FCND DISCUSSION PAPER NO. 51

URBAN CHALLENGES TO FOOD AND NUTRITION SECURITY: A REVIEW OF FOOD SECURITY, HEALTH, AND CAREGIVING IN THE CITIES

Marie T. Ruel, James L. Garrett, Saul S. Morris, Daniel Maxwell, Arne Oshaug, Patrice Engle, Purnima Menon, Alison Slack, and Lawrence Haddad

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

October 1998

FCND Discussion Papers contain preliminary material and research results, and are circulated prior to a full peer review in order to stimulate discussion and critical comment. It is expected that most Discussion Papers will eventually be published in some other form, and that their content may also be revised.

ABSTRACT

No developing country can afford to ignore the shift in the locus of poverty, food insecurity, and malnutrition from rural to urban areas it is now experiencing. This review of recent literature explores the urban face of food and nutrition security in a more comprehensive, integrated way than most previous efforts.

The review is organized around a conceptual framework that identifies food insecurity, inadequate caring behaviors, and poor health as the primary causes of malnutrition. It discusses current knowledge in eight areas that require the special attention of policymakers, development practitioners, and program administrators who wish to improve urban food and nutrition security:

- the sources and cost of food;
- incomes and employment;
- urban agriculture;
- urban diets;
- child caregiving practices;
- childhood mortality, morbidity, and malnutrition;
- health and environment; and
- social assistance programs, or safety nets.

The review also reports on the magnitude of rural-urban and intra-urban health differences in mortality, morbidity, and malnutrition. In conclusion, the review indicates which policy issues and knowledge gaps remain for future research to address.

CONTENTS

TABLES

FIGURES

ACKNOWLEDGMENTS

We express our appreciation to all those who have encouraged us to tackle the subject of urban food security and nutrition, most especially those who responded to our first inquiries on the issue almost three years ago. We are also grateful to Mauricio Barreto, Rainer Gross, and Richard Stren for comments on an earlier version of this paper. Thanks are also due to Haydee Lemus, Bonnie McClafferty, Kara Sulmasy, and Jay Willis for administrative assistance and editorial advice.

Marie T. Ruel, James L. Garrett, Saul S. Morris, Alison Slack, Lawrence Haddad
International Food Policy Research Institute

Daniel Maxwell
CARE International—Kenya

Arne Oshaug
Department of Food Production and Health
Ministry of Agriculture, Norway

Patrice Engle
Department of Psychology and Human Development
California Polytechnic State University

Purnima Menon
Cornell University

1. INTRODUCTION

This review explores the urban face of food and nutrition security. It should give policymakers, program administrators, and development practitioners a better grasp of the most important factors to consider when designing urban food and nutrition programs and policies, and point researchers to areas where further information is needed.

THE GROWTH OF THE CITIES

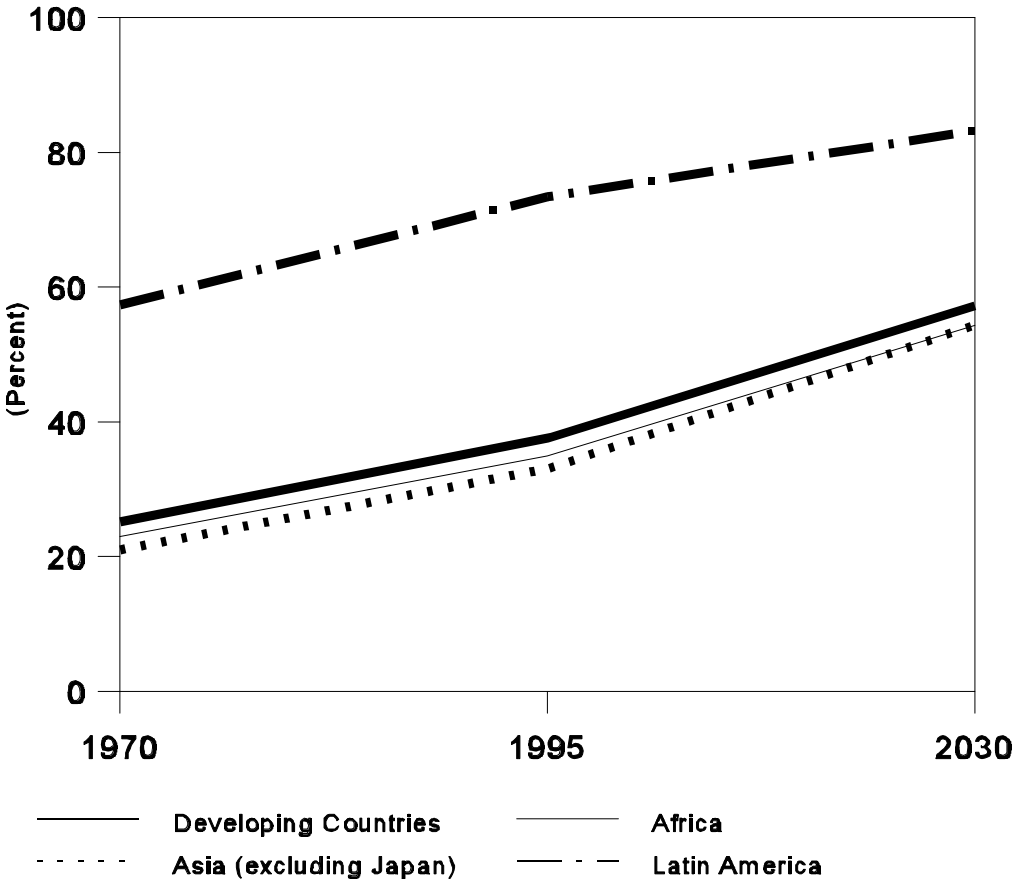
No developing country can afford to ignore the phenomenon of urbanization, which will be one of the strongest social forces in coming years, especially in developing countries. Within the next 20 years, more poor and undernourished people in developing countries will live in the cities than in rural areas. High rates of urbanization mean that urban food insecurity and malnutrition are concerns even for regions like Africa and Asia, where current levels of urbanization are relatively low.

Sixty-six percent of the world's urban population lives in developing countries, and this will increase to 80 percent by the year 2030[1] (United Nations 1998). Within developing countries, 38 percent of the population, some 1.8 billion people, now lives in urban areas. About 75 percent of Latin Americans live in cities, and about a third of Africans and Asians. By the year 2030, almost 85 percent of Latin Americans will live in cities, as will over one-half of all Africans and Asians (Figure 1) (United Nations 1998).

The urban population in developing countries is growing three times faster (3 percent annually) than the rural population (less than 1 percent annually). By the year 2030, the rural population will have grown by more than 235 million, but the urban

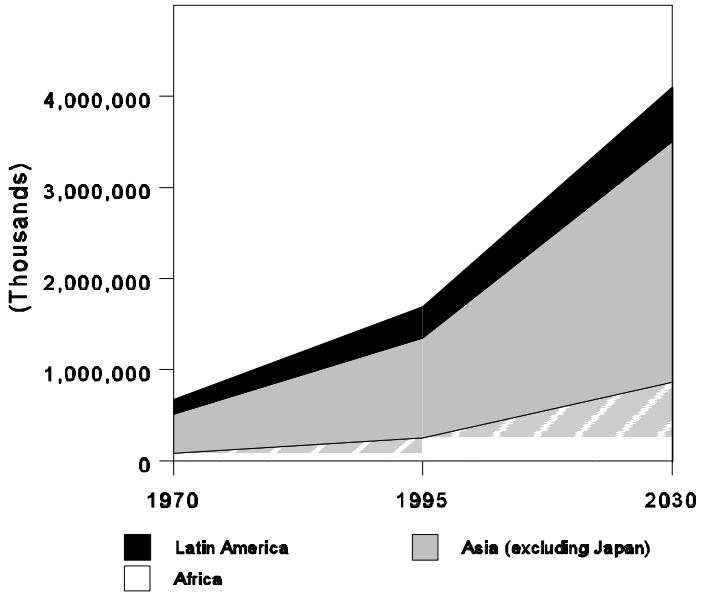
[1] The United Nations (1998) follows national definitions of "urban," and these definitions vary widely. Many countries refer to population centers of about 2,000 or more inhabitants as urban areas.

Figure 1 Percentage urban, by developing country region



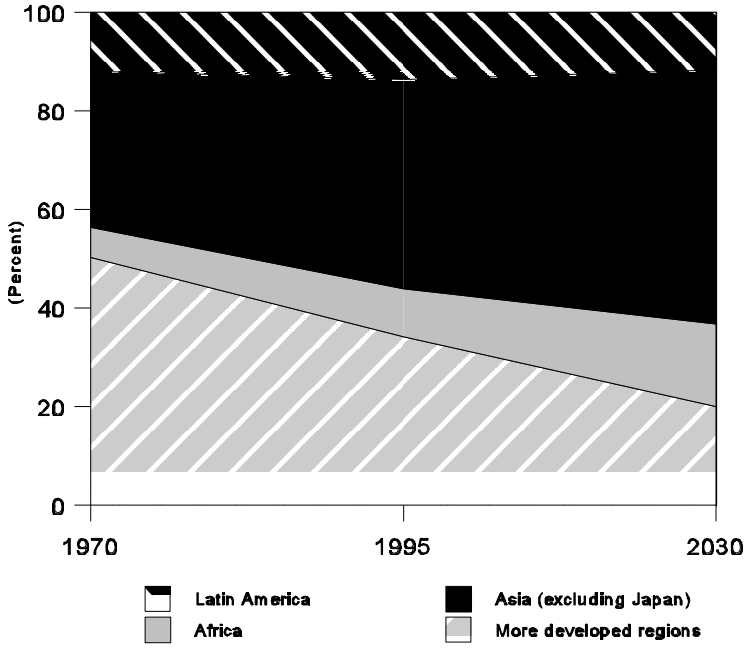
population will have grown by 2.4 *billion* (United Nations 1998). The number of people living in cities in Africa will more than triple, from 251 million to 864 million. The number in Asia will grow from 1.09 billion to 2.63 billion, and in Latin America, from 350 million to 599 million. The total in developing countries, then, is expected to more than double, from 1.7 billion to 4.1 billion. By 2030, Asia will have the largest urban population in the world, almost twice as many people in cities as in Africa and Latin America combined, and Africa will have more urban residents than Latin America (Figures 2 and 3) (United Nations 1998).

