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Previous Medicaid Expansion May Have Had Lasting Positive Effects On Oral Health Of Non-Hispanic Black Children

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ABSTRACT Healthy tooth development starts early in life, beginning even before birth. We present new evidence suggesting that a historic public health insurance expansion for pregnant women and children in the United States in the 1980s and 1990s may have had long-lasting effects on the oral health of the children gaining eligibility. We estimated the relationship between adult oral health and the extent of state public health insurance eligibility for pregnant women, infants, and children throughout childhood separately for non-Hispanic whites, non-Hispanic blacks, and Hispanics. We found that expanded Medicaid coverage geared toward pregnant women and children during their first year of life was linked to better oral health in adulthood among non-Hispanic blacks. Our results also suggested that there might be a benefit to expanded public health insurance eligibility for children at ages 1–6 among non-Hispanic blacks and Hispanics. Medicaid expansions appear to have had long-lasting effects for certain low-income children and helped narrow racial/ethnic disparities in adult oral health.

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Dental caries (tooth decay) is a common condition in the United States, even among very young children. About 23 percent of US children ages 2–5 have had at least one cavity, and about 10 percent have untreated tooth decay.[1] Furthermore, non-Hispanic black and Hispanic children are twice as likely as their non-Hispanic white counterparts to have untreated tooth decay.[1]

Healthy tooth development starts early in life, beginning even before birth. The development of primary (baby) teeth begins at approximately the fourth week of pregnancy, while permanent teeth begin to form at or close to the time of birth.[2] Poor maternal oral health is associated with an increased risk of early childhood caries, defined as the presence of caries in children younger than age six.[3] This connection could stem from the fact that cariogenic bacteria, which are the primary cause of dental caries, can be transmitted from mother to child during the prenatal period and after birth through saliva.[4] The nutritional intake of the mother during pregnancy can also affect both healthy tooth development and later susceptibility to dental decay in the child.[5] Research has shown that nutritional counseling and oral health interventions during pregnancy can result in persistent improvements in child oral health.[5,6] For example, one study found that counseling pregnant women on oral health was associated with reductions in their children's caries that persisted up to ages 6–7.[6]

In addition to the connection between maternal health during pregnancy and childhood oral health, prior research suggests that care received during the first year of life could affect the development of early childhood caries.[7] Preventive visits provide an opportunity for pediatricians to assess risk factors for dental caries and counsel parents on infant dental hygiene. For exam-

ple, formula feeding on demand; having an infant spend more than ten hours per week in a child care facility; and failing to brush an infant's teeth at least twice a day, after tooth eruption, are all associated with higher levels of exposure to cariogenic bacteria.[7] Moreover, early use of dental care during the first year of life is associated with greater use of preventive dental care at other times during childhood, particularly among children at high risk for childhood caries.[8]

In this study, we examined the effects of a historic expansion in Medicaid eligibility for infants and pregnant women in the United States in the 1980s and 1990s on the adult oral health of those who gained eligibility as infants. Prior to the 1980s, Medicaid eligibility was tied to receipt of cash welfare under the Aid to Families with Dependent Children (AFDC) program. During the 1980s and 1990s, a series of congressional acts first expanded state options and later imposed requirements on states to extend Medicaid eligibility to pregnant women and infants younger than age one in families not receiving AFDC benefits and with income levels exceeding AFDC eligibility cutoffs. AFDC eligibility limits varied across states but were often considerably below the federal poverty threshold. For example, the 1979 income limit for a family of four residing in Texas was about 24 percent of the federal poverty threshold.[9] As a result, between 1979 and 1992 the percentage of women ages 15–44 who were eligible for Medicaid in the event of a pregnancy increased by more than 30 percentage points, from 12.4 percent to 43.3 percent.[9] The percentage of children eligible for public health insurance doubled under additional Medicaid expansions during this period and further increased later under the introduction of the Children's Health Insurance Program (CHIP) in 1997.[10] These expansions increased expectant mothers' receipt of prenatal care and access to health care, including dental care, among children,[10,11] as well as reduced infant and child mortality.[9–11]

