The Impact of Massachusetts Health Care Reform on Access, Quality, and Costs of Care for the Already-Insured

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Objective. To assess the impact of Massachusetts Health Reform (MHR) on access, quality, and costs of outpatient care for the already-insured.

Data Sources/Study Setting. Medicare data from before (2006) and after (2009) MHR implementation.

Study Design. We performed a retrospective difference-in-differences analysis of quantity of outpatient visits, proportion of outpatient quality metrics met, and costs of care for Medicare patients with ≥ 1 chronic disease in 2006 versus 2009. We used the remaining states in New England as controls.

Data Collection/Extraction Methods. We used existing Medicare claims data provided by the Centers for Medicare and Medicaid Services.

Principal Findings. MHR was not associated with a decrease in outpatient visits per year compared to controls (9.4 prereform to 9.6 postreform in MA vs. 9.4–9.5 in controls, $p = .32$). Quality of care in MA improved more than controls for hemoglobin A1c monitoring, mammography, and influenza vaccination, and similarly to controls for diabetic eye examination, colon cancer screening, and pneumococcal vaccination. Average costs for patients in Massachusetts increased from \$9,389 to \$10,668, versus \$8,375 to \$9,114 in control states ($p < .001$).

Conclusions. MHR was not associated with worsening in access or quality of outpatient care for the already-insured, and it had modest effects on costs. This has implications for other states expanding insurance coverage under the Affordable Care Act.

Key Words. Insurance expansion, costs, quality, outpatient care

As states implement the Affordable Care Act, there is mounting concern that the influx of large numbers of newly insured individuals into the health care system could have a negative effect on access to care for the already-insured. Recent studies have shown, for example, that Medicaid expansion is associated with higher rates of use of office and emergency department visits (Baicker et al. 2013; Taubman et al. 2014); in the setting of a fixed supply of providers

and appointments, this could unduly strain the system and worsen access to care. Indeed, this was the concern that led Congress to provide funds for more primary care training slots as well as additional pay for primary care visits under the Medicaid program (Patient Protection and Affordable Care Act 2010). However, while these interventions may help improve primary care capacity in the long run, the impact of the ACA will be felt in the short run—before many of these fixes take effect.

The potential impact of insurance expansion on access to care may be particularly important for patients with ongoing health care needs, including older Americans, and especially those with chronic illness. These patients, who rely on readily available access, could face longer wait times to see a physician, potentially worsening the management of chronic disease or impeding the delivery of high-quality preventive services. Reduced access to care, particularly in the urgent setting, could also lead to increased use of emergency department services or unplanned hospitalization, both of which could increase total costs; prior evidence suggests that crowding in emergency departments, for example, is associated with worse quality and clinical outcomes (Bernstein et al. 2009). Indeed, if the influx of newly insured patients decreases the ability of older, chronically ill Americans to access outpatient care as a result of crowding in already-busy clinics, the clinical and economic consequences could be substantial.

While this concern has been widely discussed, the empirical evidence to assess whether it is likely to occur or not is weak. One place to begin to assess how insurance expansion affects access to care for previously insured, chronically ill, older Americans is to examine what happened in Massachusetts. The Commonwealth expanded to near-universal insurance coverage in 2006, yet its impact on access to timely visits for this vulnerable population has not been

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examined. Given the importance of understanding the impact of insurance expansion on the broader health care system, and given that Massachusetts was arguably the model of the ACA, it may serve as the best available laboratory to understand what happened to chronically ill older Americans as an influx of new patients came into the system.

Therefore, in this study, we set out to answer three questions, using Massachusetts as a test case for the impact of health insurance expansion on the already-insured, and comparing its experience to that of nearby states without insurance expansion. First, what was the impact of Massachusetts health reform on access to outpatient care for the already-insured, as measured by number of annual visits for patients with chronic illnesses before versus after health reform was implemented? Second, what was the impact on the quality of outpatient care received? Third, what was the impact on total costs of care? As states consider options for Medicaid expansion and roll out health insurance exchanges, understanding the impact of these expansions on the broader health care system, and particularly on some of its most vulnerable patients, can provide important guidance for policy makers.

