.070	.123	−.018[a]	.035[a]	.008	.061[a]
Average number of ED visits	.213	.141	.140	.269	−.073[a]	.056[a]	−.001	.128[a]
Average number of office-based visits	3.47	4.46	5.13	5.85	1.66[a]	2.38[a]	.67[a]	1.39[a]
Average number of prescribed medicines	7.92	8.52	9.59	16.33	1.67[a]	8.41[a]	1.07[a]	7.81[a]

Estimates are adjusted for differences in age, sex, race, marital status, geographic region, MSA, income, and fair/poor health status.
[a]Difference between groups is statistically significant from 0 at $p < .05$.

than or equal to 200% FPL ($1,701). This pattern is consistent with the findings of earlier descriptive analyses of medical care spending by insurance status that also use the MEPS.[6-9]

The magnitudes of these differences are attenuated in the adjusted estimates. Adjusted spending by the uninsured with incomes less than or equal to 200% FPL is $2,983, or 76% of average spending among the privately insured. When contrasting this group with the publicly insured, the difference is larger, with the average spending by the uninsured only 56% of the spending by the publicly insured. In general, the differences between the uninsured with incomes greater than 200% FPL and either the privately or the publicly insured are smaller. Such differences in spending may reflect either differences in the unit prices paid for services or differences in the quantity or intensity of the services received.

To determine whether such differences are driven by utilization, I also estimated the unadjusted and adjusted rates of inpatient stays, emergency department (ED) visits, office-based visits, and prescribed medicines by insurance status (Table 3). The measurement of prescribed medicines in the MEPS is based on each original purchase and refill; thus a medication that is refilled monthly for a year would count as 12 prescriptions.

Across the four service types, differences in adjusted average utilization between the uninsured and the privately insured are smaller compared with the differences between the uninsured and those with public coverage. The rates of uninsured inpatient utilization (≤200% FPL) on average are approximately 26% higher than those of the privately insured (.088 vs .07), but 28% lower than those of the publicly insured (.088 vs .126). Relative to the privately insured, the uninsured (≤200% FPL) on average also have 53% higher ED utilization (.212 vs .139) but 33% lower utilization of office-based visits (3.45 vs 5.13). Comparisons of the uninsured with those with public coverage reveal the latter group's much higher utilization. For example, the publicly insured have more than double the average number of prescribed medicines than do the lower-income uninsured (16.33 vs 7.92).

Since descriptive analyses are not able to account fully for unobserved factors that influence differences in medical care consumption, I next consider the current state of knowledge regarding the causal effect of health insurance on the demand for medical care.

Causal Evidence Regarding the Effect of Health Insurance on Demand for Medical Care

Research estimates of the causal impact of health insurance on the nonelderly adult population's demand for medical care use "natural experiments" of federal or state-based public insurance expansions as well as other methods. Buchmueller and colleagues summarized the early evidence regarding the demand response of new enrollees (eg, children and adults).[10]

Recently, a number of scholarly studies examined changes in demand for medical care in Massachusetts (MA) and Oregon (OR). In 2006, Massachusetts passed comprehensive health reform that included both an expansion of its Medicaid program (MassHealth) and the introduction of its Commonwealth Care Health Insurance Program, which provides sliding-scale subsidized coverage to low-income households (<300% FPL) without employer-based insurance. By 2011, 439,000 more MA residents had insurance than before reform.[11] In 2008, using a lottery, the state of Oregon expanded Medicaid to a limited number of adults aged 19 to 64 who otherwise would not have been eligible for public insurance. Eligibility criteria included having an income below 100% FPL and assets of $2,000 or less and having been uninsured for the previous 6 months or longer. The expansion led to approximately 10,000 nonelderly adults obtaining coverage.

As purchasers and providers develop strategies to ensure the timely and effective delivery of care to the newly insured population, we should consider how this research evidence may inform their potential demand response. A summary of the estimated effects of insurance on nonelderly adults' demand for inpatient hospitalizations, ED visits, and ambulatory care follows.

