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METHODOLOGY

Opportunities for States To Improve Infant Health Outcomes

By Cristina Novoa

To estimate the two infant health outcomes disaggregated by race and ethnicity and by state that are displayed in the first interactive, the author pooled Centers for Disease Control and Prevention vital statistics data from 2015 to 2017 to enhance the estimates' reliability. The author estimated states' overall health outcomes as well as outcomes by race and ethnicity where estimates met reliability and precision standards—at least 20 deaths or low-weight births (infants weighing less than 5.5 pounds at birth) in the numerator. These estimates form the basis of the first interactive[1] and can be explored in further detail through that platform.[2]

In selecting indicators for the interactive map[3], the author considered several criteria:

1. High-quality data must be available for all 50 states and Washington, D.C.
2. Data must have been collected and published within the past three years.
3. If an indicator represents a policy, such as Medicaid expansion, it must have a demonstrated connection to infant health outcomes and must be something that a state policymaker can implement.

The author used the most recently available data; dates are indicated in the citations. These indicators were then organized into three interrelated domains: healthy families, economic and work supports, and infant health.

Explanation of domains

Healthy families

Policy and community-level indicators that capture how well families in a state can meet their health care and physical needs include:

- **Medicaid expansion:** States are classified in one of three categories: no expansion, passed expansion but has not yet implemented, or implemented expansion.[4]
- **Medicaid eligibility:** This measure comprises two parts: the income limit as a percentage of the federal poverty line up to which infants ages 0 to 1 are eligible for Medicaid and the income limit up to which pregnant women and deemed newborns are eligible for Medicaid.[5]
- **Children's Health Insurance Program (CHIP) eligibility:** This measure examines CHIP-funded Medicaid coverage for infants as well as separate CHIP coverage for all children ages 0 to 18 by state, since not all states offer both eligibility pathways. Based on consultation with health policy experts, the author chose this metric since not all states offer both eligibility pathways.[6]
- **Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) coverage rate:** This is calculated as a percentage of beneficiaries who are eligible for WIC and receive benefits.[7]
- **Infant home visiting coverage rate:** This is calculated as a percentage of all infants served by evidence-based home visiting.[8]
- **Limited maternity care access:** This is calculated as a percentage of all women of reproductive age—ages 15 to 44—in a state living in areas with either no obstetric providers or limited access to maternity care.[9]

Economic and work supports

Policy indicators that measure a state's progress in enacting social or economic policies that improve infants' health outcomes by reducing poverty and supporting parents' ability to work include:

- **State earned income tax credit (EITC):** States are classified into one of three categories: no state EITC, nonrefundable EITC, and refundable EITC.[10]
- **State child tax credit (CTC):** States are classified into one of three categories: no state CTC, nonrefundable CTC, and refundable CTC.[11]
- **State paid leave:** States are classified into one of four levels: no local or statewide paid leave law, local paid leave for public employees only, statewide policy passed but not implemented, and statewide law implemented.[12]

- **Paid sick leave:** States are classified into one of three levels: no law requiring employers to provide workers time away from work to access preventative care or care for their own or a family member's illness; only city- or county-level laws; and statewide law implemented.[13]

Infant health

Infant health outcomes are broadly used as measures of community health and are an obvious starting point for constructing an infant health index. Specific indicators include:

- **Infant mortality ratio:** This represents the total number of infant deaths before first birthday for every 1,000 live births.[14]
- **Low birth weight percentage:** This represents the percentage of infants weighing less than 5.5 pounds at birth.[15]
- **Infant mortality disparity ratio:** This is a ratio comparing the group with the lowest infant mortality rate with the average for all other groups.[16]
- **Low birth weight disparity ratio:** This is a ratio comparing the group with the lowest rate of low birth weight to the average for all other groups.[17]

How are state scores computed?

