

Life Course Indicator: Exclusive Breastfeeding at Three Months

The Life Course Metrics Project

As MCH programs begin to develop new programming guided by a life course framework, measures are needed to determine the success of their approaches. In response to the need for standardized metrics for the life course approach, AMCHP launched a project designed to identify and promote a set of indicators that can be used to measure progress using the life course approach to improve maternal and child health. This project was funded with support from the [W.K. Kellogg Foundation](#).

Using an RFA process, AMCHP selected seven state teams, Florida, Iowa, Louisiana, Massachusetts, Michigan, Nebraska and North Carolina, to propose, screen, select and develop potential life course indicators across four domains: Capacity, Outcomes, Services, and Risk. The first round of indicators, proposed both by the teams and members of the public included 413 indicators for consideration. The teams distilled the 413 proposed indicators down to 104 indicators that were written up according to three data and five life course criteria for final selection.

In June of 2013, state teams selected 59 indicators for the final set. The indicators were put out for public comment in July 2013, and the final set was released in the Fall of 2013.

Basic Indicator Information

Name of indicator: Exclusive breastfeeding at three months (LC-27)

Brief description: Percent of children exclusively breastfed through three months of age

Indicator category: Family Wellbeing

Indicator domain: Risk/Outcome

Numerator: Estimate of the number of children exclusively breastfed through 3 months of age

Denominator: Number of individuals surveyed

Potential modifiers: Age, race, maternal education, income level, social and family support, marital status

Data source: Primary: National Immunization Survey (www.cdc.gov/breastfeeding/data/NIS_data/index.htm) to get annual estimates; Comparison: National Survey on Children's Health (www.childhealthdata.org) to look at risk and supportive factors.

Notes on calculation: Exclusive breastfeeding is defined as ONLY breast milk – NO solids, no water, and no other liquids.

Similar measures in other indicator sets: HP 2020 Focus area MICH-21.4; CDC Winnable Battle (Increase the proportion of infants who are breastfed by 15 percent); Title V Performance Measure #11 (similar); MIECHV Benchmark Area Improved Maternal and Newborn Health: Breastfeeding; Chronic Disease Indicator

Life Course Criteria

Introduction

Breastfeeding impacts women and infants in the immediate postpartum period and infancy and confers lifelong benefits to both. It is consistent with the life course model which states that early exposures during a critical or sensitive period during childhood influence adult health outcomes. Breastfeeding also can reduce cumulative exposures to health risks over time for both the mother and infant.¹

Implications for equity

Compared with white infants, breastfeeding initiation and continuation rates for Black infants are approximately 50 percent lower. Although the reason for this is not yet fully understood, the need to return to work earlier and lack of social support for Black women desiring to breastfeed are thought to be contributing factors to lower breastfeeding initiation and duration rates than White women.² However, breastfeeding can improve food security as it is usually readily available, low cost, and requires no preparation to provide an infant feeding.^{3,4,5} Breastfeeding also may reduce financial strain as families can save \$1,200-\$1,500 in the cost of non-specialty formula during the first year of a baby's life depending on the type, brand, and amount of formula purchased.⁶ Breastfeeding improves infant health and has been shown to decrease direct and indirect insurance claims cost and lost days from work due to caring for a sick infant; cost savings for infant illness are estimated at 3.6 billion annually in direct and indirect health care.^{7, 8}

Additionally, the relationship of breastfeeding rates to lower income is demonstrated in the studies done by the U.S. Department of Agriculture (USDA) Supplemental Nutrition Program for Women, Infants, and Children (WIC). This study found that sociodemographic factors such as WIC participation, for which eligibility is based on income, and maternal education, are inversely related with the likelihood to have ever breastfed and similarly up to six and twelve months duration.

Breastfeeding has psychosocial impacts; breastfeeding has been shown to improve bonding between a mother and her newborn as well as lower postpartum depression, which affects approximately 13 percent of all mothers. Reducing postpartum depression helps a mother better care for her needs as well as the needs of her infant.⁹ Improved maternal-infant bonding could reduce the potential for later child abuse and neglect.¹⁰

Human milk is renewable and requires no containers, paper, or fuel to prepare, transport or deliver. Widespread breastfeeding could conserve resources and energy, contributing to environmental justice.¹¹ For every one million formula fed infants, 150 million formula containers are discarded, many into landfills that pollute neighborhoods already burdened by health disparities.¹²

Public health impact

Infants who are exclusively breastfed or breastfed to any extent experience significantly fewer infections and diseases than formula fed infants. Longer and more exclusive breastfeeding also is associated with better health outcomes. A 2010 *Pediatrics* study demonstrated that the United States incurs \$13 billion in excess costs annually and suffers more than 900 preventable deaths per year because breastfeeding rates fall far below medical recommendations.¹³