An emerging literature has found improved later-life health and well-being among the children who benefited from the public health insurance expansions we studied.[12–17] This body of research builds on seminal work that developed a new measure of public health insurance eligibility to assess the concurrent effects of changes to the state-level rules governing eligibility.[9,10] By using differences in the timing of expanded eligibility for cohorts of children depending on their birthdate and state of residence, researchers have been able to track how exposure to public health insurance during infancy and childhood affects longer-term outcomes. This research has linked the public health insurance expansions of the 1980s and 1990s to improved health,[12,14–16] higher educational attainment,[13] and better socioeconomic status in young adulthood.[12,17]

These eligibility expansions may have improved later-life oral health among infants and children in a number of ways. First, previous literature has shown that these expansions increased the use of prenatal care.[9] For example, women on Medicaid during pregnancy were likely to receive counseling about proper nutrition and information about other social services such as the Special Supplemental Nutrition Program for Women, Infants, and Children,[12] which might have improved the nutritional intake of both mother and child. Second, most states provided optional dental benefits to adult Medicaid beneficiaries during the late 1980s and early 1990s.[18] Since studies have found that Medicaid coverage of preventive dental care among adults increases use of dental care and reduces the likelihood of untreated cavities,[19] these expansions might have affected child oral health indirectly through improvements in maternal oral health for children living in states that covered preventive dental services. Third, expanded coverage for infants provided new opportunities for early dental screening and treatment under Medicaid's comprehensive dental benefit for children. In addition, Medicaid eligibility for older children also grew considerably during this period, increasing their potential access to dental care.[11] Finally, as mentioned earlier, prior research has found that expanded public health insurance eligibility is linked with higher educational attainment and improved socioeconomic status in young adulthood.[12,13] Both of those factors are associated with greater rates of preventive health care use and superior health outcomes, including oral health outcomes.[20,21]

Using Behavioral Risk Factor Surveillance System (BRFSS) surveys and a sample of adults born between 1979 and 1991, we estimated the relationship between adult oral health and the extent of state public health insurance eligibility for each birth cohort for the mother while the child was in utero and then throughout their childhood. The documented impact of the public health insurance expansions we studied varied by race/ethnicity.[15] Furthermore, poor oral health is more prevalent among racial/ethnic minorities.[1] For these reasons, we estimated models separately for non-Hispanic whites, non-Hispanic blacks, and Hispanics.

Study Data And Methods

DATA, OUTCOME MEASURES, AND SAMPLE Our main data source was the BRFSS, a telephone

Addressing potential barriers to the receipt of dental care among children and adults might lessen remaining racial/ethnic oral health gaps.

survey of the civilian noninstitutionalized US population conducted monthly in all fifty states and the District of Columbia. We used the survey's oral health module administered in all states in 1999 and in subsequent even-numbered years beginning with 2002. We constructed binary indicators (yes/no) for having lost at least one tooth, between one and five teeth, and six or more teeth, based on responses to a survey question asking how many of the respondent's permanent teeth had been removed because of tooth decay or infection.

Major changes were made to the survey in 2011, including the addition of a mobile phone sample and changes to the survey weighting methodology.[22] These changes resulted in discontinuities in state-level prevalence estimates for 2011 and subsequent years that varied by survey question and state.[22,23] For these reasons, we excluded respondents to the 2012 survey from our main analysis, but results including 2012 data are available in the online Appendix.[24]

Since the public health insurance expansions we studied had the largest impact on people who were born in the 1980s, our sample included adult respondents born between 1979 and 1991 (that is, ages 19–31 at the time of the survey). Because the BRFSS does not collect date of birth, we assigned birth year using interview year and age.[25] We excluded Arizona from our sample because it did not adopt a Medicaid program until 1982. Our final sample included 70,975 non-Hispanic white, 13,005 non-Hispanic black, and 13,688 Hispanic individuals with complete demographic and tooth loss information.

MEASURING PUBLIC HEALTH INSURANCE ELIGIBILITY FOR PREGNANT WOMEN AND CHILDREN Simple comparisons of health outcomes among adults who were and were not enrolled in public health insurance as children could be biased because the likelihood of enrolling in coverage when eligible might depend on health status (for example, public health insurance might be more valuable to people in worse health) or on other factors that are correlated with health, such as risk toleration. To mediate these potential biases, our analysis used changes to public health insurance eligibility instead of information about observed insurance status (that is, as reported in the survey) to identify the effects of expanded public health insurance eligibility on later-life oral health. An additional advantage of this approach was that the estimates could be interpreted as the populationwide effects of changes in Medicaid eligibility policy.