METHODS

Conceptual Framework

The conceptual framework for our research question is a rationing model. The supply of medical care is relatively inelastic in the short term, while it may adjust in the long term. Thus, if we have greater demand than short-term supply, then we will have patients who need outpatient care who will not get it. The components in this rationing model are (1) the supply or capacity within the health care system; (2) the number of patients who need outpatient or urgent care; (3) the number of patients who do not need such care; and (4) the ability to discriminate between patients who do and do not need to be seen urgently or frequently in the outpatient setting. We would expect to see a worsening in care for the already-insured if supply or capacity is constrained in the short term, the number of patients needing care is large, and the ability to discriminate between patients who do versus do not need outpatient care is poor. Conversely, we would not expect to see significant worsening in care for the already-insured if supply or capacity is either already adequate or can adjust quickly to the increased demand, if the number of patients needing outpatient services is small, or if the ability to discriminate between patients who do versus do not need outpatient care is good.

Data and Patients

We used three standard Medicare files from 2006 and 2009 for this study: the 20 percent Physician/Supplier Part B claims file, the 20 percent Outpatient file, and the Inpatient file (limited to the same 20 percent of patients). Patients under 65 years of age and those enrolled in Medicare HMO plans for any portion of the year (9.0 percent in Massachusetts in 2006 and 9.3 percent in 2009; 5.9 percent in control states in 2006 and 9.4 percent in 2009) were excluded. We used the Center for Medicare and Medicaid Services (CMS) Hierarchical Condition Categories coding to assign comorbidities to each patient in our database, based on their inpatient and outpatient diagnoses. International Classification of Diseases, Ninth Revision (ICD-9) codes that were used to identify each major comorbidity are provided in Table S1. To assess the impact of insurance expansion on access for those who have ongoing health needs, we limited our cohort to patients with diagnosis codes for any of five common chronic diseases: diabetes, chronic obstructive pulmonary disease, ischemic heart disease, heart failure, and hypertension. This cohort represented 68 percent of eligible Medicare patients. Patients in Massachusetts were our group of interest; we used the remaining states in New England (Maine, New Hampshire, Vermont, Rhode Island, and Connecticut) as controls.

Outcomes

Outpatient, Observation, and Emergency Department Visits. We defined outpatient visits as those with billing codes indicating evaluation and management services, as has been done in prior published work. Specifically, outpatient visits were defined as those occurring at a physician office, outpatient hospital, independent clinic, public clinic, rural clinic, or Federally Qualified Health Center, with a Berenson-Eggers type of service code indicating office visits for new patients (M1A), office visits for established patients (M1B), or consultations (M6). We defined ED visits as those in the outpatient file with Revenue Center Code 0450-0459 or 0981, and observation visits as those with Revenue Center Code 0760 or 0762. Because Medicare claims data combine ED visits with inpatient visits if a patient is admitted to the hospital, we limited our sample of independent ED visits to those visits not leading to an admission.

Quality of Outpatient Care. To identify the quality of outpatient care provided, as measured by appropriate delivery of preventive services, we used beneficia-

ries' Medicare claims to determine the receipt of hemoglobin A_{1c} testing for diabetic patients, eye examination for diabetic patients, colonoscopy/sigmoidoscopy for colon cancer screening, mammography for breast cancer screening, and influenza and pneumococcal vaccination for eligible Medicare patients, using methods that have been well-described previously (Pham et al. 2005).

Total Costs and Complexity of Care. We used published Medicare fee schedules from 2009 to assign standardized Medicare costs to each inpatient, outpatient, and carrier file service, regardless of the actual amount Medicare paid for each service. The use of standardized costs allows us to identify patients that use a comparable amount of medical care even across providers or areas of the country in which the actual spending may vary significantly. We used the 2009 fee schedule for both the prereform and postreform period so that our results would reflect true differences in the utilization of health care services rather than inflation or changes in supplemental payments for teaching or safety-net hospitals, for example. Costs were summed for each patient within three categories (physician costs, inpatient costs, and outpatient costs) as well as across all three categories for each year. We assessed complexity of outpatient care using the levels of billing as represented by CPT codes. We grouped CPT codes for outpatient visits by their last digit (i.e., 99201: new outpatient, level 1 visit with 99211: return outpatient, level 1 visit) and calculated the median visit level in each study period. We assessed complexity of inpatient care using DRG weights, with higher weights representing more complex hospitalizations.

