Access to Care for Children with Chronic Health Conditions in the ACA

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ABSTRACT

As of September 2010, the Affordable Care Act (ACA) required health insurers to no longer exclude children from enrollment due to a pre-existing condition. We used data from the National Health Interview Survey to compare changes in health insurance coverage and access to care before and after the ACA's guaranteed issue requirement between children with (n=15,661) and without (n=50,835) chronic health conditions. Insurance purchased on the individual market increased by 1.9 percentage points ($p<0.05$) for adolescents with chronic conditions relative to the trend for adolescents without chronic conditions. Adolescents with chronic health conditions also experienced reductions in delayed and forgone care due to cost, by -3.3 ($p<0.001$) and -1.9 ($p<0.05$) percentage points, respectively. Similar results were not found for young children. This study provides early evidence that guaranteed issue requirements in the ACA strengthened access to insurance and medical care for adolescents with chronic health conditions.

Access to Care for Children with Chronic Health Conditions in the ACA

Millions of Americans have historically been denied health insurance coverage, faced exclusionary riders that denied coverage for specific services or were priced out of the market by unaffordable insurance premiums because they were living with a pre-existing health condition.[1-3] Prior to the Affordable Care Act (ACA), insurers offering coverage in the individual market were allowed to exclude people previously diagnosed or treated for common health conditions, including cancer, heart disease, asthma, arthritis, hypertension and diabetes among other physical and mental health conditions.[4,5] This practice, known as underwriting, allowed insurers to manage risk and keep premiums lower for the general population, but it prevented many people that likely had the greatest need for coverage from purchasing insurance. An estimated 57 million people under the age of 65 are living with a pre-existing condition—of those, 17 million are children.[4,5]

Uninsurance and underinsurance can have a significant impact on childhood health outcomes, especially for children with special health care needs. Several studies have documented the positive impact of health insurance for children following expansions in Medicaid and the Children's Health Insurance Program (CHIP), including reduced infant and childhood mortality.[6,7] Children with health insurance are also more likely to maintain a regular medical provider and are less likely to delay or forgo medical care due to cost.[8-12] Expanding access to affordable health insurance to children remains an important national health policy goal.[13,14]

As of September 23, 2010, the ACA mandated guaranteed issue requirements for all children under the age of 19. Specifically, the ACA prohibits health insurers offering coverage in both the group and individual market from excluding specific services or completely denying coverage because of pre-existing health conditions.[15] Prior law prohibited health plans from excluding individuals enrolled in large group plans because of their medical history but allowed such practices in the individual market.[2,3]

The new provision did not apply to existing plans, "grandfathered plans," but any plan undergoing changes in benefit design would need to comply with the new federal policy.

While several studies have evaluated other ACA provisions, including the impact of allowing parents to keep young adult children on employer-sponsored health plans until age 26, no studies have evaluated the impact of restricting pre-existing condition exclusions for children on coverage and access to care.[16-19] We focus on this issue using data from the National Health Interview Survey (NHIS) to measure the extent to which children with chronic health conditions have been affected by the ACA's guaranteed issue requirement. Unlike other federal surveys measuring health insurance coverage, the NHIS also allows researchers to study access to care.

Prior expectations about the early impacts of the guaranteed issue requirement on access to care are ambiguous. First, guaranteed issue is expected to impact children seeking coverage through the individual market, as prior law prevented large group health plans from using health status to determine eligibility.[2,3] The law, however, did not prevent insurers in the individual market from underwriting, meaning that families with chronically ill children potentially faced high premiums that prevented them from obtaining coverage. Additionally, some states had guaranteed issue policies for adults and children prior to the ACA, and 35 states had high-risk pools that served as insurers of last resort.[1,2,20] To the extent that those policies were effective, the ACA's guaranteed issue provision may have a limited impact, but we expect some chronically ill children to gain health insurance, particularly through the individual insurance market.