We constructed measures of public health insurance eligibility for pregnant women and children during their first year of life, at ages 1–6, and at ages 7–18 for each birth cohort (1979–91), and by racial/ethnic group using the Annual Social and Economic Supplement (ASEC) of the Census Bureau's Current Population Survey.[26] Following the existing literature, we created a measure of the extent of state Medicaid eligibility rules by computing the percentage of a national sample eligible for Medicaid or CHIP using state, year, and age-specific eligibility information.[9,10,12,13,17] Computing these measures using a national sample instead of state-specific samples allowed us to isolate the effects of state-level changes in public health insurance eligibility driven by changes in the rules governing eligibility rather than changes to underlying socioeconomic or demographic trends. Additional details on the construction of these eligibility measures and source material is available in the Appendix.[24]

STATISTICAL ANALYSIS We linked measures of public health insurance eligibility to pregnant women and to children during their first year of life, at ages 1–6, and at ages 7–18 computed using the ASEC with adult respondents from the BRFSS differentiated by racial/ethnic group, birth year, and state of residence.[27] We then regressed the tooth loss outcomes against these measures to estimate the effects on adult oral health of increasing the percentage of people eligible for public health insurance during each of the three childhood age ranges. Our linear probability regression models controlled for demographic characteristics including age, sex, parental status, and birth-year indicators, as well as time-varying state-level characteristics measured during the year of birth, and state and survey-year fixed effects. Including birth-year indicators provided flexible control for birth cohort trends in tooth loss, while survey-year fixed effects accounted for national trends in tooth

loss over time. Controlling for state fixed effects and time-varying state-level characteristics accounted for relatively stable state-level factors and selected time-varying factors, respectively, that could have been correlated with both the propensity to expand public health insurance and population oral health.[28]

Furthermore, we controlled for concurrent state Medicaid adult dental coverage policies since states with more generous Medicaid programs in the 1980s and 1990s could also have been more generous in their provision of dental benefits during our study period. Dental coverage policies for adult beneficiaries by state and year were obtained from a recent study, which classified policies by two categories: coverage of preventive or restorative services, emergency coverage, or no coverage.[19] This control was interacted with a measure of adult eligibility for Medicaid, which is described in the Appendix.[24]

Although these controls represent a variety of state-level factors, it is possible that omitted variables could be correlated with both tooth loss and a person's exposure to eligibility for public health insurance in utero and during childhood. Therefore, our preferred specification included state-specific linear trends in birth year (that is, allowing trends in each outcome around the time of the public health insurance expansions we studied to differ by state). Results without state-specific trends are provided for comparison. All models incorporated survey weights, and standard errors are heteroscedasticity-robust and clustered by state. Models were estimated separately for each racial/ethnic group.

LIMITATIONS Our study had several limitations. First, we used adult state of residence to proxy for state of birth. Our analysis of the 2010 American Community Survey suggested that a substantial percentage of young adults did not reside in their state of birth (that is, 35 percent of non-Hispanic white, 32 percent of non-Hispanic black, and 59 percent of Hispanic adults ages 19–31), which could have biased our results. However, prior research did not find evidence of a significant correlation between public health insurance eligibility and the propensity to move from one's state of birth, which would pose the largest concern for our analysis.[12,16] Another study using a methodology similar to ours found that using state of residence instead of state of birth led to a downward bias in estimated impacts.[12] Second, our model did not take into account immigration status; therefore, some of the mothers of the young adults in our sample would not have been eligible for expanded coverage while their child was in utero, or the young adults might not have been eligible or might not have resided in the United States as children. For this reason, our measures of public health insurance eligibility might have been inflated, particularly among Hispanics, which would likely have contributed to underestimated effects. Third, we imputed year of birth because date of birth was not available, and we might have mischaracterized the year of birth and other ages of childhood for some respondents. Fourth, if the state-level control variables included in our model were highly correlated with our measures of public health insurance eligibility, this could have affected the interpretation of the estimated coefficients of interest. However, we found no evidence of excess correlation between these controls and our eligibility measures. Finally, the 1999–2010 BRFSS sample frame included only households with landline telephones, which could have led to an underrepresentation of low-income, minority, and young adult respondents.

The effects of gaining coverage can persist, and some effects might only show up later in life.