Figure 2 Distribution of urban population, by developing country region



Source: UN (1998)

Figure 3 Distribution of world's urban population, percentage



Source: UN (1998)

Changes in the size of cities result mainly from differences in birth and death rates, and net migration from rural areas. Migration is most important in the early stages of structural transformation, such as in Africa; natural increase tends to dominate the more industrialized countries, such as most of Latin America; and reclassification of peri-urban communities is of particular importance in the densely populated regions of Asia (Naylor and Falcon 1995).

IS POVERTY INCREASING IN THE CITIES?

What is the significance of this massive growth of urban populations around the world? Does it augur large increases in urban poverty and malnutrition as growth in urban areas outstrips the capacity of the city to provide jobs, or to build the necessary infrastructure for urban agriculture, effective markets, health, and good water and sanitation. Generally, policymakers, donors, and other development practitioners believe that rural conditions are much worse than urban ones; so does this mean that resources should not be directed to the urban poor and malnourished?

Although the figures may not hold for all developing countries, recent data from eight countries containing approximately two-thirds of the developing world's people suggest that the locus of poverty is shifting to urban areas (Haddad, Ruel, and Garrett 1998). The data show that for five out of eight countries, the absolute number of urban poor are increasing over time (Table 1). For seven of the eight countries, the share of poor people in urban areas is increasing.

The prevalence of urban poverty in each country is highly dependent on country-specific experiences and policies. Higher prevalence could result from civil wars that drive people into the cities, as in Somalia, or from implementation of an industrial strategy that builds on unequal income distribution, as in Brazil, even when average levels of economic development are similar (Naylor and Falcon 1995).

Furthermore, levels of urban and rural poverty are linked, underscoring the profound positive impact that broad-based economic growth can have on overall poverty

Table 1 Changes in poverty in selected developing countries

Country	Survey years	Percent poor in urban areas		Number of urban poor	
		Year 1	Year 2	Year 1	Year 2
				(thousands)	
Bangladesh	1983/4–1991/2	11	12	6,686	7,665
China	1988–1995	7	11	19,203	28,139
Colombia	1978–1992	36	38	2,052	1,808
Ghana	1987/88–1992/3	25	29	1,203	1,353
Nigeria	1985/6–1992/3	22	31	8,176	10,278
Indonesia	1990–1993	16	15	5,760	3,717
India	1977/78–1993/4	19	23	57,210	72,510
Pakistan	1984/5–1991	25	26	11,669	10,928

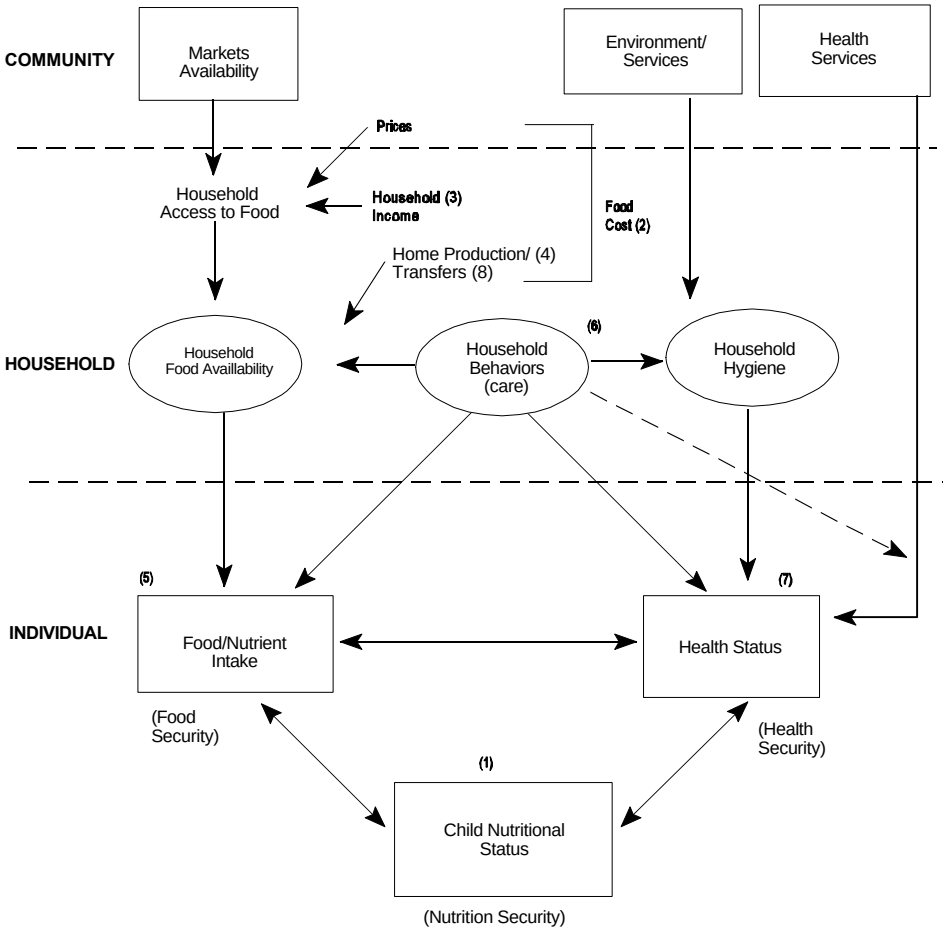
Source: Haddad, Ruel, and Garrett (1998).

reduction. Naylor and Falcon (1995) note, however, that the sectors with the highest rates of growth do not necessarily have the highest rates of poverty alleviation, because they attract more (often poor) people than they can absorb. This could be one explanation for the fact that in many countries, rural poverty rates are decreasing much more rapidly than urban poverty rates (which may even be increasing). While urban-based employment is growing and helping to decrease rural poverty, it cannot absorb all the additional supply of labor coming from the countryside. Moreover, poverty alleviation within particular sectors can be offset by large income inequalities. In fact, such inequalities, as well as the type of growth pursued in the urban sector, may be much more important to the location of poverty than the aggregate growth and distribution effects (Naylor and Falcon 1995).

2. CONCEPTUAL FRAMEWORK

The present review draws on a conceptual framework for analyzing causes of malnutrition among young children in developing countries that was developed by UNICEF during the 1980s (UNICEF 1990). An adaptation of this model is presented in Figure 4. This framework has two important features: first, it identifies three essential

Figure 4 Conceptual framework of the determinants of child nutritional status



clusters of determinants of child nutritional status, namely: *food security*, *adequate care*, and *health.* Second, it distinguishes between individual, household, and community factors that affect child nutritional status. *Food security*, *adequate care,* and *health* are all necessary conditions for achieving *nutrition security*, but none of the three is sufficient in isolation.

FOOD SECURITY

Availability of food, access to food,[2] and risks related to either availability or access are the essential determinants of food security (von Braun et al. 1992). National food security implies that within a country the amount of food available, if evenly distributed, is enough to meet people's food needs. At the household level, "a household is food secure when it has access to the food needed for a healthy life for all its members (adequate in terms of quality, quantity, safety, and culturally acceptable), and when it is not at undue risk of losing such access" (UN ACC/SCN 1991).

The broad area of food security may be usefully disaggregated into questions relating to *adequacy* of food availability and *stability* of both food availability and access. This approach focuses on conditions necessary to achieve food security and highlights the need to consider both the nature of the food itself and the range of factors determining security of food availability and access.

Adequacy of food availability means that the overall supply should potentially cover overall *nutritional needs* in terms of quantity (energy) and quality (providing all essential nutrients); furthermore, it should be *safe* (free of toxic factors and contaminants) and of good food quality (taste, texture, and so on). Last but not least, the types of foodstuffs commonly available (nationally, in local markets, and eventually at the household level) should be *culturally acceptable* (Oshaug 1994).

Stability of the food supply and of *access to food* presupposes *environmental sustainability*, implying that there is a judicious public and community management of the natural resources that have a bearing on the food supply; and also presupposes *economic* and *social sustainability* in terms of conditions and mechanisms securing food access. This implies just income distribution and effective markets, together with various formal (public-sector) and informal safety nets. These could be public social security schemes, programmatic interventions, income-generating programs, and numerous forms of

[2] In this review, food availability refers to availability at the market level and food access refers to availability at the household level.

community transactions, and self-help and solidarity networks, the latter taking on particular importance when people have to cope with shocks and crisis situations of various kinds (Oshaug 1994).

As shown in Figure 4, the main factors that affect an individual's food intake (individual food security) are household food availability, household behaviors (including decisions and choices regarding food acquisition and intrahousehold allocation), and the individual's health and nutritional status (mainly through an effect on appetite). In urban areas, the main determinants of food availability at the household level are prices and income, access to home production (urban agriculture), and access to formal and informal transfers. Household behaviors, influenced by cultural factors and knowledge, also affect patterns of food demand and distribution within the household.

