

# Mapping Diaper Insecurity in the US

*Technical Appendix*

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This dashboard is based on the National Diaper Bank Network’s Annual Member Survey data from 2024. It reflects the services provided and areas covered by basic needs banks that are members of its network. As such, it may not include all basic needs banks providing free diapers and period products.

To calculate how many diapers it would take to fill the gap faced by families in each county, we drew on demographic and financial data from the 2023 American Community Survey (ACS). [Based on previous research](#), we first estimated that families fall short by an average of 50 diapers a month for the average child age 3 and younger. We then multiplied this monthly gap by 12 months to get the annual diaper gap. Next, we multiplied the annual diaper gap by the total number of children 3 and younger living in households with incomes less than 300 percent of the federal poverty level. The final estimate reflects the number of diapers needed, at the county, state, or national level, to fill the gap families in households with low-to-moderate incomes face.

However, not all counties are represented in the 2023 ACS. To estimate the diaper gap in these counties, we approximated the number of children ages 3 and younger living in households below 300 percent of the federal poverty level using state and county-level Census Bureau data. To calculate the diaper gap, we used the same method outlined above. In the data tool, any values calculated using Census data are denoted by an asterisk. For counties with fewer than 50 estimated children, we mask the estimate for data validity and confidentiality reasons. See below for more information.

The financial security and health and well-being indicators were calculated based on the latest years of data available from the annual data releases from County Health Rankings and Roadmaps. We use data from the Survey of Income and Program Participation (SIPP), the ACS, and [Urban’s machine learning models](#) to generate the share of households with at least \$2,000 in emergency savings. We relied on 2024 data from [March of Dimes](#) to identify maternal care deserts. We use data from [the National Home Visiting Resource Center's 2024 Home Visiting Yearbook](#) to understand which counties had evidence-based early childhood home visiting services. For information on how we calculated the other health and well-being indicators, see below.

The share of children ages 3 through 4 enrolled in preschool, prekindergarten, or nursery school program, is drawn from Urban’s [Upward Mobility Dashboard](#). The share of children proficient in third-grade reading and math are drawn from Urban’s [Education-to-Workforce Framework Data Tool](#).

# Metric Definitions

The following are definitions of all the metrics in the dashboard and their data sources.

- **Child diaper gap:** Number of diapers needed to fill the gap families with young children and low-to-moderate incomes face. This is the number of children age 3 and under living in households with income less than 300 percent federal poverty level by county, state, and nationally, times 50 diapers for an average child, and times 12 months. The 50 diapers represent the number of supplemental diapers needed that households fall short of. This number is derived from Raver et al. 2010. We round the numbers up to the nearest hundred for consistency, as ACS statistics are estimates (Source: authors' calculation based on 2023 ACS data).
- **Number of children age 3 and under living in households with income less than 300 percent federal poverty level:** This value is estimated at the county, state, and national levels. For 2,573 counties, data are not available directly in the ACS. When unavailable, we estimated the county-level number by using the following formula:

$$N_{age\ 3\ and\ under\ living\ below\ 300\%\ FPL\ in\ a\ county} =$$

$$\frac{N_{age\ 3\ and\ under\ living\ below\ 300\%\ FPL\ in\ this\ county's\ state}}{N_{age\ 4\ and\ under\ in\ this\ county's\ state}} \times N_{age\ 4\ and\ under\ in\ this\ county}.$$

The three values on the right side of the equation are generally available. This estimation is based on an assumption that the state-level share of children from birth to age 3 living below 300 percent the FPL relative to children from birth to age 4 is similar to the county-level share in the given state. We round the numbers up to the nearest hundred for consistency, as ACS statistics are estimates. For 149 counties with fewer than 100 estimated children, we round them up to the nearest tenth. For counties with fewer than 50 estimated children, we mask the estimate for data validity and confidentiality reasons (Authors' calculation based on 2023 ACS data).