Inpatient Hospitalizations

Although the utilization rates of inpatient hospital care have been declining over time and are lower, on average, for the nonelderly population than for those aged 65 and older, hospital-based care still comprises the largest share of national health expenditures.[12] Researchers have investigated how changes in insurance status through expansions and

contractions of coverage may influence hospitalization on both the extensive and intensive margins.

Young adults represent a disproportionate share of the uninsured population. Anderson, Dobkin, and Gross[13] estimated how declines in insurance coverage among young adults affected their demand for care. Specifically, they used variations generated by the rules adopted by private insurers, before enactment of the ACA, for young adults' dependent coverage status when they turned age 19. Using a near census of hospital discharge records from 6 states and a regression discontinuity modeling approach, they found large declines in inpatient admissions as young adults turned 19 years old and were at greater risk of losing their insurance. In their sample of 18- and 19-year-olds, approximately 2.4% of males and 9.1% of females had an inpatient stay (the difference explained almost entirely by the females' childbirth-related stays). The authors estimated that the probability of an inpatient stay dropped by 61% for males and 66% for nonpregnant females, with most of the decrease in nonurgent conditions.

Kolstad and Kowalski[14] examined the initial effects of Massachusetts's reform on hospitalizations. Using the 2004-2008 National Inpatient Sample (NIS) and a difference-in-differences specification to compare with other states the state before and after the reform, they did not find that the reform had led to an increase in the overall volume of hospital discharges in Massachusetts. But they did note a significant decrease in the proportion of hospital discharges by uninsured individuals following the expansion. The authors looked at the fraction of hospital admissions occurring through the ED and estimated a decline of 5.2% (MA-specific mean of 38.7%), suggesting a shift in the types of hospitalizations. Another dimension of care that Kolstad and Kowalski[14] investigated was service intensity, including length of stay (LOS). The predicted effect of coverage on LOS is ambiguous. If the newly insured or their physicians demanded more treatment as a result of income effects or moral hazard, then LOS would be expected to increase. But if the newly insured were enrolled in plans with stronger utilization management, then the patients' LOS could decrease. Results of their models suggest a very small decrease in LOS of .05 days on a base of 5.42, or a 1% decline.

Also using variation from the Massachusetts reform, Hanchate and colleagues[15] used 21 months of hospital discharge data to estimate changes in 17 rates of nonobstetric procedures initiated primarily by

outpatient physician referral and addressing musculoskeletal, urinary and genital, nervous, cardiovascular, and digestive conditions. They estimated the differences in rates for the adult population aged 40 to 64 before and after reform by patients' zip-code income (low, medium, and high). Adjusting by age and sex and using a comparison group of Medicare enrollees aged 70 and older to control for secular trends, they found that low- and medium-income zip code areas reported a 13% to 15% net increase in procedure rates (156/10,000 to 169/10,000), with the largest effects for musculoskeletal, urinary and genital, and digestive conditions.

As part of the first-year evaluation of Oregon's coverage expansion, researchers investigated changes in the probability of hospitalization and length of stay. Using linked hospital discharge and administrative data on the Medicaid lottery list, Finkelstein and colleagues[16] investigated changes in non-childbirth-related hospital admissions. Results from their analyses of administrative data show a 2.1 percentage point increase in the probability of hospital admission (control mean of 6.7%), with most admissions not occurring through emergency departments. They found no significant differences in length of stay, however. In the second-year evaluation based on in-person surveys of 12,229 respondents, Baicker and colleagues[17] found no statistically significant change in hospital admissions between those who had won the lottery and obtained coverage and those who had signed up for the lottery but were not selected.

Emergency Department Visits

Although many uninsured individuals are most likely to obtain care in the emergency department, the overall effect on ED utilization of obtaining insurance is difficult to predict. Individuals with insurance have better financial access to care outside the ED, which should lead to a decrease in utilization, all else being equal. Yet insurance also reduces the out-of-pocket price of ED care, particularly for enrollees in public programs, who often face no or very low cost-sharing requirements. As summarized next, a number of recent studies have investigated the causal effect of insurance on ED utilization.