CHILD CAREGIVING

The second condition for nutrition security is *adequate care*. Care is the provision in the household and the community of time, attention, and support to meet the physical, mental, and social needs of the growing child and other household members (ICN 1992). Care encompasses a number of critical factors in the development of nutritional well-being among individuals—especially the most vulnerable groups in society: young children and pregnant and lactating women. The focus of this review is on care of children, as provided by their main caregiver (typically women). The types of caregiving behaviors reviewed here are those that are most likely to be affected by specific characteristics of urban life (Engle et al. 1997). These include maternal health (both physical and mental), maternal education, employment and time constraints, family support and social networks, and the availability of substitute child care. The caregiving behaviors reviewed include breast-feeding and complementary feeding of young children, food preparation and food storage behaviors, hygiene behaviors, and care for children during illness, including diagnosis of illness and health-seeking behaviors.

HEALTH

The third condition for nutrition security is health, which is largely a consequence of adequate prevention and control of diseases. This review will focus on diseases of poverty and on the synergism between morbidity from infectious diseases and malnutrition. The issue of chronic diseases will not be addressed, although it is recognized as an increasingly important health concern in urban areas.[3]

Health is determined by a series of factors that act at three levels. At the community level, factors such as the quality of the overall environment (biological pathogens and chemical pollutants in air, food, and water), and the availability, cost, and quality of services such as water, electricity, sewage, refuse disposal, and health services are important health determinants. At the household level, the most important factors include the general conditions of the household, including the type of housing, the availability and cost of water and hygienic facilities, and the number of rooms per household member (an indicator of crowding); the availability of food; and household caring behaviors related to the use of preventive and curative health services, the use of water and hygienic facilities to provide a healthy, hygienic, and safe environment, and food-related behaviors such as the acquisition of food, the intrahousehold allocation of resources, feeding practices (including breast-feeding), and food preparation methods. At the individual level, the determinants of health relate to the interactive mechanisms among an individual's food and nutrient intake, nutritional status, and health status.

The health and nutrition of mothers and preschool children, rather than that of other household members, will be emphasized throughout this review, mainly because of their greater biological vulnerability. Young children are more susceptible to infectious diseases, malnutrition, and poor growth, and are likely to suffer long-term negative

---

[3] The nutrition transition and its consequences for the rapid emergence of obesity and chronic diseases is not discussed here. The ever-growing importance of these issues, however, for all urban areas, including those of even the poorest countries of the developing world, is well recognized. Excellent reviews of this topic are available (Popkin 1994, 1998; Drewnowski and Popkin 1997).

consequences of these insults on their physical, cognitive, and reproductive performance in adulthood (Martorell 1993). Mothers are also more biologically vulnerable to ill-health because of their reproductive role. Maternal health is of special concern because of the excessive demands on their body, and the particular health risks associated with pregnancy and child birth. In addition, maternal health and nutritional status are important for maintaining a safe pregnancy, ensuring adequate growth of the fetus, and experiencing satisfactory lactation. In urban areas, the health of women is also crucial for their role as income earners and ability to provide adequate care for their children and family.

THE MAIN ISSUES

Based on this conceptual model, we have identified various issues of particular policy importance in urban areas. These include four issues related to individual food security (issues 1–4 below), one related to child caregiving (issue 5), and two related to health (issues 6–7). Each of these issues will be addressed separately in the chapters that follow. The program and policy response to these issues and the constraints to food and nutrition security in urban areas will be discussed in Chapter 10 (as issue 8), followed by a summary of the main research and policy questions arising from the review and some concluding remarks (Chapter 11).

The eight issues are the following:

Issue 1: **Food sources and costs**. Where do the poor get their food and at what cost? (Chapter 3)

Issue 2: **Incomes**. What are the constraints to an adequate income in urban areas? (Chapter 4)

Issue 3: **Urban agriculture**. Can it improve food security, nutrition, and health, and have a positive impact on the environment? (Chapter 5)

Issue 4: **Urban diets**. Are they adequate (that is, nutritious, safe, and culturally acceptable)? (Chapter 6)

Issue 5: **Child caregiving**. What are the threats to adequate child caregiving in urban areas? (Chapter 7)

Issue 6: **Rural/urban, inter-urban, and intra-urban differentials in childhood mortality, morbidity, and malnutrition**. Are urban populations really better-off? (Chapter 8)

Issue 7: **Health**. What are the determinants of ill health in urban areas? (Chapter 9)

Issue 8: **Safety nets and food and nutrition programs**. How can they improve food and nutrition security in urban areas? (Chapter 10)

3. FOOD SOURCES AND COSTS: WHERE DO THE POOR GET THEIR FOOD AND AT WHAT COST? (ISSUE 1)

Historically, the most significant difference between food access in urban and rural areas has been that rural people can often produce their own food, whereas urban people are more dependent on food purchases. A recent study in Accra found that households purchase 90 percent of their food (Maxwell et al. 1998). This dependence on markets is further increased because, unlike their rural counterparts, urban dwellers cannot exploit natural resources to provide for housing, energy, and water. Food expenditures can make up as much as 60 to 80 percent of total income among low-income urban households (Tabatabai 1993; Maxwell et al. 1998).[4]

People can get their food from three sources: the market, their own production, and transfers from public assistance programs or other households. The efficiency of the food marketing and distribution system, household purchasing patterns (such as whether the family buys in bulk or in small quantities), the household's ability to produce its own

[4] Asaduzzaman (1989, cited in Drakakis-Smith 1992b) showed that in Bangladesh, per capita expenditure on food in cities is 30 percent higher than in rural areas, although the average caloric intake is lower.

food, as well as the household's access to public transfers, such as food subsidies or food aid programs, or private transfers, such as exchange relationships with rural relatives, are among the most important factors affecting the cost of food for the urban household.

URBAN MARKETS

Clearly, food prices and the ability to earn cash income are crucial to the achievement of food security in urban areas. Food prices are dependent on a number of factors, including the efficiency of the food marketing system and availability and access to food subsidies or other food programs.[5] Inefficient food marketing systems linking rural and urban areas can increase the costs of food for the urban poor. For example, bad roads and inadequate storage facilities can lead to high losses that increase costs as goods are transported to towns from agricultural production areas.

Within the city, urban food distribution systems are highly diverse. Food for the cities can come from areas of agricultural production either at home or abroad, rural or urban, or from international trade or aid (Drakakis-Smith 1992b). Traders, distributors, processors, and retailers are major participants in the marketing chain that gets food from producer to consumer, with each actor potentially performing multiple functions or overlapping with others.[6]

---

[5] This is not an exhaustive list of the factors that affect food costs, which would also include agricultural policies, input costs, technologies, macroeconomic and import policies, and so on. These issues are beyond the scope of the present review. Furthermore, though improving the efficiency of urban food processing and distribution systems has undoubted potential to reduce prices and increase urban consumers' food security, this review confines its focus on food availability to the retail market level, where direct interaction between market and household occurs.

[6] Despite the importance of the city as a node through which food aid and imports are channeled and of urban dwellers as a principal influence on a country's food demand and, consequently, production pattern, the urban food system is little studied (Lourenco-Lindell 1995). Studies of urban markets and the food system tend to be location-specific and descriptive, and they often review the roles or characteristics of specific market actors, such as market women, or of specific marketing programs, such as food distribution schemes. Other studies concentrate on the functioning of agricultural markets in rural areas or in general (Scott 1995; Abbott 1993), but rigorous, comprehensive studies of the urban food marketing system are scarce. The Food and Agriculture Organization of the United Nations's Food Supply and Distribution to Cities Programme should make a substantial contribution to this literature.

Almost 20 years ago, Mittendorf and Abbott (1979) identified the problems that continue to affect urban food supply and increase urban food costs today. Wholesale markets that connect producers and traders with retailers are often run-down and obsolete, with ineffective management. Generally built decades ago, they do not have sufficient space or storage facilities to handle the large volumes of food currently processed. Frequently located in highly urbanized areas, traffic congestion around the markets is immense. Urban retail markets are often small and scattered. This means that, although they are able to create employment and effectively meet the demand of poor urban consumers who need easy access to markets and make purchases in small quantities, gains from economies of scale are difficult.

Macroeconomic policies also have a significant impact on the price of urban food. For many years, and in many countries, "cheap food" policies deliberately kept the price of urban food low, but structural adjustment programs in the 1980s and 1990s have reversed many of these policies (Walton and Seddon 1994). Virtually all single-city case studies and review articles of urban food security note that the price of food has risen faster than the general cost of living since the mid-1980s, and much faster than increases in income (Tabatabai 1993; Gebre 1993; Tripp 1990; Hussain 1990; Atkinson 1992; von Braun et al. 1993; Pearce 1991). The impact of structural adjustment on prices has been felt mainly through the deregulation of domestic food markets, but also through the devaluation of currencies and the price of imported foods (Kelly et al. 1995). On the other hand, prices for urban food could fall in some countries if deregulation were broadened to include the food-processing sector (Jayne and Rubey 1993).

PURCHASING PATTERNS OF URBAN DWELLERS

Tight time constraints, coupled with an income pattern where wages are earned and spent daily, often compel the urban poor to buy their food in small quantities from neighborhood shops rather than central markets. These latter facilities usually offer bulk food at lower prices, but do not provide the option to buy in small quantities.

Development-associated increases in income and the opportunity cost of time, especially women's time, as well as exposure to advertising, also have tended to favor a shift to processed foods more widely provided by supermarkets and street vendors than by traditional markets (Kennedy and Reardon 1994; Drakakis-Smith 1992b). Furthermore, with increasing development and the burgeoning size of cities, producers, retailers, and wholesalers have tended to become more specialized and distinct (Mittendorf and Abbott 1979). The structure of food retailing has also been affected by the introduction of new technologies such as refrigeration, which has prolonged the storage, transport, and shelf-life of perishables.[7] However, despite the rising importance of supermarkets, Drakakis-Smith (1992a, 1992b) has insisted on the continued vital role of the traditional, "petty commodity" sector. The tiny quantities in which food is often sold in this sector make food more accessible to the poor, who may have very little to spend and cannot afford the cheaper bulk purchases possible from supermarkets.

