

# The Impact of the Massachusetts Health Care Reform on Health Care Use Among Children

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In 2006 Massachusetts enacted a major health care reform aimed at achieving near-universal coverage in the state. While other studies have found that this reform substantially affected the use of health services in general, the impact of the reform on children is largely unexplored.<sup>1</sup> Children are of special interest to policymakers because it is widely believed that better health in early childhood results in large payoffs to adult health and achievement (e.g., Heckman (2006), Case et al. (2005)). I analyze how the reform affected the insurance coverage, health care utilization patterns, and health outcomes of children ages 18 and under.

Ample evidence suggests that insurance coverage induces consumers to use more medical services because it lowers out-of-pocket costs (Newhouse (1993), Card et al. (2007), Finkelstein et al. (2011)). Public efforts to expand insurance coverage to the uninsured may therefore damage cost-control efforts by increasing total medical expenditures. However, insurance coverage may also improve the composition of health care. For example, insurance

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<sup>1</sup>Long and Masi (2009) and Miller (2011) analyze the effect of the reform on health care utilization and emergency room care in the general population. Kolstad and Kowalski (2010) examine how the reform affected inpatient hospital visits and provide some results for the under 18 population; in particular, they find that the reform reduced total hospital charges for this group and increased the probability that a hospital visit originated in the emergency room.

may induce substitution away from relatively expensive hospital emergency room care and towards physician's offices. Insurance may also encourage timely preventive care that reduces future medical costs. These offsetting changes in behavior may reduce the "per dollar" cost of health even if the total amount spent on health services increases.

Using data from a large survey, I find evidence that the Massachusetts reform improved both the composition of health services used by children and their reported health outcomes. Most children had health insurance coverage prior to the reform, and I find that the reform only modestly increased total insurance coverage among the children surveyed (about 2.4 percentage points). However, I find that the reform had a large effect on the *type* of insurance that covered them, moving children off of less generous "stop-gap" public programs and on to more comprehensive plans. Relative to the children surveyed in other states in the region, I find that children in Massachusetts were less likely to visit the hospital emergency room visits after the reform. I also find some evidence that they increased their use of office visits and preventive care. Furthermore, I provide evidence that the reform reduced the number of children that had forgone care due to costs and improved reported health quality.

## 1 The Massachusetts Reform and Health Care Utilization

In 2006 Massachusetts mandated that all residents have health insurance meeting certain coverage standards.<sup>2</sup> As of June 2007, failure to obtain insurance results in the loss of the personal income tax exemption (\$219 for an individual) and, beginning in 2008, monthly penalties equal to half of the price of the least costly available insurance plan. To ease the burden of this mandate on low- and middle-income residents, the legislation introduced means-tested subsidies to purchase private insurance and expanded the Medicaid program (called "MassHealth") that provides health care to families in poverty. Gruber (2008) pro-

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<sup>2</sup>Notably, non-comprehensive public programs such as the Children's Medical Security Plan do not meet minimum coverage standards.

vides an overview of the reform.<sup>3</sup>

Table 1: Healthcare Use Among Children in MA and Comparison States by Insurance Status, 2002-2006

In the last 12 months, did the child have at least one...	Massachusetts		Comparison States	
	Insured	Uninsured	Insured	Uninsured
Office visit	0.9432 (0.0070) [1092]	0.8696 (0.0502)*** [46]	0.9499 (0.0024) [8160]	0.8217 (0.0160)*** [572]
ER visit	0.2805 (0.0136) [1098]	0.3696 (0.0720) [46]	0.2334 (0.0047) [8242]	0.2401 (0.0177) [583]
Check-up	0.9026 (0.0090) [1098]	0.7825 (0.0615)*** [46]	0.8687 (0.0037) [8235]	0.6927 (0.0192)*** [576]
Overnight hospital stay	0.0476 (0.0044) [2313]	0.0345 (0.0197) [87]	0.0524 (0.0017) [16593]	0.0382 (0.0057)** [1152]
Did not get needed medical care due to cost	0.0082 (0.0019) [2322]	0.1724 (0.0407)*** [87]	0.0104 (0.0008) [16593]	0.1111 (0.0093)*** [1152]
Health reported as “excellent”	0.6171 (0.0101) [2322]	0.4023 (0.0529)*** [87]	0.5381 (0.0039) [16606]	0.4571 (0.0147)*** [1153]

