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**A MULTIPLE-METHOD APPROACH TO STUDYING
CHILDCARE IN AN URBAN ENVIRONMENT:
THE CASE OF ACCRA, GHANA**

Marie T. Ruel, Margaret Armar-Klemesu, and Mary Arimond

Food Consumption and Nutrition Division

International Food Policy Research Institute

2033 K Street, N.W.

Washington, D.C. 20006 U.S.A.

(202) 862-5600

Fax: (202) 467-4439

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ABSTRACT

This document summarizes findings from the Accra Urban Food and Nutrition Study (AUFNS) about the importance of care as an input to child nutrition and the relative contribution of various maternal and household resources to the provision of care. Findings from the quantitative survey (n = 556) and the in-depth observational study (n = 22) are reviewed and complemented with insights from the participatory rapid appraisals (PRAs) carried out at the onset of the study. Results of each phase of the research have been reported separately; this report aims to integrate findings from all three components. The key findings related to the five main questions addressed by this study are summarized as follows.

- *Is care an important input into child nutrition in Accra?* The Accra study provides unequivocal evidence of the critical role of childcare practices as a key input into children's nutritional status.
- *Which care practices seem to be most crucial for child nutrition?* Findings from the observational study confirmed the suggestion from the quantitative survey that optimal feeding practices during the first 6 months of life contribute to the prevention of growth failure among young infants in Accra and that the benefits may linger beyond the first year of life.
- *Which maternal and household resources contribute the most to enhancing care in Accra?* Maternal education was the characteristic most strongly associated with good childcare practices. For the majority of women, employment did not seem to be a

severe constraint for childcare and nutrition in this context. However, maternal early return to work after delivery—usually a response to economic constraints—may entail risks for children.

➤ ***What are the program and policy responses to promote optimal childcare practices in this urban context?*** Our findings support the universal consensus on the importance of investing in girls' education. In the short term, effective nutrition education and behavior change strategies can simulate some of the benefits of formal education. Support for workingwomen in the form of low-cost, community-based childcare facilities should also be given priority, as well as policies to address poverty alleviation, income generation, hygiene and sanitation, and quality control of street food sales.

➤ ***How do the three research approaches used for the measurement of childcare complement each other?*** Each method provided unique information and also enriched and informed interpretation of other study components. The “triangulation” of findings also helped generate additional hypotheses that could be tested using an iterative process of analysis. This allowed for obtaining a richer and more complete picture of the role of care as an input into child nutrition in Accra.

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Marie T. Ruel and Mary Arimond
International Food Policy Research Institute

Margaret Armar-Klemesu
Noguchi Memorial Institute for Medical Research
University of Ghana

1. INTRODUCTION

The Accra Urban Food and Nutrition Study (AUFNS) was carried out as a result of increasing concerns about the impact of rapid urbanization and the growth of urban poverty on access to adequate food and nutrition by the urban poor. While there is no evidence to suggest that the immediate determinants of nutritional status (food, health and care) are different in an urban context, differences in the constraints that households face in providing adequate levels of these inputs may be important. The high dependence on cash income, the exposure to high levels of air, food and water contamination and the increasing necessity of women to participate in income-generating activities are examples of some of the constraints faced by the urban poor. The overall aim of the AUFNS study was to understand the nature of urban poverty and the inter-relationships between urban poverty, food insecurity and malnutrition in a major urban African center (Accra). The ultimate goal was to provide high-quality information to policy makers and to promote appropriate policies and programs for intervention in urban poverty, food security and malnutrition.

The present report focuses on one of the sub-themes addressed by the Accra study, the specific role of care as an input into child nutrition and the relative contribution of a number of maternal and household resources to the provision of care. Although the importance of care for child nutrition has been increasingly recognized over the past decade, experience with measuring and quantifying care is still scant. The Accra study was an excellent opportunity to develop and test various methodologies to measure

different dimensions of care because the study was designed to include a number of research approaches, both quantitative and qualitative, and was designed by a multi-disciplinary team. The different approaches used in the study that addressed the issue of childcare included participatory community studies, a household survey, and a follow-up small observational study.

The main purpose of the present report was to integrate the findings related to childcare from these three data sources and to specifically address the following questions:

1. Is care an important input into child nutrition in Accra?
2. Which care practices seem to be most crucial for child nutrition?
3. Which maternal and household resources contribute the most to enhancing care in Accra?
4. What are the program and policy responses to promote optimal childcare practices in this urban context?
5. How do the three research approaches used for the measurement of childcare complement each other?

Although this research used a case-study approach and focused on Accra, the methodologies developed and the lessons learned from the experience are highly relevant for the current efforts aiming at incorporating childcare interventions into the design of existing nutrition and integrated child survival programs (Engle and Lhotska 1999).

The report is structured as follows: Section 2 describes the process and methodologies used in the Accra study to explore the topic of childcare; Section 3 summarizes the main findings of previous analyses carried out using data from the three research methods on childcare. The following section presents new analyses of the quantitative survey that were carried out for the purpose of this report to complement the information already available and to investigate additional hypotheses and research questions generated from previous analyses. The final section discusses and summarizes the main findings related to five key questions addressed by the study.

2. PROCESS AND METHODS USED

The research was carried out in three stages, and was preceded by an initial roundtable seminar convened in Accra to elicit the views of the main stakeholders interested in the study. The workshop brought together national policymakers, city political leaders and managers, nongovernmental organizations (NGOs), community leaders and activists, and representatives of international organizations, donor agencies and research institutions. The aim was to identify information gaps that limit the understanding of urban food and nutrition security in Accra and that hinder the formulation of effective food and nutrition policy and programs. Following this workshop, the first stage of the research was implemented and involved a series of qualitative data collection activities to rapidly familiarize the research team with the context, to identify key issues to be followed up in the quantitative phase of the study, to

guide the design of a survey questionnaire, and to build up an understanding of the Accra urban context from the point of view of the poor themselves. The second phase was a representative quantitative survey of 556 households that aimed at understanding urban livelihoods and exploring the interrelationships between urban poverty, food insecurity, and malnutrition. The final stage was an observational study of a small sub-sample of households from the quantitative survey. The main purpose of this component was to complement the information available from the survey on child caregiving practices and resources and to gain a more in-depth understanding of various aspects of childcare that could not be explored through recall techniques. The observational study provided additional information on intrahousehold processes such as food and nutrient distribution, maternal time and child feeding, and care practices.

The methods used for each of the three stages of the research have been described in detail in previous reports (Ga Mashie Study Team 1996; Ngleshie-Amanfro Study Team 1996; Maxwell et al. 1997; Maxwell et al. 2000; Armar-Klemesu and Ruel 2000). Only a brief summary is provided below.

PARTICIPATORY RAPID APPRAISAL (PRA)

The first qualitative data collection activities undertaken were rapid assessments (using PRA methodologies) of two communities in the study area: an indigenous, densely populated, low-income slum area in the center of the city, and a rapidly growing peri-urban community on the outskirts of the study area (Ga Mashie Study Team 1996; Ngleshie-Amanfro Study Team 1996). The community studies were intended to provide

rapid insight into the problems of food insecurity and related factors in order to gain an understanding of people's own perceptions of malnutrition and its causes.

The community studies had several objectives and the most relevant ones for the study of childcare were the following:

- to gain a better understanding of the range of knowledge, attitudes and practices related to food and livelihood security and procurement and provision of food and care;
- to design with community members a conceptual framework of the determinants of childhood malnutrition (using participatory mapping) based on their perceptions of the causes of malnutrition and the identification of local solutions to the problem.

Within these broad objectives, the specific themes discussed in the PRA's that are of particular relevance to the study of childcare included (1) participatory mapping of the determinants of child malnutrition; (2) a discussion about beliefs and practices related to breastfeeding; (3) a discussion of the phenomenon relatively common in Accra of overweight mother/stunted child¹ and its hypothesized causes.

¹ The phenomenon referred to as the overweight (or obese) mother/stunted child refers to the presence in the same household of an overweight or obese mother and of at least one malnourished (stunted) child.

QUANTITATIVE REPRESENTATIVE SURVEY

The quantitative survey was based on a random sample of 556 households with children under the age of three years, selected from 16 enumeration areas in the Greater Accra Metropolitan Area.² The overall goal of the survey was to provide an understanding of the nature of urban poverty and its relationship with food insecurity and malnutrition to offer decisionmakers policy options they can use to address the underlying causes of urban poverty (Maxwell et al. 2000).

The survey included the following questionnaire modules: household roster, employment and self-employment, adaptive strategies, credit, transfers and other income, urban agriculture, livestock and fishing, food habits and coping strategies, meals roster, household consumption and expenditure, maternal socio-demographic and employment characteristics, child feeding practices and the use of preventive health services, child morbidity, a hygiene spot check, and maternal and child anthropometry. All modules were based on an interview (self-reporting), except anthropometry (measurements were

² Details about the sampling strategy and sample size calculations are available in Maxwell et al. 2000. In brief, the survey used a two-stage cluster sampling strategy, with enumeration areas and households as the units of sampling, respectively. Sample sizes were calculated in order to detect statistically significant differences of 0.5 Z-scores in height-for-age with 90 percent power. The minimum required sample size was 36 households in 16 enumeration areas, for a total of 576 households. The achieved sample size was 559 households distributed among 16 primary sampling units. For many variables, however, only 556 observations were available, and this value was taken as the final sample size.

taken using standardized techniques) and the hygiene spot check, which was done by observation.³

The survey had a variety of objectives, but the ones most specifically concerned with childcare were the following:

1. To understand and quantify the role of care as an input into child nutrition;
2. To document what are the main constraints to adequate childcare in this major urban African center, with an emphasis on maternal and household-level constraints;
3. To guide the design of interventions to improve childcare practices and nutrition.

Three broad categories of care practices were measured: (1) child feeding practices, which included breastfeeding and early complementary feeding, and feeding style (whether the child was being helped to eat and what the caretaker did when the child refused to eat)⁴; (2) preventive health seeking behaviors (attendance at growth monitoring and immunizations); and (3) hygiene behaviors.

³ The hygiene spot check approach used consisted of training and standardizing field workers to observe and grade a list of predetermined hygiene-related aspects of the caregiver, the child and the house and compound in which they lived. Because of the nature of the observations (spot checks as opposed to extended observation periods), the aspects observed were proxies for positive or negative behaviors (such as whether the mother's hands were dirty or clean), rather than observations of the behaviors themselves (whether the mother washed her hands or not).

⁴ Feeding style, and more specifically, "active feeding" or maternal encouragement to eat are increasingly recognized as important determinants of children's nutrient intake. This is thought to be particularly important during periods of infectious diseases or during convalescence when children may be anorectic (Arimond and Ruel 2001; Bentley et al. 1991; Engle and Zeitlin 1996).

The characteristics studied as potential resources (or constraints) to caregiving were classified in two broad categories, maternal and household characteristics. At the maternal level, the characteristics hypothesized to be potentially important for the provision of care were: maternal age, nutritional and health status; education; employment status and use of childcare alternatives; marital status; head of householdship; and ethnicity. At the household, level, the care resources studied included: household size and crowding; household income (proxied by total per capita expenditure); household food availability (measured by using the food expenditure information to derive the amount of energy per adult equivalent available at the household level); socioeconomic status (proxied by an index of household asset ownership and quality of housing); availability of water, sanitation, and garbage disposal services; and financial support from the child's father.

OBSERVATIONAL STUDY

The main purpose of the observational study was to complement the information available from the survey on caregiving resources and practices with more in-depth information gathered through observations within the households. It was felt that the analysis of household behaviors that reflect the nature and quality of care provision for young children could not be adequately addressed by survey methods and that extensive observations in a subsample of households could add invaluable insight to the already existing information.