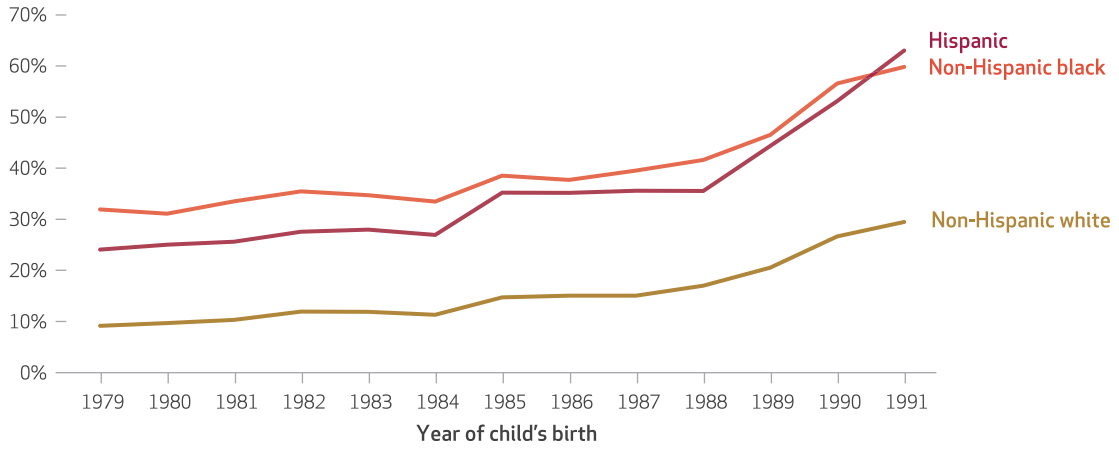
Study Results

CHANGES IN ELIGIBILITY FOR MEDICAID AND CHIP

Exhibit 1 plots the percentage of a national sample of women who would have been eligible for Medicaid coverage in the event of a pregnancy, based on the child's birth year between 1979 and 1991, by racial/ethnic group. While the percentage of women eligible for coverage increased over this period for all racial/ethnic groups, absolute increases were larger among non-Hispanic blacks and Hispanics compared to non-Hispanic whites. For example, the percentage of non-Hispanic white women who would have been eligible for coverage in the event of a pregnancy increased from 9.1 percent to 29.5 percent, or 20.4 percentage points, from 1979 to 1991. The increases for non-Hispanic blacks ranged from 31.9 percent to 59.8 percent, or 27.9 percentage points, and for Hispanics from 24.1 percent to 63.0 percent, or 38.9 percentage points.[29] Exhibit 2 plots the average number of years of Medicaid or CHIP eligibility for birth cohorts born between 1979 and 1991 for children ages 1–6 and 7–18, by racial/ethnic group. It shows a

EXHIBIT 1

Percentage of a national sample of women eligible for prenatal Medicaid coverage in the event of a pregnancy, by racial/ethnic group and year of child's birth, 1979–91



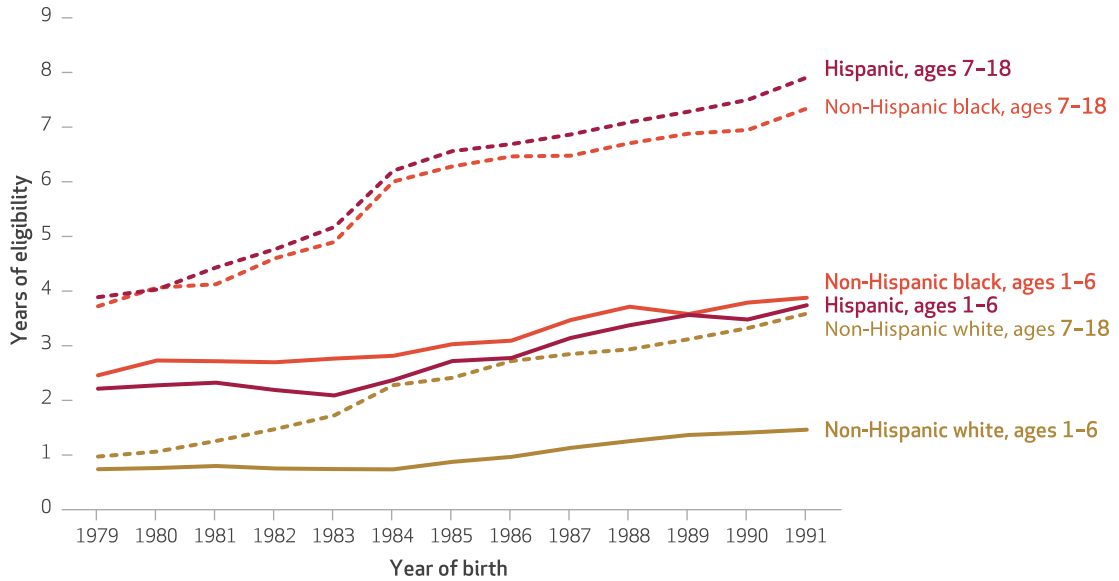
SOURCE Authors' analysis of data from the 1980–92 Annual Social and Economic Supplement of the Census Bureau's Current Population Survey. **NOTE** Information on the source for the state-specific eligibility rules is in the online Appendix (see Note 24 in text).

