

Medicaid Expansion and Infant Mortality in the United States

Chintan B. Bhatt, MBBS, MPH, and Consuelo M. Beck-Sagué, MD

Objectives. To explore the effect of Medicaid expansion on US infant mortality rate.

Methods. We examined data from 2010 to 2016 and 2014 to 2016 to compare infant mortality rates in states and Washington, DC, that accepted the Affordable Care Act Medicaid expansion (Medicaid expansion states) and states that did not (non-Medicaid expansion states), stratifying data by race/ethnicity.

Results. Mean infant mortality rate in non-Medicaid expansion states rose (6.4 to 6.5) from 2014 to 2016 but declined in Medicaid expansion states (5.9 to 5.6). Mean difference in infant mortality rate in Medicaid expansion versus non-Medicaid expansion states increased from 0.573 ($P=.08$) in 2014 to 0.838 in 2016 ($P=.006$) because of smaller declines in non-Medicaid expansion (11.0%) than in Medicaid expansion (15.2%) states. The 14.5% infant mortality rate decline from 11.7 to 10.0 in African American infants in Medicaid expansion states was more than twice that in non-Medicaid expansion states (6.6%: 12.2 to 11.4; $P=.012$).

Conclusions. Infant mortality rate decline was greater in Medicaid expansion states, with greater declines among African American infants. Future research should explore what aspects of Medicaid expansion may improve infant survival. (*Am J Public Health.* 2018; 108:565–567. doi:10.2105/AJPH.2017.304218)

The future of medical insurance coverage remains uncertain in the United States. As the most frequent users of needed medical services, this uncertainty disproportionately affects mothers and infants. The Medicaid program has an excellent record of financing coverage for pregnant women in low-income populations; approximately 45% of US births are covered by Medicaid.¹ Millions of Americans were affected by The Patient Protection and Affordable Care Act (ACA; Pub L No. 111-148, 124 Stat 855 [March 2010]), which made crucial changes in health care benefits, coverage, and related regulations.² Since 2014, when ACA was implemented, the uninsured rate decreased considerably, especially in women aged 18 to 64 years (from 17% to 11%); Medicaid expansion, adopted by 31 states and Washington, DC, was reportedly largely responsible for this decline.²

The federal government requires that several specific services be covered by Medicaid.¹ Medicaid expansion states are mandated to cover 10 essential health benefits,

which include pregnancy, maternity, pediatric care, chronic disease management, breastfeeding support, contraception, mental health and substance abuse screening and treatment, and other behavioral health services recommended by the US Preventive Services Task Force.^{1,2}

Because of the large proportion of maternal, infant, and child health care and preventive services funded by Medicaid,^{1,3} Medicaid expansion may be among the most important ways in which the ACA could improve maternal and child health indicators, such as the infant mortality rate. In this study, we examined the potential effect of Medicaid expansion on infant mortality rate by comparing infant mortality rate trends in states and Washington, DC, by

whether they accepted Medicaid expansion, stratifying by race and Hispanic ethnicity.

METHODS

We created a data set of infant mortality rates from publicly available data from the 50 states and Washington, DC, from 2010 to 2016.^{4–6} Infant mortality rates by state and race/ethnicity were available for 2010 and 2015 but not 2016. We categorized the 50 states and Washington, DC, by whether they accepted (Medicaid expansion states) or declined (non-Medicaid expansion states) Medicaid expansion. We used 2010 data for baseline, because Medicaid expansion was not implemented in any region before 2014. Data were subjected to Bartlett's test for homogeneity of variances to assess the appropriateness of using the Student *t* test to compare mean infant mortality rates of Medicaid expansion and non-Medicaid expansion states and for other analyses.

Once we established its appropriateness, we compared mean infant mortality rates in Medicaid expansion with those in non-Medicaid expansion states. To assess differences in effect of Medicaid expansion by race/ethnicity, we compared changes in infant mortality rate by race/ethnicity from 2010 to 2015.