The study used a modified version of the “positive deviance” approach, which is based on the identification of specific behaviors and practices that differentiate children who are growing well from those who are growing poorly while sharing the same generally impoverished conditions prevalent in their communities (Zeitlin 1991). In the present study, poorly growing children in their first year of life (at the time of the survey) were identified and compared with better growers from the same age, socioeconomic status and neighborhood. Data from the quantitative survey were used to select a sample ($n = 11$) of 0-15 months old children with height-for-age (HAZ) or weight-for-age (WAZ) less than -2 Z-scores who were still malnourished according to this definition at the time of the observational study when they were 20-34 months of age (16 months later). These poor growers were compared with a group of better growers who were at or above the 40th percentile for weight and length both as infants and during their second year of life ($n = 11$).⁵

The observational study used structured interview techniques and 12-hour observations for three consecutive days in children’s homes (or where they were being cared for). Data were collected on the following maternal and household aspects: maternal time allocation patterns, with a special emphasis on care practices; maternal child feeding and care practices; and food intake of each individual member of the household, including the index child, measured by direct weighing. Data from the

⁵ For details about the selection of children, see Armar-Klemesu and Ruel 2000.

quantitative survey on family composition, maternal employment and household asset ownership were updated at the time of the observational study.

3. SUMMARY OF FINDINGS

This section presents a summary of the main findings of the three main components of the research that contributed to improving our understanding of the role of care as an input into child nutrition and to identifying the main constraints to care in Accra.

PARTICIPATORY RAPID APPRAISAL (PRA) STUDIES

The findings of the PRA studies summarized here relate to the following three topics: (1) perceptions about childhood malnutrition and its determinants; (2) knowledge and attitudes regarding breastfeeding; and (3) perceptions about the causes of the obese mother/stunted child phenomenon. The reason for including this last topic as part of the PRA studies was that the researchers had observed this phenomenon in the communities where the study took place and were perplexed about its etiology. They hypothesized that the occurrence of obesity among women in households where at least one child was stunted suggested that malnutrition in this case was not a problem of household food insecurity (or lack of economic resources), but rather one of inadequate intrahousehold distribution of resources and inadequate child feeding and caregiving practices possibly

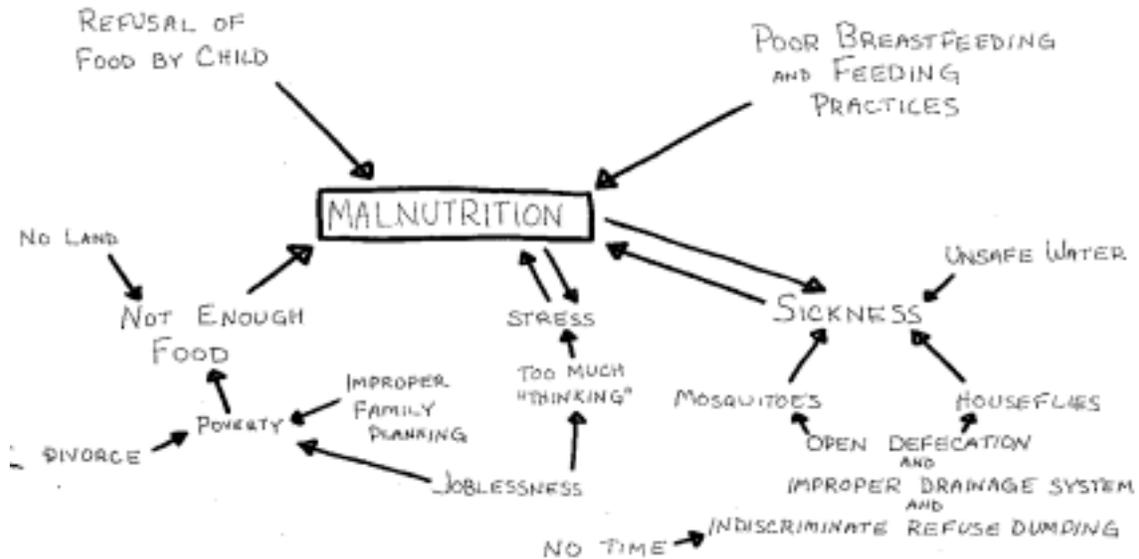
resulting from poor maternal knowledge and education. This issue was discussed in the PRA studies.

Perceptions About Childhood Malnutrition and Its Determinants

Participatory concept-mapping methods were used to discuss the concept of childhood malnutrition with groups of women in different areas of the city. The exercise consisted of asking participants in focus groups to brainstorm about all possible causes of child malnutrition, then noting each response on a card and asking participants to arrange the cards in a way that reflected their understanding of causes and effects. An example of the results of one such exercise carried out with a group of women from a peri-urban community (Ngleshie Amanfro) is presented in Figure 1. This concept map depicted a rather sophisticated understanding of various causes of malnutrition, especially given that participants were mainly illiterate women with little or no formal schooling.

Various features of the well-known UNICEF conceptual framework (UNICEF 1990) were easily recognizable in the map, with participants' analysis going beyond the initial emphasis they placed on the poverty—food insecurity—malnutrition connection. General perceptions of the root causes of malnutrition could be classified in three main categories of determinants:

Figure 1—Results of the participatory concept mapping exercise on the causes of child malnutrition in Ngleshie Amanfro



Source: Ngleshie-Amanfro Study Team 1996.

1. Income, unemployment, poverty and food insecurity;
2. Illness, poor environmental hygiene and sanitation, overcrowding, and food contamination;
3. Low education and ignorance, and social factors such as stress, “irresponsible parents,” and tiredness.

This map, and many other similar ones made by various groups throughout the city, provided interesting information. It showed that food insecurity was seen as a result of unemployment, landlessness and several features of household structure, and was

identified as a main determinant of childhood malnutrition. Other proximal determinants identified included poor health (sickness), poor breastfeeding and other child feeding practices, maternal (and/or household) stress resulting from unemployment and poverty, and the child's lack of appetite (which was seen as an independent factor). Poor health was viewed as a result of a combination of environmental factors (unsafe water, mosquitoes, house flies) as well as unhygienic practices such as open defecation and indiscriminate refuse dumping. It is noticeable that knowledge and education were not included in the conceptual model, although the concept of poor nurturing, expressed in terms of "irresponsible" and stressed parents was highlighted. The map clearly indicated that women were well aware of the importance of good caregiving practices, especially with respect to feeding and hygiene, and that they considered lack of time to be a major constraint to good care.

Knowledge and Attitudes Regarding Breastfeeding

Breastfeeding is universal and generally prolonged in Accra, with the usual age of weaning being between 18 – 24 months. Exclusive breastfeeding is, however, rare and water, and in some cases supplements, can be given right from birth or within a week of delivery. Conflicting advice from older family members, midwives and medical personnel has been noted to be a major source of confusion and distress. This was a common concern as expressed by one mother from Ngleshie Amanfro:

“The medical staff said it was okay to give water that had been boiled and then cooled to the baby. Now that I have had my second baby, the same staff say it is not good to give water for six months. I am confused. Our elders say my child will die if I did not give her water to drink” (Ngleshie-Amanfro Study Team 1996).

However there were examples of mothers who had followed the advice from nurses and community-based health personnel recommending exclusive breastfeeding for six months, and one mother proudly proclaimed the benefits:

“I breastfed my baby for six months. No water, no porridge. At nine months you can see for yourself that my baby is strong and healthy. But I faced a lot of opposition in giving my baby no water for six months” (Ngleshie-Amanfro Study Team 1996).

The Phenomenon of Obese Mother/Stunted Child

The observation of undernutrition in children alongside a tendency towards obesity in adult women in Accra generated discussions centered on the care of children. Focus groups specifically designed to explore the issue indicated a consensus among participants that the observed phenomenon was common, although views as to its causes were divergent. Men tended to blame the situation on “irresponsible mothers.” On probing, however, many admitted that they themselves contributed little to the upkeep of their own children. Some women participants suggested that the causes had to do with a grossly unequal distribution of resources for purchasing street foods, combined with

inadequate supervision of what the children actually purchased and consumed. Others suggested poor supervision in other aspects, particularly the child's health and hygiene, and attributed the poor care to either mothers being overworked, or simply being "irresponsible." Being "irresponsible" was captured by one woman's description:

"[She, the "irresponsible mother"] might even have a bleached face⁶ and spend all her money on expensive clothes and shoes, and spend all her time attending outdoorings and funerals⁷ (...)" (Ga Mashie Study Team 1996).

Still others suggested that stress contributed to both the overweight mother and the underweight child.

The findings suggest that participants in the focus groups recognized that, at least in households where both childhood malnutrition and maternal obesity prevailed, child malnutrition may not have been the result of household food insecurity, but rather, it reflected problems of inadequate distribution of resources, poor maternal care and "irresponsible" behaviors.

⁶ This is the lightening of the face with chemicals. It is a known fact that mothers with "bleached" faces who send their severely malnourished children for rehabilitation at the Princess Marie Louise Hospital in Accra, are often not spared the wrath of health personnel.

⁷ Outdoorings is the introduction of the newborn to the outside world usually a week after delivery. Outdoorings and funerals are big events where friends and family freely give donations to the bereaved or the new mother. Whilst both men and women participate in these events, women outnumber men by far, the idea being that if you support someone during these difficult times you will also receive similar support. However such occasions become costly due to the expense involved not only because of the money one is compelled to donate but friends and family members may opt to buy and wear similar clothing for the occasion. This means such expense is multiplied as often as one makes it a habit of attending.

The findings of the PRA studies were used to refine the survey objectives, to design the study and to prepare the survey questionnaires. The survey instruments were designed to capture all the dimensions of household resources identified in the PRAs and to complement them with the child and maternal characteristics that were hypothesized to be determinants of child malnutrition from the general literature on the topic (most factors overlapped). The aspects that could not be adequately covered by the quantitative survey included: intrahousehold allocation of resources, individual and household dietary intake, maternal time allocation and maternal “nurturing” skills. To the extent possible, these dimensions were explored in the observational study that was carried out after the quantitative survey in a small sample of households. The concepts of stress and “irresponsible mothers” were not addressed specifically in any of the components of the study because of resources constraints, although they appeared to be important at least from the point of view of the participants in the PRA work.

QUANTITATIVE SURVEY

This section summarizes the findings from the analysis of the role of childcare for nutrition and the analysis of the maternal and household constraints to good childcare practices in Accra. Detailed reports on this work are published elsewhere (Ruel et al. 1999; Armar-Klemesu et al. 2000).

The Importance of Childcare for Child Nutritional Status in Accra

The analysis of the importance of childcare practices for child nutritional status was carried out using a composite childcare index. The index was derived using variables related to early child feeding practices (breastfeeding, use of prelacteals, timing of introduction of complementary liquids and foods in the child's diet), feeding style (who helped the child eat and what did the caregiver do when the child refused to eat), and preventive health seeking behavior (attendance at growth monitoring and whether the child had been immunized). The index was created only for children 4 months and older and was made age-specific by carefully selecting both the variables and the scoring system that were relevant for each age group (4-8.9; 9-17.9; ≥ 18 months). Appendix 1 presents the list of variables and the scoring system used to create the index (for more details about the methodology, see Ruel et al. 1999).

Results of bivariate analyses showed a strong association between care practices and child stunting. There was a threefold increase in stunting (24 percent) among children whose mothers' care practices were in the lowest tercile of the index scores compared to children whose mothers' practices were in the highest tercile (7 percent). The difference in mean height-for-age Z-scores (HAZ) was 0.5, a large effect size considered to be biologically meaningful (Habicht, Martorell, and Rivera 1995; Martorell 1995; Rivera et al. 1998).

Findings of the multivariate analysis looking at the importance of care practices for children's HAZ while controlling for other child, maternal, and household

determinants are presented in Table 1⁸. The findings show that better care practices were significantly associated with greater height-for-age Z-scores among children less than 36 months of age in this population. Other positive determinants of child nutritional status included mother's height and formal schooling and household socioeconomic status (proxied by an index of housing quality and assets ownership).⁹ Child age was negatively associated with HAZ, indicating the well-documented gradual deterioration in growth that occurs from early infancy up to 3 years of age. Other hypothesized determinants of child nutrition were not statistically significant in this model. These included maternal age, parity, ethnic group, marital status, and employment, as well as household income, calorie availability, family composition, and crowding.¹⁰

Further examination of the data showed that the importance of good care practices for child nutrition was particularly strong among children of less educated mothers (less than secondary schooling) and among households of lower socioeconomic status. These

⁸ Hygiene practices were not included in the final model because they were highly correlated with many household socioeconomic characteristics. Hygiene was also hypothesized to be a direct determinant of health (diarrhea and other infectious diseases), rather than nutritional status.