METHODS

Data Source

This study relied on data from the 2007-2012 National Health Interview Survey (NHIS), harmonized over time by the Minnesota Population Center at the University of Minnesota.[21] The NHIS is conducted annually by the National Center for Health Statistics and serves as the predominant resource

on health and health care in the United States.[22] The NHIS collects general information on demographic and socioeconomic characteristics, insurance coverage, and self-reported health status, for the entire sample. For a randomly selected child in each household interviewed, the NHIS collects more detailed information about specific health conditions and access to medical care. The NHIS also includes an indicator for the calendar year and quarter of interview, making it possible to account for the timing of the ACA's guaranteed issue requirement for children that began in September 2010.

Study Sample

Our analytic sample was based on the randomly selected sample child up to 17 years of age. Children at risk of health insurance denials due to pre-existing conditions were identified when the responding adult (usually a parent) indicated whether the child was previously diagnosed with at least one of ten chronic health conditions included in the NHIS questionnaire: attention-deficit hyperactivity disorder (ADHD), mental retardation, Down syndrome, asthma, cerebral palsy, sickle cell anemia, muscular dystrophy, autism, congenital or other heart disease, and diabetes. The comparison group included children without any of these health conditions. Our final sample included 52,359 children residing with at least one parent: 10,909 children had a chronic condition and 41,450 children did not have a chronic condition.

Statistical Analysis

We used a difference-in-differences quasi-experimental design to analyze the ACA's guaranteed issue requirement for children beginning on September 23, 2010. We examined changes in health insurance coverage and access to care between the pre-period (January 2007—September 2010) and the post-period (October 2011—December 2012). We exclude children interviewed during the implementation period (October 2010—September 2011) because some questions on access to care required a 12-month recall that overlapped the pre-post periods.

Several other factors were also changing during the study period, including the Great Recession (2009-2011), which contributed to reductions in private health insurance for both parents and children.[23] To account for these secular trends, we compared changes in the treatment group to changes in the comparison group. We implemented a difference-in-differences design using logistic regression models that controlled for race and ethnicity, age, sex, health status, citizenship, household language, family income, parents' highest educational attainment, parents' work status, family structure, region and quarter of interview. These controls improve the precision of the model and adjust for any compositional shift in the population that occurred during the course of the study period.

The primary outcome of our analysis was children's health insurance status. Although we expected the greatest impact on insurance coverage through the individual market, we tested four insurance outcomes. If multiple sources of coverage were reported for a child, we assigned the primary source of insurance in the following order: dependent coverage through someone's employer-sponsored insurance (ESI) plan, insurance purchased through the individual market, public health insurance, and no health insurance (uninsurance).[23] Our final analysis did not include the small number of children (<1%) missing information which allowed us to differentiate the specific source of private health insurance (ESI versus individual). We also examined the following four measures of access to care: whether the sample child delayed care because of cost, forgone medical care because of cost, maintained a usual source of care besides an emergency room (such as a clinic or physician's office), and received a well-child checkup.

Separate regression models were estimated for infants and toddlers (0-3 years), young children (4-11 years) and adolescents (12-17 years) because the health profile and insurance options of children differ substantially by age (Table S1 in the Supplementary Appendix). Adolescents, for instance, are more likely to be uninsured relative to younger children.[24] All analyses were conducted in Stata using survey weights and the *svy* command to adjust standard errors for the complex survey design of the

NHIS. Weighted estimates and proportions are representative of the U.S. non-institutionalized population of children. Estimates from our difference-in-differences regression models report the ACA's average marginal effect on children with chronic conditions while controlling for demographic and socioeconomic factors.

RESULTS

We estimated that 14.6 million children—or 20.3% of all children—have been diagnosed with at least one chronic health condition in the NHIS (Table 1). Prior to the ACA's implementation, children diagnosed with a chronic health condition tended to be older, male and from families with lower levels of income, education and employment compared to children without any chronic conditions. At baseline, more than half of children with (50.3%) and without (54.9%) chronic conditions were insured as dependents on someone's ESI plan. Although coverage through the individual market remained low for children with (2.1%) and without (3.4%) chronic conditions, children with chronic conditions were more likely to have public health insurance (40.7%) compared to children without chronic conditions (32.2%).