Each domain is given its own score indicating state progress in that area, and then an overall score is computed based on these domains. To create the domain scores, the author followed the process explained below:

1. **Rescale indicators**

   Indicators represented by categorical variables, such as Medicaid expansion or all economic and work support indicators, were assigned a score ranging from 0 to 100 as follows:

   - **Medicaid expansion:** States that have not expanded Medicaid were assigned a score of 0; states that have passed expansion but have yet to implement were assigned 50; and states that have fully implemented Medicaid expansion were assigned 100.
   - **State EITC and state CTC:** States with no tax credit were assigned a score of 0; states with nonrefundable credit were assigned 50; and states with refundable credit were assigned 100.
   - **Paid leave:** States with no local and no statewide paid family and medical leave laws were assigned a score of 0; states that do not have a statewide law but have localities providing paid leave to public employees were assigned a score of 25; states that passed a statewide law but have yet to implement were assigned 50; and states that passed and implemented statewide laws were assigned 100.[18]

- **Paid sick leave:** States that have not implemented any local or statewide paid sick days laws were assigned a score of 0; states with localities that have implemented paid sick days laws were assigned a score of 50; and states that have implemented a statewide paid sick days law were assigned a score of 100.

For the remaining indicators represented by continuous variables, the author used the most recently available data to compute a rescaled score ranging from 0 to 100.

$$\textit{Score (rescaled value)} = 100 \times \frac{\textit{(observed value - lowest value)}}{\textit{(highest value - lowest value)}}$$

These transformed scores facilitate comparisons across indicators and across states.[19]

2. Reverse score-rescaled indicators as needed

For some measures, such as infant mortality and low birth weight, a lower rescaled score indicates that a state is doing well. For those measures, the author adjusted the directionality so that higher rescaled scores always indicate better outcomes.

3. Compute domain and overall scores

The author calculated the average rescaled score within each of the three domains—infant health outcome, healthy families, and economic and work support—to determine a domain score. Similarly, the author calculated the overall score by taking the average of each state's three domain scores. This yields domain scores and an overall domain score of 0 to 100, where higher scores reflect better performance on these indicators of infant health.

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Endnotes

1 See Cristina Novoa and Mathew Brady, "Interactive: Exploring Infant Health Outcomes Across Race and Ethnicity and by State," Center for American Progress, December 16, 2019, available at https://www.americanprogress.org/?p=478645.

2 Author's analysis of Centers for Disease Control and Prevention, "Linked Birth / Infant Death Records for 2007–2017 with ICD 10 codes," available at https://wonder.cdc.gov/lbd.html (last accessed August 2019); Centers for Disease Control and Prevention, "Natality for 2007–2018," available at https://wonder.cdc.gov/natality.html (last accessed August 2019).

3 See Cristina Novoa and Mathew Brady, "Interactive: Opportunities for States To Improve Infant Health Outcomes," Center for American Progress, December 16, 2019, available at https://www.americanprogress.org/?p=478644.

4 Data reflect status of state action as of November 2019. Kaiser Family Foundation, "Status of State Medicaid Expansion Decisions: Interactive Map," November 15, 2019, available at https://www.kff.org/medicaid/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/.

5 Data reflect eligibility limits as of January 2019. Kaiser Family Foundation, "Medicaid and CHIP Income Eligibility Limits for Children as a Percent of Federal Poverty Level," available at https://www.kff.org/health-reform/state-indicator/medicaid-and-chip-income-eligibility-limits-for-children-as-a-percent-of-the-federal-poverty-level/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D (last accessed November 2019); Kaiser Family Foundation, "Medicaid and CHIP Income Eligibility Limits for Pregnant Women as a Percent of Federal Poverty Level," available at https://www.kff.org/health-reform/state-indicator/medicaid-and-chip-income-eligibility-limits-for-pregnant-women-as-a-percent-of-the-federal-poverty-level/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D (last accessed November 2019).

6 Ibid.

7 Carole Trippe and others, "National- and State-Level Estimates of WIC Eligibility and WIC Program Reach in 2016: Final Report: Volume I" (Washington: U.S. Department of Agriculture, 2019), pp. 39–40, available at https://fns-prod.azureedge.net/sites/default/files/resource-files/WICEligibles2016-Volume1.pdf.

8 Due to the lapse of federal home visiting funding between September 2017 and February 2018, which could have affected home visiting rates in 2018, the author used 2017 data. See National Home Visiting Resource Center, "2018 Home Visiting Yearbook" (Arlington, VA: James Bell Associates; Washington: Urban Institute, 2018), available at https://www.nhvrc.org/wp-content/uploads/NHVRC_Yearbook_2018_FINAL.pdf.

