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Health E-Stat 118: Prevalence of High and Low Weight-for-recumbent Length, and Low Recumbent Length-for-age and Weight-for-age, Among Infants and Toddlers: United States, 1971–1974 Through August 2021–August 2023

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This report presents historical trends in anthropometric (body measurement) indicators among U.S. infants and toddlers younger than age 2 years using data from the National Health and Nutrition Examination Survey (NHANES).

During August 2021–August 2023, an estimated 8.1% of infants and toddlers younger than 24 months had high weight-for-recumbent (lying down) length based on international growth standards (Table 1). Based on the Centers for Disease Control and Prevention (CDC) U.S.-specific growth charts, an estimated 7.4% of infants and toddlers had high weight-for-recumbent length.

For the time period August 2021–August 2023, an estimated 0.6% of infants and toddlers younger than 24 months had low weight-for-recumbent length, 3.5% had low recumbent length-for-age, and 2.3% had low weight-for-age based on international growth standards (Table 2). Based on the CDC growth charts, 4.6% of infants and toddlers had low weight-for-recumbent length, 5.1% had low recumbent length-for-age, and 7.4% had low weight-for-age. Low recumbent length-for-age estimates for August 2021–August 2023 did not meet National Center for Health Statistics (NCHS) statistical reliability criteria.

Data sources and methods

NHANES, conducted by NCHS, uses a stratified, multistage probability sample of the U.S. civilian noninstitutionalized population. A household interview and health examination are conducted for each survey participant. During the health examination, recumbent length (for children younger than 4 years) and weight are measured by trained technicians in a mobile examination center using standardized procedures and equipment. Observations for infants and toddlers missing a valid recumbent length or weight measurement (1.7%) were excluded.

NHANES 1976–1980 included participants 6 months and older, and NHANES 1988–1994

included participants 2 months and older. Beginning with 1999–2000, NHANES included participants from birth. Table 3 shows the sample sizes for infants and toddlers from birth to younger than 24 months with both weight and recumbent length measurements. For some estimates, the small sample size for infants and toddlers resulted in variability and statistical unreliability. However, all estimates are provided for reference. NHANES August 2021–August 2023 had an examination response rate of 25.6%, which was lower than previous cycles. For information on historical response rates, visit: https://wwwn.cdc.gov/nchs/nhanes/ResponseRates.aspx.

For additional information on NHANES methods, visit: https://wwwn.cdc.gov/nchs/nhanes/analyticguidelines.aspx.

CDC recommends using international growth standards to monitor growth in children younger than age 2 years in the United States (1). The recommended definition of excess weight in infants is +2 *z* scores (corresponding to the 97.7th percentile) on international sex-specific weight-for-recumbent length growth standards (2). The recommended definition of low weight-for-recumbent length, recumbent length-for-age, and weight-for-age in infants is –2 *z* scores (corresponding to the 2.3rd percentile) on international sex-specific growth standards (2).

Some analyses have used the CDC sex-specific growth charts to define excess weight in infants as greater than or equal to the 95th percentile of weight-for-recumbent length (3), and low weight-for-recumbent length, recumbent length-for-age, and weight-for-age as less than the 5th percentile of the respective sex-specific chart (3). This report presents estimates using both definitions.

Examination sample weights and design variables were used to account for the complex sample design. Analyses were conducted using SAS version 9.4 (SAS Institute, Cary, N.C.) and SAS-callable SUDAAN version 11.0 (RTI International, Research Triangle Park, N.C.).

This *Health E-Stat* supersedes the *Health E-Stat*s below, due to the addition of August 2021–August 2023 data:

- Prevalence of High Weight-for-recumbent Length Among Infants and Toddlers From Birth to 24 Months of Age: United States, 1971–1974 Through 2017–2018
- Prevalence of Low Weight-for-recumbent Length, Recumbent Length-for-age, and Weight-for-age Among Infants and Toddlers From Birth to 24 Months of Age: United States, 1999–2000 Through 2017–2018

References

1. Grummer-Strawn LM, Reinold C, Krebs NF. Use of World Health Organization and CDC growth charts for children aged 0–59 months in the United States. MMWR Recomm Rep. 2010;59(RR–9):1–15. Available from: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5909a1.htm.