Children with chronic conditions were also more likely to delay or forgo medical care due to cost, but they were more likely to maintain a usual source of care and receive a well-child checkup compared to children without chronic conditions. Maintaining access to health care grew progressively difficult as children grew older. Adolescents were more likely to be uninsured and delay or forgo medical care compared to toddlers and younger children. For instance, only 2.9% of infants and toddlers with a chronic condition were uninsured, but 7.2% of adolescents with a chronic condition were uninsured at baseline (Table S1 in the Supplementary Appendix). Given these differences, it is essential to stratify analyses by age group, as adolescents have more to gain from the guaranteed issue requirements in the ACA.

Health Insurance Coverage

Table 2 presents unadjusted pre-post changes in health insurance coverage for children with and without chronic conditions by age group, as well as the adjusted difference-in-differences estimates from the multivariate analysis. Between the pre-implementation (Jan. 2007—Sep. 2010) and post-implementation period (Oct. 2011—Dec. 2012), dependent ESI coverage dropped among children with (-4.2 percentage points; $p<0.05$) and without (-3.0 percentage points; $p<0.001$) chronic conditions. When the changes in the comparison group were netted out from the changes in the treatment group, the differences-in-differences estimate found the ACA's guaranteed issue requirement led to no significant impact on dependent ESI coverage for children with chronic conditions (0.2 percentage points; $p>0.05$). Similarly, public coverage increased for all children, and there were no differential changes in public insurance take-up for children with chronic conditions.

We also found limited take-up of health insurance through the individual market for most children. Health insurance purchased on the individual market seemingly increased 1.9 percentage points ($p<0.05$) for adolescents with chronic conditions relative to the trend for adolescents without chronic conditions, but this effect was explained by a steady trend in individual coverage for adolescents with chronic conditions (0.7 percentage point increase; $p>0.05$) alongside a downward trend in individual coverage among adolescents without chronic conditions (-1.0 percentage point decrease; $p<0.05$).

Access to Health Care

Results in Table 3 indicate that the ACA's guaranteed issue requirement may have improved access to health care for children with chronic conditions. The decline in *delaying medical care* due to cost between the pre- and post-implementation period was significantly larger for children (of all ages) with chronic conditions (-3.2 percentage points; $p<0.001$) compared to children without chronic conditions (-1.1 percentage points; $p<0.001$). The differential decline in *delaying medical care* for

children with chronic conditions (-1.6 percentage points; $p<0.05$) represented a 25.8% relative reduction following the ACA's guaranteed issue requirement. Most of this change was concentrated among adolescents with chronic conditions, as they experienced a -2.9 percentage point ($p<0.05$) reduction in delayed medical care relative to the trend for children without chronic conditions. A similar effect was not found among infants, toddlers and young children.

Similarly, *forgoing medical care* due to cost declined significantly for children of all ages with (-2.1 percentage points; $p<0.001$) and without (-0.6 percentage points; $p<0.001$) chronic conditions. The difference-in-differences estimate—representing the differential impact on children with chronic conditions—indicated a reduction of -1.1 percentage points ($p<0.05$) in forgoing medical care due to cost. The drop in forgoing medical care due to cost was isolated to adolescents with chronic conditions. Adolescents with chronic conditions experienced a -2.6 percentage point reduction ($p<0.001$) in *forgoing medical care* compared to adolescents without chronic conditions who did not experience a statistically significant decline in forgoing medical care (-0.6 percentage points; $p>0.05$). The difference-in-differences reduction of -1.8 percentage points ($p<0.001$) represented a 43.9% decline in forgoing medical care among adolescents with chronic conditions.

Maintaining a *usual source of medical care* also improved for children of all ages with chronic conditions (1.2 percentage points; $p<0.05$) and for children without chronic conditions (1.6 percentage points; $p<0.001$). However, the results from the difference-in-differences analysis were not statistically significant. Finally, receiving a *well-child checkup* increased 2.4 percentage points ($p<0.05$) for children of all ages with chronic conditions, but this fell short of the 4.3 percentage point ($p<0.001$) increase in checkups for children without chronic conditions. The difference-in-differences model found that children without chronic conditions fared better following the implementation of the ACA's guaranteed issue provision, particularly among young children (children aged 4-11).