Asterisks indicate significant difference between insured and uninsured respondents within the state grouping. Significance levels: \*=10%, \*\*=5%, \*\*\*=1%. Cell size is in []. Cell size differs between questions because only one child per household completes full interview. Cell size also differs due to missing values in the outcome variable. Comparison states are New Jersey, New York, Pennsylvania, Connecticut, Maine, New Hampshire, Rhode Island and Vermont.

Both the expansion of MassHealth and the individual mandate could affect the insurance status of children under 18 and, subsequently, their medical care consumption and health outcomes. MassHealth eligibility expanded substantially to include all children in households

<sup>3</sup>Other aspects of the reform include requirements on insurance companies to cover dependents until the age of 26 and employer participation rules that fine employers that do not offer health insurance. These new requirements may affect children’s coverage indirectly by increasing premiums or expanding coverage in general.

with incomes up to 300 percent of the federal poverty line. As a result, many children that were previously enrolled in non-comprehensive state-sponsored health programs such as the Children’s Medical Security Plan (CMSP, which covers office visits and up to \$200 worth of prescription drugs but not hospitalizations or outpatient surgery) or FreeCare (which only pays for emergency room and community health clinic visits) became eligible for more generous coverage through MassHealth.<sup>4</sup> Families that meet the income requirements may enroll their children in both programs.<sup>5</sup> Additionally, as their parents complied with the individual mandate, children’s enrollment in private insurance potentially increased, both by displacing enrollment in the CMSP and FreeCare and by increasing total insurance coverage in this group.

I use data from the National Health Interview Survey (NHIS) to analyze the impact of this reform on health care utilization and outcomes of children under 18. The NHIS is a nationally representative cross-sectional survey that is collected annually and includes data on health care use and health status of adults and children. An advantage of the NHIS is that it deliberately includes a large sample of children under 18 and conducts detailed interviews about their well-being and health care utilization patterns. I use data from 2002 to 2008 to compare the trends in the health care use of children in Massachusetts to those of children in other states in the Northeast region (New Jersey, New York, Pennsylvania, Connecticut, Maine, New Hampshire, Rhode Island and Vermont).<sup>6</sup> In Massachusetts and the comparison states there are 26,722 surveyed children ages 18 and under. The survey provides data about insurance coverage, reported health status, overnight hospital stays, and health costs for all children surveyed. Roughly half of those surveyed were given more detailed interviews to provide additional data on emergency room use, office-based care, and check-ups.

Table 1 displays descriptive statistics from the NHIS for insured and uninsured children up

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<sup>4</sup>See, e.g., Bigby (2007), who reports that over 15,600 members of the Children’s Medical Security Plan were enrolled in MassHealth as of July 1, 2007.

<sup>5</sup>The CMSP has no income requirements. Enrollment in FreeCare is restricted to residents with family incomes less than 200% of the Federal Poverty Line.

<sup>6</sup>I find similar results when limiting the comparison group to only residents of states in the New England census division (Vermont, New Hampshire, Maine, Connecticut, and Rhode Island) and when using residents of all other states as comparison.

to the year of the reform (2002-2006). Prior to the reform, insured children in Massachusetts were 8.6 percent more likely to have visited the doctor’s office in the last year and 15.3 percent more likely to have had a check-up, but were 25 percent *less* likely to have visited the emergency room, although the difference in ER use is not statistically significant. Sixty-one percent of insured children had their health reported as “excellent,” as compared to 40 percent of uninsured children. Despite visiting the ER more often and having poorer health, uninsured children were less likely to have spent the night in the hospital during the last year, although this difference is only statistically significant in the comparison states. Uninsured children in Massachusetts were over 20 times more likely have forgone medical care because of costs. These patterns are similar in the comparison states.