In their analysis of 18- and 19-year-olds just described, Anderson, Dobkin, and Gross[13] also examined changes in ED use resulting from a loss of insurance through eligibility for dependent coverage. Using

records from five states (Arizona, California, Iowa, New Jersey, and Wisconsin) over the 2004-2007 period and the same basic econometric approach, the authors reported that males and females who had lost their insurance made 40% fewer visits.

Three recent studies found mixed findings regarding the effect on ED visits of the coverage expansion in Massachusetts. Using the National Health Interview Survey and a difference-in-differences estimation strategy, Miller[18] found no evidence among adults aged 18 to 64 of a significant change in the probability of visiting the ED. However, using administrative data on all ED visits that occurred in Massachusetts between 2002 and 2008, she found that reform had led to a decrease in ED use by about 5%.[19] As part of that analysis, she also reported that most of the effect could be attributed to fewer visits for primary or nonurgent care. An analysis of the 2006-2010 Massachusetts Health Reform survey by Long, Stockley, and Dahlen[20] found a decrease of 3.8 percentage points in the likelihood that a respondent would visit the ED over that time period, corresponding to an 11% reduction. Interestingly, their analyses reveal no statistically significant reductions in this outcome until 2010. Finally, a trend analysis from 2004 to 2009 of the total number of ED visits per quarter reveals that the reform in Massachusetts did not alter the state's trend in ED utilization when compared with that of neighboring states (New Hampshire and Vermont) with no such reform.[21]

Researchers evaluating the Oregon Medicaid expansion also investigated ED utilization using responses from a survey administered to newly enrolled individuals who had won the lottery as well as responses from those who had entered the lottery but were not selected. Finkelstein and colleagues[16] reported positive but statistically insignificant effects of coverage on both the probability of visiting the ED and the number of visits. The second-year evaluation summarized by Baicker and colleagues[17] also revealed no significant increase in the number of ED visits.

Ambulatory Care and Prescribed Medicines

With improved financial access to medical care, it is expected that newly insured individuals who previously did not have a regular provider or place of care will begin to establish new relationships with providers

and health systems. Findings from Massachusetts and Oregon provide insights into how these coverage expansions influenced individuals' care-seeking behavior and utilization of ambulatory care, including preventive services and prescribed medicines.

Using data from the Behavioral Risk Factor Surveillance System, Kolstad and Kowalski[14] found an increase of 1.26 percentage points in the probability that after the reform in Massachusetts, an individual would report having a personal doctor. Their results did not, however, reveal any substantive effects on the use of medications to lower blood pressure or other direct measures of preventive care, such as flu shots, mammograms, and PSA tests. Also investigating changes in care following the reform in Massachusetts, Miller[18] studied the utilization of office visits and preventive care using the National Health Interview Survey and a difference-in-differences modeling strategy. She estimated that the probability of making an office visit in Massachusetts after the reform increased by 3 percentage points (a 4% change). Taking a longer-term perspective, Long, Stockley, and Dahlen[20] used the MA Health Reform survey and found that in 2006, 85.7% of the population indicated having a usual source of care (excluding the ED) and that by 2010, this percentage had risen to 90.4%. Their findings also suggest a generally rising trend in an individual's probability of making any general doctor visits during the year, from 79.5% in 2006 to 85.2% in 2009, although a slight decline was observed in 2010 (81.7%). For specialty care, an individual's probability of a visit increased between 2006 and 2010 from 50.0% to 53.7%. With respect to prescribed medicines, the authors did not find any strong evidence that the probability of utilization rose over time as a result of reform.