Sensitivity Analyses

To examine how sensitive our results were to the choice of control group, we examined an alternative comparison group unaffected by the ACA's 2010 guaranteed issue requirements—adults with chronic health conditions. We created a comparison group of adults 26-34 years of age previously diagnosed with at least one of the following health conditions: asthma, chronic bronchitis, emphysema, diabetes, hypertension, atherosclerosis (coronary heart disease, angina, myocardial infarction) and cerebrovascular disease (stroke). We chose not to use adults 18-25 as a comparison group because several studies have found this group of young adults to gain health insurance under another ACA provision allowing parents to keep children covered through their plans until they reach 26 years of age.[16-19] After using adults with chronic conditions as a comparison group, difference-in-differences estimates indicated that insurance through the individual market increased (2.2 percentage points), delaying medical care decreased (-2.2 percentage points), forgoing medical care decreased (-2.6 percentage points), and having a usual source of care increased (0.5 percentage points) among children with chronic conditions relative to the trend among adults with chronic conditions. However, our results were not statistically significant at traditional levels.

DISCUSSION

Our study found limited evidence of increased coverage through the individual market for children with pre-existing conditions following the ACA's guaranteed issue requirement. However, we did find significant gains in access to care for adolescents (children aged 12-17) who typically have higher rates of uninsurance than other age groups. There may be several explanations to limited take-up in the individual market across the study period. First, the ACA did not enforce community rating until January 2014, and insurers were allowed to charge higher premiums to children with pre-existing conditions. Starting January 2014, qualified health plans were no longer allowed to deny coverage or

charge different premiums based on pre-existing conditions, health status or claims history for children and adults. Additional analysis with more recent data may find significant increases in coverage.

Our findings may also mirror participation in Medicaid and CHIP. We may not find gains in private insurance for younger children because Medicaid eligibility rules tend to be more generous for younger age groups. For example, income eligibility for Medicaid in 2012 for children aged 0–3 years ranged from the federally required minimum of 133% of the federal poverty level (FPL) to a high of 300% (median of 185%) while the median eligibility for children aged 6-19 years was 100% FPL.[25] Medicaid may be a better safety net for younger children than for older children. Medicaid may also be a better option for children with chronic conditions. With limited to no copayments, coinsurance or deductibles in public program benefit designs, there are fewer cost barriers to obtaining needed care. Children with chronic conditions may have satisfied pent-up demand and experienced better access to care as they enrolled in Medicaid and CHIP during the Great Recession.

Limitations to using data from the NHIS for this study should be noted. For instance, the region of residence is the lowest level of geography available in the public use sample. Knowing the state of residence would improve precision on measuring the impact of guaranteed issue requirements for children under the ACA, as some states had adopted guaranteed issue of health insurance regardless of health status. Prior to the ACA, five states required insurers in the individual market to guarantee insurance to all residents regardless of health status, and four other states mandated Blue Cross Blue Shield plans as the insurer of last resort for enrollees denied by insurers in the individual market.[1,2] Finally, 35 states used high risk pools to insure individuals who were denied coverage or were uninsured for more than six months.[1,2,20]

Notwithstanding these limitations, our study provides early evidence that guaranteed issue may have improved access to health care for children with chronic conditions without limiting access to other children. The continued, bipartisan support for children's health insurance coverage—as evidenced by

the passage and reauthorization of CHIP[14] and the early implementation of the ACA guarantee issue requirement for children[15]—enables increased coverage options for children of all ages.