Economic effects of breastfeeding can be experienced by families, insurers, employers, schools, society as a whole through decreased health care cost, missed work and school, cost of formula for families and society, etc. It is estimated that the United States could save \$10.5 billion per year in additional healthcare costs associated with breastfeeding. A cost savings to families for breastfeeding versus purchasing formula for a year is estimated to be \$1,200-\$1,500 depending on the type, brand, and amount of formula purchased.⁶

Although exclusive breastfeeding for longer than three months is recommended, this indicator is not meant as guidance. The World Health Organization and the American Academy of Pediatrics recommend exclusive breastfeeding through six months of age, and breastfeeding through six months of age is a national performance measure for the Title V MCH Services Block Grant. The Healthy People 2020 objectives for exclusive breastfeeding through 3 and 6 months of age are 46.2 percent and 25.5 percent. However, given the persistent challenge of attaining exclusive breastfeeding at six months for a large portion of the population, and the complex circumstances that align to enable a woman to breastfeed her child

to six months of age, a three month indicator allows states to understand where there might be drop off in breastfeeding from birth to three months, to allow for adjustments in policy and practice to help mothers breastfeed for longer durations.

Leverage or realign resources

The United States differs from many other developed countries that provide job-protected leave – often paid —for childbirth and newborn care. Only 59 percent of U.S. workers are eligible for the *Family Medical Leave Act* (FMLA), which provides job protection and unpaid leave up to 12 weeks for, among other things, maternity leave and newborn care. Working with the Department of Labor to expand or improve access to FMLA benefits (especially for small businesses under 50 people) could be a strategy to improve lagging U.S. breastfeeding rates. Some states have already adopted maternity leave laws to provide mothers with job reinstatement after maternity leave and financed this with temporary disability insurance programs to provide longer maternity leave.¹⁴

Other potential partners include working with the Department of Labor to utilize the Health Resources and Services Administration (HRSA) developed *Business Case for Breastfeeding* report to implement breastfeeding-friendly practices in the workplace. Additionally, state agencies need to partner with community/private physicians to support breastfeeding at the private practice level. Employers have a responsibility to provide support to breastfeeding employees since studies show that employed breastfeeding women have lower breastfeeding initiation and shorter duration rates than those who are not employed while breastfeeding.¹⁵

On March 23, 2010, the break time for nursing mothers requirement included in the ACA was signed into law. The law requires “employers to provide a nursing mother reasonable break time to express breast milk after the birth of her child.” The law also requires that employers provide “a place, other than a bathroom, that is shielded from view and free from intrusion from coworkers and the public, which may be used by an employee to express breast milk.” The duration of this requirement applies to breastfeeding employees up to the time the child is 12 months of age and applies to employers with 50 or more employees.¹⁶

Also under the ACA, women’s preventive services are covered by health plans without cost sharing. Included in these services are “comprehensive lactation support and counseling, by a trained provider during pregnancy and/or in the postpartum period, and costs for renting breastfeeding equipment.”¹⁷ The ACA also provided states with an opportunity to improve the health of MCH populations through the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) program. The law provides \$1.5 billion over five years to states, tribes and territories to develop and implement one or more evidence-based home visitation models. As part of the MIECHV program, grantees must establish and collect data on quantifiable, measurable three to five year benchmarks demonstrating that the program results in improvements in many indicators including improved maternal and newborn health.¹⁸ States have the flexibility in the program to include indicators on many facets of breastfeeding from intention and support to actual duration.

Another far-reaching program that supports breastfeeding women and families is the WIC program. The number of women, infants, and children receiving WIC benefits in 2011 was nearly 9 million per month.¹⁹ Since 1996, the USDA Food and Nutrition System has allocated a minimum expenditure for breastfeeding promotion and support activities equal to \$21 multiplied by the number of pregnant and breastfeeding women in the WIC Program, based on the average of the last three months for which USDA has final data. State agencies must spend a specified amount of the total funding for breastfeeding promotion and support. Efforts to increase and support the number of women breastfeeding also have included enhanced food packages for women breastfeeding up to 12 months and the implementation of the Peer Counseling Program.²⁰

Predict an individual’s health and wellness and/or that of their offspring

Breastfeeding is the standard method for infant feeding across multiple cultures. The health risks of not breastfeeding for mother and child are well documented.²¹ Infants who are not breastfed have a higher risk for ear and respiratory infections, atopic dermatitis, gastroenteritis, necrotizing enterocolitis, type 2 diabetes, sudden infant death syndrome (SIDS) and reduced cognitive function.^{22,23,24,25,26,27,28,29,30,31,32,33} Research shows that not breastfeeding may contribute to overweight and obesity of the child in the teenage years and even adulthood.³⁴