Street foods can also be a significant source of food for many urban dwellers, both in terms of energy intake and food expenditure.[8] In Indonesia and the Philippines, urban households spend up to 25 percent of their food budgets on street foods, a proportion that remains constant across income groups. In Ibadan, Nigeria, 98 percent of schoolchildren bought their breakfast in the streets (Children in the Tropics 1994).

Tinker (1997), in her study of street foods in seven countries of Asia and Africa, shows expenditures on street foods ranging from 16 percent of household food budgets in Bangladesh to 50 percent in Nigeria. In many cases, street foods are cheaper than home-

---

[7] Food marketing in Latin America, for example, is now characterized by a limited number of commercial agents. Major distribution chains now dominate the food marketing system, replacing the traditional system of small and unorganized commercial outlets (FAO 1994). By the late 1980s, supermarkets had captured 80 percent of food sales in Brazil and employed 500,000 people. In Chile, supermarkets supply 65 percent of the food for the middle-class and 45 percent for low-income households (IICA 1995; Schejtman 1994). In cities as diverse as Hong Kong and Harare, over half of all food is now sold through supermarkets (Drakakis-Smith 1992b).

[8] For a discussion of the contribution of street foods to urban diets, see Chapter 7.

prepared meals, especially when time spent shopping and cooking and the cost of transport and fuel are factored in (Tinker 1997).

Smaller and poorer families tend to spend more on street foods than other households. A study in Ghana (Maxwell et al. 1998) finds higher street food expenditures among the poorest groups. Households in the poorest expenditure quintile spent an average of 39 percent of their total food budget on foods purchased away from home, compared to 26 percent of the top quintile, a finding confirmed by Tinker in cities of Bangladesh and the Philippines. Also, small families in urban areas of Thailand spent 58 percent of their food expenditures on street foods, compared to 36 percent of families with eight members or more (Tinker 1997).

Street foods may also be, in some cases, the lowest-cost foods available. Vendors may be able to acquire raw materials through family or ethnic networks, or purchase discounted quantities at reduced prices. They may also rely on unpaid (in wages) labor from family members (Children in the Tropics 1994). Even if more expensive per unit than raw foods, purchase of prepared street foods can free-up time for the worker to engage in income-generating activities that have a greater benefit to the household than food preparation, especially in cases where traditional foods require long preparation times (Atkinson 1992).

OWN PRODUCTION

Urban residents may gain access to some amount of food through their own production. This may be from urban agriculture, farming operations outside the city, or the peri-urban areas (Lee-Smith et al. 1987).[9] Even if the proportion of the total household food supply coming from own production is small, it is important in the sense

[9] Urban agriculture can range from small gardens with herbs to raising livestock or growing crops in public areas. Some urban farmers produce only for home use while others also produce commercially. For further discussion of urban agriculture, see Chapter 6.

that the household can access this food at critical times, such as when income is insufficient for food purchases.

PRIVATE AND PUBLIC TRANSFERS

Private Food Transfers

Private food transfers often take the form of reciprocal exchanges between urban and rural households. Rural kin provide urban families with food, and urban family members may remit some of their cash income to rural households, or provide some other service in return, such as assisting family members in obtaining employment or schooling in the city. The literature on urban-rural linkages makes numerous references to this type of exchange, but exchanges involving food are rarely quantified (Baker and Pedersen 1992; Baker 1995; Tripp 1990).

The strength and persistence of such rural-urban ties is also the subject of debate, particularly in Africa, where the level of urbanization is the lowest but the rate of urbanization highest. Coquery-Vidrovitch (1991) argues that within a generation after migration to cities, people have lost contact with their rural kin. Others (Gugler 1991; Baker 1995; Tripp 1990) suggest that the economic constraints faced by contemporary urban dwellers in Africa tend to reinforce rural-urban ties, and encourage livelihoods that straddle both urban and rural domains.

Interviews with poor households in Dar es Salaam suggested that dependence on rural areas for food or support was not widespread. Only about 35 percent of households received any food from rural areas in the year previous to the interview, and only about a quarter of them visited their home village (CARE Tanzania 1998).

Private transfers can also come from companies that, through company cafeterias, use food as part of "wages." In this case, food compensates for low cash wages and can help to reduce absenteeism (Banguire 1987; Jamal 1985).

Public Transfers

Governments and NGOs also have social assistance programs that provide food to targeted households (Bart 1994). School feeding programs for children or food baskets given at health clinics are two such examples.[10]

Although programmatic food transfers are not by any means unique to cities, by virtue of their population density and infrastructure, a larger variety of food assistance programs is often available in cities. Emergency relief programs to prevent famine are also usually logistically easier to mount in cities than in rural areas. Indeed, in the late 20th century, outright famine is largely a rural, not urban, phenomenon.[11]

SUMMARY

Urban food systems that the poor rely on are fragmented, and this leads to inefficient marketing and an increase in the unit cost of food. The fragmentation of the food distribution system is partially linked to the level of economic development. Increased efficiency and integration are difficult without adequate transportation and storage facilities and without good information systems and access to credit. Improved integration of the food distribution system is also hard when a large proportion of the population is poor and can only afford to buy small amounts of food at a time. This demand pattern logically leads to a large number of sellers who sell small quantities of food, which are generally higher in price per unit than bulk purchases. With economic development, a shift occurs in how and where people obtain their food. Supermarkets replace traditional street sellers and central markets. This leads to increased consumption of processed products. Urban living also increases the amount of food prepared and eaten away from home. Processed foods may be more expensive than nonprocessed ones, but

---

[10] Safety net and food programs are discussed in more detail in Chapter 10.

[11] There are important exceptions to this observation, particularly where cities become havens for refugees or people displaced by conflict, and where these cities are either geographically remote and cannot easily be reached with large quantities of food (for example, eastern Zaire in 1994 during the height of the Rwandan refugee crisis), or where the cities are cutoff from outside sources of food by the conflict itself (for example, eastern and southern Sierra Leone in 1995).

save preparation time (Kennedy and Reardon 1994), but street foods may actually cost less on a per-nutrient basis (Maxwell et al. 1998). Urban agriculture and private and public transfers may be particularly important for urban dwellers who have few other alternatives than purchasing their food.

4. INCOME: WHAT ARE THE CONSTRAINTS TO EARNING AN ADEQUATE INCOME IN URBAN AREAS? (ISSUE 2)

In urban areas, households buy most of their food, so lack of income is the main challenge to food security. The importance of being able to earn cash income also means that the ability to stay healthy, to get a good job (and therefore the ability to acquire good education and training), and to have access credit to smooth consumption or expand or start up businesses are critical to urban food and nutrition security.

With enough income, prices can rise and families can still buy enough to eat. Millions of urban poor, however, are vulnerable to prices rises or sharp declines in income, say due to illness or loss of job by the principal income-earner. Unfortunately, governments and NGOs simply do not have the resources to support programs to meet the needs of all those who are poor and food insecure. Unable to turn to social assistance, these households must work to earn a living as best they can. Consequently, outright unemployment in developing countries is relatively low. In large cities in Latin America and Asia, unemployment is generally less than 10 percent (CEPAL 1997; ADB 1994). Yet, the majority of the urban labor force works in sectors like petty trade and services where wages are low and job tenure uncertain. In urban Sub-Saharan Africa, employment in sectors that pay regular wages, such as manufacturing and industry, accounts for less than 10 percent of total employment (Rondinelli and Kasarda 1993). Urban poverty thus is not primarily the result of lack of work but the lack of well-paying, steady jobs.

URBAN EMPLOYMENT

The poor work in a variety of jobs, but working long hours in often precarious conditions for low wages is a constant. Jobs tend to be irregular and tenure is insecure. The urban poor may work in garment factories or at home for piece-rate work, operate small shops, sell food or cigarettes in the street, scavenge in garbage dumps, sweep streets and clean latrines, drive rickshaws, or seek day-work in construction (ADB 1994; ILO 1995; CARE Bangladesh 1998; CARE Tanzania 1998). In the smaller cities, service jobs in the informal sector dominate because there is little manufacturing (Rondinelli and Kasarda 1993).[12]

Perhaps because of their concentration in these unskilled, irregular jobs, seasonality affects the earnings of the urban poor just as surely as it does those of the rural poor. CARE Bangladesh (1998) reports on the decrease in income and job availability among casual laborers such as rickshaw drivers and construction workers in Dhaka in the rainy season. This is primarily due to the outdoor nature of their work and the increased likelihood of illness. In Dar es Salaam, street vendors also lose income when it rains, both because of decreased demand and because city officials shut them down to prevent the spread of waterborne diseases like cholera (CARE Tanzania 1998).

The informal sector, where many of the poor work, is so large that it can no longer be seen as a marginal sector. In most countries it plays a central role in the economy. On average, 40 to 60 percent of urban workers in Asia are in small-scale enterprises, the Asian Development Bank's (ADB) preferred term for the informal sector. Fifty-two percent of urban workers in Sri Lanka and 30 percent in Thailand work in such small businesses (ADB 1994). Thirty percent of all employment in Latin America is in the informal sector, rising to 50 percent if wage laborers in small-scale enterprises are included (Castells and Portes 1989 in Rondinelli and Kasarda 1993).

[12] Definitions of the informal sector vary, but generally they include smallness of scale and emphasize the vulnerability of the workers, who seldom receive the employment benefits and legal protections of those who work in the formal sector.