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Table 1. Characteristics of Children by Chronic Health Condition Status at Baseline*

	Children With Chronic Conditions (n=7,593)		Children Without Chronic Conditions (n=31,257)		
	Estimated Population, in Millions	Percentage	Estimated Population, in Millions	Percentage	P Value
All children	14.6	20.3 ± 0.3	57.2	79.7 ± 0.3	
Age group (%)					<0.01
0-3 years	1.4	9.8 ± 0.4	15.0	26.2 ± 0.3	
4-11 years	6.8	46.5 ± 0.7	24.7	43.2 ± 0.4	
12-17 years	6.4	43.8 ± 0.8	17.5	30.6 ± 0.4	
Sex (%)					<0.01
Male	9.0	61.6 ± 0.7	27.8	48.5 ± 0.4	
Female	5.6	38.4 ± 0.7	29.4	51.5 ± 0.4	
Race or ethnic group					<0.01
Non-Hispanic white	8.3	57.2 ± 0.9	32.8	57.4 ± 0.6	
Non-Hispanic black	2.9	19.9 ± 0.7	7.5	13.2 ± 0.4	
Non-Hispanic other/multiple races	0.8	5.4 ± 0.4	3.7	6.4 ± 0.3	
Hispanic	2.6	17.5 ± 0.6	13.2	23.1 ± 0.5	
Income (%)†					<0.01
<100% FPG	3.4	23.3 ± 0.7	10.7	18.7 ± 0.4	
100-199% FPG	3.5	23.7 ± 0.7	13.2	23 ± 0.4	
200-399% FPG	4.0	27.8 ± 0.7	17.4	30.4 ± 0.4	
400% + FPG	3.7	25.2 ± 0.7	16.0	27.9 ± 0.5	
Non-English speaking household (%)	0.7	5.1±0.3	5.3	9.2±0.3	<0.01
Noncitizen (%)	0.2	1.3 ± 0.1	1.8	3.1 ± 0.1	<0.01
Single parent household (%)	5.3	36.4 ± 0.7	14.7	25.8 ± 0.4	<0.01
Highest parental educational attainment (%)					<0.01
Less than high school	1.7	11.6 ± 0.5	7.6	13.3 ± 0.3	

High school graduate	3.3	22.7 ± 0.6	11.9	20.9 ± 0.4	
Some college	5.1	35.2 ± 0.7	17.0	29.9 ± 0.4	
College degree or more	4.4	30.6 ± 0.8	20.4	35.9 ± 0.5	
Parental work status (%)					<0.01
Any adult working full-time	10.2	70.8 ± 0.7	43.9	77.4 ± 0.4	
Only part-time adult workers	1.7	12.0 ± 0.5	6.3	11.0 ± 0.2	
All adults unemployed	0.8	5.4 ± 0.4	2.3	4.1 ± 0.2	
All adults not in labor force	1.7	11.8 ± 0.5	4.3	7.5 ± 0.2	
Health status (%)					<0.01
Excellent	5.9	40.5 ± 0.7	34.5	60.3 ± 0.4	
Very good	4.3	29.8 ± 0.7	15.0	26.2 ± 0.4	
Good	3.6	24.5 ± 0.7	7.2	12.6 ± 0.3	
Fair or poor	0.8	5.2 ± 0.3	0.5	0.9 ± 0.1	
Health insurance coverage (%)					<0.01
Private	7.7	53.2 ± 0.8	33.5	58.8 ± 0.5	
Dependent ESI	7.3	50.3 ± 0.8	31.3	54.9 ± 0.5	
Individual	0.3	2.1 ± 0.2	1.9	3.4 ± 0.1	
Public	5.9	40.7 ± 0.8	18.4	32.2 ± 0.5	
Uninsured	0.9	6.1 ± 0.3	5.1	8.9 ± 0.3	
Delayed medical care due to cost	0.9	6.2±0.4	2.3	4.0±0.1	<0.01
Forgone medical care due to cost	0.6	3.9±0.3	1.3	2.3±0.1	<0.01
Usual source of care	13.8	94.5±0.3	52.9	92.7±0.2	<0.01
Received well-child checkup	11.5	79.8±0.6	43.2	76.2±0.4	<0.01

* Plus-minus values are percentages ± SE. The total numbers of children have been weighted to be representative of the U.S. non-institutionalized population of children. Percentages may not sum to 100 because of rounding. Baseline data are from the 2007-2010 National Health Interview Survey.