RESULTS

Only 19, including 10 southern, states declined Medicaid expansion; 31 states and Washington, DC, accepted it. Infant

ABOUT THE AUTHORS

Both authors are with Robert Stempel College of Public Health and Social Work, Department of Health Promotion and Disease Prevention, Florida International University, Miami.

Correspondence should be sent to Chintan B. Bhatt, MBBS, MPH, Robert Stempel College of Public Health and Social Work, Department of Health Promotion & Disease Prevention, Florida International University, 11200 SW 8th St, AHC 5-405, Miami, FL 33199 (e-mail: chintan.bhatt@fiu.edu). Reprints can be ordered at <http://www.ajph.org> by clicking the "Reprints" link.

This article was accepted November 1, 2017.

doi: 10.2105/AJPH.2017.304218

mortality rate declined nationally by 11.9% from 6.7 (2010) to 5.9 (2016) deaths per 1000 live births (Figure 1). Difference in mean infant mortality rate in Medicaid expansion versus non-Medicaid expansion states increased from 0.573 ($P = .08$) in 2014 to 0.599 ($P = .037$) in 2015 and 0.838 ($P = .006$) in 2016 because of mean infant mortality rate declines that were more modest in non-Medicaid expansion (11.0%) than in Medicaid expansion (15.2%) states. Mean infant mortality rate in non-Medicaid expansion states rose slightly (6.4 to 6.5) from 2014 to 2016, whereas in Medicaid expansion states, it declined from 5.9 to 5.6 per 1000 live births.

When stratified by race/ethnicity, infant mortality rate declines were most striking in African American infants—from 12.2 in 2010 to 10.7 in 2015—a 12.3% decline (Figure A, available as a supplement to the online version of this article at <http://www.ajph.org>). The 14.5% infant mortality rate decline from 11.7 in 2010 to 10.0 in 2015 in African American infants in Medicaid expansion states was more than twice the decline in African American infants in non-Medicaid expansion states (6.6%—from 12.2 in 2010 to 11.4 in 2015; $P = .012$). Declines in mean infant mortality rate from 2010 to 2015 were much smaller in White (5.3 to 5.1) and Hispanic (5.7 to 5.6) infants, in whom mortality rates did not differ significantly by Medicaid expansion in 2015 versus 2010 (Figures B and C, available as a supplement to the online version of this article at <http://www.ajph.org>).

DISCUSSION

Infant mortality rate declined in both Medicaid expansion and non-Medicaid expansion states between 2010 and 2016, meeting the *Healthy People 2020* 10% infant mortality rate decline objective nationally.⁷ However, the decline in Medicaid expansion states was more than 50% greater than in non-Medicaid expansion states. Declines and difference in mean state infant mortality rates by Medicaid expansion were greatest in African American infants, driving the overall infant mortality rate difference by Medicaid expansion and substantially reducing the infant mortality rate racial disparity.

Under pre-Medicaid expansion federal law, all pregnant women with gross family income up to 133% of federal poverty level were eligible for Medicaid coverage nationwide.⁸ For more low-income pregnant women to qualify for coverage, states could set higher income limits (up to 300% of federal poverty level).^{2,8} Nonpregnant women did not automatically qualify because of income, and eligibility criteria varied by state.⁸ All hospital-related maternity services, including vaginal and cesarean delivery, anesthesia, and postpartum care up to 90 days, were covered by Medicaid in most states, but Medicaid coverage for many health care services varied considerably by state.^{1,2,8} Medicaid expansion increased dramatically the number of women eligible for Medicaid coverage by extending eligibility to nonpregnant women with household income up to 138% of federal poverty level. Presumptive eligibility, which Medicaid expansion extends considerably, expedites access to multiple services. The ACA

benefited pregnant women with enhanced maternity benefits. However, essential health benefits for low-income women of childbearing age included treatment of chronic diseases, substance abuse screening, and, importantly, increased access to prescribed contraceptives—particularly, highly effective long-acting reversible contraceptives; this increase coincided with declines in out-of-pocket spending for contraception and numbers of abortions and births, suggesting a decline in unwanted pregnancies, which are associated with increased infant mortality rate risk.^{2,3,8,9}

Our study could not identify which features of Medicaid expansion could account for infant mortality rate reductions, especially in African American infants. However, reductions in unintended pregnancies and improved preconception, prenatal and maternal chronic disease, and mental health management for mothers throughout their child's infancy could have contributed to this reduction.