About 1.7 million people work in the informal sector in the urban areas of Central America. The informal sector is at or near three-fourths of the labor force in Guatemala, El Salvador, and Honduras. Of course, this means that one-fourth of the labor force is in the formal sector. The numbers of workers in the informal sector are significant, but can fluctuate widely over time. For example, in Nicaragua in 1985, the informal sector was substantially larger than formal but substantially smaller in 1993 (Funkhouser 1996).

Becker, Jamer, and Morrison (1994) estimate that 40 percent of the urban work force finds employment, including self-employment, in the informal sector in Kenya, and as much as 90 percent of the urban work force is in the informal sector in Freetown, Sierra Leone. Wage workers seem to be relatively rare in Africa, amounting to only about 25 percent of informal labor. It is generally assumed that family labor composes the bulk of the informal-sector labor, but apprentices may be one-half to four-fifths of the informal labor force in some countries in Africa, although significantly less in east Africa (Meagher 1995).

Whether a person finds a job in the formal or informal sector is to a large extent determined by education and training (Amis 1997). But factors such as an economic sector where employment can be found, skills, neighborhood, caste, and gender can be even more important than human capital (ILO 1995; Yamada 1996). In Central America, those employed in the informal sector tend to be the least educated; the youngest and the oldest; and female (Funkhouser 1996).

Informal-sector work is less assured than formal-sector work, but it can also possess a dynamic, entrepreneurial character that contrasts with the traditional view that it provides employment to those who cannot find formal-sector jobs (Funkhouser 1996). Average incomes from formal- and informal-sector work are often similar. Yet the "informal" label disguises the existence of at least two distinct strata: employers, including the self-employed, and intermediary traders in one group, and family laborers, employees, and apprentices in another (Meagher 1995; Yamada 1996). Even then, "self-employed" covers a wide range of activities, where small owner-operators have wages roughly

equivalent to informal-sector wage labor, and may include those who work on commission. Differentiation among these groups is more apparent in Latin American cities but is also present in Africa (Meagher 1995).

Some interpret these statistics as evidence that, instead of being marginalized, informal-sector workers can earn and invest enough to climb out of poverty. Yet only a few really earn enough to do so. For example, in Africa, only informal urban workers with incomes in the highest 20 percent could be classified as genuine entrepreneurs, as owners of enterprises in more skill- and capital-intensive subsectors such as manufacturing and trade. Because a certain minimum of skills and capital is necessary to undertake these activities, successful workers are not drawn from the ranks of the unemployed but from those who are already employed and so have access to the necessary social, physical, and financial resources. Even for these workers, backward linkages to other informal activities that provide inputs are more prevalent than forward linkages to formal-sector businesses, especially in Africa (Meagher 1995).

While acknowledging the potential for dynamism, weaknesses inherent in the informal sector inhibit it from generating escapes from poverty for everyone. Lack of capital is one obstacle. Urban livelihood assessments in Bangladesh and Tanzania have pointed out the great need for additional credit facilities for both men and women (CARE Bangladesh 1998; CARE Tanzania 1998). These assessments showed that many of the urban poor did participate in savings groups of some sort, including funeral funds or rotating funds, but the amounts of credit available for, say, business expansion were limited. In Tanzania, for example, most poor urban households relied on friends, relatives, or shopkeepers for credit when needed, and less than 10 percent had access to microcredit finance schemes or formal banks (CARE Tanzania 1998).

WOMEN AND EMPLOYMENT[13]

[13]Also see employment and the caregiver, Chapter 7.

Female labor-force participation has been steadily increasing throughout the developing world, particularly in Southeast Asia and Latin America. More than 60 percent of total female employment in the majority of West African cities is in the informal sector (Becker, de Bodisco, and Morrison 1986 in Meagher 1995). In West Africa, women are 60–80 percent of the urban work force in trading; in Asia and Latin America, women dominate trading and manufacturing in the urban economy (ILO 1995).

Distinctions among informal- and formal-sector work blur for women, as it does with men. Women in Sub-Saharan Africa may leave formal-sector jobs like teachers or nurses to work in more lucrative informal-sector activities. Also, as do the men, women may hold multiple jobs, which they combine with their household and child care activities. These household responsibilities may force women to take part-time informal sector jobs or work at on flexible hours at home (ILO 1995; Palmer 1991). Indeed, women have less access to better-paying jobs in the formal sector and are disproportionately represented among unpaid family workers and in the informal sector. Such gender distinctions are apparent in the study in Ghana, where 60 percent of the men are in wage labor while 75 percent of the women are self-employed (Maxwell et al. 1998).

Consequently, women's wages overall are usually lower than men's, and differences may be higher in the informal than in the formal sector. In India, women's wages are only 17 percent of men's; in Kenya, women's wages are 18 percent lower than men's. In Latin America, on average, females receive 51 percent of the average male's wages (World Bank 1995; Funkhouser 1996).

The gap is due in part to women's generally lower level of education and their unavailability for night or overtime work because of legal barriers or family responsibilities. The lack of access to assets, such as education, training, and credit, continues to inhibit women's ability to acquire higher-paying jobs (ILO 1995; Palmer 1991). Still, even after taking into account differences due to level of education, skill, and experience, a significant gap between the wages received by women and those received by men remains.

HEALTH, NUTRITIONAL STATUS, AND INCOME

In developing countries where mechanization is still limited, human labor provides much of the power for productive economic work. For the poor, labor is their most important asset. Work capacity, performance, and productivity of workers are therefore generally important for income (Pryer and Crook 1988). This can lead to a situation where poor, malnourished workers perform poorly because of decreased working capacity, and therefore do not get access to better-paying jobs. Various studies support this assumption, showing positive associations between wage achievement and nutritional status as proxied by either body weight, body-mass index, stature, or caloric and protein intake (Haddad and Bouis 1991; Strauss and Thomas 1996; Satyanarayana et al. 1980, cited in Pryer and Crook 1988). In urban Brazil, this was true for both men and women and associations of wages with body-mass index in men were stronger among the less-educated (Strauss and Thomas 1996). It is interesting to see that not only current short-term nutrition (reflected by body weight, body-mass index, and nutrient intake) is important for income, but also past chronic malnutrition (reflected in attained adult height), thus emphasizing the importance of nutrition during early life for human capital formation.

Pryer (1993) also showed that in an urban area of Bangladesh, illness-induced loss of employment was highly prevalent, particularly among the poorest households, and that it resulted in substantial losses of income. Households with a chronically incapacitated principal income earner were also two-and-a-half times more at risk of having a severely malnourished preschooler and at high risk of having other undernourished household members.

Thus, poor adult health and nutritional status may be a serious constraint to the household's ability to generate income and protect its members from food insecurity and malnutrition.

SUMMARY

Underemployment, rather than outright unemployment, is an important constraint to adequate income in many urban areas. The urban poor often have low-paying and unstable jobs in the informal sector. Although the informal sector often pays low wages, many analysts also see the sector as a promising source of economic growth fueled by small entrepreneurs. Because labor is often the poor's only productive resource, their dependence on highly variable wages and employment puts them at high risk of poverty and food insecurity. The ability of the poor to cope with the vagaries of the labor market, but ultimately to take advantage of it to overcome their poverty, depends critically on their own skills, their access to functioning labor markets, and their health and nutritional status. Women often fare worse than men in the labor market because they often have less access to well-paying jobs in the formal sector and frequently work as unpaid family workers or in the informal sector.

5. URBAN AGRICULTURE: CAN IT IMPROVE FOOD SECURITY, NUTRITION, AND HEALTH, AND HAVE A POSITIVE IMPACT ON THE ENVIRONMENT? (ISSUE 3)

Urban agriculture, defined as production in the home or plots in urban or peri-urban areas, is more widespread and important than generally thought.[14] Some believe that it is not only a potentially significant source of income, food, energy, and micronutrients for family members, but that it can also benefit the environment by providing a way to reuse solid wastes and water. A number of studies now exist on the topic (Yeung 1985; Sanyal 1985; Rakodi 1988; Lee-Smith et al. 1987; Freeman 1991; Mvena, Lupanga, and Mlozi 1991; Sawio 1993; Mbiba 1995; Drakakis-Smith 1991; Egziabher et al. 1994; Maxwell 1995; Maxwell and Zziwa 1992; UNDP 1996).

Most of the studies on Africa note that the importance of urban farming increased in the 1970s and 1980s as urban populations in much of the region grew at record levels and urban economies began to crumble. Virtually all of the empirical studies carried out in Africa characterize urban agriculture as a means of obtaining some amount of food for household consumption through nonmarket or subsistence means. In Latin America and Asia, commercial urban farming is more highly developed, especially with regard to vegetable and perishable-food production, but much of this production is also for home consumption (Prudencio-Bohrt 1993). Still, most research on urban agriculture continues to reflect the conclusions of Sanyal (1985) that it is predominantly a strategy adopted by

[14] The lack of a commonly agreed-upon definition of urban agriculture, and thus the lack of comparable data across cities, have made the attempt to quantify the impact of urban agriculture on poverty, food security, health, and nutrition difficult. Some argue that any household that produces food for the city practices urban agriculture. Other analysts include commercial farms on the city's edge, even if they were previously located in very rural areas and the city has grown out to meet them. We prefer a more restricted definition: *urban agriculture is the practice of producing crops or raising livestock within the boundaries of the city or metropolitan area*. This definition thus could include production in peri-urban areas, often squatter settlements or slums, but not commercial farms or households located outside the boundaries. Of course, defining the boundaries of a city is no easy task, and some judgment would have to be made.

households whose monetary incomes are inadequate to purchase sufficient food (Maxwell 1995; Maxwell and Zziwa 1992).