†Poverty levels are based on the U.S. Census Bureau poverty thresholds.

Table 2. Changes in Health Insurance Coverage by Age Group, 2007-2012.*

	Unadjusted Change from Baseline		Adjusted Difference-in-Differences Estimate†
	Children with chronic conditions (n=10, 909)	Children without chronic conditions (n=41, 450)	
	Percentage Points		
All children			
Dependent ESI	-4.2 (-6.8 to -1.7)§	-3.0 (-4.5 to -1.5)‡	0.2 (-2.1 to 2.4)
Individual	0.1 (-0.7 to 0.9)	-0.3 (-0.8 to 0.2)	0.5 (-0.4 to 1.5)
Public	5.5 (2.8 to 8.2)‡	5.3 (3.8 to 6.7)‡	-0.5 (-2.7 to 1.6)
Uninsured	-1.5 (-2.7 to -0.2)§	-2.2 (-3.0 to -1.4)‡	0.5 (-1.0 to 2.0)
Toddlers and Infants (0-3 years)			
Dependent ESI	-8.6 (-16.7 to -0.6)§	-2.6 (-5.4 to 0.1)	-4.4 (-10.6 to 1.7)
Individual	-0.9 (-2.8 to 1.1)	-0.01 (-0.9 to 0.9)	-1.2 (-4.6 to 2.1)
Public	9.8 (1.7 to 17.9)§	4.6 (1.9 to 7.2)§	3.8 (-2.1 to 9.7)
Uninsured	-0.2 (-2.9 to 2.4)	-2.3 (-3.7 to -0.9)§	1.1 (-2.2 to 4.5)
Young children (4-11 years)			
Dependent ESI	-2.9 (-6.7 to 0.9)	-3.6 (-5.8 to -1.5)§	1.3 (-2.2 to 4.8)
Individual	-0.3 (-1.5 to 0.9)	0.0 (-0.8 to 0.8)	-0.2 (-1.7 to 1.3)
Public	4.9 (1.0 to 8.7)§	5.9 (3.8 to 8.0)‡	-1.1 (-4.0 to 1.9)
Uninsured	-1.6 (-3.5 to 0.2)	-2.7 (-3.9 to -1.5)‡	0.9 (-1.3 to 3.1)
Adolescents (12-17 years)			
Dependent ESI	-5.2 (-8.8 to -1.6)§	-2.6 (-5.0 to -0.3)§	-0.6 (-3.8 to 2.6)
Individual	0.7 (-0.5 to 1.9)	-1.0 (-1.8 to -0.2)§	1.9 (0.4 to 3.4)§
Public	6.0 (2.1 to 9.9)§	5.0 (2.7 to 7.3)‡	-0.6 (-3.9 to 2.8)
Uninsured	-1.6 (-3.3 to 0.01)	-1.4 (-2.9 to 0.04)	-0.4 (-2.8 to 2.0)

* Shown are changes in coverage (by type of insurance) before and after implementation of the provision in the ACA preventing insurers from denying coverage to children with pre-existing conditions.

†Difference-in-differences estimates were calculated with the use of a multivariate model.

‡ P<0.001.

§ P<0.05.