Analysis. We first examined patient characteristics and the distribution of the chronic disease states that comprised our sample between Massachusetts and the other New England states. We calculated the mean age and the proportion of patients who were male, who self-identified in each race category, and who had each of the qualifying chronic diseases for the state of Massachusetts and the control states. Student's *t*-tests and chi-squared tests were used as appropriate to test for statistically significant differences between the two groups.

Next, we created a set of models to evaluate the impact of Massachusetts Health Reform on each of our outcomes of interest (number of outpatient and ED visits, outpatient quality, and total costs). Our primary approach was a difference-in-difference model that focused on outcomes before (2006) versus

after (2009) the implementation of Massachusetts Health Reform, and compared the change in Massachusetts to the change in control states. For each of these models, we adjusted for patient demographics, including age, sex, and race, as covariates. We dummy coded the race category to include white, African-American, Asian, and Hispanic in the model, and we used “Other” race as the reference group. Besides patient demographics, the model also included the main effect of being a patient in Massachusetts and the main effect for the postyear of 2009, as well as their interaction term; this allowed us to examine the difference-in-differences in each outcome. We calculated the least square mean rates and scores for each outcome to show the estimated rates of each outcome before and after the implementation of Health Reform in Massachusetts compared to the change in other New England states. For the outpatient visits outcome, we constructed individual models for patients with each of the five individual chronic conditions as well as a single model which included all patients with at least one of the five conditions. For the emergency department visits, outpatient quality, and cost outcomes, we only constructed a single model including all patients with at least one of the five conditions.

Sensitivity Analyses

To assess whether differential changes over time in patients’ severity of illness between Massachusetts and control states could have impacted our results, we repeated our analyses controlling for comorbidities, again using the HCC variables as outlined above. To determine if the patterns we found were consistent across both chronically insured and newly insured Medicare patients, we limited our sample to beneficiaries who were newly enrolled in each of the study years. Finally, we conducted a within-Massachusetts analysis. We used Small Area Health Insurance Estimates provided by the US Census Bureau, calculated the change in insured rates from 2005–2006 to 2007–2009, and divided the counties into two groups based on whether their insurance take-up was above or below the median. We reran our analyses with the addition of this insurance expansion variable, as well as an interaction term between this variable and time, to determine if the impact within Massachusetts varied as a function of insurance take-up.

A two-sided p -value less than .05 was considered statistically significant. All analyses were performed using SAS 9.3. The study was approved by the Office of Human Research Administration at the Harvard School of Public Health.

RESULTS

Patient Sample

Our analytic sample consisted of 43,245 patients in Massachusetts in 2006 and 2009 and 58,716 patients in our control states in the study years. Median age was 77.6 years in Massachusetts and 77.3 years in controls; roughly 36 percent of the population was male (Table 1). Over 90 percent of the patients were white. The most common qualifying chronic disease was hypertension, with two-thirds of the patients in each group qualifying based on this diagnosis.

Outpatient Visits

In the Massachusetts cohort with any chronic disease, patients had, on average, 9.4 visits per year prior to health reform, compared with 9.6 visits per year following health reform (difference 0.20 visits, $p = .004$, Table 2). In control states, these rates were 9.4 visits annually and 9.5 visits annually, respectively (difference 0.06 visits, $p = .32$). There was no difference in the change between the prereform and postreform periods between Massachusetts and controls ($p = .13$). Patterns were similar for each of the chronic diseases when examined separately (Table 2). When we examined emergency department visits, we saw an increase in Massachusetts from 0.59 visits per beneficiary in