2. World Health Organization. WHO child growth standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development. Geneva: World Health Organization. 2006. Available from: https://www.who.

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3. Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z, et al. 2000 CDC growth charts for the United States: Methods and development. Vital Health Stat 11. 2002;(246):1–203. Available from: https://www.cdc.gov/nchs/data/series/sr_11/sr11_246.pdf.

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Table 1. High weight-for-recumbent length among infants and toddlers from birth to younger than 24 months, by age: United States, 1971–1974 through August 2021–August 2023

Survey period	Birth to younger than 24 months		Birth to younger than 6 months		6 months to younger than 24 months		12 months to younger than 24 months	
	Percent	Standard error	Percent	Standard error	Percent	Standard error	Percent	Standard error
				International growth standards*				
1971–1974	---	---	---	---	---	---	6.5	1.2
1976–1980	---	---	---	---	6.3	1.0	6.8	1.1
1988–1994	---	---	---	---	7.8	0.7	8.0	1.0
1999–2000	9.2	1.3	7.5†	2.3	9.8	91.7	7.9	2.1
2001–2002	7.8	1.1	8.3	1.5	7.7	1.3	6.3	1.3
2003–2004	8.5	1.2	6.3†	2.0	9.0	1.7	9.0	2.1
2005–2006	7.1	1.0	7.4	1.5	7.1	1.4	6.7	1.7
2007–2008	8.8	0.9	5.7†	1.9	9.7	1.1	9.7	1.1
2009–2010	8.6	1.3	5.0†	2.1	9.6	1.7	9.4	2.1
2011–2012	7.1	1.3	4.0†	1.3	8.2	1.6	7.1†	2.2
2013–2014	8.1	1.2	7.3	1.9	8.4	1.5	7.9	1.8
2015–2016	8.9	0.9	8.4	2.3	9.0	1.1	8.4	1.3
2017–2018	9.6	2.1	7.7	2.2	10.3	2.7	12.3†	3.6
August 2021–August 2023	8.1	1.9	4.0†	3.8	8.9	2.2	9.9†	3.2
				CDC growth charts§				
1971–1974	---	---	---	---	---	---	6.7	1.3
1976–1980	---	---	---	---	7.1	1.0	7.2	1.2
1988–1994	---	---	---	---	8.8	0.7	8.5	1.1
1999–2000	10.4	1.6	10.3†	4.0	10.5	1.6	7.8	2.1
2001–2002	7.9	1.1	8.1	1.3	7.8	1.3	6.4	1.3
2003–2004	9.5	1.3	6.8†	1.9	10.1	1.6	9.8	2.1
2005–2006	8.2	1.1	8.5	1.8	8.1	1.5	6.9	1.7
2007–2008	9.5	1.1	6.2†	2.0	10.4	1.2	10.1	1.2
2009–2010	9.7	1.1	6.6	1.6	10.7	1.6	9.6	2.0
2011–2012	8.1	1.2	7.7	2.0	8.2	1.6	6.3†	2.0
2013–2014	9.1	1.4	7.3	1.9	9.5	1.7	8.3	1.7
2015–2016	9.9	1.2	8.9	1.9	10.2	1.3	8.1	1.5
2017–2018	9.9	1.9	8.6	1.9	10.3	2.7	11.9†	3.5
August 2021–August 2023	7.4	1.9	5.3†	4.0	7.8	2.1	7.2†	2.3

* High weight-for-recumbent length ≥ 97.7th percentile of the sex-specific weight-for-recumbent length World Health Organization growth standards (https://www.cdc.gov/growthcharts/who_charts.htm).
--- Data not available.
† Estimate does not meet National Center for Health Statistics standards of reliability. For more information, see: https://www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf.
§ CDC is Centers for Disease Control and Prevention. High weight-for-recumbent length ≥ 95th percentile of the sex-specific weight-for-recumbent length 2000 CDC growth charts (https://www.cdc.gov/growthcharts/cdc_charts.htm).