Women who do not breastfeed are at greater risk for heavier postpartum bleeding, a slower return of uterine tone after childbirth, and an earlier return to ovulation (reducing adequate child spacing).^{35,36,37} Women who do not breastfeed also

are at higher risk for type 2 diabetes, ovarian cancer, breast cancer, postpartum depression, hypertension, and cardiovascular disease.^{38,39,40}

Data Criteria

Data availability

National Immunization Survey (NIS)⁴¹

The NIS is a list-assisted random-digit-dialing telephone survey followed by a mailed survey to children's immunization providers that began data collection in April 1994 to monitor childhood immunization coverage. The survey is conducted jointly by the National Center for Immunizations and Respiratory Diseases and the National Center for Health Statistics, Centers for Disease Control and Prevention (CDC).

The study collects data by interviewing households in all 50 States, the District of Columbia, and selected large urban areas. The target population for the NIS is children between the ages of 19 and 35 months living in the United States at the time of the interview. Survey data are used to calculate vaccine coverage rates based on the recommended number of doses to be considered up to date, as recommended by the Advisory Committee on Immunization Practices. Estimates are produced for the nation and non-overlapping geographic areas consisting of the 50 states, the District of Columbia, and selected large urban areas. Data files for the NIS are available starting with 1995.⁴² NIS data are made available approximately nine months after the close of a survey period.

Breastfeeding data have been collected annually since 2001 through the NIS. The full reports starting from 2000 contain United States, state, and local areas breastfeeding rates by infant's age and selected socio-demographic factors (+/- half 95 percent CI) for the following indicators:

- Infants ever breastfed
- Infants breastfeeding at six months
- Infants breastfeeding at 12 months
- Infants breastfeeding at every age (birth to 18 months – United States rates only)

NIS breastfeeding data starting from 2004 contain exclusive breastfeeding rates (ONLY breast milk – NO solids, no water, and no other liquids) by selected socio-demographic factors for the U.S. and state and local areas (+/- half 95 percent CI) for the following indicators:

- Exclusively breastfed at three months
- Exclusively breastfed at six months
- Infants exclusively breastfeeding and breastfeeding at every age (birth to 18 months-United States rates only)

NIS breastfeeding data starting from 2004 also include data on formula supplementation for the U.S., state, and local areas (+/- half 95 percent CI) by socio-demographic data. Data from the NIS, along with data from other sources, are used to compile the CDC Breastfeeding Report Card which provides easily accessible state-to-state comparisons of breastfeeding indicators. The CDC Breastfeeding Report Card was first released in 2007 and is updated annually.

Indicator data sources and National Immunization Survey statistical information are available at:

www.cdc.gov/breastfeeding/data/.

NIS questions starting in 2006:

1. Was [child] ever breastfed or fed breast milk?
2. How old was [child's name] when [child's name] completely stopped breastfeeding or being fed breast milk?
3. How old was [child's name] when (he/she) was first fed formula?
4. This next question is about the first thing that [child] was given other than breast milk or formula. Please include juice, cow's milk, sugar water, baby food, or anything else that [child] may have been given, even water. How old was [child's name] when (he/she) was first fed anything other than breast milk or formula?

National Survey of Children's Health (NSCH)⁴³

The NSCH is a second data source available through the Data Resource Center for Child and Adolescent Health (DRC). It is sponsored by the Maternal and Child Health Bureau (MCHB), HRSA. The survey is administered using the State and Local Area Integrated Telephone Survey (SLAITS) methodology, and it is sampled and conducted in such a way that

state-level estimates can be obtained for the 50 states, the District of Columbia, and the Virgin Islands. The survey has been designed to emphasize factors that may relate to the well-being of children, including medical homes, family interactions, parental health, school and after-school experiences, and safe neighborhoods. The MCHB leads the development of the NSCH and NS-CSHCN survey and indicators, in collaboration with the National Center for Health Statistics (NCHS) and a national technical expert panel. The expert panel includes representatives from other federal agencies, state Title V leaders, family organizations, child health researchers, and experts in all fields related to the surveys (adolescent health, family and neighborhoods, early childhood and development etc.).