similar pattern as seen in Exhibit 1.

RACIAL/ETHNIC DIFFERENCES IN TOOTH LOSS AMONG YOUNG ADULTS Exhibit 3 shows the percentage of our sample with any missing teeth, between one and five missing teeth, and six or more missing teeth, by racial/ethnic group. We found that about 15 percent of non-Hispanic whites, 25 percent of non-Hispanic blacks, and 22 percent of Hispanics had at least one missing tooth. The nearly 10-percentage-point difference in this rate for non-Hispanic blacks compared to whites and the 7-percentage-point difference for Hispanics compared to whites were both statistically significant ($p < 0.01$). The majority of those with at least one missing tooth had between one and five missing teeth (compared to

EXHIBIT 2

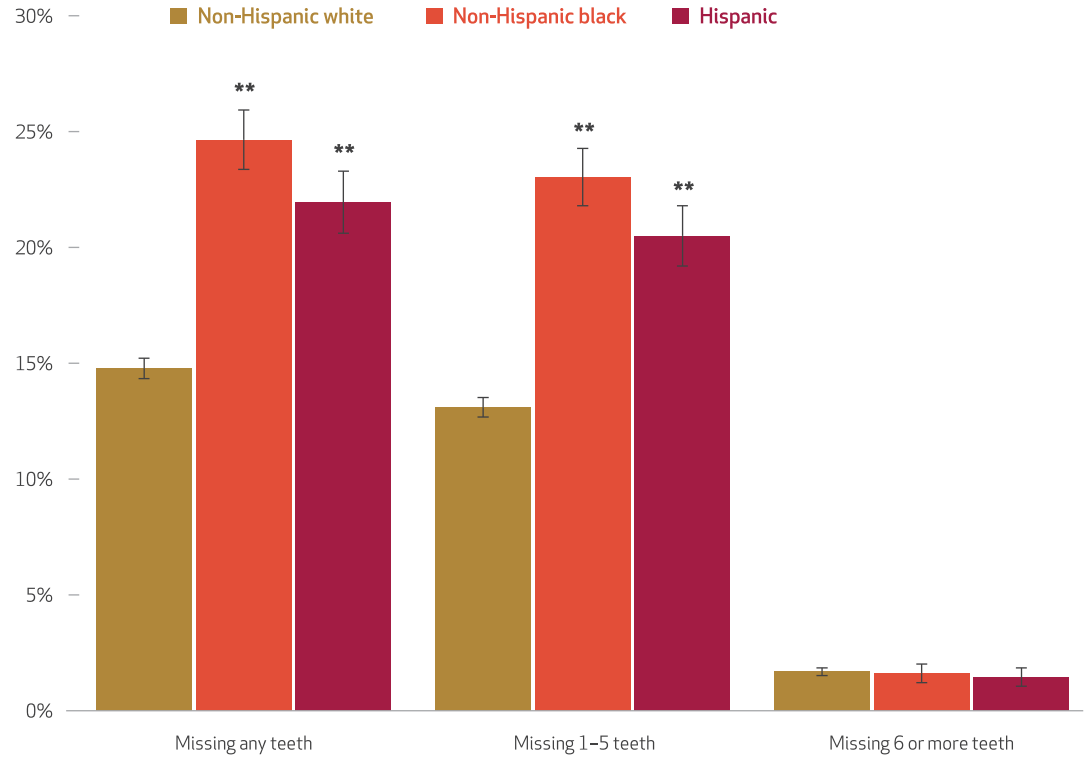
Average years of Medicaid or Children's Health Insurance Program eligibility at ages 1–6 and 7–18 for a national sample of children, by racial/ethnic group and year of birth, 1979–91



SOURCE Authors' analysis of data from the 1980–2010 Annual Social and Economic Supplement of the Census Bureau's Current Population Survey. **NOTES** Data years go up to 2010 to include the entire sample of children reaching age eighteen. Information on the source for state-specific eligibility rules is in the online Appendix (see Note 24 in text).