Table 1: Patient Characteristics

<i>Patient Characteristic</i>	<i>Massachusetts (n = 43,245), %</i>	<i>NE Controls (n = 58,716), %</i>
Age (median)	77.6	77.3
Male	15,538 (35.9)	21,355 (36.4)
White	40,361 (93.3)	54,312 (92.5)
African-American	1,492 (3.5)	1,785 (3.0)
Asian	510 (1.2)	341 (0.6)
Hispanic	333 (0.8)	1,057 (1.8)
Other/unknown	562 (1.3)	1,233 (2.1)
Congestive heart failure	5,159 (11.9)	6,711 (11.4)
Chronic obstructive pulmonary disease	6,093 (14.1)	8,666 (14.8)
Diabetes	12,753 (29.5)	18,707 (31.9)
Ischemic heart disease	11,421 (26.4)	15,618 (26.6)
Hypertension	29,670 (68.6)	38,770 (66.0)
Any chronic disease (sample selection criterion)	43,245 (100.0)	58,716 (100.0)

the prereform period to 0.65 visits per beneficiary in the postperiod (difference 0.06 visits, $p < .001$), but the findings were identical in control states (0.73 visits to 0.80 visits, difference 0.07 visits, $p < .001$; p for difference in differences = 0.71). Observation visits also increased similarly in both Massachusetts and controls during the study period (Table 2).

Quality of Outpatient Care

For five of the six metrics of quality we examined, there was either improvement or no change from prereform to postreform in Massachusetts. For example, in 2006, diabetic eye examination was performed in 64.5 percent of eligible patients, compared with 65.3 percent in 2009 (difference 1.0 percent, $p = .40$, Table 3). The only measure that worsened across the study period in Massachusetts was pneumococcal vaccination, which decreased from 5.5 to 4.3 percent from 2006 to 2009. In contrast, in control states, there were decreases in five of the six quality metrics from 2006 to 2009, though not all met statistical significance. There was no quality metric for which the change in Massachusetts from 2006 to 2009 was worse than controls.

Costs and Complexity of Care

Prior to health reform, in 2006, average total annual costs for patients in Massachusetts were \$9,389, which increased to \$10,668 in 2009 (difference \$1,279, $p < .001$, Table 4). In control states, costs increased less during the study period, from \$8,375 to \$9,114 (difference \$739, $p < .001$; difference in change between Massachusetts and controls, $p < .001$). In Massachusetts, the per-capita increase was primarily driven by an increase in outpatient and physician spending, which outweighed a decrease in per-capita inpatient spending over the same time period; patterns were similar in control states. In both Massachusetts and control states, however, the average spending per hospitalization increased during the study period.

In the outpatient setting, both Massachusetts and controls had similar small increases in complexity of care, as measured by the billing level for outpatient visits (average level 3.30 to 3.38 in Massachusetts vs. 3.30 to 3.40 in controls, $p = .007$). The complexity of inpatient care as measured by DRG weight was lower in Massachusetts than controls in both the preperiod and postperiod, and the change over time was similar (average DRG weight 1.23 to 1.36 in Massachusetts vs. 1.29 to 1.41, $p = .291$).

Table 2: Outpatient, Emergency Department, and Observation Visits in Massachusetts versus Controls

Outpatient Visits by Clinical Cohort	2006		2009		Change from 2006 to 2009		<i>p</i> for Difference in Change between MA and Controls
	Annual Number of Visits per Patient*	Annual Number of Visits per Patient*	Annual Number of Visits per Patient*	Annual Number of Visits per Patient*	Change in Number of Visits per Patient*	<i>p</i> -Value	
Congestive heart failure							
MA	12.2	13.3			1.01	<.001	.151
Controls	12.4	12.9			0.50	.030	
Chronic obstructive pulmonary disease							
MA	11.6	11.9			0.30	.191	.630
Controls	11.7	12.1			0.44	.022	
Diabetes							
MA	10.3	10.5			0.19	.165	.096
Controls	10.2	10.1			−0.11	.351	
Ischemic heart disease							
MA	11.3	11.6			0.23	.143	.485
Controls	11.4	11.5			0.09	.522	
Hypertension							
MA	9.3	9.5			0.22	.010	.294
Controls	9.6	9.7			0.10	.180	
Any chronic disease (whole cohort)							
MA	9.4	9.6			0.20	.004	.125
Controls	9.4	9.5			0.06	.324	
ED visits (whole cohort)							
MA	0.59	0.65			0.06	<.001	.705
Controls	0.73	0.80			0.07	<.001	
Observation visits (whole cohort)							
MA	0.06	0.08			0.02	<.001	.096
Controls	0.05	0.06			0.02	<.001	

*All presented data are from models accounting for age, sex, and race.
ED = Emergency Department; MA = Massachusetts. Control states are Maine, Vermont, New Hampshire, Connecticut, and Rhode Island.