This study had several limitations. We found marked regional differences in infant mortality rates. Southern states, which are overrepresented among non-Medicaid expansion states, have had higher infant mortality rates and poverty levels compared with Medicaid expansion states for decades.¹⁰ Conversely, states that adopted Medicaid expansion had lower mean infant mortality rates even before Medicaid expansion, suggesting that factors linked to improved infant survival were more common in Medicaid expansion states and that important confounding factors were associated with both higher baseline infant mortality rates and

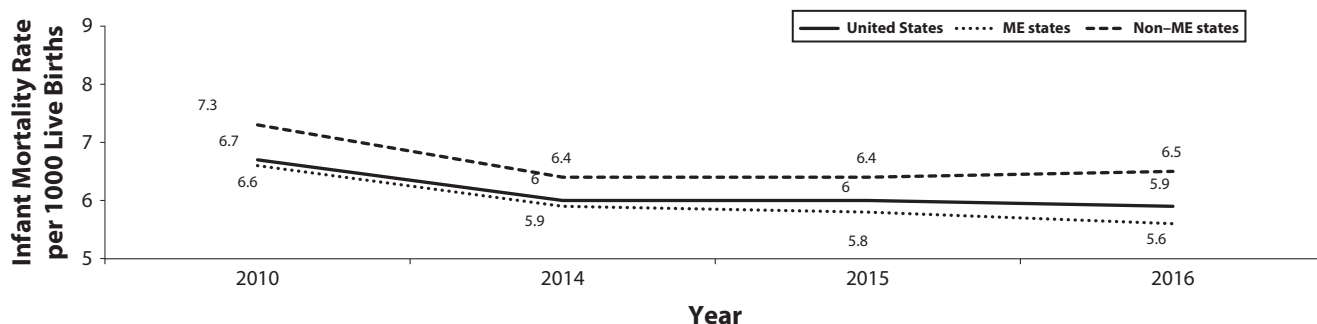


FIGURE 1—US Infant Mortality Rate by Medicaid Expansion (ME) Status and Year, 2010–2016

states' decisions to decline Medicaid expansion. Arguably, states that declined Medicaid expansion were the ones that most needed it. Because of the study's observational nature and inability to access 2015 to 2016 data in specific Medicaid expansion-related variables (e.g., states' prenatal care use and late entry, poverty levels, and other and unknown factors), we are unable to assert conclusively that Medicaid expansion per se reduced infant mortality rate.

Despite these limitations, this analysis suggests that Medicaid expansion possibly contributed to infant mortality rate reductions. Public health insurance has been known to play an important role in improving birth outcomes in low-income women.¹¹ Medicaid expansion was linked to not only reduced infant mortality but also infant mortality rate racial disparity reductions that have existed for more than a century.¹² Future directions in research should explore what aspects of Medicaid expansion may have improved infant survival, such as prenatal care use, maternal mental health care, and the role of home visiting, expanded contraception use, and other services in infant mortality rate reduction.

PUBLIC HEALTH IMPLICATIONS

Our study findings suggest that Medicaid expansion by 31 states and Washington, DC, was associated with a greater decline in infant mortality rate, particularly in African American infants, than was seen in non-Medicaid expansion states. Medicaid has served millions of US pregnant women living in poverty; Medicaid expansion has increased access to coverage and comprehensive services associated with improved maternal and infant outcomes.^{3,8–11} Medicaid expansion may have increased the effect of Medicaid for more women in need. **AJPH**

CONTRIBUTORS

C. B. Bhatt proposed the research project and refined the question and analysis process with the assistance of C. M. Beck-Sagué. C. B. Bhatt prepared the first draft of the article and the figures. C. M. Beck-Sagué provided substantive help with the analysis and editorial feedback on multiple revisions of the article. Both authors approved the final version of the article before submission.