## **2 The Effect of the Reform on Coverage, Utilization, and Outcomes**

To evaluate the impact of the reform on health care utilization and outcomes, I compare trends in Massachusetts with those in other states over the same time period. My identifying assumption is that in the absence of reform, utilization would have evolved similarly in Massachusetts as in the other states, and thus any differences can be attributed to the reform. In order to evaluate the validity of this assumption, I examine pre-reform trends in Figure 1. This figure plots the outcome variables of interest for children in Massachusetts and those in other states in the Northeast region. The horizontal lines indicate the period of the reform’s implementation.

The first panel of Figure 1 plots the fraction of children in the NHIS with insurance by year. Even prior to the reform, coverage in this group was very high, with about 96 percent of the children covered by health insurance in 2006. By 2008, insurance coverage among Massachusetts children had increased modestly by 2.2 percentage points, while coverage in the comparison states fell by 1.3 percentage points. The fraction of children who visited the emergency room evolved very similarly in Massachusetts and the comparison states prior to the reform, but fell substantially in Massachusetts after the reform, with no visible change

in the comparison states over the same period (Panel 2). In Massachusetts, the fraction of children with reported health as “excellent” increased sharply after the reform (Panel 3) as did the fraction of children who visited a doctor’s office (Panel 4). Panel 5 plots the fraction of children who had a “check-up”; it appears to be increasing in MA relative to the comparison states even prior to the reform. Although the fraction of children who had forgone care due to costs appears to have fallen after the reform, as illustrated in Panel 6, the trend is volatile and not obviously similar to that in the comparison states.

I formalize this analysis by estimating

$$\begin{aligned}
 Y_i = & \beta_0 + \beta_s + \beta_1 X_i + \beta_2 IMP_i \\
 & + \beta_3 POST_i + \beta_4 MA_i \\
 & + \beta_5 IMP_i * MA_i + \beta_6 POST_i * MA_i + \epsilon
 \end{aligned}
 \tag{1}$$

for each outcome variable of interest ( $Y_i$ ), where  $POST_i = 1$  for survey respondents in 2008 after all aspects of the reform had been implemented and  $IMP_i = 1$  for survey respondents during the implementation period of 2006 and 2007. Respondents in Massachusetts have the variable  $MA_i = 1$  and respondents in comparison states have  $MA = 0$ . I include state fixed effects,  $\beta_s$ , and in some specifications, controls for sex, race, age, and ethnicity,  $X_i$ . The parameter of interest is  $\beta_6$ , which captures how outcomes changed among children in Massachusetts relative to children in other states. The outcome variables I consider are those presented in Figure 1, as well as the type of insurance (Private, Medicaid, Other Public).

Table 2 presents estimates of equation (1). In specifications both with and without controls, I find a significant increase in the probability that a child had any health insurance coverage of between 2.2 and 2.4 percentage points. Although an increase in insurance coverage of over 2 percentage points is not trivial, I find a much larger change in the type of insurance reported. Enrollment in “Other Public” (not Medicaid or Medicare) insurance decreased significantly by over 7 percentage points. “Other Public” insurance includes the non-comprehensive public health programs CMSP and FreeCare.<sup>7</sup> In contrast, enrollment in private insurance increased by between 8 and 10 percentage points. I find little change in

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<sup>7</sup>Here, the word “insurance” is used liberally: the CMSP and FreeCare are not generally considered to be insurance coverage because they do not cover typical medical care such as doctor’s visits (in the case of

Medicaid (including CHIP) enrollment in the specification without controls. In the specification with controls, I find a small increase in Medicaid insurance coverage of 1.5 percentage points, although it is not statistically significant.