Table 3: Quality of Outpatient Care in Massachusetts versus Controls

<i>Quality Metric</i>	<i>2006</i>	<i>2009</i>	<i>Change from 2006 to 2009</i>		<i>P for Difference in Change between MA and Controls</i>
	<i>% Delivered*</i>	<i>% Delivered*</i>	<i>Change in % Delivered*</i>	<i>p-Value</i>	
Diabetic eye examination					
MA	64.5	65.3	1.0	.399	.126
Controls	62.5	61.5	−1.0	.165	
Hemoglobin A1c monitoring					
MA	50.2	50.7	0.0	.580	.004
Controls	60.6	57.8	−3.0	<.001	
Mammography					
MA	43.8	59.1	15.0	<.001	<.001
Controls	41.2	49.1	8.0	<.001	
Colon cancer screening [†]					
MA	10.4	10.0	0.0	.232	.317
Controls	11.3	10.3	−1.0	.003	
Influenza vaccination					
MA	43.4	44.0	1.0	.267	<.001
Controls	43.8	40.5	−3.0	<.001	
Pneumococcal vaccination [†]					
MA	5.5	4.3	−1.0	<.001	.347
Controls	5.7	4.3	−1.0	<.001	

Note. Control states are Maine, Vermont, New Hampshire, Connecticut, and Rhode Island.
*All presented data are from models accounting for age, sex, and race.
[†]Note that the expected rate for these metrics is 10–20%, as these are only required every 5–10 years depending on mode of screening chosen and risk factors.

Sensitivity Analyses

Adjusting our models for medical comorbidities yielded similar findings: we found no difference in the change in outpatient visits or ED visits, a slightly greater improvement in quality, and a higher increase in total costs for Massachusetts versus control states (Table S1). Newly enrolled beneficiaries had slightly different patterns over time. We found no difference in the change in outpatient visits, and again a slightly greater improvement in quality in Massachusetts, but in this cohort there was a small relative increase in ED visits in Massachusetts compared to controls (0.13 visit increase vs. 0.02 visit decrease, $p = .039$, Table S2). There were no differences in the change in total costs in this cohort.

When we limited our sample to Massachusetts only, and compared high- versus low-insurance take-up, we found no difference over time in the change in outpatient or ED visits; there was a greater increase in mammography and influenza vaccination in areas with high take-up (which might be expected to have more a problem with access) and no difference in the change in costs (Table S3).

Table 4: Costs of Care in Massachusetts versus Controls

	2006 Annual Costs per Patient*	2009 Annual Costs per Patient*	Change from 2006 to 2009		<i>p</i> for Difference in Change between MA and Controls
			Change in Annual Costs per Patient*	<i>p</i> -Value	
Total cost					
MA	\$9,389	\$10,668	\$1,279	<.001	<.001
Controls	\$8,375	\$9,114	\$739	<.001	
Physician cost					
MA	\$3,008	\$3,205	\$197	<.001	.966
Controls	\$2,905	\$3,100	\$195	<.001	
Inpatient cost for patients with a hospitalization only					
MA	\$18,210	\$21,344	\$3,135	<.001	<.001
Controls	\$16,510	\$18,502	\$1,992	<.001	
Inpatient cost for all patients					
MA	\$4,817	\$4,711	−\$106	<.001	<.001
Controls	\$4,033	\$3,648	−\$386	<.001	
Outpatient cost					
MA	\$1,673	\$2,145	\$472	<.001	.341
Controls	\$1,632	\$2,055	\$423	<.001	

*All presented data are from models accounting for age, sex, and race.

MA = Massachusetts. Control states are Maine, Vermont, New Hampshire, Connecticut, and Rhode Island.

DISCUSSION

We found that, despite widespread concerns about negative spillover, insurance expansion in Massachusetts was not associated with worsening in access to outpatient care, quality of outpatient care delivered, or total costs of care for the already-insured older Medicare population. These findings may have important implications for other states working to expand insurance coverage under the Affordable Care Act.