SIGNIFICANCE OF URBAN AGRICULTURE

As with any farm household, a household involved in urban agriculture is both producer and consumer. Urban agriculture also improves access to food by raising incomes if production is sold. The significance of urban agriculture can be measured in several ways: in terms of the proportion of the urban population engaged in the practice, in terms of income and employment, in terms of total production, and in terms of the impact on access to food and nutrition.

Farming is practiced by a surprisingly large proportion of urban populations, up to as much as 40 percent within African cities (Sanyal 1986; Sawio 1993) and 50 percent in Latin America (Mougeot 1994). Urban farming is not simply a marginal activity of recent migrants from the countryside: migrants may stay in cities for 5–10 years before acquiring land for cultivation (Sawio 1993). Several studies note that while many socioeconomic groups in the city may farm, farming constitutes a crucial form of food access for the lower income groups. Yet, because farming requires access to land, those who practice urban agriculture may not be among the poorest of the poor.

Reliable data about the proportion of the total urban food supply coming from urban production are scarce. For some commodities, especially vegetables or poultry, the proportion of total urban consumption coming from urban agriculture can be quite high. UNDP (1996) cites figures as high as 70 percent of poultry products (meat and eggs) and 90 percent of vegetables consumed in some cities in Asia and Africa coming from producers within urban areas. Maxwell and Zziwa (1992) estimate that 15–20 percent of the total consumption of staple foods in Kampala comes from urban agriculture. Memon and Lee-Smith (1993) estimate the monetary value of urban agriculture in Kenya in 1985 at $4 million. But studies are scattered, often location-specific, and use varying definitions of "urban agriculture," so the estimates remain rough.

In any case, the importance of urban agriculture varies with the city. Availability of land and agricultural inputs and municipal policies toward farming determine the extent of urban agriculture in most cases. The green spaces available in Kampala, Uganda, for example, are not so prevalent in Accra, Ghana, and very few urban households in Accra farm (Maxwell, Levin, and Csete 1998). As a secondary or complementary economic strategy, even when households farm, only a limited number of urban households are entirely dependent on farming for their livelihood. In Dar es Salaam, for instance, about 55 percent of peri-urban households in selected wards farmed, but, on average, they depended on agricultural production for food only 2 to 3 months of the year (CARE Tanzania 1998).

The majority of urban farmers in Africa are women—figures range from slightly over 50 percent in surveys where the household head was asked who farmed, to about 85 percent in time allocation studies. Only a few studies have explicitly explored intrahousehold division of labor and responsibilities related to urban agriculture (Rakodi 1988; Memon and Lee-Smith 1993; Maxwell 1995). Most studies describe urban agriculture as a "household survival strategy," and to the extent that urban agriculture is characterized in theoretical terms, it is most often placed as a special subcategory of the urban informal economy. Rakodi (1988) particularly emphasizes the "hidden" nature of much of the income generation and subsistence activity of urban women.

EFFECTS ON FOOD SECURITY, NUTRITION, ENVIRONMENT, AND HEALTH

It is widely agreed that urban agriculture increases food access and availability, but the actual impact on food security and nutrition has rarely been empirically measured. In two of the few studies available, Maxwell, Levin, and Csete (1998) and Maxwell (1995) suggest a positive association between urban farming and food access, food consumption, and the nutritional status of children.

The environmental and health impacts of urban farming are potentially both positive and negative. Previous research highlights the potential of urban agriculture to recycle

wastewater and organic materials, and thus help resolve both solid and liquid waste disposal problems in rapidly growing cities (Smit and Nasr 1992). But these suggestions add to concerns about food safety, particularly contamination from the use of untreated wastewater for irrigation. The intensive use of agricultural chemicals in a densely populated environment and urban livestock production also pose potential dangers to health and nutrition. On balance, researchers seem to agree that urban agriculture could have a beneficial impact on the urban environment through recycling wastes, stabilizing drainage and run-off, and making productive use of green spaces, but serious research and assessment is needed to ensure that urban farming employs techniques and technologies that will also safeguard human health (Birley and Lock 1998; UNDP 1996).

LEGAL AND INSTITUTIONAL CONSTRAINTS

Urban agriculture in most cities is a precarious enterprise. Reluctance to change the legal status of urban agriculture stems partly from biases against urban agriculture on the part of urban authorities, and partly from concerns about food safety and the health and environmental impact of urban agriculture discussed above. In many cities, agriculture remains technically illegal despite the potential benefits. In Nairobi after World War II, the government passed a law ordering all crops within the city to be cut down. Livestock and horticulture remain illegal today. In Kampala, more than one-fourth of farmers face harassment and eviction from the city council or landowners (UNDP 1996).

The most critical institutional constraint to urban agriculture, particularly crop cultivation, is access to land. The institutional conundrum of urban farming is that the practice is dependent on access to land, but the group to whom farming is most important is the least able to gain secure access to land (Maxwell 1996).

While some forms of urban agriculture are so intensive that they can actually compete with other land uses on an economic basis, much of the subsistence production by the urban poor relies on informal access to underutilized or unutilized urban land (Maxwell 1996; Sawio 1993). Frequently, farmers do not own the land but use public

space or use vacant lots owned by private owners, with or without their permission. Landowners and farmers may enter into informal agreements but, because of the lack of an adequate legal framework governing tenancy, lease, and appropriate use, private landowners will not formally lease their land or not lease their land at all. With low tenure security and questionable legality, the farmer is not motivated either to be efficient or to care for the land. Insecurity of tenure and other institutional constraints to land access effectively prevent technological improvements.

The uncertain legal status of urban agriculture is such that official projects or programs aimed at improving urban agriculture have been relatively rare. Typically, urban agriculture is not taken into account in the urban planning process. In India, agriculture is not part of the master plan of any city. In combination with a weak legal framework, the lack of awareness and government recognition means planners often do not think about how to provide water and drainage infrastructure to handle urban farming, and governments make little provision for research on and extension for urban farming techniques (UNDP 1996). For instance, Tanzania's National Urban Water Agency strongly opposed the use of water for urban farming, and imposed a fine for use of water for agriculture in the city (Schippers and Lewcock 1994). Property rights could be designed to give landowners and farmers the security of tenancy they need to be more productive and to farm in an environmentally friendly way, but negative planning and cultural attitudes toward urban agriculture mean there is little movement to remove existing policy, administrative, and legal hurdles for urban agriculture (UNDP 1996).

These constraints are often exacerbated by the fact that in many cities, it is mostly women who are involved in urban agriculture. Legal and cultural biases against women owning or even leasing land make their attempts at urban farming even more difficult.

Success with urban agriculture does exist, however. For decades, city authorities in Lusaka, Zambia, enforced laws against crop production in the city as a health hazard. Farming of vacant land was illegal. Legal action was rarely taken but authorities often cleared land of crops. Faced with economic decline in the 1970s, however, the president

urged urban dwellers in 1977 to grow their own food. In response, the Lusaka City Council stopped enforcing the antiurban agriculture laws. Government stores even made subsidized seeds for fruits and vegetables available. In 1977, 43 percent of Chawama, one of the largest slums in Lusaka, had home gardens. A decade later, 40 percent of households still had home plots (UNDP 1996). In a few cases in Accra, land in peri-urban areas has been deliberately protected for agricultural use. The fate of any given community in the process of urbanization depends on local leadership and the commitment of the leadership to the development of the local community (Maxwell et al. 1998).

SUMMARY

In addition to a general lack of studies, the lack of a common definition of urban agriculture and the precise definition of an "urban area" has hampered efforts to draw on available findings to state conclusively what the impact of urban agriculture is on poverty, health, food security, nutrition, and the environment. Urban agriculture appears to have greater significance for these issues, however, than most policymakers and researchers have suspected. At this stage, it seems clear that the importance of urban farming varies with the conditions found in the cities. In some areas, urban farming is clearly an important coping strategy for households and in others, it has the potential to be.

For lower-income groups, whose monetary incomes are insufficient to purchase adequate food, farming can constitute a crucial form of land access, although because farming requires access to land, those who farm tend not to be among the poorest of the poor. Because women often have responsibility for food procurement for the household, women are frequently involved in urban agricultural production and sales.

The practice of agriculture in the city, however, presents a number of challenges, from competition for scarce available land to use of techniques and technologies that degrade the soils, pollution, and increase of poisoning and infectious diseases. At the same time, urban agriculture offers new potential for recycling urban wastes, saving on

marketing transport costs, and providing poor segments of the population with employment possibilities.

6. URBAN DIETS: ARE THEY ADEQUATE ? (ISSUE 4)

In previous chapters of this review, we examined price and income constraints on demand for food in urban areas. We now turn to questions relating to the *adequacy* of urban diets.[15] In the following sections, we address first the nutrient adequacy of urban diets relative to rural diets, then the issue of food safety, with particular reference to street foods. The various issues surrounding infant feeding and breast-feeding in the city are covered in Chapter 7.[16]

NUTRIENT ADEQUACY OF URBAN DIETS

There is ample evidence that urban diets are quantitatively and qualitatively different from rural diets in all regions of the developing world. In general, rural dwellers tend to eat more cereals, especially coarse grains, while urban dwellers tend to eat more varied diets with higher levels of animal protein and fats (Popkin and Bisgrove 1988). Alarcón and Adrino (1991) have demonstrated that in Guatemala, a slum population in the capital (mostly first generation migrants from rural areas) obtained 41 percent of their total caloric intake from wheat bread, beans, and sugar, while a rural comparison group obtained 70 percent of their calories from maize. Consumption of products of animal origin was much higher among the city dwellers. Périssé and Kamoun (1987) analyzed

[15] Food adequacy is a concept that includes three distinct components: (1) that all *nutritional needs* should be satisfied, both in terms of energy and all other essential nutrients, (2) that foods consumed should be both *safe* and *palatable*, and (3) that the types of foodstuffs commonly available should be *acceptable* within the prevailing food culture (Oshaug 1994). See also Chapter 2.

