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*Defined as a fluoride concentration of 0.7-1.2 ppm, depending on the average maximum daily air temperature in the area; optimal concentrations are set lower in warmer climates, where the populations drink more water, and higher in cooler climates.

†Available at http://www.cdc.gov/nohss/fsgrowth_text.htm.

‡EPA also has set a secondary maximum contaminant level of 2.0 ppm as a precaution against possible tooth discoloration or pitting from excess fluoride exposure during the formative period for young children. Additional information is available at http://www.epa.gov/safewater/consumer/2ndstandards.html.

§Available at http://apps.nccd.cdc.gov/gisdoh.

‖Available at http://apps.nccd.cdc.gov/mwf/index.asp.

Breastfeeding-Related Maternity Practices at Hospitals and Birth Centers—United States, 2007

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2 figures, 1 table omitted

BREASTFEEDING PROVIDES OPTIMAL NUtrition for infants and is associated with decreased risk for infant and maternal morbidity and mortality[1]; however, only four states (Alaska, Montana, Oregon, and Washington) have met all five[2] *Healthy People 2010* targets for breastfeeding.[3]* Maternity practices in hospitals and birth centers throughout the intrapartum period, such as ensuring mother-newborn skin-to-skin contact, keeping mother and newborn together, and not giving supplemental feedings to breastfed newborns unless medically indicated, can influence breastfeeding behaviors during a period critical to successful establishment of lactation.[4-9] In 2007, to characterize maternity practices related to breastfeeding, CDC conducted the first national Maternity Practices in Infant Nutrition and Care (mPINC) Survey. This report summarizes results of that survey, which indicated that (1) a substantial proportion of facilities used maternity practices that are not evidence-based and are known to interfere with breastfeeding and (2) states in the southern United States generally had lower mPINC scores, including certain states previously determined to have the lowest 6-month breastfeeding rates.† These results highlight the need for U.S. hospitals and birth centers to implement changes in maternity practices that support breastfeeding.

In 2007, in collaboration with Battelle Centers for Public Health Research and Evaluation, CDC conducted the mPINC survey to characterize intrapartum practices in hospitals and birth centers in all states, the District of Columbia, and three U.S. territories. The survey was mailed to 3,143 hospitals and 138 birth centers with registered maternity beds, with the request that the survey be completed by the person most knowledgeable of the facility's infant feeding and maternity practices.

Questions regarding maternity practices were grouped into seven categories that served as subscales in the analyses: (1) labor and delivery, (2) breastfeeding assistance, (3) mother-newborn contact, (4) newborn feeding practices, (5) breastfeeding support after discharge, (6) nurse/birth attendant breastfeeding training and education, and (7) structural and organizational factors related to breastfeeding.‡ The subscales were derived from literature reviews and consultation with breastfeeding experts. Researchers assigned scores to facility responses on a 0-100 scale, with 100 representing a practice most favorable toward breastfeeding.§ Mean scores were calculated for each subscale, generally excluding questions that were unanswered or answered "not sure" or "not applicable." Mean subscale and mean total scores for each state were calculated as an average of scores from all facilities in the state; mean total scores were rounded to the nearest whole number. U.S. scores were calculated as the mean scores for all participating facilities. A subscale score was not calculated if more than half the response data were missing, and mean total scores were not calculated if more than half the subscale scores were missing.

Responses were received from 2,690 (82%) facilities; however, data from

three respondent facilities in Guam and the U.S. Virgin Islands were excluded from this analysis because of disclosure concerns, resulting in a sample size of 2,687 facilities (2,546 hospitals and 121 birth centers) in the 50 states, the District of Columbia, and Puerto Rico.‖ The response rate among birth centers (88%) was higher than among hospitals (82%).

Among states, mean total scores ranged from 48 in Arkansas to 81 in New Hampshire and Vermont, and regional variation was evident. Mean total scores generally were higher in the western and northeastern regions of the United States and lower in the southern region. Mean total scores among facilities did not differ by annual number of births, but were higher among birth centers (86 out of 100), compared with hospitals (62).