⁹ The socioeconomic index was created using principal components analysis. The variables included in the model were asset ownership, housing quality and the availability of water, sanitation and garbage removal services. The final factor retained five variables: floor and wall quality, water source, the number of assets owned and the type of sanitary facilities, all of which had factor loadings greater than 0.53 and together explained 46 percent of the variance.

¹⁰ Instrumental variables were used for income and calorie availability, which are endogenous variables, and thus correlated with the error term (for more information on the models, see Ruel et al. 1999). The care variable is also endogenous, in the sense that it is thought to be determined by some unobserved variables that may also affect the outcome nutritional status. We attempted to predict care practices using a set of maternal and household characteristics, namely maternal age, physical health, schooling, ethnic group, migration and work status, household income, calorie availability and assets, and family composition (an indicator of availability of child care alternatives). The resulting prediction equations were weak and only maternal schooling was a significant determinant of childcare practices. For this reason, the care index variable was included in the model without predicting it.

Table 1—Results of multivariate analyses of the determinants of child height-for-age Z-scores among children 4-36 months (n=519), quantitative survey

Characteristics	Significance of coefficient in multivariate analysis (OLS)
Child	
Age	Negative *
Gender	-
Mother	
Age	-
Height	Positive *
Education (none, primary and middle, secondary)	Positive *
Body mass index	-
Health (visual analogue results)	-
Ethnic group	-
Employment	-
Childcare practices (feeding and health seeking behaviors index)	Positive *
Household	
Socioeconomic status	Positive *
Total per capita expenditure	-
Household calorie availability	-
Migration status	-
Woman head of household	-
Father provides financial help	-
Household size	-
Crowding	-

Source: Ruel et al. 1999.

Note: * Statistically significant coefficient ($p < 0.05$).

relationships are illustrated in Figures 2 and 3. In Accra, almost three-quarters of mothers had less than a secondary education. Among this group, better maternal care practices brought the children's HAZ to the same level as that of children of more educated mothers or from wealthier families, approximately one-half Z-score higher. Good care practices, however, did not provide any additional benefit to children from more educated

Figure 2—The importance of good care practices for children’s height-for-age Z-scores, by maternal education status

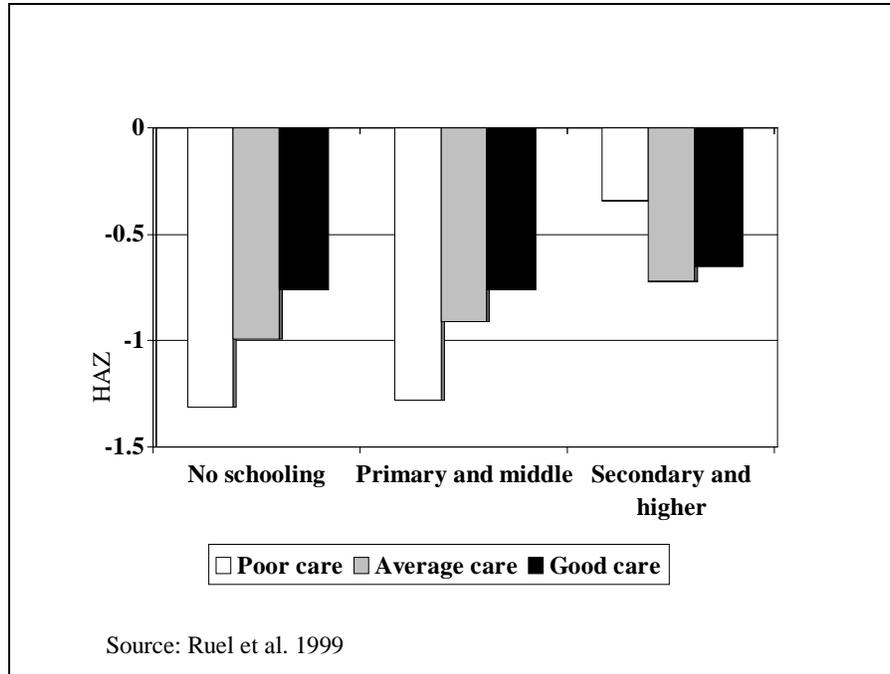
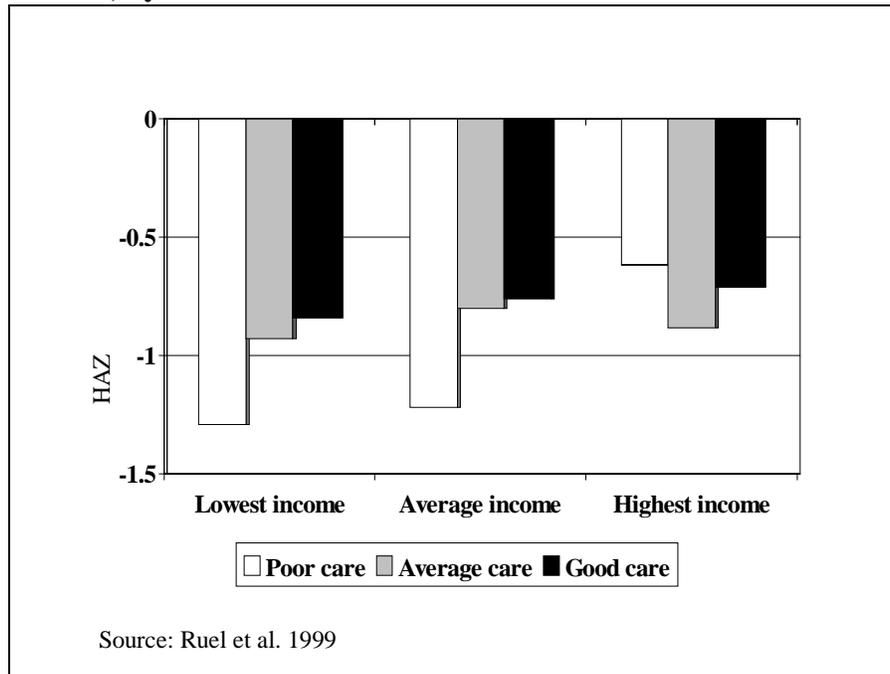


Figure 3—The importance of good care practices for children’s height-for-age Z-scores, by household socioeconomic status



mothers and from wealthier households, whose HAZ was already approximately 0.5 Z-score higher than children of the poorer and less educated groups.

The Constraints to Good Childcare Practices

After recognizing the importance of good care practices for child nutrition in this population, the next crucial question was: what are the main constraints to optimal childcare practices in the context of this urban African center? Answers to this question are particularly important for interventions to improve care practices because the success of education and behavior change interventions depends not only on targeting the right practices, but equally importantly on addressing the constraints to their adoption.

For the purpose of this analysis, the care index used previously was decomposed into its two main constituents: child feeding practices and preventive health seeking practices, using the same age-specific scoring system as described above (see Appendix 1). In addition, a hygiene index was created using information on hygiene behaviors collected using “spot check” observations (see Section 2 for method used). Appendix 2 presents the variables and scoring system used for the creation of this index.

Findings from both bivariate and multivariate analyses showed that in Accra, maternal schooling was the most consistent constraint to all three categories of childcare practices (Table 2). Maternal employment and other personal characteristics did not seem to affect childcare practices. Limited household resources such as low income, poor housing quality, few assets and limited access to water, sanitation and garbage collection

Table 2—Association between selected maternal and household care resources and three categories of care practices (child feeding, preventive health seeking and hygiene), quantitative survey

Care Resources	Care practices		
	Child Feeding	Preventive Health Seeking	Hygiene
<i>Maternal</i>			
Education	Positive *	-	Positive *
Ethnic group	-	-	-
Head of household	-	-	Women worst *
Employment	-	-	-
Workplace	-	-	Positive *
Cares for child at all time	-	-	-
Takes child to work	-	-	-
Hours worked	-	-	-
Health, BMI	-	-	-
<i>Household</i>			
Socioeconomic status	-	-	Positive *
Total per capita expenditure	-	Positive *	Positive *
Household food availability ^a	-	-	-
Household size	-	-	-
Crowding	-	-	-
Waste disposal	-	-	Positive *
Toilet	-	-	Positive *
Water source	-	-	Positive *

Source: Armar-Klimesu et al. 2000.

Note: * Positive signifies that the association was positive and statistically significant ($p < 0.05$).

^a Household food availability was proxied by the total number of calories per adult equivalent available at the household level and was derived from the food expenditure questionnaire.

services, on the other hand, were constraints only for hygiene practices (income was also a constraint for preventive health care use). These and other household-level characteristics such as food availability did not appear to limit mothers' ability to feed their children appropriately. Thus, in this population, child-feeding practices seemed to be more dependent on maternal education than on household food availability and economic resources. These findings support the hypothesis generated by the observation

of obese mothers and stunted children within the same household that inequitable or uninformed use of resources may be a more acute constraint to adequate child nutrition in Accra than absolute lack of resources. Hygiene, on the other hand, is constrained by the lack of services and resources and, thus, these factors need to be given serious consideration when designing interventions to improve hygiene practices.

OBSERVATIONAL STUDY

The main purpose of the observational study was to allow for a more in-depth exploration of some of the aspects of childcare that were identified as potentially important through the quantitative survey but could not be explored using survey methodologies. In particular, the study aimed at understanding the processes that shape the intrahousehold distribution of food and the time allocation of mothers and how these, in turn, may affect childcare practices and children's dietary intake. The study was based on the comparison of a small sample of children who had been growing poorly from infancy and well into their second year of life with children living in similarly impoverished environments but who had been growing consistently well (above the 40th percentile of this population) throughout this period.

The main findings are summarized in Tables 3 and 4, which present differences between poor and better growers in child feeding and care practices, and in maternal and household resources, respectively (Armar-Klemesu and Ruel 2000). Because sample sizes were small (and thus the statistical power of the comparisons was low), both

Table 3—Differences between poor and better growers (BG) in feeding practices and food intake, maternal time allocation, and other care practices, observational study (n=22)

Characteristics	Significant difference (p < 0.05)	Trend observed, but not statistically significant
Early child feeding practices		
Breastfeeding initiation		BG initiate earlier
Prelacteal foods given	* BG less likely to have been given	
Foods given to child during first 4 months	* BG less likely to have been given	
Age introduction of complementary foods		
- 0-3 mo	* BG less likely	
- 4-5 mo	* BG less likely	
- 6+ mo	* BG more likely	
Mean age first foods offered	* BG more likely to receive at recommended age (6 mo)	
Age weaned off breast		BG weaned 4 months earlier on average
Exclusive breastfeeding (0-4 months)	* BG much more likely to be exclusively breastfed	
Feeding style		
Self feeding supervised	-	-
Feeding on regular schedule		BG more likely
Child sits in prescribed place to eat	-	-
Observer's overall perception of child at mealtime		
Healthy appetite	-	-
Playful/happy/contented		BG more likely
Observer's perception of caregiver at mealtime		
Positive, nonconfrontational	-	-
Responds sensitively to child	-	BG a little more likely
Food intake		
Energy intake	-	-
Percent adequacy of energy intake	-	-
Frequency of intake of specific food groups		
- Staples	* Higher among BG	
- Legumes, nuts, pulses	-	-
- Meat and meat products		Higher among BG (1.3 vs. 0.5 times in 3 days)
- Fish, eggs, seafood	-	-
- Milk and milk products		Lower among BG
- Fruits		Higher among BG
- High energy soup, stew, sauce		Lower among BG
- Low energy, thin soup, stew, sauce	* Higher among BG	
Percent energy from meat, fruits and low calorie soups		Higher among BG

(continued)

Table 3 (continued)

Characteristics	Significant difference (p < 0.05)	Trend observed, but not statistically significant
Maternal time allocation		
- Care	-	-
- Holding	-	Less holding among BG
- Domestic activities	-	-
- Food preparation for household	* More time among BG (127 vs. 67 minutes/day)	-
- Income-generating activities	-	Less time among BG
- Leisure	-	Less time among BG
- Personal care	-	More time among BG
Childcare provided to the child by mother and/or other caregiver (number of occurrences):		
- Fed	-	-
- Bathed and changed	-	More often among BG (2.1 vs. 1.5 times)
- Hand washed after visiting toilet	* More often among BG (1.1 vs. 0.4)	-
- Watched/supervised	* More often among BG (2.5 vs. 1.4)	-
- Held/carried	* Less often among BG (1.1 vs. 2.8)	-
Health seeking behaviors		
Attendance at growth monitoring	-	BG more likely
Received DPT immunization	-	-
Received measles immunization	-	-

Source: Armar-Klemesu and Ruel 2000.

statistically significant differences and differences illustrating trends but without reaching statistical significance are presented (middle and right column, respectively).