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, 1971–1974, 1976–1980, 1988–1994, 1999–2018, and August 2021–August 2023.

Table 2. Low weight-for-recumbent length, recumbent length-for-age, and weight-for-age among infants and toddlers from birth to younger than 24 months: United States, 1999–2000 through August 2021–August 2023

Survey period	Low weight-for-recumbent length		Low recumbent length-for-age		Low weight-for-age	
	Percent	Standard error	Percent	Standard error	Percent	Standard error
			International growth standards*			
1999–2000	0.4	0.3	4.9	1.1	1.6	0.8
2001–2002	0.7	0.5	3.3	0.7	0.8	0.3
2003–2004	1.1	0.6	3.9	1.1	2.5	0.8
2005–2006	1.7	0.6	2.1	0.8	1.2	0.5
2007–2008	1.2	0.5	3.8	0.7	1.4	0.5
2009–2010	0.3	0.2	3.3	0.7	1.1	0.3
2011–2012	0.9	0.4	3.2†	1.1	0.4	0.2
2013–2014	0.9	0.6	3.4	0.7	0.8	0.5
2015–2016	1.4	0.6	3.2	0.9	1.7	0.7
2017–2018	0.2	0.1	2.9	0.7	0.9	0.4
August 2021–August 2023	0.6	0.4	3.5†	2.0	2.3	1.0
			CDC growth charts§			
1999–2000	3.5	0.6	6.1	1.2	6.1	1.5
2001–2002	4.4	0.9	4.0	0.8	5.0	0.9
2003–2004	5.5†	1.6	5.0	1.3	9.0	1.7
2005–2006	5.7	1.2	3.7	0.8	7.6	1.6
2007–2008	3.6	1.0	7.1	1.2	10.0	1.7
2009–2010	3.0	0.8	4.9	0.9	7.2	1.0
2011–2012	3.6	0.6	3.7†	1.1	6.4	1.6
2013–2014	3.5	0.7	5.0	1.1	7.7	1.3
2015–2016	3.9	1.1	5.5	1.0	7.3	1.0
2017–2018	2.9	0.8	4.8	1.0	8.3	1.6
August 2021–August 2023	4.6	1.2	5.1†	2.1	7.4	1.5

* Less than 2.3rd percentile of weight-for-recumbent length, recumbent length-for-age, weight-for-age on the sex-specific World Health Organization growth standards (https://www.cdc.gov/growthcharts/who-growth-charts.htm).
† Estimate does not meet National Center for Health Statistics standards of reliability. For more information, see: https://www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf.
§ CDC is Centers for Disease Control and Prevention. Less than 5th percentile of weight-for-recumbent length, recumbent length-for-age, weight-for-age on the 2000 CDC growth charts (https://www.cdc.gov/growthcharts/cdc_charts.htm).

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, 1999–2018 and August 2021–August 2023.

Table 3. Unweighted sample size for infants and toddlers from birth to younger than 24 months with measured weight and recumbent length, by age: United States, 1971–1974 through August 2021–August 2023

Survey period	Age			
	Birth to younger than 24 months	Birth to younger than 6 months	6 months to younger than 24 months	12 months to younger than 24 months
1971–1974	---	---	---	553
1976–1980	---	---	1,014	719
1988–1994	---	---	2,442	1,287
1999–2000	671	205	466	256
2001–2002	667	179	488	256
2003–2004	766	192	574	332
2005–2006	822	220	602	345
2007–2008	719	195	524	295
2009–2010	703	182	521	317
2011–2012	584	181	403	219
2013–2014	609	159	450	240
2015–2016	630	165	465	272
2017–2018	535	172	363	221
August 2021–August 2023	238	43	195	114

--- Data not available.

SOURCE: National Center for Health Statistics, National Health and Nutrition Examination Survey, 1971–1974, 1976–1980, 1988–1994, 1999–2018, and August 2021–August 2023.