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Breast-, complementary and bottle-feeding practices in Kenya: stagnant trends were experienced from 1998 to 2009

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ABSTRACT

The pattern of infant and young child feeding that provides the most benefit includes being put to the breast within an hour of birth, exclusive breastfeeding for 6 months, continued breastfeeding along with complementary foods up to 2 years of age or beyond, and avoidance of any bottle-feeding. However, since there are no published data from Kenya regarding trends in these feeding practices, this research undertook time trend estimation of these feeding practices using the 1998, 2003, and 2008–2009 Kenya Demographic and Health Survey and also examined the multivariate relationships between sociodemographic factors and feeding practices with data from 2008 to 2009. Logistic regression was used to test the significance of trends and to analyze sociodemographic characteristics associated with feeding practices. There was a significant decline in early initiation of breastfeeding among children in Central and Western provinces and those residing in urban areas. Trends in exclusive breastfeeding showed significant improvement in most sociodemographic segments, whereas trends in complementary feeding and breastfeeding remained stable. Bottle-feeding significantly decreased among children aged 12 to 23 months, as well as those living in Coast, Eastern, and Rift Valley provinces. In the multivariate analysis, the province was significantly associated with feeding practices, after controlling for child's size, birth order, and parity. The stagnant (and in some cases worsening) trends in early initiation of breastfeeding and complementary feeding with breastfeeding paint a worrisome picture of breastfeeding practices in Kenya; therefore, efforts to promote the most beneficial feeding practices should be intensified.

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1. Introduction

Over the years, the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) have recognized breastfeeding as the most cost-effective, health-promoting,

and disease-preventing strategy across the globe [1,2]. Given the overwhelming evidence of the importance of breastfeeding in reducing child mortality and morbidity, especially in developing countries, breastfeeding remains at the core of achieving millennium development goals 4 and 5 [3]. Unfortunately

Abbreviations: CI, 95% confidence interval; DHS, Demographic and Health Survey; KDHS, Kenya Demographic and Health Survey; OR, odds ratio; UNICEF, United Nations Children's Fund; WHO, World Health Organization.

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though, 1.4 million child deaths and a further 44 million disability-adjusted life years experienced in low-income and middle-income countries are attributable to suboptimal breastfeeding [4].

The benefits of breastfeeding to the health and development of the child as well as the mother have been well documented [5–9]. Research reviews have highlighted various physical, motor, cognitive, and psychosocial advantages that breast milk offers to the child [7,9]. Breast milk boosts a child's immune system through protection from infection, it is a protective factor against obesity and other adult diseases such as diabetes and hypertension, and it saves money that might be used in buying breast milk substitutes. High child malnutrition rates and poor living environments characterized by unhygienic conditions and contaminated drinking water are common in developing countries. These conditions increase the risk of child infection, thus exacerbating the negative effects of not breastfeeding [3,7,10]. Breastfeeding enhances the bond between the child and mother, a prerequisite for normal child development. Furthermore, breastfeeding mothers enjoy benefits such as reduced postpartum bleeding, early uterine involution, delayed resumption of the menstrual cycle (and hence birth spacing), reduced risks of breast and endometrial cancer, and lessened risk of bone remineralization (which in turn reduces the risk of hip fractures in older age).

The global strategy for infant and young children feeding provides the roadmap toward achieving optimal child feeding practices [2]. The Kenyan government has adopted this strategy, and breastfeeding is among 11 prioritized high-impact nutrition interventions for child survival and development [11]. Among other guidelines, it is recommended that the newborn has skin-to-skin contact with the mother and start breastfeeding within 1 hour after birth [12]. This practice helps in bonding the dyad, stimulates production of colostrum milk that has high immunological benefit to the child, and also aids contraction of the mother's womb for faster expulsion of the placenta and reduced risk of heavy bleeding. Children are expected to be exclusively breastfed for 6 months and, thereafter, receive adequate complementary foods with continued breastfeeding for 2 years or beyond. Feeding a child using a bottle with a teat is highly discouraged because it endangers the baby's health and survival through contamination and interference with breastfeeding establishment [12].

Despite improvements in breastfeeding at the national level in developing countries, there are fears of decline in certain sociodemographic segments, especially among mothers in urban areas and of higher socioeconomic status [13,14]. It is also evident that breastfeeding practices in sub-Saharan Africa vary from country to country, and within countries [14,15]. Numerous cross-sectional studies have been undertaken on breastfeeding practices in Kenya [16–18], but long-term trends are not yet documented. To fill this gap, an aim of this study was to examine trends in early initiation of breastfeeding at 0 to 23 months of age, exclusive breastfeeding at 0 to 5 months of age, complementary feeding and breastfeeding at 6 to 23 months of age, and bottle-feeding at 0 to 23 months of age, using measures and definitions recommended by WHO [19]. To provide details at the levels of subgroups and subnational areas, the trends estimations were disaggregated by child's sex, child's age, province,

residence, maternal education, household wealth, maternal literacy, and media exposure.

A second aim was to examine multivariate relationships between sociodemographic factors and feeding practices with data from 2008 to 2009, the most recent available data. The health promotion conceptual model guiding this analysis is UNICEF's social-ecological model of child care, as further specified by Engle et al [20]. Child feeding practices are in focus in this analysis, as well as a critical part of a cluster of mother/child dyad care behaviors, including care for mother, child psychological and social stimulation, home hygiene practices, home health care practices, and food preparation and storage practices. To facilitate a manageable analysis, only the feeding practices "early initiation of breastfeeding," "exclusive breastfeeding the first 6 months," "complementary feeding and breastfeeding at 6 to 23 months," and "bottle feeding at 0 to 23 months" are included as endpoints. The relationships of these 4 feeding practices were examined with respect to 2 clusters of independent variables that are specified in the UNICEF model: resources for care (eg, maternal education) and contextual factors (eg, urban-rural setting). By specifying and focusing on resources for care, the analysis was guided by an unequivocal health promotion perspective, contra a disease promotion perspective, in which risk factors have a more prominent place than do protective factors.

2. Methods and materials

2.1. Data sources

The study used data from the Kenya Demographic and Health Survey (KDHS), which is publicly available [21]. The 1998, 2003, and 2008–2009 KDHS datasets used in this study are from nationally representative household surveys that collected data on maternal, paternal, and child demography, health, and nutrition. For each survey, the KDHS used a two-stage cluster sampling design whereby enumeration areas (clusters) were first drawn from a national master sample frame. Thereafter, a sample of households was drawn from the selected clusters using systematic sampling methods. Women aged 15 to 49 years and men aged 15 to 54 years from the sampled households were interviewed using specific questionnaires for women and men, following an enumeration of all household inhabitants. The interview questionnaires were based on model Demographic and Health Survey (DHS) questionnaires that underwent slight adjustments to reflect relevant issues in Kenya and conducted through a consultative process with technical institutions, government agencies, and local and international organizations. The number of households sampled were 8380 in 1998, 8561 in 2003, and 9057 in 2008 to 2009, with a response rate to the women's questionnaire (from which all the data used in this study were obtained) of greater than 96% in all surveys [22–24]. To enhance data quality, DHS conducted rigorous training for its data collection fieldworkers, and data management was closely supervised at all stages [25].

The 4 cross-sectional datasets from each survey year were merged into a single file to enable trend estimation. To compare the prevalence of breastfeeding practices, the study used identical questions asked across the 3 surveys. From

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