Despite an influx of newly insured patients into the system, we saw no decrease in the number of visits annually for chronically ill patients in Massachusetts and no decrement in the quality of preventive care delivered. This suggests that clinics were adequately able to absorb the additional volume, perhaps through adding additional appointment slots, shortening existing slots, or recruiting additional practitioners. This may have been feasible in Massachusetts due to its supply of medical practitioners and other medical resources at baseline. It is also possible that despite insurance expansion, providers were able to prioritize services in ways that did not lead to reductions in access to care for the most chronically ill, older patients. On the other hand, it

is possible that the newly insured predominantly sought care in different locations than the already-insured, and that there was little direct competition for clinical services between these two populations.

We found that total costs of care for the chronically ill Medicare population increased at a higher rate than in Massachusetts than in control states. This is consistent with overall health care spending in the Commonwealth of Massachusetts, which outstripped national health care spending growth during this time period. This supports our finding that there was no significant drop-off in the outpatient care provided to Medicare patients as a result of insurance expansion. The increase in per-hospitalization spending was seen in both Massachusetts and controls, though the increase was greater in Massachusetts; it is possible this reflects broader trends in health care spending in Massachusetts or greater efforts to cross-subsidize patients with less generous insurance.

Others have examined the relationship between insurance expansion and clinical outcomes and costs, and indeed there is a growing body of evidence in Massachusetts to suggest that insurance expansion has had a positive impact on health in the state, including lower uninsured rates and fewer cost-related barriers to accessing medical care as well as improvements in self-reported health status (Kolstad and Kowalski 2010; Zhu et al. 2010; Long, Stockley, and Dahlen 2012). We previously reported no increase in potentially preventable hospitalizations for the previously insured in Massachusetts following health reform (Joynt et al. 2013); our current findings extend these findings to specifically examine outpatient visits and preventive care. Our own prior work aside, to our knowledge there have been no previous publications specifically examining whether insurance expansion has negative spillovers on outpatient visits, quality, or costs among the already-insured.

There are limitations to our study. We limited our study to Medicare Part B enrollees who were chronically ill and over 65, hypothesizing that these individuals would be most sensitive to reductions in access to outpatient care. If crowding had a negative impact on Medicare HMO enrollees or privately insured individuals, we would not have detected that in our study. However, each of these populations tends to be younger and healthier than Medicare fee-for-service beneficiaries, and thus we suspect that they might be less vulnerable to reductions in access to outpatient care. It is also possible that the impact of health reform would take longer to accrue, as additional individuals joined the insurance rolls over time; however, by our postreform sample in 2009, insurance coverage had largely plateaued (Kolstad and Kowalski 2012). We did not have additional prereform data with which to conduct a trends

analysis, so our models only examine pre–post differences in visits, quality, and costs. We could not account for other external factors that may have impacted care in Massachusetts or surrounding states during the study period, including provider supply, state coverage standards, or more local variations in the quantity and quality of care provided. Finally, while Massachusetts is a key test case for insurance expansion, it had relatively high physician supply and a relatively low uninsured rate at baseline; therefore, these findings may not generalize to states with particularly low physician supply or high baseline uninsured rates, or states with low levels of other important supporting medical resources such as ancillary staff and office space. It will remain critical to track additional states’ experience with insurance expansion, not just to see if Massachusetts is unique, but also to identify common factors associated with success and failure in the broader experience.

CONCLUSION

Insurance expansion in Massachusetts was not associated with worsening in access or quality of outpatient care for the already-insured. We found minimal effects on cost growth, likely reflecting broader trends in the health care sector in Massachusetts. These findings have important implications for other states working to expand insurance coverage under the Affordable Care Act.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.

Table S1. Outpatient, Emergency Department, and Observation Visits, Quality of Care, and Total Costs in Massachusetts versus Controls, Adjusting for Medical Comorbidities.

Table S2. Outpatient, Emergency Department, and Observation Visits, Quality of Care, and Total Costs in Massachusetts versus Controls, Limited to New Enrollees.

Table S3. Outpatient, Emergency Department, and Observation Visits, Quality of Care, and Total Costs in High- versus Low-Insurance Take-Up Counties in Massachusetts.