I find that the reform significantly altered health care utilization patterns and reported health outcomes. The reform substantially reduced the probability that the surveyed child had an emergency room visit by 8.7 percentage points, or 30 percent. The probability that the surveyed child had an office visit increased by 1.3 percentage points and the probability of a check-up increased by 2.9 percentage points, although these effects are only significant in the models that do not include controls. The reform significantly increased the probability that a child’s health was described as “excellent” by between 5.5 and 6 percentage points, or about 10 percent. Finally, after the reform almost no children were reported to have foregone medical care because of costs, representing a significant reduction of between 0.9 and 1.2 percentage points relative to the comparison states.

One limitation of this analysis is that it is not possible to distinguish whether the changes in utilization are driven by the increase in total insurance coverage (the “extensive” margin) or the change in the type of coverage (the “intensive” margin). The magnitude of the effects on utilization suggests that changes on the extensive margin alone are not sufficient to explain the observed changes in utilization. For example, if all uninsured children visited the emergency room prior to the reform but did not visit the emergency room once they gained insurance, this change in behavior would only account for a reduction in the probability of an ER visits of between 2.2 and 2.4 percentage points, significantly smaller than the estimated 8.4 percentage point reduction caused by the reform.

### 3 Conclusion

It is widely believed that health in childhood has a strong impact on future productivity, educational attainment, and well-being, making the effect of health care reform on children FreeCare or hospitalizations (in the case of CMSP). Furthermore, Massachusetts law considers enrollees in CMSP and FreeCare to be uninsured.

of special interest to policy-makers. This paper is the first to examine the impact of the 2006 Massachusetts health care reform on the health care utilization patterns and health status of children.

I find that the Massachusetts reform had a substantial effect on children's insurance coverage. In particular, the reform reduced enrollment in non-comprehensive public health programs and increased private insurance coverage. Office visits and check-ups increased while emergency room use fell, consistent with the hypothesis that insurance induces substitution away from hospital emergency rooms and towards primary care. After the reform, the fraction of children reported to have forgone medical care because of costs fell to almost zero and reported health quality increased. Overall, these results suggest that the reform improved both the composition of health services used and health outcomes for children.

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Figure 1: Outcomes for Children in MA (Black) and Comparison States (Gray), 2002-2008