Two studies from Oregon indicate clear increases in the utilization of ambulatory care and prescribed medicines as well as the establishment of provider relationships following the expansion of Medicaid. Finkelstein and colleagues[16] found that the probability of a person making an outpatient visit in the last 6 months rose by 21.2 percentage points (control percentage is 57.4%). Individuals in the treatment group made 1.083 more visits (a 55% increase from the control mean of 1.914) on average in the last 6 months, relative to those for persons not selected through the lottery. The use of prescription drugs also went up on the extensive and intensive margins, including a 13.8% increase in the probability of any use (.088 increase; control mean .637) and a 14.9% increase in the number of medications, on average (.347 increase; control mean 2.318).

In their second-year evaluation, Baicker and colleagues[17] estimated that those with Medicaid coverage were 23.75 percentage points more likely to report having a usual place of care compared with those who were not selected in the lottery. Those who obtained coverage also had an average of 2.70 more office visits in the past 12 months than did the control group (control mean is 5.5 visits) and were also more likely to have obtained preventive care. Finally, the authors reported a statistically significant 37% increase in the number of medications used by those with Medicaid coverage compared with the control group (control mean of 1.8).

To summarize, the recent evidence regarding changes in medical care utilization in response to the gain or loss of insurance reveals very heterogeneous effects for inpatient hospitalizations, ranging from no effect in Massachusetts[14] to moderate effects in Oregon[16] to large magnitudes in the analysis of young adults.[13] For inpatient stays, the most consistent evidence shows that any changes in hospitalization rates appear to be predominantly for elective admissions rather than for those initiated through an ED and that any changes in length of stay are quite small. Findings from the literature also suggest heterogeneous effects of coverage changes on ED use, ranging from small decreases[18,20] to large ones under the assumption of a symmetrical behavioral response for gains versus losses of coverage.[13] For ambulatory care, the evidence suggests that on average, the newly insured make many more office-based visits and also are more likely to have a usual source of care. The evidence regarding changes in medication use, however, is quite heterogeneous across the analyses from Massachusetts and Oregon.

Predicting Aggregate Changes in Medical Care Utilization

From a policy perspective, it is important to consider both the behavioral responses of individuals who obtain coverage as well as the aggregate impact of the expansion on the health care delivery system. The latter is critical to developing policy- and/or market-based responses to address any constraints on provider capacity. In this section, I provide a set of "back of the envelope" calculations based on both the descriptive analyses and published estimates from the quasi-experimental literature

to estimate the overall increase in utilization for the coverage expansion population. I then compare these estimates to aggregate utilization for the noninstitutionalized US population to gauge the overall effect of the expansion on the system as a whole.

Specifically, I used the reported adjusted rates of service-specific utilization for the uninsured groups in Table 3 to generate a weighted average based on the relative size of each within the overall uninsured population (.66 for the uninsured with an income $\leq$200% FPL and .34 for the uninsured with an income >200% FPL). Next, I created four scenarios, each reflecting different assumptions about the potential behavioral responses of uninsured persons after they obtained coverage. Two scenarios are based on the descriptive analysis findings. The first scenario assumes that uninsured persons will demand medical care at rates equal to those of the privately insured, while the second assumes that uninsured persons will demand care at rates equal to those of the publicly insured. The final two scenarios use the lower- and upper-bound point estimates of behavioral responses from the quasi-experimental literature, measured in terms of percentage changes from baseline. Each percentage change is applied to the uninsured population's baseline utilization rate from the MEPS. To quantify the expected increase in medical care by the newly insured, I scaled this value by 25 million individuals. Finally, each change in utilization by the newly insured is expressed as a percentage of overall medical care utilization in the United States, also estimated from the MEPS.