EXHIBIT 3

Percentage of adults (birth years 1979–91) at ages 19–31 with tooth loss, by racial/ethnic group



SOURCE Authors' analysis of data from the 1999–2010 Behavioral Risk Factor Surveillance System (BRFSS) surveys. **NOTES** The sample includes 70,975 non-Hispanic white, 13,005 non-Hispanic black, and 13,688 Hispanic adults born between 1979 and 1991, and observed in the 1999, 2002, 2004, 2006, 2008, or 2010 BRFSS survey. All estimates represent the mean percentage for our analysis sample. Whiskers represent 95% confidence intervals. Significance indicates difference compared to non-Hispanic whites. ** $p < 0.05$

six or more missing teeth).

EFFECTS OF PUBLIC HEALTH INSURANCE COVERAGE ON TOOTH LOSS Exhibit 4 presents regression estimates of the effect of a 10-percentage-point increase in a mother's public health insurance eligibility during the prenatal period and a child's first year of life and a child's eligibility at other ages during childhood on adult tooth loss outcomes by racial/ethnic group. We did not find any evidence of an effect of Medicaid eligibility during the prenatal period and first year of life on these outcomes for non-Hispanic whites or Hispanics. However, our results suggest a negative association between expanded Medicaid eligibility and tooth loss among non-Hispanic blacks. Specifically, the results of our preferred model, which included state-specific trends, implied that a 10-percentage-point increase in Medicaid eligibility during the prenatal period and the first year of life was associated with a 3.4-percentage-point reduction ($p < 0.05$) in the likelihood of having lost any permanent teeth among young adult non-Hispanic blacks. Because 24.7 percent of non-Hispanic blacks in our sample had lost any teeth (Exhibit 3), our estimate represented a 14 percent reduction in tooth loss relative to the mean. This reduction appeared to be driven by a 4-percentage-point ($p < 0.01$) decrease in the likelihood of having lost between one and five teeth—a reduction of 16 percent relative to the sample mean.[30] The results of models that did not control for state-specific trends were somewhat smaller in magnitude (Exhibit 4), implying reductions of about 2.8 percentage points in the likelihood of having lost any teeth and between one and five teeth among non-Hispanic blacks. Regardless of whether we controlled for state-specific trends, our point estimates for the association between expanded eligibility for pregnant women while their children were in utero and during the infants' first year of life and the likelihood of having lost six or more teeth for non-Hispanic blacks were relatively small and not statistically significant at conventional levels.

Similar to our findings for public health insurance eligibility for pregnant women while their children were in utero and during the infants' first year of life, we did not find evidence of improvements in tooth loss outcomes for non-

EXHIBIT 4

Regression estimates of the effect of a 10-percentage-point increase in public health insurance eligibility on tooth loss among a sample of adults ages 19–31 (birth years 1979–91), by racial/ethnic group

	Model includes state-specific trends in birth year					
	Non-Hispanic white		Non-Hispanic black		Hispanic	
Degree of tooth loss and age	No	Yes	No	Yes	No	Yes
ANY TOOTH LOSS						
Up to 12 months of age	−0.07	−0.34	−2.77*	−3.44**	1.10	0.79
Ages 1–6	0.10	0.36	−0.27	−1.00*	−0.32	−1.12***
Ages 7–18	0.08	0.30	0.26	−0.33	0.16	−0.09
LOST BETWEEN ONE AND FIVE TEETH						
Up to 12 months of age	0.34	0.22	−2.79**	−3.97***	1.00	0.91
Ages 1–6	0.00	0.24	−0.28	−1.19**	−0.35*	−1.12***
Ages 7–18	0.03	0.29	−0.21	−0.45*	0.14	−0.11
LOST SIX OR MORE TEETH						
Up to 12 months of age	−0.41	−0.56	0.02	0.53	0.10	−0.13
Ages 1–6	0.10	0.12	0.01	0.53	0.02	−0.07
Ages 7–18	0.05**	0.01	0.05	0.19	0.03	0.01