Probably the most defining characteristic of better growers that emerged from the analysis was that they were much more likely than poor growers to receive optimal child feeding practices during early infancy. Mothers of better growers were more likely than mothers of poor growers to initiate breastfeeding soon after delivery and to withhold prelacteal feedings, and they were more likely to exclusively breastfeed up to 4 months of age and to delay introduction of complementary foods until the recommended 6 months

Table 4—Differences between poor and better growers (BG) in maternal and household characteristics and resources, observational study (n=22)

Characteristics	Significant difference	Observed trend, but not statistically significant
Maternal		
Education		Higher among BG
Marital status		Mothers of BG less likely to be married and only wife
Employment at time 1 (child 2-16 months old)	*BG more likely not to be working *BG less likely to be working full-time	
Employment at time 2 (child 20-34 months old)	*BG more likely not to be working (45% vs. 27%) *Same number in both groups work full-time (55%)	
Place of employment at time 1		BG more likely to work in markets/streets than poor growers
Place of employment at time 2		-
Among working mothers:		
- Takes child to work		BG less likely to
- Use of childcare alternatives		BG more likely to use
Body mass index	-	-
Health status (visual analogue results)	-	-
Ethnic group	-	-
Household		
Asset ownership		
- Time 1	* Less among BG	
- Time 2		
Socioeconomic status	-	Lower among BG
Expenditure quintile		Lower among BG
Per capita expenditure (mean)	-	-
Food expenditure	-	-
Food expenditure share	-	-
Water, sanitary and garbage disposal services	-	-
Household size	-	-
Father provides financial assistance to mother	-	-
Living arrangements	-	-
Intrahousehold allocation of energy	-	-

Source: Armar-Klemesu and Ruel 2000.

of age. Contrary to our expectations, the observations of feeding style did not reveal any striking differences between poor and better growers, with the exception that better growers were more likely to be fed on a regular schedule. Because mothers from both groups had a generally positive and responsive feeding style, it may be that our sample lacked the necessary variability to detect differences in this aspect. Better growers were more likely to be happy, playful and contented than poor growers at meal time, but it is not clear whether this was an indication of a more positive and pleasant feeding environment, rather than simply a reflection of a generally healthier and happier child.

Interestingly, the current diet of better growers (when they were 20-34 months of age) did not provide a higher energy intake compared to the diet of poor growers and both groups met their daily energy requirements. There was an indication, however, that dietary diversity might have been greater among better growers, especially with respect to the frequency of intake of meat and fruits. Dietary diversity is particularly important for micronutrient status, and the fact that poorer growers were almost twice as likely to be anemic than better growers supports the notion that poor growers may be suffering from some micronutrient deficiencies (Armar-Klemesu and Ruel 2000).

Maternal inherent characteristics such as age, ethnicity, nutrition, and health status did not reveal any differences between poor and better growers. Maternal practices and behaviors related to employment, time allocation and childcare, however, highlighted some important differences between the two groups that may at least to some extent contribute to the differences in their nutritional status. There was clearly a difference in mothers' working patterns between poor and better growers, the most important one

being the greater involvement in income-generating activities of mothers of poorly growing children as early as in the first year postpartum. This finding is likely to reflect an economic constraint among mothers from that group, who probably felt that they had no choice but to pursue their income-generating activities in order to maintain their household's livelihood and food security. Another related finding was the fact that when mothers of poor growers went back to work in the first year following delivery, they were more likely to take their child along to their place of work, compared to mothers of better growers who were more likely to report using an alternative caretaker. It appears that mothers of poor growers may have had fewer resources available to assist them with childcare responsibilities. Taking the child with them to work was probably their only alternative, but it resulted in the children being carried on their mothers' back for extended periods of time. Although this practice may allow mothers to carry on with their work more freely and also protects the child from wandering around in unsafe environments, it may also constrain children and delay their motor and cognitive development and their socialization.

There were other indications of a possibly lower quality of nurturing among mothers of poor growers compared to the better growers, such as the fact that they spent less time in hygiene-related childcare and in food preparation. Families of poor growers appeared to rely more heavily on the use of street foods than families of better growers, a practice that may increase the health risks of family members and of young children in particular.

Finally, household-level resources such as income, assets, per capita food, and nonfood expenditures, and the availability of water and sanitation services and intrahousehold energy distribution did not show any major difference between the poor and better growers.

4. ADDITIONAL ANALYSES AND FINDINGS

Analysis of the observational study generated additional hypotheses about the interrelationships between care resources, practices and child nutrition and health outcomes that could not be explored with these data due to small sample sizes. Some of these hypotheses, however, could be tested by returning to the survey data, to the extent that data were available on the relationships of interest. This was done, and the following aspects were revisited:

1. Maternal early return to work

In the analyses discussed previously, the problem faced by mothers who had to return to work soon after birth was identified as a potential indicator of vulnerability and economic distress. It was therefore decided to use the survey data to try to derive a profile of mothers who returned to work early and to also look at the consequences of their early return for childcare practices and for children's nutritional status.

2. *Exclusive breastfeeding for the first 4 months*

Exclusive breastfeeding in the Accra sample was relatively uncommon (12 percent), but it appeared to convey great benefits for children as expected. Considering that exclusive breastfeeding was not the norm and that the PRA studies highlighted the fact that mothers who wanted to exclusively breastfeed faced a lot of opposition, the questions that arose then were (1) who are these mothers who manage to exclusively breastfeed in this somewhat hostile environment; and (2) what are the apparent benefits for children's nutrition and health?

3. *Maternal education*

In Accra, low maternal education was the most consistent constraint to all three categories of childcare practices studied and improved care practices were one of the mechanisms by which maternal education benefited child nutrition (Ruel et al. 1999). A key question then was which specific child feeding, hygiene and health seeking behaviors were most impacted by maternal education? Answers to this question can guide the design of nutrition education and behavior change interventions that could, at least in the short term, substitute for low maternal education.

MATERNAL EARLY RETURN TO WORK

Findings From the PRAs, the Quantitative Survey, and the Observational Study

Results of the PRA studies indicated that mothers were facing important trade-offs related to the timing of their return to work after delivery. The age of the child—or

the time elapsed since birth—was mentioned as one of the main factors that determined when mothers went back to work. Mothers in the focus groups clearly indicated that the two primary factors determining when they returned to their income-generating activities were first, how “rested” they felt after delivery, and second, how severe the imperative of earning an income was (Maxwell et al. 2000). Mothers clearly demonstrated in the focus groups that they were fully aware of the potential risks for their young infant of their returning to work at a time when their infant was most vulnerable, and that they were also aware of the fact that their return to work increased that vulnerability. Testimonies about this dilemma were expressed in stark terms by women in focus groups:

“When I have to leave my child [to go back to work] my stomach burns me¹¹, but I have to work to earn money. Caring for your child is important, but you also have to earn money to provide for your child.”

“If you are wealthy, or your husband is taking good care of you, you can even stay [off work] for three years. But things are now hard. I have to earn an income.”

Data from the quantitative survey indicated that mothers returned to work between 3 and 18 months after birth.¹² Maternal work patterns and use of childcare alternatives were also clearly associated with their child’s age (Amar-Klemesu et al.

¹¹ Literal translation of a Ga colloquialism.

¹² The survey results reveal that after giving birth women take off a mean period of 18 weeks (just over 4 months). But this figure does not take into account women who had stopped working when they gave birth and had not yet returned to work by the time of the interview, so 18 weeks is likely to be a low estimate.

2000). For instance, the likelihood of mothers working outside the home and working full-time increased with the child's age, from 23 percent among mothers of 0-4 month old children to 76 percent among those who had children 18 months and older. All mothers who worked when their child was less than 4 months of age took their child along, compared to less than half among mothers of older children. Similarly, the type of childcare substitutes evolved gradually with age, from only 9 percent using alternative childcare among mothers of young infants to 53 percent among mothers of toddlers. Finally, the type of substitute childcare used also varied with age, with mothers of infants being more likely to use a single alternative caretaker and mothers of older children being more likely to use multiple caretakers or day care centers.

The observational study also confirmed that mothers tended to return to work gradually as their child aged, but more importantly, it showed that poor growers were more likely than better growers to have a full-time working mother when they were in their first year of life. In this sample, more than half of the mothers of poor growers were working full-time when their infant was less than 15 months of age, compared to only 27 percent among mothers of better growers. By the time children were 20-34 months of age, a similar percentage of mothers from both groups were working full-time (55 percent), but there was still a greater percentage of mothers of better growers who were not working at all (45 percent compared to 27 percent among poor growers). Thus, it is possible that the group of mothers who had to return to work soon after delivery may have been a group that was particularly vulnerable to economic stress.

In order to verify this hypothesis, we used data from the quantitative survey and looked at whether there was any evidence that differences existed between mothers who returned to work at different stages. The analysis showed no evidence of any marked differences in socioeconomic or other maternal and family characteristics of mothers who returned to work at different stages (when the child was < 3 months, 3-6 months and >6 months). It is important to note, however, that our data were not the most suitable for this type of analysis because, for the majority of mothers, the measurement of socioeconomic status (current) referred to a different period than the question about the timing of their return to work. For a mother of a 3-year-old child who had returned to work when her child was 6 months of age, for example, her current socioeconomic status may not be a reflection of her conditions 2.5 years before when she returned to work. Because of these limitations, we decided to narrow down the age range of analysis and to pursue this issue with the group of mothers who had a child younger than 12 months of age at the time of the survey. We compared the characteristics of mothers who were not yet working with those of mothers who were working either full-time or part-time.

Characteristics of Mothers Who Returned to Work Before Their Child's First Birthday

The purpose of the analysis was to identify maternal or household characteristics that differentiated mothers who returned to work early from those who had not yet returned, among mothers of infants (< 12 months of age). We also examined whether maternal working patterns affected their care giving behaviors, and whether there was

any evidence of a short-term impact on the nutritional status of this particularly vulnerable subgroup of children.

The findings presented in Tables 5 and 6 show that none of the household characteristics were statistically significantly different between mothers who were not working and those who were working part-time or full-time. There was, however, some

Table 5—Differences in maternal and household characteristics, by maternal employment status (sample of infants < 12 months of age [n=194]), quantitative survey

Characteristics	Not working n = 105	Working part-time n = 16	Full-time n = 73
Household characteristics			
Father helps	84.8	75.0	90.4
Female household	67.6	62.5	74.0
Percent in lowest socioeconomic quintile	18.1	21.4	22.2
Percent in highest socioeconomic quintile	26.7	21.4	18.1
Percent in lowest quintile for total per capita expenditure	21.0	12.5	23.3
Percent in highest quintile for total per capita expenditure	21.9	37.5	19.2
Total per capita expenditure/year	1.05	1.35	0.99
Food expenditure per capita	0.48	0.56	0.42
Maternal characteristics			
Mean age (years)	26.7	31.1	28.8*
Ethnic group (Gha/Adangbe)	39.0	31.3	35.6
Education			
- None	9.5	12.5	15.1
- Primary	64.8	50.0	57.5
- Secondary +	25.7	37.5	27.4
Marital status (married only wife)	71.4	50.0	75.3
Parity	2.4	3.0	2.7
Cares for child all time	89.2	75.0	72.6*
Takes child to work		81.3	76.7
Where works			
- Home		68.8	37.0
- Market/street		25.0	45.2
- Shop/factory/office		6.3	17.8

Notes: * Statistically significant difference between the three groups (ANOVA, $p < 0.05$). Abbreviations: HAZ = height-for-age Z-scores; WHZ = weight-for-height Z-scores.