Table 4 summarizes these results. With respect to inpatient stays, 3 of the 4 scenarios suggest expected increases in demand, ranging from 0 and 3.7 million stays per year (0 to 10.87% of aggregate utilization). But if the newly insured respond in the same way as the privately insured do, inpatient stays are predicted to fall slightly. ED visits also show considerable variation. Two scenarios suggest a drop in ED visits, and two scenarios suggest an increase (−8.99% to 11.98%). Interestingly, the scenarios based on the descriptive analyses lie in the middle of the range reported in the quasi-experimental literature. All four scenarios indicate a positive demand response with respect to office-based visits and suggest increases of between 33 million and 149 million additional visits per year (a 2.15% to 9.68% increase from current baseline levels). Finally, with respect to the utilization of prescribed medicines, the smallest and largest predicted effects are from the quasi-experimental

TABLE 4
Potential Impact of Coverage Expansion on Overall Demand for Medical Care

	Inpatient Stays	ED Visits	Office-Based Visits	Prescribed Medicines
Annual utilization estimates for noninstitutionalized civilian US population	29,249,278	55,060,952	1,539,093,888	3,203,007,232
Adjusted MEPS estimate: uninsured respond in same way as privately insured	−229,000	−1,213,000	33,085,000	36,650,000
Percentage change relative to overall demand	−.78	−2.2	2.15	1.14
Adjusted MEPS estimate: uninsured respond in same way as publicly insured	1,096,000	2,012,000	51,085,000	205,150,000
Percentage change relative to overall demand	3.75	3.65	3.32	6.40
Quasi-experimental literature (lower-bound point estimate from literature)	0[14]	−4,948,650[18]	98,971,600[19a]	0[14]
Percentage change relative to overall demand	0[14,17]	−8.99	6.43	0
Quasi-experimental literature (upper-bound point estimate from literature)	3,186,190[13b]	6,598,200[13b]	149,028,390[16]	278,247,000[17]
Percentage change relative to overall demand	10.87	11.98	9.68	8.69

The first two sets of estimated changes in medical care utilization are based on results from the descriptive analysis in Table 3. The final two sets of estimates are calculated from the quasi-experimental literature using the lower- and upper-bound point estimates for the specific service categories, measured as percentage changes from baseline. Each percentage change is then applied to the baseline uninsured utilization rates from the MEPS (weighted across the two subgroups based on their relative size) and multiplied by 25,000,000, which is the current CBO estimate for the expected number of uninsured who will gain coverage.

[a]Miller estimates the change in probability of visit rather than the number of visits.

[b]Anderson, Dobkin, and Gross estimate the change in probability rather than number.

literature and suggest the possibility of no demand response to an 8.7% increase in overall utilization.

Discussion and Implications

Together, the descriptive analysis and causal evidence provide important insights into how the ACA's expansion of coverage could affect newly insured persons' demand for medical care. Even though the descriptive analysis effectively characterizes the attributes of the population expected to obtain coverage and their corresponding medical care utilization compared with those of the insured populations, it is limited by selection bias that can lead to estimated differences that may be too large. The causal evidence, in contrast, addresses this limitation through the use of exogenous "policy shocks" in conjunction with econometric modeling. These studies, however, have focused on quantifying the responses of very specific populations within a given age group, state, or income range and thus may not necessarily generalize well to the broader population likely to obtain coverage under the ACA.

Because the uninsured population is heterogeneous with respect to its demographic, economic, and health status attributes, it will be important for policymakers and other stakeholders to measure and understand the differences between the characteristics of uninsured persons who actually enroll in Medicaid or exchange-based plans and those who remain uninsured. If those who enroll in coverage are disproportionately less healthy or have stronger unobserved preferences for care, then their utilization may differ from what is predicted by average rates.

The demand response by the newly insured may also depend on their access to care before obtaining coverage. For example, before passing health reform in Massachusetts, the state had a program called the Uncompensated Care Pool. The purpose of this program, which spent approximately $1 billion per year, was to compensate hospitals for care of the uninsured that would otherwise not be compensated. The result was to decrease providers' incentives to avoid treating the uninsured. The existence of this program before reform suggests that in Massachusetts, the effect on hospital utilization of insuring previously uninsured individuals might be smaller than in other states without similar uncompensated care funding mechanisms.