SOURCE Authors' analysis of data from the 1999–2010 Behavioral Risk Factor Surveillance System (BRFSS) surveys. **NOTES** The sample includes 70,975 non-Hispanic white, 13,005 non-Hispanic black, and 13,688 Hispanic adults born between 1979 and 1991, and observed in the 1999, 2002, 2004, 2006, 2008, or 2010 BRFSS. All estimates are expressed in terms of percentage points and represent the effect of a 10-percentage-point increase in eligibility during one year of the specified age range. Estimates were produced using linear probability models that controlled for age, sex, parental status, birth year, survey year, state-level characteristics measured during the year of birth, concurrent state Medicaid adult dental coverage policies, and state fixed effects. Some models also controlled for state-specific linear trends in birth year, as indicated. All models used survey weights, and errors were clustered by state of birth. The online Appendix contains a complete description of the public health insurance eligibility measures for pregnant women and children during their first year of life, at ages 1–6, and at ages 7–18, as well as source information for the state-specific eligibility rules (see Note 24 in text). *$p < 0.10$ **$p < 0.05$ ***$p < 0.01$

Hispanic whites associated with increased Medicaid or CHIP eligibility at other ages during childhood. The results of our preferred model including state-specific trends imply that expanded Medicaid eligibility at ages 1–6 reduces the likelihood of tooth loss in adulthood among non-Hispanic blacks and Hispanics. Specifically, we estimated that a 10-percentage-point increase in eligibility during one year between ages one and six was associated with a decline of about 1 percentage point in the likelihood of having any missing teeth among non-Hispanic blacks and Hispanics, although the former estimate was significant only at the 10 percent level. These reductions represent declines of about 4–5 percent relative to their respective means. Again, these declines appear to be driven by a reduction in the likelihood of having lost between one and five teeth, with no evidence of effects on the loss of six or more teeth.[31]

While our point estimates of the effects of eligibility at ages 1–6 on any tooth loss and the loss of between one and five teeth for non-Hispanic blacks and Hispanics were consistently negative in models that did not include state-specific trends, these estimates were much smaller in magnitude compared to those incorporating state-specific trends and were generally not statistically significant. However, these alternative models still implied a borderline significant reduction of about 0.4 percentage points in the likelihood of having lost between one and five teeth among Hispanics. Regardless of whether we controlled for state-specific trends, we found little evidence to support an association between Medicaid or CHIP eligibility at ages 7–18 and any of the tooth loss outcomes we studied.

Discussion

We found that for non-Hispanic black cohorts born between 1979 and 1991, expanded Medicaid eligibility to pregnant women and infants during the first year of life was linked to better oral health as a young adult, with a significant decrease in the likelihood of the loss of any permanent teeth. We found no evidence of a similar change in adult oral health among non-Hispanic white or Hispanic cohorts associated with the Medicaid expansions for pregnant women and infants. However, we did find some evidence that expanded eligibility for Medicaid or CHIP at ages 1–6 reduced the likelihood of the loss of permanent teeth for both non-Hispanic black and Hispanic cohorts.

Given the 27.9-percentage-point increase in Medicaid eligibility among non-Hispanic black pregnant women and infants born between 1979

and 1991 (Exhibit 1), our results imply that the Medicaid expansions of this period were associated with a reduction in tooth loss among non-Hispanic black young adults of about 8–10 percentage points, depending on the model specification. The results of our preferred model also imply, given that non-Hispanic blacks and Hispanics born in 1991 had, on average, an additional 1.5 years of Medicaid or CHIP eligibility at ages 1–6 compared to those born in 1979 (Exhibit 2), that public health insurance expansions to children during this period were associated with a reduction in tooth loss among non-Hispanic black and Hispanic young adults of about 15 percentage points. While these latter results were sensitive to model specification, even our more conservative estimates imply that the observed gap between non-Hispanic black and non-Hispanic white young adults would be approximately 80 percent larger without the Medicaid and CHIP expansions of the 1980s and 1990s.