Table 6—Differences in maternal care practices and in children’s nutritional status, by maternal employment status (sample of infants < 12 months of age [n=194]), quantitative survey

Characteristics	Not working n = 105	Working part-time n = 16	Full-time n = 73
Feeding practices			
Exclusively breastfed first 4 months	25.7	6.3	19.2
BF initiation < 1 h	22.2	25.0	18.6
Gave prelacteals	22.1	25	26
Feeding 0-4 months, gave:			
- Water	62.9	87.5	55.6 (p = 0.06)
- Sugared water	15.2	31.3	20.5
- Formula	22.9	25	24.7
- Milk	9.6	12.5	9.6
- Semi-solids, solids	45.7	62.5	56.2
Mean age (in months) of introduction of semi-solids or solid foods (among those who had started)	4.33	4.07	4.25
Age of introduction:			
- 0-3 mo	42.6	42.9	26.4
- 4-5	37.7	42.9	50.9
- 6+	19.7	14.3	22.6
Breastfed fewer because of work	1.0	12.5	21.9*
What does she do when child refuses to eat			
- No problem	36.0	50.0	24.7
- Appropriate response	30.0	37.5	35.6
Mother helps child eat	97.1	100.0	89.9 (p =0.05)
Hygiene practices score (mean)	4.7	5.1	4.3
Mother dirty	21.0	25.0	29.2
Child dirty	12.4	12.5	16.7
House not swept	14.0	0.0	26.5 (p=0.09)
Compound not swept	44.2	25.0	64.3*
Unwashed utensils in house	22.1	16.7	38.0 (p=0.10)
Health seeking behaviors			
Attended growth monitoring	79.0	87.5	79.5
Received DPT3 immunization	83.8	93.3	84.6
CHILD			
AGE (months)	5.17	6.62	7.48*
Percent stunted	6.7	0	12.3
Percent wasted	0	0	1.4
Mean HAZ	-0.28	-0.51	-0.65 (p = 0.07)
Mean WHZ	-0.07	0.06	-0.47 *

Notes: * Statistically significant difference between the three groups (p< 0.05). Abbreviations: HAZ = height-for-age Z-scores; WHZ = weight-for-height Z-scores.

indication that mothers working full-time may have been from a lower socioeconomic group (18 percent of mothers from this group were in the highest socioeconomic quintile, compared to 27 percent among those who were not working and 21.4 percent among the part-time workers; not statistically significant)¹³. Contrary to expectations, there were no differences in the percentage of mothers who reported receiving financial help from the child's father, nor in the percentage of households headed by women. Maternal education levels were similar across the groups as well as parity and marital status (not shown). As expected, mothers working full-time were the least likely to care for their child at all times, followed by the part-time workers and by mothers who did not work. Part-time workers were more likely to work at home and full-time workers were more likely to work in the market or streets, but the difference did not reach statistical significance.

In sum, the data did not point to any marked differences in maternal and household characteristics between mothers who returned to their income-generating activities before their child was 12 months of age (either part or full-time) and those who did not. The fact that household expenditures were very similar between mothers who worked full-time and those who did not work suggests that early return to work may have been necessary among the group of full-time workers for them to maintain their current level of expenditure. In other words, socioeconomic status may have been similar *because* women were working; had they not returned to work, expenditures in these households may well have been lower.

¹³ Note that this analysis may have lacked statistical power because the total sample size was 194 children and only 16 belonged to the group of part-time working mothers.

Consequences of Maternal Early Return to Work for Childcare and Nutrition

The main difference in child feeding practices between the three groups of mothers (not working, working part-time and full-time) was that a much greater proportion of women reported breastfeeding less because of their work among those who worked full-time compared to the other two groups (Table 6). This difference was not surprising since full-time working mothers were more likely to work away from home and were less likely to care for their child at all times. For this same reason, mothers who worked full-time were less likely to help their child eat than mothers from the other two groups.

Mothers who worked part-time appeared in some respect to have the worst feeding practices during the first 4 months, being less likely to exclusively breastfeed their child (although the difference was not statistically significant). Part-time working mothers also showed a greater tendency to give water, sugared water, formula, semi-solid and solid foods, although only the difference in the percentage who gave water reached statistical significance. This group, however, contained only 16 mothers, and thus the findings should be interpreted with caution. The age of introduction of semi-solid and solid foods was similar between the three groups among those who had started at the time of the interview. Except for a few individual practices, hygiene practices and preventive health seeking were not markedly different between the groups, even during this critical first year of life, although there was some suggestion of poorer hygiene practices among women working full-time. Overall we can conclude that maternal work did not appear to have a substantial impact on childcare practices.

The association between maternal work and child nutrition and health is also presented in Table 6. The bivariate analysis suggests that maternal work was associated with poorer nutritional status of infants, both relative to height-for-age and to weight-for-height (mean WHZ and HAZ [borderline statistical significance]). It is important to note, however, that even within the restricted age group selected for this analysis (< 12 months of age), infants of nonworking mothers were significantly younger (5.2 months) than those of part-time (6.6 months) and full-time (7.5 months) working mothers. Thus, we tested with multivariate analysis the importance of employment for child nutritional status and found no evidence of an association with either HAZ or WHZ when child age and gender, and maternal height, education, and socioeconomic status were controlled for.

EXCLUSIVE BREASTFEEDING

Another intriguing question that arose from the analyses summarized in Section 3 is the issue of exclusive breastfeeding. Only 12 percent of mothers with children 4-36 months of age in the survey sample reported having exclusively breastfed their infant for at least four months. Moreover, according to the PRA studies there was generally a strong social pressure discouraging exclusive breastfeeding. Thus, the questions that came to mind were (1) who are these mothers who choose to exclusively breastfeed under these somewhat unfriendly circumstances? and (2) what are the benefits for their child's nutrition? These two questions were addressed using the quantitative survey data for children 4-36 months old.

Characteristics of Mothers Who Exclusively Breastfeed

Table 7 compares the characteristics of mothers who exclusively breastfed¹⁴ for up to 4 months of age with those who did not. Mothers who exclusively breastfed their child in this sample were more educated, they were less likely to be head of household and more likely to be of the Gha or Agbande ethnic group and to have their first child. Although differences in socioeconomic status did not reach statistical significance, there was some indication that mothers who exclusively breastfed were less likely to belong to the lowest socioeconomic group of this sample. The findings strongly suggest that better educated mothers and those who were having their first child may have been more receptive to recent breastfeeding promotion education efforts that had been carried out in the health centers. Mothers in the PRA studies reported being confused by the new messages they had heard from health staff, mentioning that they used to be told that young infants needed water in addition to breast milk and that the new messages were discouraging the use of water and promoting exclusive breastfeeding. So, it seems that more educated mothers and those who had a first child were more likely to respond to the new trend promoting exclusive breastfeeding and to be able to resist the social pressures that discouraged this practice. Mothers who exclusively breastfed were also more likely to initiate breastfeeding soon after birth and were three times more likely to introduce complementary foods at the recommended age of 6 months or older (Table 8). Clearly,

¹⁴ Exclusive breastfeeding was defined as the child having received no prelacteal feeds and no liquid (not even water), semi-solid or solid foods for the first 4 months. Only children 4-36 months of age were included in this analysis.

Table 7—Maternal and household characteristics, by patterns of breastfeeding during the first four months of life (sample of 4-36 months old children [n = 519]), quantitative survey

Characteristics	Exclusive Breastfeeding (n=69)	Mixed feeding (including prelacteal feeds and any liquid, semi-solid and solid foods (n=450)
Child's age (months)	15.44	18.18
Household characteristics		
Father helps	81.4	78.3
Female head of household	23.7	35.5 (p = 0.07)
Percent in lowest socioeconomic quintile	13.6	21.8 (p = 0.07)
Percent in highest socioeconomic quintile	27.1	18.5
Percent in lowest quintile for total per capita expenditures	13.6	21.2
Percent in highest quintile for total per capita expenditures	22.0	19.4
Total per capita expenditures per year	1.10	1.04
Food expenditure per capita	0.51	0.47
Food share	0.51	0.54
Calories/adult equivalent unit	2629	2605
Household size	4.86	5.06
Crowding	0.41	0.42
Maternal characteristics		
Age (years)	28.07	29.03
Ethnic group		
- Gha/Adangbe	49.2	33.2*
- Ashanti/Fanti/Akan	27.1	29.5
- Ewe	20.3	24.0
- Other	3.4	13.4
Education		
- none	3.4	12.7*
- primary	52.5	64.1
- secondary +	44.1	23.3
Marital status (married and only wife)	78.0	63.1
Parity (number of children)	2.3	2.7 *
Parity (percent 1st child)	35.6	27.1*
Care for child at all times	57.9	63.0
Takes child to work	48.6	56.9
Where works		
- home	32.4	34.1
- market/street	43.2	50.7
- shop/factory/office	24.3	15.2
Time did not work after delivery (weeks)		
- < 12 weeks	38.8	36.4
- > 25 weeks	22.4	21.3

Note: * = p < 0.05.

Table 8—Maternal childcare practices, by patterns of breastfeeding during the first four months of life (sample of 4-36 months old children [n=519]), quantitative survey

Characteristics	Exclusive Breastfeeding (n=69)	Mixed feeding (including prelacteal feeds and any liquid, semi-solid and solid foods (n=450)
Feeding practices		
BF initiation < 1 h	32.1	18.2*
Age introduced complementary foods (among those who had already introduced (mean age in months)	6.5	4.8*
Mean age of introduction, % at:		
- 0-3 months	0.0	31.4*
- 4-5 months	29.4	40.4
- 6+ months	70.6	28.2
Breastfeeding fewer because of work	28.1	13.8*
What does she do when child refuses to eat		
- No problem/appropriate behavior	66.1	63.3
Mother helps child eat	66.1	64.5
Hygiene practices scores (mean)	4.56	4.24
Mother dirty	25.4	32.4
Child dirty	22.0	31.1
Preventive health seeking behaviors: percent who had attended/received:		
- Growth monitoring	66.1	64.3
- DPT (3rd) immunization	98.3	88.9*
- Measles immunization (only for children 9 months and older)	95.0	82.7*

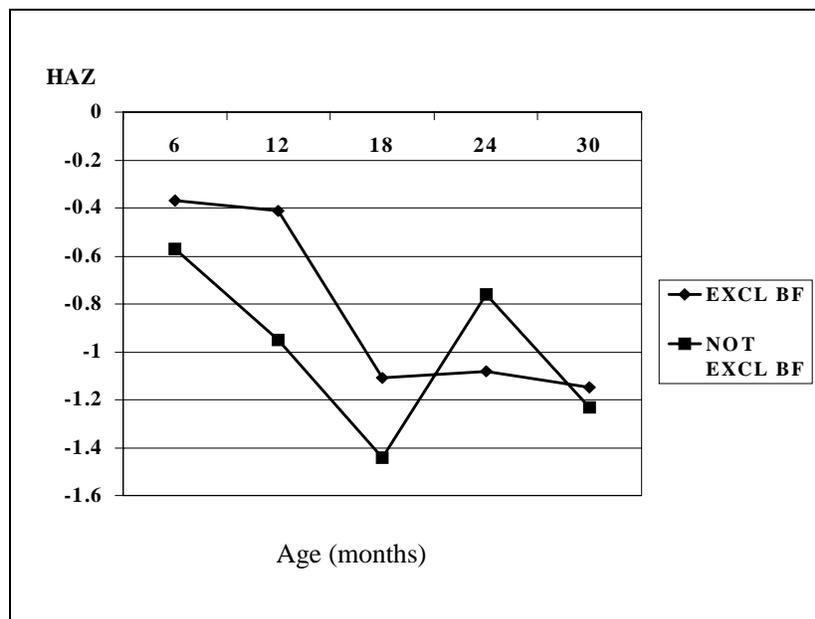
Note: * = $p < 0.05$.

mothers who exclusively breastfed their children were better educated about the different dimensions of optimal child feeding practices, including the timing of initiation of breastfeeding, the importance of exclusively breastfeeding, and the appropriate timing of complementary feeding. Exclusively breastfeeding mothers were also more likely to have taken their child for immunizations (measles and DPT), probably an indication of their greater health awareness.