[16] This review does not address issues related to the nutritional transition, and the magnitude, impact, or determinants of dietary excess in developing country cities, although we recognize that the risks of obesity, diabetes, heart disease, and diet-related cancers are increasing at an alarming rate in most urban areas of the developing world. See reviews in Popkin 1994 and 1998, Drewnowski and Popkin 1997, and WHO 1998.

data from three rounds of a national household budget survey in Tunisia and showed a sharp rural-urban gradient in the consumption of traditional durum wheat products, which are being replaced in urban areas by soft-wheat bread. Meat, poultry, fish, and milk products were all consumed more frequently by small-town and, especially, large-city dwellers. In Burkina Faso, rice accounted for 35 to 46 percent of the cereal expenditures of residents of the capital city (all income groups) compared to insignificant amounts in three different rural areas of the country; and in Kenya, "quasi-urban" groups devoted a proportion of their total cereal expenditures to bread (as opposed to maize) that was threefold greater than agricultural households of similar incomes (Kennedy and Reardon 1994). Finally, in a weighed intake study in Bangladesh, urban slum dwellers consumed more oils, leafy vegetables, pulses, and potatoes than a predominantly landless group of rural peasants, but consumed less cereals and other vegetables (Hassan and Ahmad 1991). Similar findings have been reported from Brazil, Turkey, and Pakistan (Pinstrup-Andersen 1986; Gencaga 1985; Pakistan 1979; all quoted in Popkin and Bisgrove 1988).

The different composition of urban diets relative to rural diets has important implications for the nutrient adequacy of urban dwellers. First, it is interesting to note that all the studies described above have indicated that overall energy intakes were lower for urban residents than their rural counterparts. This may relate to different age/sex compositions of urban households, different activity levels, and, therefore, different energy requirements, or perhaps inadequacies of the data collection methods in capturing the more diverse food sources in urban areas, particularly snacks and street foods. Ferguson, Gibson, and Opare-Obisaw (1994) have shown that 24-hour recalls are prone to omit snack foods and fruits when compared to the weighed intake method in rural Ghanaian children. In a controlled clinical trial, Rosado et al. (1992) have shown that healthy volunteers in Mexico actually ate more of a typical urban diet than they did when offered a typical rural diet: this they ascribed to either the satiety-inducing effects of the high-fibre rural diet, or the sheer monotony of its relatively unvarying contents. Furthermore, the same study showed that the *digestibility* of the rural diet was lower than that of the urban

diet, with an apparent absorption of energy of 89 percent (rural) versus 95 percent (urban). Even bigger discrepancies were seen for protein, with apparent digestibilities of 67 percent and 90 percent for rural and urban, respectively.

The studies noted above all suggest that the micronutrient intake of the urban poor is likely to be higher than that of their rural counterparts, particularly for vitamin A, vitamin C, folate, and some minerals.[17] These differences may affect even the nutritional status of breast-fed infants, since multicountry studies of the nutrient content of human breast milk have indicated that protein, nitrogen, vitamin A, and iron levels tend to be lower in rural than in poor urban samples (WHO 1985; WHO/IAEA 1989). The controlled trial of urban and rural Mexican diets by Rosado et al. (1992) found that both iron and calcium intakes were higher for the *rural* diet, while zinc intakes were similar. The particular interest of this study lies in the fact that the authors were able to investigate the relative bioavailability of zinc, iron, and calcium in the two diets. All three minerals were markedly better-absorbed from the urban-type diet than from the rural-type diet, presumably because of the lower concentration of inhibitors such as phytates, the greater concentration of promoters such as ascorbic acid, and the contribution of animal food sources, which contain more available forms of iron (heme-iron) and promote absorption of calcium.

There are various reasons why urban diets tend to be more diverse than rural diets—namely higher income, changing values and norms, and cultural diversity. Musgrove (1988) has pointed out that in northeast Brazil, traditional staples are more expensive in urban areas than in rural areas, while the opposite is true for processed foods:

---

[17] In the Guatemalan study, calcium and vitamin A intakes were higher among urban residents, while iron intakes were the same. In Tunisia, vitamin A and vitamin C were more available at the household level in urban areas, as were—to a lesser degree—calcium, riboflavin, and niacin, but thiamine was less abundant. There were no major differences with regard to iron in 1980 or 1985. The Bangladesh study suggests that vitamin A and vitamin C intakes were higher among urban slum dwellers, but that the intake of the B-vitamins (especially niacin) was lower. Iron intake was similar. A 24-hour dietary recall study in South Africa (Steyn et al. 1989, quoted in Walker 1995) showed higher intakes of calcium, folate, and vitamin C in urban 11-year olds, with similar intakes of iron, vitamin A, and the B vitamins (except for vitamin B12, which was higher in the rural sample).

this means that it is relatively less expensive to shift away from traditional staples to processed foods in urban areas. Kennedy and Reardon (1994) suggest that in the towns of Africa, "working women have less time for food preparation and have a tendency toward higher-priced, 'convenience' source of calories; the higher price is counterbalanced by savings in time and transport." A study in an urban area of Sri Lanka provides strong evidence that the opportunity cost of women's time can be an important determinant of food consumption patterns (Senauer, Sahn, and Alderman 1986). The value of time of the primary woman had a positive effect on bread consumption and a negative impact on rice consumption, which requires preparation and cooking time. Furthermore, because of the greater availability of different foodstuffs in the urban market, urban consumers (especially those at low-income levels) tend to be more price sensitive than rural consumers, and to switch between substitute foods more easily (Musgrove 1988). In times of crises, poor urban households in Guayaquil substituted potatoes with plantains and fresh fruit juices with powdered fruit-flavored drinks (Moser 1989). Some of the substitutions are likely to have a negative nutritional impact, especially when they involve replacing nutrient-dense foods with "empty calories" as is the case with the fruit juice example above.

FOOD SAFETY IN DEVELOPING-COUNTRY CITIES

The poor sanitary conditions of many developing-country cities are notorious. Combined with poor hygiene practices, these conditions create a situation in which food safety is severely compromised. In Chapter 7, we examine the role of improved hygiene practices in protecting family members from food-related diarrheal illness in the home. In this section, we focus on street food,[18] which, because it is produced in bulk and is eaten by large numbers of different customers, has the potential to seed serious epidemics of infectious diseases such as cholera (Lim-Quizon et al. 1994; Koo et al. 1996).

[18] The term *street food* is understood to refer to all foods bought outside the home (prepared or otherwise) and intended for consumption outside the home.

Street foods make up a large proportion of the foods eaten in developing-country cities, especially for certain age groups. In a food frequency survey of secondary school students in Port-au-Prince, Haiti, it was found that, on average, 25 percent of the students' daily energy and 15 percent of their daily protein were obtained from street foods (Webb and Hyatt 1988). Similar results were obtained in a study of Nigerian adolescents, who also obtained 25 percent of their daily energy from street foods, as well as more than half their total intakes of protein, iron, calcium, vitamins A and C, and thiamin (Oguntona and Kanye 1995). Other studies have shown that in Kuala Lumpur, Malaysia, and Iloilo, the Philippines, almost 25 percent and 30 percent of household expenditure, respectively, are spent on street foods (E.P.O.C. 1983 and 1984, cited in FAO 1990). In Accra, households spend one-third of their food budget on street foods (Maxwell et al. 1998). The importance of street foods in the diets of vulnerable groups in developing countries (especially preschool children and pregnant and lactating women) has not been adequately documented. Battcock (1992) has noted high levels of sugar, salt, and fat in many street foods, a factor that should be taken into account when assessing the overall impact of street food consumption on dietary intakes.

With respect to the safety of street foods, both the Expert Consultation of the Food and Agriculture Organization of the United Nations in 1988 (FAO 1990) and the results of a multicountry study by Tinker (1997) concluded that the types of pathogens found in street foods were similar to those found in foods prepared and served indoors, and that food hygiene practices of street vendors were similar to those of indoor restaurant workers. A study carried out in Colombia suggested that foods of animal origin, those with a high protein or moisture content, a relatively high pH, or a relatively large number of ingredients tended to present the highest risk of contamination (PAHO 1992, cited in Arambulo et al. 1994).

Constraints to better practices identified by FAO (1990) were the lack of potable water for cooking, drinking, washing utensils, and hygiene; improper handling and storage of ingredients and cooked foods; lack of facilities for waste disposal; use of unlawful

additives, and poor personal hygiene by street vendors. One study in India analyzed water and food samples from both ambulant vendors and restaurants in the city of Pune, and found that the restaurants were no more hygienic than the ambulant vendors (Kulkarni 1992). There are no available data comparing the levels of microbial contamination in street foods and the foods poor city dwellers commonly prepare and eat at home.

The determinants of reliance on street foods have not been well documented, although several possible determinants are mentioned in the FAO Expert Consultation report. These include reduced transportation costs and time needed to obtain meals; high opportunity costs of cooking at home for working women; lack of appropriate cooking facilities in many urban dwellings, and the fact that street foods are often cheaper because vendors can take advantage of economies of scale in their preparation.

SUMMARY

Major qualitative differences are seen between rural and urban diets. These differences persist even when analyses are restricted to groups with broadly similar incomes and result in significant rural-urban differentials in intakes of many nutrients. Even those nutrients such as iron, which do not appear to be consumed at consistently higher levels in urban diets, may be better absorbed because they are obtained from animal rather than vegetable sources. The relatively high cost of traditional staples in urban areas, the greater range of potential “substitute” foods, and the opportunity costs of women's preparation time have all been suggested as possible determinants of the greater diversity of urban diets. Street foods are a major feature of urban eating, but the health and nutritional consequences of this pattern—especially for young children and women—have not been investigated. The trade-off between greater convenience and perhaps lower cost on the one hand, and poor nutritional quality and higher risks of contamination on the other, remains to be fully explored.