ACKNOWLEDGMENTS

The authors gratefully acknowledge support from the Health Resources and Services Administration Maternal and Child Health Bureau (training grant T76MC28438).

The authors are also thankful to the anonymous reviewers for their helpful comments. This work also received support in the form of graduate assistantship from the Department of Health Promotion and Disease Prevention, Robert Stempel College of Public Health and Social Work.

HUMAN PARTICIPANT PROTECTION

Institutional review board approval was not required because the study used de-identified, publicly available data sets.

REFERENCES

1. Kaiser Family Foundation. Medicaid coverage of pregnancy and perinatal benefits: results from a state survey. April 27, 2017. Available at: <http://files.kff.org/attachment/Report-Medicaid-Coverage-of-Pregnancy-and-Perinatal-Benefits>. Accessed June 7, 2017.
2. Ranji U, Salganicoff A, Sobel L, Rosenzweig C. Ten ways that the House American Health Care Act could affect women. May 8, 2017. Available at: <http://www.kff.org/womenshealthpolicy/issue-brief/ten-ways-that-the-house-american-health-care-act-could-affect-women>. Accessed June 7, 2017.
3. Kaiser Family Foundation. Medicaid's role for women. June 22, 2017. Available at: <http://www.kff.org/womens-health-policy/fact-sheet/medicaids-role-for-women>. Accessed July 14, 2017.
4. Matthews TJ, MacDorman MF, Thoma ME. Infant mortality statistics from the 2013 period linked birth/infant death data set. *Natl Vital Stat Rep*. 2015;64(9):1–30.
5. United Health Foundation. America's Health Rankings: 2015 Annual Report: infant mortality rate. Available at: <https://www.americashealthrankings.org/explore/2015-annual-report/measure/IMR/state/ALL>. Accessed June 15, 2016.
6. Kaiser Family Foundation. State health facts, status of state action on the Medicaid expansion decision. Available at: <https://www.kff.org/health-reform/state-indicator/state-activity-around-expanding-medicaid-under-the-affordable-care-act/?currentTimeframe=0&sortModel=%7B%22collid%22:%22Location%22,%22sort%22:%22asc%22%7D>. Accessed June 14, 2017.
7. US Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Maternal, infant, and child health: Healthy People 2020 objectives. Available at: <https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health>. Accessed July 3, 2017.
8. Ranji U, Salganicoff A, Stewart AM, Cox M, Doamekpor L; Kaiser Family Foundation. *State Medicaid Coverage of Perinatal Services: Summary of State Survey Findings*. Menlo Park, CA: The Henry J. Kaiser Family Foundation; 2009. Publication 8014. Available at: <https://kaiserfamilyfoundation.files.wordpress.com/2013/01/8014.pdf>. Accessed July 12, 2017.
9. Peipert JF, Madden T, Allsworth JE, Secura GM. Preventing unintended pregnancies by providing no-cost contraception. *Obstet Gynecol*. 2012;120(6):1291–1297.
10. Centers for Disease Control and Prevention, National Center for Health Statistics. Infant mortality rates by state, 2015. Available at: https://www.cdc.gov/nchs/pressroom/sosmap/infant_mortality_rates/infant_mortality.htm. Accessed July 3, 2017.
11. Susan Marquis M, Long SH. The role of public insurance and the public delivery system in improving birth outcomes for low-income pregnant women. *Med Care*. 2002;40(11):1048–1059.
12. Brown Speights JS, Goldfarb SS, Wells BA, Beitsch L, Levine RS, Rust G. State-level progress in reducing the Black-White infant mortality gap, United States, 1999–2013. *Am J Public Health*. 2017;107(5):775–782.