The most recent data set, the 2011-2012 NSCH, encompasses a sample size of more than 95,000 children with approximately 1,800 interviews completed in each of the 50 states and the District of Columbia. MCH programs can readily gain access to the data through datasets released by the NCHS, and on the MCHB sponsored National Data Resource Center for Child and Adolescent Health Website (www.childhealthdata.org). Data from the 2011/2012 NSCH were made available in early 2013. The survey questionnaire and raw dataset are available for download on the CDC NCHS website in SAS format. The Data Resource Center (DRC) website provides data nationwide, for all 50 states and the District of Columbia. Additionally, both the raw datasets and the website allow users to stratify measures by sociodemographic groups, including but not limited to age, sex, race/ethnicity, primary household language, household income, and special health care needs. Cleaned, state-specific datasets with new variables that include national and state indicators are available at no cost in SAS and SPSS formats. For information on how to order state-specific sets, contact cahmi@ohsu.edu. Local data is not searchable. The NSCH is not administered annually. Over the past decade, the NSCH has been administered four times. The DRC also provides mapping with state rankings for indicators.⁴⁴

Breastfeeding data are collected and percentages are pre-calculated at national, state, and HRSA region levels and by selected socio-demographic characteristics at the Data Resource Center.

The 2003 NSCH included the following breastfeeding indicators:

- Percent of children ever breastfed
- Age breastfeeding stopped
- Children who were breastfed zero to five years
- Percent of children six months to five years received breast milk any length of time

The 2007 NSCH included the following breastfeeding indicators:

- Never breastfed or given breast milk
- Exclusively breastfed or given breast milk for first six months
- Breastfed but not exclusively for first six months
- Breastfed exclusivity not known
- Age at which breastfeeding stopped
- Age at which child was first fed formula
- Age at which other foods introduced⁴⁵

Data quality

NIS

For the NIS, parents and guardians are asked for consent for a second phase of the study in which the child's pediatrician is contacted. The provider receives an immunization history questionnaire to fill out for the selected child; this information is used to ensure the accuracy and precision of the vaccination coverage estimates. CDC publishes an NIS "Guide to Quality Control Procedures" that describes the procedures used to ensure the quality of the data through all phases of the sampling, data collection, and processing.

The data are weighted to reduce potential biases from non-response and non-coverage. In addition to households with an eligible child that do not respond to the survey, an additional source of potential error is a household that responds but does not have complete provider information. Item non-response for the NIS is typically very low. However, for data elements used in weighting, the hot-deck method of imputation is used. Although in one year a total of about 14,000 data elements are imputed, these account for only 0.08 percent of all data items in the file.

Breastfeeding prevalence is calculated at the 95 percent CI for each year and estimated as weighted percentages. Household response rates for NIS ranged from 61.6 percent to 74.2 percent during the survey years examined.⁴⁶

NSCH

The main limitation of the NSCH that the information provided is from parent recollection of screenings received and perception of child's health and development over the past year survey (families are asked about breastfeeding activities that occurred primarily or exclusively before the survey collection of the child's age at 19-35 months). The survey methodology does not provide an opportunity for confirmation with medical records or physical measurements. The NSCH is weighted to represent the national population of non-institutionalized children age 0-17 years. According to the survey documentation, missing data for income were relatively high for 2011-2012 data, and a study of nonresponse patterns indicated that excluding records with missing income could impact the representativeness of the remaining data; therefore, a data file with imputed values for income is provided to be used with the datasets. Other limitations of the survey include uncertainty of the definition of exclusive breastfeeding, limited frequency of data collection, and changes to the questions that make comparison between years difficult.

The NSCH documentation presents both response rates and completion rates. For 2011-2012 data, the combined national response rate for both landline and cell phone samples was 23 percent. The completion rate, which is calculated as the proportion of households known to include children that completed all sections up to and including Section 6 (for children less than six years of age) or Section 7 (for children six to 17 years of age), was 54.1 percent for the landline sample and 41.2 percent for the cell-phone sample.

Qualitative testing of the entire 2007 National Survey of Children's Health was conducted by the NCHS. They conducted cognitive interviews with the 2007 NSCH Computer-Assisted Telephone Interview (CATI) to make sure the entire survey instrument was functioning properly. N=640 interviews were completed over three days in December 2006. The questionnaire was then revised and finalized based on feedback from participants in these interviews.

Previously validated questions and scales are used when available. All aspects of the survey are subjected to extensive literature and expert review. Respondents' cognitive understanding of the survey questions is assessed during the pretest phase and revisions made as required. All final data components are verified by NCHS and DRC/CAHMI staff prior to public release. Face validity is conducted in comparing results with prior years of the survey and/or results from other implementations of items. At this time, information on the validity and reliability of the specific breastfeeding indicator is not available.

Simplicity of indicator

Exclusive breastfeeding at three months is an indicator that is neither difficult to explain nor conceptually understand. NIS is a simple data source to use with pre-calculated percentages of three-month exclusive breastfeeding at national and state levels. Data also is available for selected socio-demographic groups. NSCH is a simple data source to use with pre-calculated percentages on a variety of breastfeeding indicators at national, state, and HRSA region levels and for selected socio-demographic groups.

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