- **Basic needs bank coverage offering diapers:** Whether there is at least one basic needs bank offering diapers for children in a given county, the percentage of counties served by basic need banks offering diapers for children in a given state or nationally (2024 National Diaper Bank Network Annual Member Survey data).
- **The number of diapers distributed:** The number of diapers distributed annually by basic needs banks that are members of the National Diaper Bank Network at the state or national level (2024 National Diaper Bank Network Annual Member Survey data).

- *The number of children served*: The average number of children served monthly with diapers by basic needs banks that are members of the National Diaper Bank Network at the state or national level (2024 National Diaper Bank Network Annual Member Survey data).
- *Percentage of children ages 3 and younger in households with low to moderate incomes in a given racial or ethnic group*: percentage of children from birth to age 3 living in household below 300 federal poverty level by Asian American and Pacific Islander non-Hispanic, American Indian and Alaska Natives non-Hispanic, Black non-Hispanic, Hispanic, and White non-Hispanic (Authors' calculation based on 2023 ACS data).
- *Household income ratio (80th to 20th percentile)*: The ratio shows how much more money households at the 80th percentile make compared with households at the 20th percentile of household income. This number helps people understand income inequality. A higher number means there's a bigger gap between households with higher income compared with households with lower income (County Health Rankings, raw data: 2019–23 ACS data).
- *Households with at least \$2,000 in emergency savings (estimated)*: Share of households with nonretirement savings greater than or equal to \$2,000. Savings data at the local level are not available, so we used machine learning to estimate these values. We consider the following nonretirement savings as sources of emergency savings: government securities, checking accounts, savings accounts, money market accounts, certificates of deposit, municipal and corporate bonds, stocks, and mutual funds. We chose \$2,000 as a measure of emergency savings because other studies have used the same amount to gauge a family's ability to meet unexpected financial needs (Deevy et al. 2021; estimated using machine learning based on 2023 SIPP with the reference year of 2022, and 2022 ACS data).
- *Unemployment rate*: Percentage of population ages 16 and older unemployed but seeking work. (County Health Rankings, raw data: 2023 Bureau of Labor Statistics).
- *Homeownership rate*: Percentage of households who are homeowners (2023 ACS data).
- *Severe housing cost burden*: Percentage of households that spend 50 percent or more of their household income on housing (County Health Rankings, raw data: 2019–23 ACS).
- *Children covered by TANF*: Number of TANF recipients under age 6, nationally and by state. County-level data is not available (2023 Prenatal to Five Policy Network, raw data: Characteristics and Financial Circumstances of TANF Recipients, Fiscal Year 2023 | The Administration for Children and Families).

- *Rural county*: Whether 100 percent of a given county is marked as rural areas, and the share of counties that are 100 percent rural, nationally and by state ([2020 Census Bureau data](#)).
- *Maternal care desert rating*: March of Dimes defines maternal care deserts as “counties across the US in which access to maternity care services is limited or absent, either through lack of services or barriers to a woman's ability to access that care within counties.” We use their ratings to indicate whether a given county is a maternal care desert, has low access, has moderate access, or has full access to maternal care. We also report the share of counties that are maternal care deserts nationally and by state (March of Dimes, Perinatal Data Center, updated April 2025).
- *Uninsured adults*: Percentage of adults under age 65 without health insurance (County Health Rankings, raw data: 2022 Small Area Health Insurance Estimates).
- *Share of births paid for by Medicaid*: Percentage of births in 2023 financed by Medicaid, nationally and by state. County-level data is not available (Prenatal to Five Policy Network, raw data: KFF).
- *Number of births*: Number of babies born in 2023. County-level data is not available (Prenatal to Five Policy Network, raw data: Natality, 2016–23 expanded Request Form, CDC).
- *Children under age 3 covered by Medicaid or CHIP*: Percentage of children younger than age 3 covered by Medicaid or CHIP in 2023. County-level data is not available (Prenatal to Five Policy Network, raw data: Georgetown University Center for Children and Families analysis of US Census Bureau 2023 ACS).
- *Babies born with low birth weight*: Percentage of live births with low birth weight (< 2,500 grams) (County Health Rankings, raw data: 2017–23 National Center for Health Statistics - Natality Files).
- *Child care cost burden for a household with two children*: Child care costs for a household with two children as a percent of median household income (County Health Rankings, raw data: 2024 The Living Wage Institute; 2023 Small Area Income and Poverty Estimates).
- *Children ages 5 and younger served by Head Start or Early Head Start*: Share of children from birth to age 5 in poverty (living in households below 100 percent federal poverty level) served in Head Start or Early Head Start by state and in the nation (Meek et al. 2025). County-level data was not available for this analysis.