9 The author combined county-level population data from the 2017 American Community Survey (ACS) five-year estimates with county-level data from the March of Dimes to determine the proportion of women of reproductive age living in maternity care deserts or areas with limited access to maternity care within a state. County-level data were then aggregated at the state level. March of Dimes defines a maternity care desert as a county with no hospitals offering obstetric (OB) care and no OB providers—OB-GYNs or certified nurse midwives—per 10,000 people. Areas of limited access to maternity care are defined as counties with fewer than two hospitals offering OB care and fewer than 60 OB providers per 10,000 people. See U.S. Census Bureau, "2017 American Community Survey 5-year Estimates," available at https://factfinder.census.gov/faces/nav/jsf/pages/download_center.xhtml (last accessed November 2019); March of Dimes, "Nowhere to Go: Maternity Care Deserts Across the U.S." (Arlington, VA: 2018), available at https://www.marchofdimes.org/materials/Nowhere_to_Go_Final.pdf.

10 Tax Credits for Workers and Their Families, "State Tax Credits: States with EITCs," available at http://www.taxcreditsforworkersandfamilies.org/state-tax-credits/#1468434105720-80bc7ff8-d202 (last accessed November 2019).

11 Tax Credits for Workers and Their Families, "State Tax Credits: States with CTCs," available at http://www.taxcreditsforworkersandfamilies.org/state-tax-credits/#1468434105770-44f9c6c5-52e0 (last accessed November 2019).

12 National Partnership for Women and Families, "State Paid Family and Medical Insurance Leave Laws: August 2019" (Washington: 2019), available at http://www.nationalpartnership.org/our-work/resources/economic-justice/paid-leave/state-paid-family-leave-laws.pdf; National Partnership for Women and Families, "Paid Family/Parental Leave for Municipal Employees (Not Exhaustive)" (Washington: 2018), available at http://www.nationalpartnership.org/our-work/resources/economic-justice/paid-sick-days/paid-family-leave-policies-for-municipal-employees.pdf; A Better Balance, "Comparative Chart of Paid Family and Medical Leave Laws in the United States," available at https://www.abetterbalance.org/resources/paid-family-leave-laws-chart/ (last accessed November 2019).

13 National Partnership for Women and Families, "Paid Sick Days – State and District Statutes" (Washington: 2019), available at http://www.nationalpartnership.org/our-work/resources/economic-justice/paid-sick-days/paid-sick-days-statutes.pdf.

14 Author's analysis of Centers for Disease Control and Prevention, "Linked Birth / Infant Death Records for 2007–2017 with ICD 10 codes."

15 Author's analysis of Centers for Disease Control and Prevention, "Natality Public Use Data 2007–2017."

16 This is a common relative measure in epidemiological literature. See Makram Talih and David T. Huang, "Measuring Progress Toward Target Attainment and the Elimination of Health Disparities in Healthy People 2020" (Hyattsville, MD: National Center for Health Statistics, 2016), available at https://www.cdc.gov/nchs/data/statnt/statnt27.pdf.

17 Ibid.

18 This approach resembles that used by the Institute for Women's Policy Research Status of Women data. Paid leave laws for public employees were only considered for states with no local or statewide paid family and medical leave law, as statewide law would also naturally include public employees. This analysis considers Hawaii's temporary disability insurance law as a form of paid family and medical leave. See Institute for Women's Policy Research, "Status of Women in the States: Methodology" (Washington: 2019), available at https://statusofwomendata.org/explore-the-data/methodology/#wfmethodology.

19 This scoring process closely resembles the process used by ZERO TO THREE and Child Trends in their 2019 "State of Babies Yearbook." This scaling procedure uses yields-rescaled scores that are easier to interpret than Z-scores, another common standardization method. See Kim Keating and others, "State of Babies Yearbook: 2019" (Washington: ZERO TO THREE; Bethesda, MD: Child Trends, 2019), available at https://stateofbabies.org/?utm_source=ZTT%20website&utm_medium=referral&utm_campaign=SOBY&utm_content=landingpage-02252019.