Consequences of Exclusive Breastfeeding for Children's Nutritional Status

Figure 4 compares the growth patterns (height-for-age Z-scores [HAZ]) of children who were exclusively breastfed for four months with those who were not. This figure suggests a marked benefit from exclusively breastfeeding throughout the first three years of life. The mean HAZ of exclusively breastfed children was higher at almost every age throughout the first three years of life. However, because mothers who exclusively breastfed were different from those who did not, particularly with respect to education, we tested by multiple regression analysis whether the beneficial effect of breastfeeding remained when controlling for maternal education, height and household socioeconomic

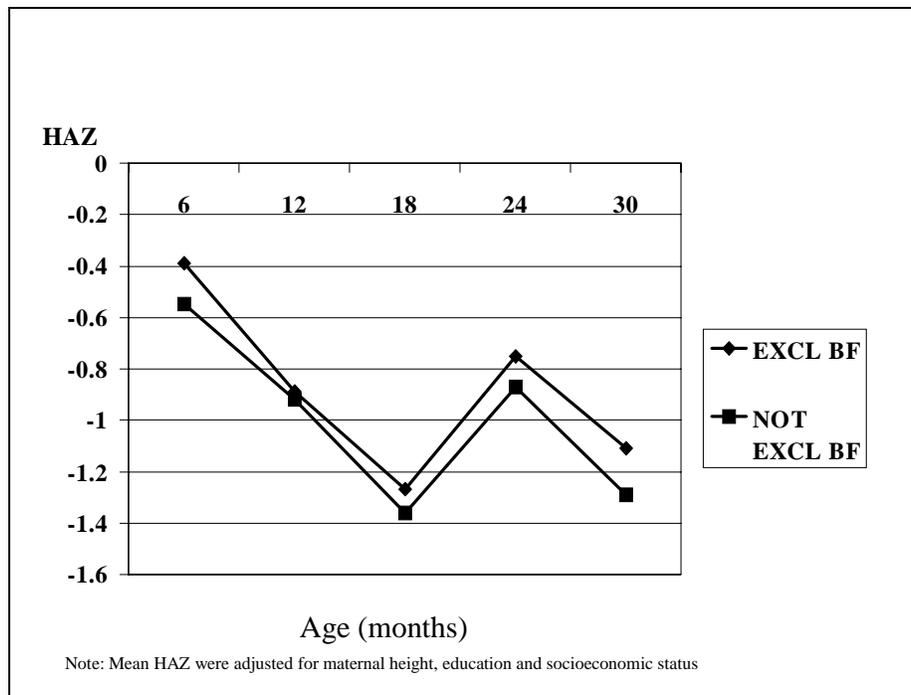
Figure 4—Mean height-for-age Z-scores, by age and breastfeeding status (4-36 months old children), quantitative survey (n=517)



characteristics. The mean HAZ adjusted for these variables are presented in Figure 5, which shows that the control for potential confounders in the model almost completely eliminated the apparent beneficial effect of breastfeeding on HAZ. This means that this apparent beneficial effect was actually due to the higher educational level of mothers who exclusively breastfed and possibly to other maternal or household characteristics that were also positively associated with better nutritional status.

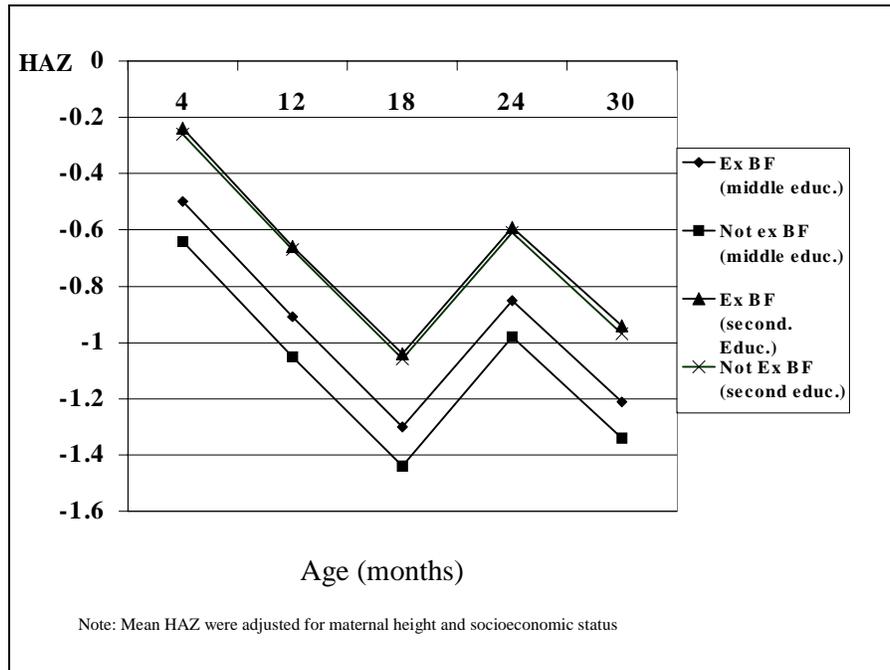
An additional question that we examined through multiple regression analysis was whether exclusive breastfeeding could be more beneficial among some subgroups of

Figure 5—Mean height-for-age Z-scores, by age and breastfeeding status, adjusted for maternal education and height and for household socioeconomic status (4-36 months old children), quantitative survey (n = 517)



children, as suggested from our previous analysis using the care index (Ruel et al. 1999). In this analysis, good care practices were more beneficial for children of mothers with lower educational levels. Thus, we tested the statistical significance of the two-way interaction between exclusive breastfeeding and maternal education. Because only 77 mothers in the whole sample exclusively breastfed, sample sizes were very small for some cells in the analysis, particularly for the group of exclusively breastfed mothers with no education. For this reason, only data for the two upper education groups are presented in Figure 6. As hypothesized, there was some indication that exclusive breastfeeding was more beneficial for children whose mothers had less than secondary

Figure 6—Mean height-for-age Z-scores, by breastfeeding status and maternal schooling, adjusted for maternal height and socioeconomic status, quantitative survey (n = 515)



schooling, and the p-value for the interaction was 0.28. It is possible that an even greater benefit would have been obtained among mothers with no formal education, but this association could not be tested because there were only two mothers who exclusively breastfed among the group that had no education.

MATERNAL EDUCATION: WHICH SPECIFIC PRACTICES DOES IT AFFECT?

Maternal education was found to be the most crucial factor for good care practices in Accra, having a positive effect on all three categories of childcare practices studied: child feeding, hygiene and health seeking behaviors (Armar-Klemesu et al. 2000).

Although there is ample literature showing the importance of maternal schooling for child health, nutrition and well-being (Caldwell and McDonald 1982; Cleland and van Ginneken 1988; Alderman 1990; Cebu Study Team 1991), the mechanisms by which it affects these outcomes is still poorly understood. For this reason we explored, using our representative sample from Accra, which specific feeding, hygiene and health seeking behaviors were positively (or negatively) influenced by maternal education. Table 9 summarizes the findings.

Maternal education was associated with a surprisingly large number of childcare behaviors from all three dimensions. Except for a few feeding practices where maternal education was associated with a negative practice, all other associations indicated that maternal schooling improved childcare practices. The negative practices related to maternal education were a greater use of milk and baby formula during the first 4 months of life, a phenomenon that has been documented by others (Guldan et al.1993).

Table 9—Specific child feeding, hygiene and health seeking behaviors affected by maternal education

Practices	Association with maternal education
Child feeding	
Still breastfeeds	-
Breastfeeding initiation < 1 hour	Positive (more likely)*
Breastfeeding initiation < 5 hour	-
Prelacteals	-
Exclusive breastfeeding during the first 4 months	Positive (much more likely)*
Feeding during the first 4 months, gave:	
- Water	Positive (less use) *
- Sugared water	Positive (less use) *
- Formula	Negative (more use) *
- Milk	Negative (more use) *
- Solids/semi-solids	Positive (less use) *
Mean age complementary foods introduced	- (not significant but definite trend for more
Helping the child to eat:	
- Caregiver helps	Positive (more likely)*
- No one helps	Positive (less likely)
When refuses to eat, child left alone or forced to eat	-
Breastfeeds less because of work	Negative (more likely to happen)*
Weaned because of work	Negative (more likely to happen)*
Hygiene	
- Mother clean	Positive *
- Child clean	Positive *
- Child's diaper clean	Positive *
- Compound swept	Positive (p = 0.06)
- No poultry feces	Positive *
- No stagnant water	Positive (p = 0.09)
- No human feces	Positive *
- No unwashed utensils	-
- Drinking water covered	-
- House swept	-
Health seeking behavior	
- GMP	-
- 3rd DPT	Positive (p= 0.07)
- Measles	Positive *

Notes: Positive * means that higher maternal education is statistically significantly associated with a good practice; Negative * means that higher maternal education is statistically significantly associated with a bad practice.

Additionally, better educated mothers were more likely to report breastfeeding less or to have weaned their child because of their work and this was probably due to the fact that more educated mothers were more likely to work in factories, shops or offices, which may not allow them to take their child along. Aside from these few potentially negative practices, maternal education had a positive effect on early child feeding practices, including a much greater likelihood of exclusive breastfeeding, and it was also associated with a large number of better hygiene practices and health seeking behaviors. Because maternal education is highly correlated with socioeconomic status, better hygiene practices were probably facilitated by the greater availability of household services and the better quality of housing. For feeding practices, however, the observed better practices were not related to the greater availability of socioeconomic and financial resources because in fact, it is cheaper (in money, fuel and time) for a mother to exclusively breastfeed and to avoid the use of complementary liquids and foods than to use these products. Thus, better feeding practices among better-educated mothers in this population are likely to be purely a result of better knowledge and awareness and possibly greater self-confidence and a greater exposure to and more efficient use of the information provided in health clinics or in the media. The negative behaviors, on the other hand, are the natural result of greater employment opportunities, which in the absence of childcare alternatives at their place of work, forces them to breastfeed less, to wean earlier, and to use baby formula.

5. DISCUSSION AND CONCLUSION

This section summarizes the findings of our analyses of care in Accra and focuses on the five key questions addressed:

1. Is care important for child nutrition in Accra?
2. Which specific aspects of care seem to be most crucial?
3. Which maternal and household resources contribute the most to enhancing care?
4. What are the program and policy responses to promote optimal care practices in this urban context?
5. How were the three research methods complementary and what are the strengths and weaknesses of each for measuring and quantifying care practices and resources? What insights have been gained for future policy and program research efforts?

IS CARE AN IMPORTANT INPUT INTO CHILD NUTRITION IN ACCRA?

Results from the three research methods used strongly support the notion that good childcare practices are a key determinant of child nutrition in Accra. Both the perception of participants in the PRA work and the empirical evidence suggested from our data confirm the importance of care in the Accra urban context. The three dimensions of childcare practices that were analyzed in the study were child feeding, hygiene practices, and preventive health care practices. In the concept mapping of the

determinants of malnutrition done in the PRA studies, the participants were clearly well aware of the importance of care as it relates to breastfeeding and other feeding and hygiene practices, but they did not mention the importance of health seeking behaviors and home treatment of illness. The concept of poor nurturing, described as “irresponsible” mothers or parents and the issue of stress as it relates to economic worries and time famine, were also highlighted as key factors associated with child malnutrition.

The quantitative survey provided a measure of the magnitude of the association between childcare and nutrition. It showed that children whose mothers had poor childcare practices were up to three times more likely to be stunted and were, on average, shorter by 0.5 Z-scores compared to children whose mothers had good practices. The importance of care remained strong in multivariate models that controlled for other determinants of child nutrition and even more importantly, care was more critical for children whose mothers had less than secondary schooling (the vast majority in Accra) and for households of the two lower socioeconomic terciles.

The observational study also corroborated that childcare was one of the most important discriminating factors between children who were growing poorly during their first 2-3 years of life compared to those who were growing better (at or above the 40th percentile for the sample). Early child feeding practices were particularly important and maternal time spent in hygiene-related behaviors also appeared to be positively associated with better growth.

Thus, the Accra study provides unequivocal evidence of the crucial role of childcare practices as a key input into children’s nutritional status. This may be

particularly true in this urban context where economic constraints and household food insecurity were not as severe as in many rural areas and where the rates of stunting were relatively low (17 percent) (Maxwell et al. 2000).