Among the seven subscales, the highest mean score (80) was for breastfeeding assistance (i.e., assessment, recording, and instruction provided on infant feeding). Within this subscale, 99% of facilities had documented the feeding decisions of the majority of mothers in facility records, and 88% of facilities had taught the majority of mothers techniques related to breastfeeding. However, 65% of facilities advised women to limit the duration of suckling at each breastfeeding, and 45% reported giving pacifiers to more than half of all healthy, full-term breastfed infants, practices that are not supportive of breastfeeding.[7]

The lowest score (40) was for breastfeeding support after discharge. For this subscale, 70% of facilities reported providing discharge packs containing infant formula samples to breastfeeding mothers, a practice not supportive of breastfeeding.[8] Although 95% of facilities reported providing a telephone number for mothers to call for breastfeeding consultation after leaving the birth facility, 56% of facilities reported initiating follow-up calls to mothers. Facility-based postpartum follow-up visits were offered by 42% of facilities, and postpartum home visits were reported by 22% of facilities.

For newborn feeding, 24% of facilities reported giving supplements (and not breast milk exclusively) as a general practice with more than half of all healthy, full-term breastfeeding newborns, a practice that is not supportive of breastfeeding.[7,10] When asked whether healthy, full-term breastfed infants who receive supplements are given glucose water or water, 30% of facilities reported giving feedings of glucose water and 15% reported giving water, practices that are not supportive of breastfeeding. In addition, 17% of facilities reported they gave something other than breast milk as a first feeding to more than half the healthy, full-term, breastfeeding newborns born in uncomplicated cesarean births.

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CDC Editorial Note: This report summarizes results from 2,687 hospitals and birth centers in the first survey of breastfeeding-related maternity practices conducted in the United States. These results provide information regarding maternity practices and policies in birthing facilities and can serve as a baseline with which to compare future survey findings. Individual facilities and states can use this information to improve maternity practices known to influence breastfeeding in the early postpartum period and after discharge.

The findings indicate substantial prevalences of maternity practices that are not evidence-based and are known to interfere with breastfeeding. For example, 24% of birth facilities reported supplementing more than half of healthy, full-term, breastfed newborns with something other than breast milk during the postpartum stay, a practice shown to be unnecessary and detrimental to breastfeeding.[7,10] In addition, 70% of facilities reported giving breastfeeding mothers gift bags containing infant formula samples. Facilities should consider discontinuing these practices to provide more positive influences on both breastfeeding initiation and duration.[5,6,8]

The findings demonstrate that birth centers had higher mean total scores, compared with hospitals. Facility size (based on annual number of births) was not related to differences in scores. Further research is needed to better understand the difference in scores for birth centers and hospitals. Previous research has indicated that the more breastfeeding-supportive maternity practices that are in place, the stronger the positive effect on breastfeeding.[5,6,9] Comparison of the findings of this report with state breastfeeding rates also suggests a correlation between maternity practice scores and prevalence of breastfeeding. For example, in the 2006 National Immunization Survey, seven states (Alabama, Arkansas, Kentucky, Louisiana, Mississippi, Oklahoma, and West Virginia) had the lowest percentages (<30%) of children breastfed for 6 months. The same seven states were among those with the lowest mean total maternity practice scores (48-58) in mPINC.

The findings in this report are subject to at least one limitation. Data were reported by one person at each facility and might not be representative of actual maternity practices in use. However, CDC sought to prevent inaccuracies by requesting that the survey be completed by the person most knowledgeable about the facility's maternity practices, in consultation with other knowledgeable persons when necessary. The survey was pretested with key informants in nine facilities across the country, with follow-up visits to each facility to validate responses. Information from the key informants generally was found to be accurate. Further validation through patient interviews

or medical chart reviews has not been conducted.

In July 2008, mPINC benchmark reports will be provided to each facility that completed a survey, comparing the facility's subscale and total scores with the scores of all other participating facilities, other facilities in the state, and facilities of a similar size nationally. These reports also will provide the facility score for each item comprising the subscales, which can help facilities identify specific maternity practices that might be changed to better support breastfeeding. Aggregate data will be shared with state health departments to facilitate their work with birth facilities to improve breastfeeding care. CDC plans to repeat the mPINC survey periodically to assess changes over time.