Our findings suggest that the public health insurance expansions to pregnant women and children might have led to improvements in the oral health of young non-Hispanic black and Hispanic adults. However, this analysis cannot identify the specific pathways (for example, changes in dietary practices for pregnant women and infants, maternal oral health, dental screenings for infants and children, among others) through which these effects are operating, either in utero or in early childhood. Moreover, we could assess only a single oral health measure: loss of permanent teeth. It will be important for future research to consider impacts on precursors to tooth loss, such as untreated caries, as well as other measures of oral health, including extent of pain, abscesses, and difficulty chewing in adulthood, which might also have been affected by the expansion of public health insurance to pregnant women and children. Furthermore, understanding whether and which Medicaid program features, such as coverage of optional dental benefits,[19] higher payment rates for dental services,[19,32] or presumptive eligibility for pregnant women[33] amplified the effects of the expansions could inform future state and federal policies and questions for future research.

Our findings also raise questions about the stronger impacts of Medicaid expansions to pregnant women and infants found for young non-Hispanic black adults relative to non-Hispanic whites and Hispanics. Prior research has found that non-Hispanic blacks who are eligible for Medicaid or CHIP are more likely to enroll in the program than their non-Hispanic white counterparts,[34] which might explain why the changes in public health insurance eligibility we studied appeared to have had a larger impact on the health of non-Hispanic blacks in the targeted group. Additionally, poor oral health is more common among non-Hispanic black compared to white children;[1] therefore, there might have been more opportunity for improvement among black infants and children who gained Medicaid or CHIP eligibility. The fact that our model did not take into account immigration status, in combination with a higher potential for impediments to enrollment in public insurance for Hispanics because of language or cultural barriers, may have contributed to the weaker effects of the Medicaid expansions on pregnant women and infants for Hispanic young adults.

The connection between public policy intervention and later-life health warrants further study.

Research has shown a reduction in racial/ethnic disparities in children's dental care receipt over the past several decades,[35] and we found that expanded access to public health insurance for pregnant women and children narrowed racial/ethnic oral health disparities in young adulthood. Nonetheless, non-Hispanic blacks and Hispanics in our analysis sample were still more than 1.5 times as likely as non-Hispanic whites to have lost at least one permanent tooth. Addressing potential barriers to the receipt of needed dental care among children and adults— including affordability, transportation, provider availability, and oral health literacy—might lessen these remaining racial/ethnic oral health gaps.[36] When states face the decision of whether to roll back maintenance of effort in Medicaid and CHIP, which requires states to maintain eligibility and enrollment standards, both the availability and the generosity of alternative sources of oral health coverage could be important considerations. Our analysis suggests that these decisions could have impacts that extend well into the future.

Conclusion

This study provides suggestive evidence that expanded eligibility for public health insurance during the 1980s and 1990s may have had

long-lasting effects on oral health for the cohorts of non-Hispanic black children whose mothers gained eligibility while pregnant and during the child's first year of life. We also found more limited evidence that expanded eligibility at ages 1–6 improved adult oral health for non-Hispanic black and Hispanic children. Our results add to the growing literature that finds later-life effects of Medicaid and CHIP expansions to pregnant women and children, including lowered mortality, reduced hospital emergency department use, improved educational outcomes, and increased earnings.[12,13,15–17,37] This literature indicates that the effects of gaining coverage can persist and that some effects might only show up later in life. The fact that some of the effects of coverage might lag public health insurance expansions by many years could pose challenges to evaluating the benefits of these policies. Tooth loss is an example of an adverse health outcome that could take many years, or even decades, to develop. Although links to systemic health problems (for example, metabolic disease) that typically emerge even later in life may be difficult to discern in a relatively young study sample, one analysis found that the Medicaid and CHIP expansions we studied were associated with lowered rates of obesity and fewer hospitalizations related to endocrine, nutritional, and metabolic diseases and immunity disorders.[12] As these cohorts continue to age, the connection between public policy intervention and later-life health—which was the focus of our study on Medicaid eligibility expansions and adult oral health outcomes and other evaluations of long-term systemic health outcomes from public policy interventions—warrants further study. ■

The views expressed in this article are those of the authors and do not necessarily represent the views of the Agency for Healthcare Research and Quality, the Department of Health and Human Services, or the Urban Institute.

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24 To access the Appendix, click on the Appendix link in the box to the right of the article online.
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26 These age groups correspond with the transition from primary (baby) to permanent teeth.
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29 Because these estimates do not account for immigration status, they likely overstate the percentage of people eligible, particularly among Hispanics.
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