WHICH CARE PRACTICES SEEMED THE MOST CRUCIAL FOR CHILD NUTRITION IN ACCRA?

As indicated above, the childcare practices that were perceived by the participants to be associated with child malnutrition in the concept mapping exercise were breastfeeding and other feeding practices and poor hygiene, whereas preventive or curative health seeking and disease prevention and management were not mentioned. It is important to note that the PRA studies were not intended to explore the concept of care in particular; their objective was much more global and care was only one component of the overall framework. Thus, the information generated by the PRA studies on care is understandably more limited than it would have been had care been the main focus.

The quantitative survey, on the other hand, specifically aimed at understanding the interrelationships between care resources, practices, and child outcomes and gathered a substantial amount of information to investigate these issues in depth. The initial analysis of the quantitative survey, however, used a care composite index as a proxy for care practices. Although there were many analytical advantages to using the index, the disadvantage was that it did not illuminate the relative contribution of individual practices or identify the most crucial ones in this particular context. We addressed this issue by looking at simple bivariate relationships between the individual practices and child

nutritional status, but as expected, many of the variables were confounded by children's age and other factors. Keeping these limitations in mind, the bivariate analysis suggested that early child feeding practices (exclusive breastfeeding and, in particular, avoidance of prelacteals, sugar water, solids and semi-solids during the first 4 months of life) as well as a few of the hygiene variables were associated with taller children. Among the hygiene variables, the strongest associations were with whether the mother and the child had a clean appearance. Because exclusive breastfeeding appeared to be so strongly associated with children's nutrition, we used a multivariate approach to verify whether these results were confounded by some maternal or household characteristics. We found that, indeed, the apparent relationship completely disappeared when maternal height, schooling, and socioeconomic status were controlled for. The fact that the association disappeared with the control of these variables does not by any means imply that exclusive breastfeeding does not enhance children's growth in this population. It only reflects the fact that mothers who exclusively breastfed in our sample were a very select (biased) group, not representative of the population in general. In Accra, mothers who exclusively breastfed their infant were more educated than average and lived in more favorable and hygienic conditions. Among the group of mothers with secondary schooling, for instance, it is likely that exclusive breastfeeding did not convey additional benefits in growth because these children were already better off by at least 0.3 Z-scores, irrespective of whether they were exclusively breastfed or not. Clearly these children must have benefited in other ways from exclusive breastfeeding, such as bonding and increased immunity, but their growth was not enhanced. It is likely, however, that exclusive breastfeeding would

have a much greater impact on growth among children of poorer and less educated mothers who were more likely to live in crowded and unhygienic environments. Our findings suggest that this was true for children whose mothers had some primary school education, but the effect would probably have been even more remarkable among mothers with no formal education. Unfortunately, this group could not be studied because only two of the mothers who had never attended school had exclusively breastfed their child.

The observational study probably generated the most convincing evidence of the importance of specific early child feeding practices for growth in this population. Of all the practices and resources compared between poor and better growers, the most consistent differences were related to early child feeding. Children who had been growing well throughout their first 2-3 years of life were more likely to have been breastfed soon after birth, to have been exclusively breastfed for four months and to have received complementary foods at the recommended 6 months of age. These differences were all statistically significant, although sample sizes were very small. Note that these two groups had the advantage of being matched on age, and therefore were not subject to the age biases described above. Of all the other care practices studied—feeding style and situation, health seeking behaviors, and children's energy intake, only attendance at growth monitoring sessions was significantly higher among the group of better growers.

Thus, findings from the observational study confirmed the suggestion from the quantitative survey that optimal feeding practices during the first 6 months of life

contribute to the prevention of growth faltering among young infants in Accra and that the benefits may linger beyond the first year of life.

WHICH MATERNAL AND HOUSEHOLD RESOURCES CONTRIBUTE THE MOST TO ENHANCING CARE IN ACCRA?

The perceptions of the participants in the concept mapping exercise were that poverty affected food security, and that food security (enough food), in turn, was directly related to malnutrition. Poor breastfeeding and feeding practices were perceived as independent determinants and were not linked to any resources either at the maternal or household level. Knowledge and education were left out of the model as well as maternal employment. Time (probably referring to maternal time, although not specified) was linked to poor hygiene practices, but not to any other care or feeding practices. Thus, the concept map revealed that the perception of the participants about how the determinants of child malnutrition related to each other and more specifically how resources were thought to affect practices were slightly different from the widely accepted UNICEF conceptual model.

The discussion surrounding the phenomenon of obese mothers/stunted children suggested that the participants perceived that malnutrition in some cases was due to a problem of unequal intrahousehold allocation of resources as well a problem of “irresponsible” parenting, referring to an inadequate use of resources and poor caring and nurturing skills. Another constraint that was discussed in focus groups was maternal employment. Participants commented on the harsh trade-offs they faced when economic

pressures forced them to return to work soon after delivery, and expressed their concern about the potential consequences it could have on their small, vulnerable child. Again, relatively little information was available from the PRAs on care resources because it was not a central objective of this component of the research.

Findings from the quantitative and observational study highlighted maternal education as the resource most strongly and consistently associated with childcare in this population. This was expected considering the wealth of empirical evidence showing the crucial role of maternal education for child nutrition, health, and survival. Although the importance of maternal education is indisputable, the mechanisms involved often remain unclear. Few studies have actually gathered as much information as the Accra study on such a wide range of maternal behaviors, which allows for a complete review of the care behaviors mostly affected by maternal education. In Accra, maternal education was positively associated with all three composite indices—child feeding, hygiene, and preventive health seeking behaviors—as well as with a large number of the individual practices included within these categories. Although the association between maternal education and care practices was usually positive—more educated mothers having better practices, a few practices related to breastfeeding were negatively affected by higher maternal education. In particular, more educated mothers were more likely to use breast milk substitutes and other types of milk during the first four months and to breastfeed less or to wean their child because of their employment. This was probably due to the fact that they were also more likely to work in more formal environments less amenable to taking their child along. However, because more educated mothers tended to have better

practices in almost all other respects, these negative practices did not appear to affect their child's nutritional status as much as they probably would among children of less educated mothers who live in more precarious and unhygienic environments.

The other maternal resource (or possibly constraint in this case) identified as important in Accra was maternal employment, which presents a much more complex picture than education. It is well recognized that maternal employment can confer both benefits to children from increased income and women's greater control over income, as well as disadvantages from reduced maternal time for childcare and household responsibilities. The ultimate outcome depends on a series of factors related to the specific nature, location, and flexibility of the work environment and, most importantly, the availability and quality of childcare alternatives (Engle, Menon, and Haddad 1997).

In Accra, 55 percent of mothers of children less than 3 years of age were working full-time and 9.5 percent were working part-time. Of those working, 83 percent were doing so outside their home. Initial analyses of the quantitative survey suggested no evidence of an association between maternal employment and childcare practices, and this was true for all three care indices (Armar-Klemesu et al. 2000). This suggested that mothers could maintain their usual caregiving practices irrespective of whether they worked or not. Maternal employment also showed no evidence of a detrimental effect on children's nutritional status, as seen by the results of multivariate analyses (Maxwell et al. 2000; Ruel et al. 1999). This appeared to be due to the fact that women in Accra strived to adapt their working patterns to their children's age, in an attempt to protect them. Overall, women of young infants were much less likely to work than women of

older children, they were less likely to use alternative childcare and more likely to take their child along with them. Thus, it seems that at least to some extent, mothers were successful in adapting their work patterns to fit their infants' caring needs.

The observational study, however, unveiled important information about the potential vulnerability of some women who had to return to work soon after birth because they did not have the economic flexibility to prolong their unpaid maternity leave. Mothers of poorly growing children were much more likely to have resumed their full-time income-generating activities during their first year postpartum than mothers of better growers. When children were in their second to third year of life, mothers of better growers were still more likely not to be working and were less likely to work part-time than mothers of poor growers, although an equal proportion from both groups were working full-time. On the other hand, mothers of good growers who had returned to work were more likely to use alternative caregivers, which suggests that they may have had more support and greater access to adequate substitute childcare. These important differences between poor and better growers suggest, as clearly stated by the mothers themselves in focus groups, that maternal early return to work is imperative when economic constraints are pressing and that the sooner mothers have to return, the greater the potentially negative effect on their vulnerable infant.

However, the analysis of the subsample of working mothers who had a child less than one year of age did not confirm an effect on practices or outcomes. On the contrary, we found that, with the exception of a few practices, maternal work status generally had little impact on caregiving. When controlling for other important determinants of growth

(child's age, maternal height and education, and SES), no effect of work status was observed in this subsample.

Mothers who returned to work early also did not exhibit any marked differences in their personal or household demographic and economic characteristics from those who did not work. The lack of differences in expenditures, however, may indicate that families of full-time workingwomen may have had fewer alternatives; i.e., without the working mother's income, expenditures may well have been lower and insufficient to meet household needs.

Thus, it appears that for the majority of women, employment may not be such a severe constraint for childcare and nutrition as could have been expected, even among those who had to return to work soon after their infant was born. This is *not* inconsistent with the idea that, for a small group of the most vulnerable families, return to work does put children at risk. For example, it is possible that risk is elevated only with very early return to work (when the child is < 6 months), as has been seen elsewhere (Zeitlin 1996).

Many other mothers may have been particularly astute in finding ways to protect their young child, even in situations where economic and time constraints prevailed. It is not clear whether the apparent success of mothers in Accra was due mainly to effective social and family support and high quality childcare alternatives or whether it resulted from mothers continuing to assume most of the childcare responsibilities. Our limited data on the use and quality of childcare alternatives did not allow a firm conclusion on this aspect, but from our observations, it seems that the latter hypothesis may be more likely.

In addition to reviewing relationships between practices and the key maternal resource variables of education and employment, we also explored relationships between household-level resources and practices. Household demographic and socioeconomic characteristics—income, food availability, quality of housing, availability of services, family composition, living arrangements and intrahousehold energy distribution—were not associated with any of the feeding variables or with the feeding index, nor with the health seeking behavior practices. Hence there was no evidence that poor feeding practices resulted from severe poverty, food insecurity, or economic constraints. Income, wealth, housing quality, and availability of services, on the other hand, were strongly related to hygiene, highlighting the well-documented fact that good personal, household, and environmental hygiene are particularly difficult to maintain in the absence of a minimum level of services and resources.

WHAT ARE THE PROGRAM AND POLICY RESPONSES TO PROMOTE OPTIMAL CHILDCARE PRACTICES IN ACCRA?

The overall Accra study of urban livelihoods, poverty, food security, and child malnutrition identified four groups as being particularly vulnerable: (1) female-headed households; (2) large households with few working members; (3) working women with children below the age of two years; and (4) individuals with low education or few salable skills (Maxwell et al. 2000). The more focused analysis of care presented here confirms the vulnerability of at least the last two groups with regards to the constraints they experience relative to the provision of adequate care and its potential impact on their

children's nutrition. Poorly educated women were by far the group with the least adequate childcare practices and the related higher child malnutrition rates. Working mothers with a young infant also were vulnerable because they appeared to have very few alternatives but to work for income and to take their child along in environments that were often not conducive to good childcare. This group of women, however, seemed to manage to cope amazingly well with the situation and many succeeded in maintaining their care practices and in protecting their child from malnutrition.

There is a universal consensus that investing in policies to promote girls' education is a good investment, not only because of the large benefits it conveys to women and their children, but also because of the potential to reduce poverty. In our Accra study, maternal schooling was associated with a range of positive outcomes in addition to good care practices, namely higher household income, food availability, dietary quality, and better paid employment (Maxwell et al. 2000). Education of girls is a long-term strategy, but, fortunately, some of the benefits of maternal schooling can be simulated by effective nutrition education and behavior change strategies (Caulfield, Huffman, and Piwoz 1999). The success of these strategies depends on a clear understanding of which practices need to be modified and what the main constraints to their adoption are. The findings of our study constitute a first step in that direction.