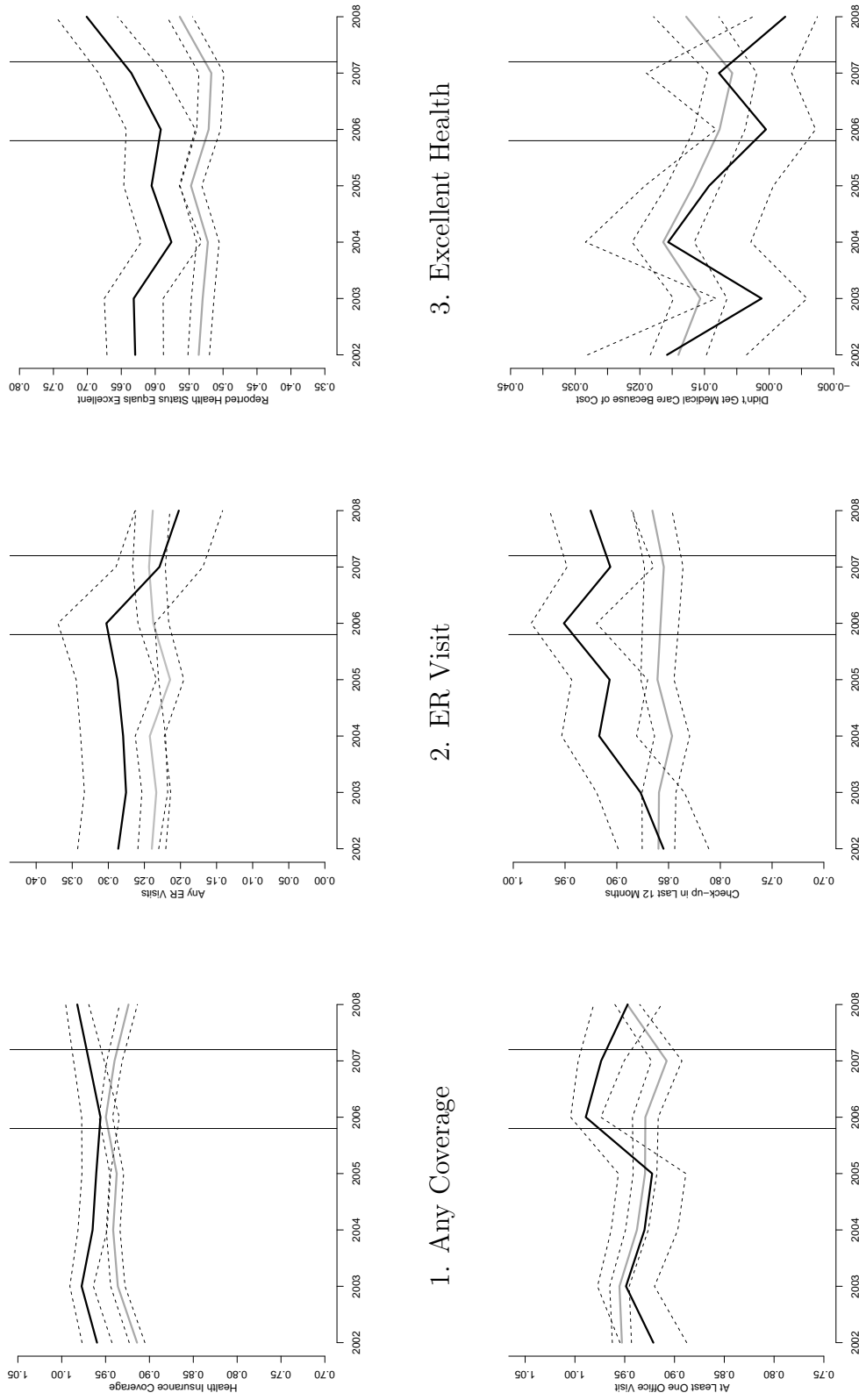


Table 2: Regression Estimates

	Any Insurance	Private Insurance	Other Public Insurance
<b>MA*Post</b>	0.024 (0.004)***	0.022 (0.004)***	0.104 (0.019)***
MA Pre-Reform Mean:	0.965	0.633	0.079 (0.017)***
Controls? <sup>1</sup>	No	No	Yes
N:	26504	26504	22116
	Medicaid	Visited ER	Visited Dr's Office
<b>MA*Post</b>	0.000 (0.0247)	0.015 (0.021)	-0.087 (0.018)***
MA Pre-Reform Mean:	0.238	0.238	0.287
Controls? <sup>1</sup>	No	No	Yes
N:	26504	22116	10886
	Check-up	Did not get Care due to Cost	Excellent Health
<b>MA*Post</b>	0.0294 (0.012)**	0.012 (0.010)	-0.012 (0.004)**
MA Pre-Reform Mean:	0.888	0.888	0.016
Controls? <sup>1</sup>	No	No	Yes
N:	13036	10870	26677

I. Controls include age, gender, race, and ethnicity. Specifications with controls exclude 2002 because of changes to the variable

denoting race. All models include state fixed effects. Asterisks indicate the coefficient differs significantly from zero. Significance levels: \* = 10%, \*\* = 5%, \*\*\* = 1%. Sample size differs across questions because only one child per household completes full

interview. Sample size also differs due to missing values in outcome variable. Standard errors clustered by state. Comparison

states are New Jersey, New York, Pennsylvania, Connecticut, Maine, New Hampshire, Rhode Island and Vermont.