Table 3. Changes in Access to Health Care by Age Group, 2007-2012.*

	Unadjusted Change from Baseline		Adjusted Difference-in-Differences Estimate†
	Children with chronic conditions (n=10, 909)	Children without chronic conditions (n=41, 450)	
	Percentage Points		
All Children			
Delayed medical care due to cost	-3.2 (-4.2 to -2.1)‡	-1.1 (-1.6 to -0.6)‡	-1.6 (-2.8 to -0.5)§
Forgone medical care due to cost	-2.1 (-3.0 to -1.2)‡	-0.6 (-1.0 to -0.2)§	-1.1 (-2.2 to -0.1)§
Usual source of care	1.2 (0.1 to 2.3)§	1.6 (1.0 to 2.2)‡	-0.4 (-1.6 to 0.9)
Received well-child checkup	2.4 (0.3 to 4.6)§	4.3 (3.2 to 5.5)‡	-2.1 (-4.2 to -0.01)§
Toddlers and Infants (0-3 years)			
Delayed medical care due to cost	-1.8 (-4.1 to 0.4)	-1.1 (-1.9 to -0.4)§	-0.7 (-4.3 to 3.0)
Forgone medical care due to cost	-1.8 (-3.5 to -0.1)§	-0.7 (-1.3 to -0.01)§	-0.9 (-4.3 to 2.5)
Usual source of care	1.4 (-1.5 to 4.4)	0.9 (-0.1 to 1.9)	0.9 (-2.8 to 4.7)
Received well-child checkup	7.6 (2.8 to 12.4)§	2.5 (0.9 to 4.1)§	3.0 (-1.2 to 7.1)
Young children (4-11 years)			
Delayed medical care due to cost	-2.2 (-3.4 to -0.6)§	-0.9 (-1.6 to -0.2)§	-0.9 (-2.8 to 1.0)
Forgone medical care due to cost	-1.7 (-3.1 to -0.2)§	-0.5 (-1.0 to -0.01)§	-0.7 (-2.5 to 1.1)
Usual source of care	1.4 (-0.3 to 3.1)	1.7 (0.7 to 2.7)§	-0.4 (-2.3 to 1.6)
Received well-child checkup	1.3 (-1.4 to 4.0)	5.5 (3.8 to 7.3)‡	-3.7 (-6.7 to -0.7)§
Adolescents (12-17 years)			
Delayed medical care due to cost	-4.6 (-6.0 to-3.1)‡	-1.4 (-2.4 to -0.4)§	-2.9 (-4.6 to -1.2)‡
Forgone medical care due to cost	-2.6 (-3.6 to -1.6)‡	-0.6 (-1.4 to 0.1)	-1.8 (-3.0 to -0.6)§
Usual source of care	0.9 (-0.7 to 2.4)	1.9 (0.7 to 3.1)§	-1.1 (-3.1 to 1.0)
Received well-child checkup	3.0 (-0.6 to 6.5)	4.2 (2.0 to 6.4)‡	-1.5 (-5.5 to 2.5)

* Shown are changes in access to health care before and after implementation of the provision in the ACA preventing insurers from denying coverage to children with pre-existing conditions.

†Difference-in-differences estimates were calculated with the use of a multivariate model.

‡ P<0.001.

§ P<0.05.

Appendix Table S1. Characteristics of Children by Age and Chronic Health Condition Status at Baseline*