In the context of Accra, the promotion of exclusive breastfeeding should definitely be prioritized and messages should be targeted to both the health sector and to the mothers themselves. Currently one of the main obstacles seems to be the general confusion that results from contradictory messages being transmitted from different

sources and sometimes from the same source (different health personnel giving different messages). Large-scale breastfeeding promotion strategies are currently being implemented in Ghana (e.g., by the Linkages project), but to our knowledge Accra is not included as a priority area. Hopefully it will be in the future because our study suggests that the benefits of this type of program for children's nutrition in Accra would be substantial, especially if targeted to poorly educated mothers.

Another aspect that our study highlighted is that health centers could be an effective vehicle for breastfeeding promotion interventions because a very high proportion of women used the health centers for prenatal care (97 percent had attended at least once) and for childhood immunization (Armar-Klemesu et al. 2000). Although the poorest segments of the population are usually the least likely to use the health service facilities even in urban areas, the coverage of prenatal services in Accra is high enough to justify investing in effective breastfeeding promotion in this context.

Mothers with secondary schooling were twice as likely to exclusively breastfeed as mothers who had some primary or middle school level and eight times more likely than those who had no schooling at all. Only 25 percent of the mothers had secondary schooling; however, the vast majority had some primary or middle level schooling (63 percent). Within this group, exclusive breastfeeding increased gradually with schooling, from 10 percent among those who had some primary schooling to 14 percent among those who had attended middle school. We hypothesize that the explanation for the higher rate of exclusive breastfeeding among mothers with secondary education was that they tended to be better informed and more receptive to new ideas and that they may have

been more self-confident and less influenced by cultural beliefs. This makes them a particularly good target for behavior change interventions. It was encouraging, however, to see that even among the less educated mothers, who constitute the large majority in Accra, between 10-14 percent also exclusively breastfed, and thus had already responded to some type of educational effort. The fact that mothers with no education were the least likely to exclusively breastfeed suggests that either they were less exposed to the messages (a possibility because they were less likely to visit the health centers) or that the current behavior change strategies would need to be better adapted to their particular needs, or a combination of both factors. Our study did not explicitly investigate the cultural beliefs associated with non-exclusive breastfeeding, but the perceived danger of completely withholding water from children for months was expressed as a real concern by some women in the focus groups. Additional qualitative work would need to be carried out to get a more in-depth understanding of the cultural factors that may impede adoption of optimal child feeding practices for women from various education and ethnic groups.

The program and policy recommendations to address the problem of working mothers, and in particular those with young infants, are more complex. Overall, however, it was encouraging to see that mothers had adopted some apparently successful coping strategies to protect their child while they pursued their income-generating activities. Full-time working mothers were equally likely to breastfeed or exclusively breastfeed as those who did not work and they also had similar care practices in general. There was also no evidence either overall or among the group of 0-12 month old children of a

deleterious effect of working on child nutrition. Although these findings were reassuring, a concern remains that some subgroup of economically vulnerable mothers, particularly women heads of household, may have had very little support for childcare either from relatives or from the community. At the time of the study there were no low-cost or subsidized day care centers available for poor urban dwellers such as the ones that have become popular in urban areas of Latin America. One such government-supported program in Guatemala, which offers community-based day care facilities for women working outside their home, has been found to be extremely popular and to provide greatly needed assistance to urban dwellers and particularly to women heads of household (Ruel 2000). These types of programs and other alternatives are urgently needed in Accra to assist women working in formal and informal sectors. Special consideration should be made to include the care of young infants as a priority (which is usually not the case in this type of program, for security reasons) because of the severity of this problem in Accra.

Finally, poverty alleviation, income generation, hygiene and sanitation interventions, and quality control of street food sales are other interventions that are needed to improve the livelihoods of the poor in Accra (as discussed in Maxwell et al. 2000). Achievement of these goals should further enhance care practices and nutrition and the general quality of life of poor urban dwellers.

COMPLEMENTARITY AND LIMITATIONS OF THE APPROACHES USED FOR THE MEASUREMENT OF CARE

The complementarity of the different research approaches used to address the overall objectives of the Accra study was discussed previously by Maxwell (1998). The manuscript was written before the survey data collection was completed, and therefore, the primary focus was on the PRA methods used and how the findings fed into the development of the quantitative survey instrument and data collection methods. From a theoretical point of view, Maxwell argues that multiple methods provide a greater range of insights and perspectives and permit more triangulation (the confirmation of findings by different methods).

In the present report, we discussed findings from the three main research methods used, once data collection had been completed and a substantial amount of analyses on each one had been carried out. As indicated throughout this report, the quantitative and observational studies both had “care” as one of their main areas of emphasis, whereas the PRA studies did not address this issue as directly. In spite of this, the PRA studies still provided useful insight about a few topics of relevance for the analysis of care.

One specific illustration of triangulation comes from the analysis of the complex issue of maternal employment. The PRA studies provided some input on this issue, indicating that women who had to return to work early felt conflict between their various roles and worried about risk for their infants. Overall modeling exercises with the quantitative data did not reveal strong effects of maternal employment on care or on outcomes. However, the observational study provided some evidence that some cases of

the worst early growth may have been related to maternal work. In this very small group, an early return to work was linked with both poor early feeding practices and poor growth. In this case, the PRA and observational results supported each other to provide an important “caveat” to the quantitative results.

The PRA also allowed triangulation on the importance of the issue of care itself. The fact that poor care (or “irresponsible” parenting) was viewed as an important cause of malnutrition by community members both lends support to the interpretation of quantitative results and also points to the potential for improvements in child nutrition that would not depend on major social or economic changes.

A third example of the usefulness of the multi-method approach is the range of new hypotheses generated by the observational study. Some of these were then tested with the quantitative survey data, and by this iterative process of analysis helped form a richer and more complete picture of the role of specific resources for care and care practices.

Though the multi-method approach yielded richer insights than would have been possible with the survey alone, PRA exercises more specifically focused on care would have been very useful. One can think of various questions that remain only partially answered following the analysis presented in this report, many of which would be particularly suitable for a new round of PRA or other qualitative studies.

More information could be gathered on the question of why exclusive breastfeeding is rare among mothers with no education. Is it a question of cultural taboos and beliefs, of less exposure to the education messages, or are the education messages not

well adapted to the needs of women with no formal education? The issue of mothers' early return to work and coping strategies for caring for young infants in these circumstances could also be revisited in light of the findings of the quantitative and observational study results. Focus groups and key cultural informants could also yield insights into how women define "the good mother" and the "irresponsible" mother, and into how these views may vary between generations and ethnic groups. Local definitions of "the good mother" may also identify specific practices that protect and nurture children under difficult circumstances.

Thus, in retrospect, it appears to us that the overall study (and the care component in particular) would have benefited from additional rounds of PRA studies once data collection and preliminary analysis of the other research components had been completed. PRA studies could have been useful to help interpret findings as well as to inform program design. Although this approach would seem ideal from the point of view of enriching the information and guiding its interpretation and use, this is likely to be unrealistic under most field research conditions because of the time required to process and analyze the data.

The quantitative survey was the most important component of the overall study. It used the UNICEF model of the determinants of child malnutrition as its conceptual framework, and thus identified "Food – Health – and Care" as the three main pillars of the model. Indicators to measure most of the concepts included in the model were easily identified. No indicator was readily available, however, to represent the concept of care. There was also a strong feeling at the time that care should be measured through

extended observations in households and through longitudinal studies that allow the timing and the nature of changes and transitions to be captured (Engle and Ricciuti 1995). Although we certainly recognized the validity of the argument, this type of approach was not possible in the context of our survey of 500 households that had a wide variety of other objectives and for which care was only one component. Thus, we decided to take up the challenge and to try to measure the dimensions of care that were more suitable to the use of recall methods (child feeding and health seeking) and spot observations (hygiene practices).

Our experience was quite successful and showed that it was possible to generate at least some basic information on these selected dimensions of care using large-scale survey approaches. The spot check for hygiene has proved particularly useful in various contexts and is very fast. This method requires local adaptation and careful standardization of staff but data are useful and simple to use. The possibility of creating care indices with the information on the three dimensions of care was useful because it allowed us to model the importance of care relative to other determinants of child nutrition and it also permitted us to quantify the importance of various resources for care. This type of information is particularly important for advocacy purposes and it facilitates the graphic illustration of these important relationships in a convincing and attractive way for policymakers. For programmatic purposes, however, it is more appropriate to study the relative importance of the different components of the index, and this was also feasible with the type of information available.

Limitations of the quantitative survey with respect to measurement of care included a lack of rich information on current dietary intake of children (or families). While the most rigorous dietary methods would have been clearly impractical in the context of this survey, some measure of dietary diversity, and, possibly, of frequency of feeding for young children, might have been feasible. In addition to the limited dietary data, we concur with earlier authors that for some dimensions of care, survey approaches remain inadequate. In particular, it is doubtful whether a survey approach will ever be appropriate for measuring all dimensions of feeding styles and interactions, “cuddling care,” etc. Progress towards survey measurement of these complex behavioral “transactions” would require intense and culture-specific qualitative work and multiple validation exercises.

In conclusion, the use of multiple methods in the Accra survey proved fruitful; each method provided unique information but each also enriched and informed interpretation of other study components. Future work with these data will provide further elaboration of issues relating to the measurement of care, and of the feasibility and utility of these measurements in research, policy, and program contexts.

APPENDIX 1

Practices and Scoring System Used, by Age Group, to Create the Care Index (Child Feeding and Use of Preventive Health Services)

PRACTICES INCLUDED IN THE INDEX	Results	Scores allocated, by age group (mo)		
		4-8.9	9-17.9	≥ 18
Breastfeeding and feeding practices				
Prelacteal feeds used	Yes: 33%	Yes:-1 No: 0	Yes:-1 No: 0	Yes:-1 No: 0
Still breastfeeding	Yes: 51%	No =-1 Yes = 1	No = 0 Yes = 1	
<i>Gave to child when he/she was 0-4 months old:</i>	Yes: 69%	Yes:-1 No: 0	Yes:-1 No: 0	Yes:-1 No: 0
- Water				
- Sugar-based liquids	Yes: 26%	Yes:-1 No: 0	Yes:-1 No: 0	Yes:-1 No: 0
- Infant formula	Yes: 32%	Yes:-1 No: 0	Yes:-1 No: 0	Yes:-1 No: 0
- Cow milk	Yes: 17%	Yes:-1 No: 0	Yes:-1 No: 0	Yes:-1 No: 0
- Solid foods	Yes = 58%	Yes:-1 No: 0	Yes:-1 No: 0	Yes:-1 No: 0
First food offered to child	a)Unfortified cereals (koko): 60%	a) 0	a) 0	a) 0
	b)Fortified cereals: 30%	b) +1	b) +1	b) +1
	c)Nothing special: 10%	c) -1	c) -1	c) -1
Does anyone help the child eat	No: 28%		No: -1 Yes: 0	No: -1 Yes: 0
What does caregiver do when child refuses to eat	a) Nothing (child left alone): 21%	a) -1	a) -1	a) -1
	b) Other (coax, play with, force, change food, not a problem): 79%	b) 0	b) 0	b) 0
Preventive health care services use				
Growth monitoring (past month)	Yes: 63%	No: -1 Yes: 0	No: -1 Yes: 0	No: -1 Yes: 0
DPT immunization (> 3 mo)	Yes: 91% ²	No: -1 Yes: 0		
Measles immunization (> 9 mo)	Yes: 85% ³		No: -1 Yes: 0	No: -1 Yes: 0

APPENDIX 2

Aspects Observed and Used to Create the Hygiene Index^a

Observation	<i>Households with good hygiene</i>		Missing or not observed
	n	%	n
*Mother clean	353	69.6	5
*Index child clean	348	69.3	10
*Diaper clean	342	68.8	15
*Compound swept	247	49.5	13
*No poultry faeces	337	69.8	29
*No stagnant water	446	89.6	14
No human faeces	475	97.5	25
No unwashed utensils	262	69.3	134
Drinking water covered	94	68.6	370
House swept	201	77.9	254

^aThe variables preceded by an asterisk (*) were used in the construction of the index. Other variables were not used either because they had no variability (such as absence of human faeces), or because there were too many instances where the aspect could not be observed and thus resulted in a large number of missing values (unwashed utensils, drinking water covered, house swept).

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