Although the overall demand response expected from the coverage expansion population is relatively modest in absolute terms because the uninsured are not uniformly distributed across the country, the impact of the coverage expansion on local health care markets could vary extensively. It is unclear whether those states with high percentages of uninsured individuals will have the necessary provider capacity to deliver timely medical care to the newly insured and the existing covered population. Policymakers and other stakeholders will need to invest in monitoring local markets' delivery system capacity to ensure that the policy goal of expanded financial access to medical care is not thwarted by other barriers. Monitoring may use a variety of methods. For example, exchange-based plans must meet network adequacy standards, which include offering enrollees a sufficient choice of providers and ensuring a sufficient number of community providers serving predominantly low-income, medically underserved areas.[22] Consumer-focused strategies such as survey questions about access to care and appointment waiting times also may be used to monitor access. Similarly, provider surveys or "mystery shopper" approaches may be effective for assessing providers' willingness to accept new patients. For hospital care, longitudinal administrative data can be used to track occupancy as well as shifts in payer mix and ED-initiated hospital admissions.

In addition to monitoring overall access to care, it will be important to promote the utilization of care that is clinically appropriate to individuals' specific medical needs. As noted earlier, there is considerable uncertainty about predicting newly insured persons' behavioral changes in ED utilization. Individuals' financial access to care in non-ED settings should improve with insurance, potentially leading to a decrease in ED utilization rates. But if newly insured individuals prefer the ED because it has no out-of-pocket costs, it is more convenient, or they face other barriers to non-ED based care (eg, providers not accepting new Medicaid patients), then utilization rates may not fall.

To promote the utilization of care in those settings most appropriate to an individual's needs, insurers and health systems may consider strategies to strengthen the connections between newly covered individuals and primary care providers. One approach is to use care coordinators to provide information and help to individuals in

identifying providers that are accepting new patients in their local market. In addition, providers or support staff may be able to connect individuals accessing nonurgent ED care in vertically integrated health systems directly to a primary care provider from which they can seek care within the organization, potentially reducing strain on the existing ED capacity.

States with short-term capacity constraints may need additional strategies. One is using the existing provider capacity through new incentives and policies. In the past, a key driver of publicly insured persons' poor access to care was providers' unwillingness to see new Medicaid patients, given the lower reimbursement rates relative to those for Medicare or private insurance. Although the ACA provides temporary increases in payment, new Medicaid enrollees' difficulties in accessing providers may persist in some markets. Thus one strategy, albeit costly, is to increase Medicaid reimbursement rates to encourage providers' willingness to care for these patients.

Another consideration is that providers may not be well represented in geographic areas with many uninsured individuals. Although network adequacy standards should alleviate some of these concerns, additional federal or state investments to encourage providers to practice in these underserved areas could complement such efforts. Shortages of primary care capacity also could be addressed by broadening the state-level scope of practice laws, so that nurse practitioners and physicians' assistants would be able to supply some types of primary care to the newly insured.

Market-based expansions of alternative care delivery models may also help ease capacity constraints. Such innovations include e-visits, retail clinics, hospital-based urgent care clinics, and mobile health clinics. While these care models have the potential to reach the newly insured in both urban and rural areas, it will be important to monitor the extent to which they actually contribute to fragmenting care.

Finally, broader efforts to reform the delivery system (eg, bundled payments, accountable care organizations, high-deductible benefit designs, and price and quality information transparency) can strengthen the incentives of consumers and providers to reduce the provision of low-value medical care. The result should be freeing up some capacity in the system to accommodate the increased demand for medical care by the larger insured population in the United States.

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Acknowledgments: I thank two anonymous reviewers as well as Ira Moscovice and Roger Feldman for valuable suggestions on the manuscript. I also thank Lance Udy for providing excellent research assistance.

Supplementary Material

Additional Supporting information may be found in the online version of this article at http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1468-0009:

Appendix 1
Appendix 2
Appendix 3