- *Children ages 3 through 4 enrolled in preschool, kindergarten, or a nursery school program:* Percentage of 3- and 4-year-olds enrolled in nursery, kindergarten, or preschool. (2019–23 ACS for state and national estimates; Urban Institute's Upward Mobility Dashboard access to preschool metric for counties, raw data: 2019–23 ACS).
- *County or counties has at least one agency offering early childhood home-visiting services:* Whether a county has at least one local agency delivering evidence-based home visiting, or the percentage of counties covered by at least one home visiting agency nationally and by state (2024 *Home Visiting Yearbook*, National Home Visiting Resource Center, analysis conducted by the Urban Institute).
- *Children proficient in third grade reading:* Percentage of students in grade 3 who meet grade-level standards in reading/English language arts as measured by state standardized tests calculated at the county level (2020 Urban Institute's Education to Workforce Framework Tool).
- *Children proficient in third grade math:* Percentage of students in grade 3 who meet grade-level standards in math as measured by state standardized tests (2020 Urban Institute's Education to Workforce Framework Tool).
- *Period products coverage:* Whether there is at least one basic needs bank that is a member of the National Diaper Bank Network offering period products in a given county, and the percentage of counties served by basic need banks offering period products in a given state or nationally (2024 National Diaper Bank Network Annual Member Survey data).
- *Number of period products distributed:* Number of period products distributed annually by basic needs banks that are members of the National Diaper Bank Network at state and national level (2024 National Diaper Bank Network Annual Member Survey data).
- *Number of clients served with period products:* Average number of people served monthly with period products by basic needs banks that are members of the National Diaper Bank Network (2024 National Diaper Bank Network Annual Member Survey data).
- *Adult disposable briefs coverage:* Whether there is at least one basic needs bank that is a member of the National Diaper Bank Network offering adult disposable briefs in a given county, and the percentage of counties served by basic need banks offering adult disposable briefs in a given state or nationally (2024 National Diaper Bank Network Annual Member Survey data).

In the dashboard, we present data for all the metrics above at the county, state, and national levels when available. Some metrics are unavailable at the county level, which we specified above. The map

breaks are determined using the [Jenks Natural Breaks method](#), based on the natural logarithm of the child diaper gap at the county level.

## References

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### **ABOUT THE NATIONAL DIAPER BANK NETWORK**

The National Diaper Bank Network (NDBN) leads a nationwide movement dedicated to helping individuals, children and families access the basic necessities they require to thrive and reach their full potential...including clean, dry diapers, period supplies and other basic needs. Launched in 2011 with the support of founding sponsor Huggies®, NDBN is dedicated to creating awareness, providing assistance and building community to #EndDiaperNeed in the US. Its active membership includes more than 300 basic needs banks serving local communities in all 50 US states, the District of Columbia and Puerto Rico. More information on NDBN and diaper need is available at [nationaldiaperbanknetwork.org](http://nationaldiaperbanknetwork.org), and on [Twitter](https://twitter.com/DiaperNetwork) (@DiaperNetwork), [Instagram](https://www.instagram.com/DiaperNetwork) (@DiaperNetwork) and [Facebook](https://www.facebook.com/NationalDiaperBankNetwork) (facebook.com/NationalDiaperBankNetwork).

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