	Children With Chronic Conditions			Children With Chronic Conditions		
	Infants & Toddlers (0-3 years)	Young Children (4-11 years)	Adolescents (12-17 years)	Infants & Toddlers (0-3 years)	Young Children (4-11 years)	Adolescents (12-17 years)
Sex (%)						
Male	61.3±2.2	62.3±1	61±1.1	50.7±0.7	48.2±0.6	47.2±0.6
Female	38.7±2.2	37.7±1	39±1.1	49.4±0.7	51.8±0.6	52.8±0.6
Race or ethnic group						
Non-Hispanic white	44.8±2.3	53.6±1.1	63.9±1.1	54.5±0.9	57.9±0.7	59.1±0.8
Non-Hispanic black	22.9±1.8	21.1±0.9	18.0±0.9	14.0±0.6	12.3±0.4	13.7±0.5
Non-Hispanic other/multiple races	7.0±1.0	6.2±0.6	4.1±0.4	6.3±0.4	6.7±0.3	6.0±0.3
Hispanic	25.3±1.9	19.2±0.8	14.0±0.8	25.2±0.7	23.1±0.6	21.2±0.6
Income (%)†						
<100% FPG	35.1±2.3	26.5±1.0	17.2±0.8	23.7±0.7	18.1±0.5	15.2±0.5
100-199% FPG	27.4±2.1	24.1±0.9	22.5±1.0	23.5±0.6	23.4±0.6	22.0±0.6
200-399% FPG	22.6±1.8	26.2±0.9	30.6±1.0	28.4±0.7	30.7±0.6	31.8±0.6
400% + FPG	15.0±1.5	23.2±1.0	29.7±1.0	24.5±0.7	27.8±0.7	31.0±0.7
Non-English speaking household (%)	8.0±1.1	5.8±0.5	3.6±0.3	9.8±0.5	9.2±0.4	8.9±0.3
Noncitizen (%)	0.5±0.2	1.3±0.2	1.5±0.2	0.7±0.1	2.9±0.2	5.5±0.3
Single parent household (%)	39.6±2.1	36.5±1.1	35.6±1.1	23.2±0.7	25.4±0.6	28.4±0.6
Highest parental educational attainment (%)						
Less than high school	18.4±1.8	11.7±0.7	9.9±0.7	14.0±0.6	13.1±0.5	13.0±0.5
High school graduate	24.9±1.9	23.5±0.9	21.2±0.8	21.3±0.6	20.0±0.5	21.8±0.6
Some college	33.2±2.0	35.2±1.0	35.7±1.0	29.0±0.7	30.1±0.6	30.5±0.6
College degree or more	23.5±1.9	29.6±1.0	33.2±1.2	35.7±0.8	36.8±0.7	34.7±0.7
Parental work status (%)						
Any adult working full-time	62.8±2.2	69.0±1.0	74.4±1.0	73.6±0.7	78.2±0.5	79.6±0.5
Only part-time adult workers	13.7±1.6	13.2±0.7	10.4±0.6	12.0±0.5	10.9±0.4	10.4±0.4
All adults unemployed	8.5±1.3	5.9±0.5	4.3±0.5	4.8±0.3	3.9±0.2	3.6±0.3
All adults not in labor force	15.0±1.8	12.0±0.7	11±0.7	9.5±0.5	7.0±0.3	6.4±0.3

Health status (%)						
Excellent	37.7±2.2	40.6±1.1	41.1±1.1	62.5±0.7	60.1±0.6	58.8±0.7
Very good	26.1±1.7	30.2±1.0	30.2±1.0	25.4±0.7	26.4±0.5	26.7±0.6
Good	28.6±2.1	24.5±1.0	23.5±1.0	11.4±0.5	12.6±0.4	13.6±0.5
Fair or poor	7.7±1.2	4.7±0.4	5.3±0.5	0.8±0.1	1.0±0.1	1.0±0.1
Health insurance coverage (%)						
Private	39.7±2.1	49.7±1.1	59.8±1.1	51.5±0.8	59.7±0.7	64.0±0.7
Dependent ESI	37.7±2.1	46.6±1.1	57.2±1.1	48.2±0.8	55.8±0.7	59.4±0.7
Individual	1.8±0.7	2.4±0.4	1.8±0.3	2.8±0.2	3.4±0.2	3.9±0.3
Public	57.4±2.1	44.4±1.1	33.1±1.1	41.6±0.8	31.6±0.7	25.1±0.6
Uninsured	2.9±0.7	6.0±0.6	7.1±0.5	6.9±0.4	8.8±0.4	11.0±0.4
Delayed medical care due to cost	3.4±0.8	5.8±0.5	7.2±0.6	3.2±0.3	3.8±0.2	5.0±0.3
Forgone medical care due to cost	2.8±0.7	3.9±0.5	4.1±0.4	1.9±0.2	2.1±0.2	2.9±0.2
Usual source of care	95.3±1.6	94.5±0.5	94.4±0.4	95.1±0.3	93.0±0.3	90.2±0.4
Received well-child checkup	86.9±1.6	82.4±0.7	75.3±1.1	88.1±0.5	75.0±0.5	67.7±0.6

* Plus-minus values are percentages ± SE. The total numbers of children have been weighted to be representative of the U.S. non-institutionalized population of children. Percentages may not sum to 100 because of rounding. Baseline data are from the 2007-2010 National Health Interview Survey.

†Poverty levels are based on the U.S. Census Bureau poverty thresholds.