The American Academy of Family Physicians,¶ American Academy of Pediatrics,# and Academy of Breastfeeding Medicine** all recommend that physicians provide intrapartum care that is supportive of breastfeeding. Hospitals and birth centers provide care to nearly all women giving birth in the United States. Thus, improving maternity practices in these facilities affords an opportunity to support establishment and continuation of breastfeeding. Establishing these practices as standards of care in birth facilities throughout the United States can improve progress toward meeting the *Healthy People 2010* breastfeeding objectives and improve maternal and child health nationwide.

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10 Available.

*Breastfeeding objectives are increases in the proportions of mothers who breastfeed their babies to meet the following targets: 75% in the early postpartum period (16-19a), 50% at 6 months (16-19b), 25% at 1 year (16-19c), 40% who exclusively breastfeed for 3 months (16-19d), and 17% who exclusively breastfeed for 6 months (16-19e). Objectives 16-19d and 16-19e were revised since the midcourse review. Additional information is available at ftp://ftp.cdc. gov/pub/health_statistics/nchs/datasets/data2010/focusarea16/o1619d.pdf and ftp://ftp.cdc.gov/pub/health_statistics/nchs/datasets/data2010/focusarea16/o1619e.pdf.

†Available at http://www.cdc.gov/breastfeeding/data/nis_data/data_2004.htm.

‡*Labor and delivery*=mother-newborn skin-to-skin contact and early breastfeeding initiation. *Breastfeeding assistance*=assessment, recording, and instruction provided on infant feeding; not giving pacifiers to breastfed newborns. *Mother-newborn contact*=avoidance of separation during postpartum facility stay. *Newborn feeding practices*=what and how breastfed infants are fed during facility stay. *Breastfeeding support after discharge*=types of support provided after mothers and babies are discharged. *Nurse/birth attendant breastfeeding training and education*=quantity of training and education that nurses and birth attendants receive. *Structural and organizational factors related to breastfeeding*=(1) facility breastfeeding policies and how they are communicated to staff, (2) support for breastfeeding employees, (3) facility not receiving free infant formula, (4) prenatal breastfeeding education, and (5) coordination of lactation care.

§Additional information regarding survey questions and scoring is available at http://www.cdc.gov/mpinc.

‖In describing the results of this study, the District of Columbia and Puerto Rico are referred to as states.

¶Available at http://www.aafp.org/online/en/home/policy/policies/h/hospuseinfantformulabreastfeeding.html.

#Available at http://aappolicy.aappublications.org/cgi/reprint/pediatrics;115/2/496.pdf.

**Available at http://www.bfmed.org/ace-files/protocol/mhpolicy_abm.pdf.

Notice to Readers: Release of Computer-Based Case Study: "*Salmonella* in the Caribbean"

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A NEW COMPUTER-BASED CASE STUDY, "*Salmonella* in the Caribbean," is now available from CDC. This self-instructional, interactive exercise is based on an outbreak investigation conducted in Trinidad and Tobago. The study teaches public health practitioners skills in outbreak investigation and allows them to apply and practice those skills. The study also focuses on the role of surveillance in identifying and characterizing public health problems, developing hypotheses about the problems, and monitoring the effectiveness of control measures.

"*Salmonella* in the Caribbean" is the fourth and final case study in the Foodborne Disease Outbreak Investigation Case Study Series. The Foodborne Disease Outbreak Investigation series was created for students familiar with basic epidemiologic and public health concepts. Each case study was developed in collaboration with the original investigators and experts from CDC, the Council of State and Territorial Epidemiologists, the U.S. Department of Agriculture, and the U.S. Food and Drug Administration.

Other case studies in the series include "Botulism in Argentina" (released 2002), "*E. coli* O157:H7 Infection in Michigan" (released 2004), and "Gastroenteritis at a University in Texas" (released 2005). The curriculum provided by these four case studies covers a wide range of outbreak investigation topics. Because these case studies are self-instructional, students can complete them at their own pace and convenience. Students can select which case study activities to undertake and focus on areas most relevant to their learning needs and goals. The computer-based case studies also can be used in the classroom as group exercises, assigned as homework, or given as tests to reinforce concepts covered in class.

All four case studies can be downloaded at no cost from CDC's Epidemiologic Case Studies website at http://www. cdc.gov/epicasestudies. They also can be purchased from the Public Health Foundation at 1-877-252-1200 or http://book store.phf.org. Additionally, students can receive continuing education credits (e.g., CEUs, CMEs, CNEs, CHES, and AAVSB-RACE) for completing selected case studies.