7. CHILD CAREGIVING: WHAT ARE THE THREATS TO ADEQUATE CHILD CAREGIVING IN URBAN AREAS? (ISSUE 5)

The following section will review the literature on some of the determinants of child care in urban areas, namely the mother's health and nutritional status, education, employment, family support and social networks, and the availability of alternative child care. A few selected food-, health-, and hygiene-related caring behaviors will then be discussed, with an emphasis on how they may affect children's nutritional and health status.

DETERMINANTS OF MATERNAL CAREGIVING BEHAVIORS

Physical Health and Nutritional Status of Mothers

Mothers with poor health or nutritional status may have decreased energy levels and a reduced capacity to perform certain caregiving activities. Studies show that maternal deficiencies in iron and certain vitamins result in less active caring behaviors (Kirksey et al. 1992). Results from Egypt indicate that anemic women spent substantially less time caring for their children than non-anemic women, and that mothers with low vitamin B-6 status were less responsive to their infant's vocalization and distress, and were more likely to request help from older siblings for caregiving duties (Allen 1993; McCullough et al. 1990). Severe maternal malnutrition is also known to be associated with reduced lactational performance, potentially reducing both milk quantity and quality (Subcommittee on Nutrition During Lactation et al. 1991). Thus, maternal malnutrition can negatively affect breast-feeding, which is one of the most important caring behaviors for protecting the health and nutrition of children in the developing world.

Unfortunately, data on the health and nutritional status of women in urban areas are scarce (see also Chapter 9), let alone data on the effect of this status on maternal caring behaviors.

Mental Health of the Caregiver

Studies have reported high levels of stress and depression among women in developing countries (Chakraborty 1990). Urbanization has also been shown to be associated with mental disorders, probably as a result of changes in social support and life events (Harpham 1994). A study that examined the physical and mental health of family members both before the onset of rapid urbanization and after the peak of the urbanization trend (1965 and 1980, respectively) in Khartoum, Sudan, found that 40 percent of mothers reported being anxious or depressed after urbanization (Rahim and Cederblad 1986; Cederblad and Rahim 1986). A study in urban slums in Bangladesh reported anecdotally that some women were extremely socially isolated, and were often so depressed that they were unable to care for their children properly (Immink et al. 1994).

Education of the Caregiver

Maternal education has been consistently associated with positive child health and nutrition outcomes (Caldwell 1979; Cochrane, Leslie, and O'Hara 1982; Cleland and van Ginneken 1988). The mechanisms by which maternal education is beneficial for the child, however, are not well understood. It is not clear whether maternal education influences health through an improvement in child care practices directly (such as with the development or enhancement of caring skills and better use of health care facilities), or whether the influence is more a result of increased maternal income resulting from better employment opportunities, or both (Cleland and van Ginneken 1988; Behrman and Wolfe 1984, 1987). There is evidence that in some cases, maternal education and socioeconomic status interact so that maternal education is more important among poor households that have access to a minimum level of resources (Bairagi 1980; Doan 1988; Ruel et al. 1992). In Accra, maternal education was the single most important determinant of good care practices, whereas household income, assets, and food availability were not associated with good care practices (Maxwell et al. 1998). The impact of maternal education on the nutritional status of children was mediated through improved care practices.

Maternal education also appears to have a greater effect on children's nutritional status at certain ages. Sahn and Alderman (1997) showed this to be the case in Maputo (Mozambique), where maternal education was significantly associated with height-for-age Z-scores only among children less than two years of age. Income, on the other hand, was important only for older children.

Results from Ecuador, Mexico, Paraguay, Peru, and the Dominican Republic showed that maternal schooling was associated with increased use of health services (Cleland and van Ginneken 1988). In the Philippines, maternal schooling had a positive effect on children's energy intake, maternal practices related to hygiene, and the use of health services for preventive purposes (immunization) (The Cebu Team 1991). These positive behaviors, in turn, reduced the incidence of diarrhea among young children.

Employment and the Caregiver[19]

The characteristics of employment in urban areas may make the provision of adequate caring for children more difficult (Engle et al. 1997). Many women in cities are more active in the informal sector, where wages are generally low and hours often uncertain and long (Merrick and Schink 1976). The conditions of many urban occupations may be less compatible with child care in that they make it more difficult for a mother to take a child with her if the work is on the street or in an office, as opposed to out in the field as in a rural area.

Leslie (1989) has examined the relationship between women's work and child welfare, including the nutritional status of children under five. She notes a conflict in perspectives between the *Child Survival* literature, which tends to emphasize the negative impact of women's work on child health due to less time spent in child care activities and shorter duration of breast-feeding, and the *Women in Development* literature, which tends to emphasize the positive influence of increased women's income.

---

[19] Also see Women and Employment (Chapter 4).

It is usually assumed that maternal employment outside the home is a major determinant of the use of breast-milk substitutes and is associated with reduced initiation of breast-feeding as well as shorter duration of any breast-feeding. A comparative analysis of demographic health survey (DHS) data from 15 countries estimated the proportion of breast-milk-substitute use attributable to employment away from the baby during the first 6 months of life (Hight-Laukaran et al. 1996). The results showed that, contrary to general beliefs, maternal employment was not a main determinant of breast-milk-substitute use in developing countries. The proportion of breast-milk-substitute use attributable to maternal employment ranged from 0.7 to 22 percent and was less or equal to 5 percent in 10 of the 15 countries studied. Similar findings were reported in studies undertaken in Nairobi, Bogota, Bangkok, and Semarang (Java), where maternal employment per se was not found to be a consistent predictor of breast-feeding duration and use of infant formula (Winikoff, Castle, and Hight Laukaran 1988).

Overall, the impact of maternal employment on child health and nutritional status appears to be linked not only to income, but to other related factors such as type of work (for example, wage labor and self-employment), place of work, length of working day, the availability and quality of substitute child care, and the child's age. A study in Guayaquil (Ecuador) showed that, in times of recession, maternal employment had a negative impact on child caregiving time and on children's nutritional status, not only because more women started to work and tended to work longer hours, but also because women returned to work when their children were younger (Moser 1989).

Family Support and Social Networks

An important source of support for a caregiver is the family, regardless of the environment. Changes in family structure related to the transition from rural to urban areas, and their impact on caring behaviors and the health and nutritional status of family members, are not well researched or understood. Fathers are a potentially important source of support to the caregiver, both physically and emotionally, and the opinions of

fathers may have significant consequences on the initiation of certain caring behaviors, such as breast-feeding (Littman, Medendorp, and Goldfarb 1994).

The community structure is clearly different in urban and rural areas. As a result, the opportunities and resources available for caring are different as well. Residents in urban areas, however, may develop new networks, or may recreate networks based on the rural ones in an attempt to adapt to the new urban situation (Engle et al. 1997).

Alternative Care

A common pattern of child care, especially in developing countries, is for the mother to provide the primary care during a child's first year, and then share the caring responsibilities with the child's older siblings or other adult family members, once the mother takes on employment responsibilities outside the home. A study in Guatemala (Engle and Pedersen 1989) suggests that there is no consistent relationship between who provides childcare and the health or nutritional status of the child, but adult caregiving was generally positively associated with children's health and nutrition, whereas sibling caregiving was detrimental to the child. Other studies suggest that care by a preteen caregiver is associated with lower nutritional status of a child under 2 years old, controlling for maternal education and socioeconomic status (Engle 1991; LaMontagne, Engle, and Zeitlin 1998).

Little data exist on the availability of older siblings as caregivers in an urban setting. However, with increased school attendance in urban areas, their availability is likely to be limited. The number of children left without any form of child care is difficult to ascertain. Anecdotal stories of children left alone, locked in the house, are frequently heard in large cities of the developing world, but systematic data on this phenomenon are not available.

Institutional day care could be a good alternative for child care in urban areas. Traditional institutional care, however, is usually too expensive for poor urban households, which results in low coverage underutilization of these services (Engle, García de Sanchez, and Suarez 1988; deSouza and Grein Santos 1993). Many governments in

Latin America and some countries of Africa and Asia have started to implement community day care centers to support working parents living in poor urban slums (Young 1995; Colletta and Reinhold 1997). These programs have enormous potential to relieve some of the time pressures on working mothers and may be particularly indispensable for the large number of women head of households living in urban areas.

CARING BEHAVIORS

Breast-Feeding and Complementary Feeding

Breast-feeding is the best example of a caring behavior that provides unequivocal nutritional, health, and emotional benefits to the child, as well as potential positive effects to the mother[20] (UN ACC/SCN 1991). Breast-feeding also provides immunity to the child and protection against infectious diseases. The beneficial effect of breast-feeding is thus particularly important for children living in contaminated environments such as urban slums. In these settings, where it is almost impossible to prepare complementary liquids or breast-milk substitutes hygienically, infants exclusively breast-fed have significantly lower diarrheal morbidity and mortality, compared to those who receive mixed feeding (Victora et al. 1989; Brown et al. 1989; Popkin et al. 1990). Thus, exclusive breast-feeding for the first 4 to 6 months may be particularly important in urban areas.

There is a general belief that urban mothers are less likely to initiate breast-feeding and more likely to wean earlier if they do breast feed. This is supported by studies carried out in Thailand, Egypt, and Ghana (Khanjanasthiti and Wray 1974; Brink et al. 1983; Grimble 1981, cited in Atkinson 1993a). Our analysis of the DHS data comparing urban and rural samples, however, does not indicate such clear patterns (Figures 5 and 6).[21]

---

[20] Exclusive breast-feeding during the first six months of life is associated with the delayed onset of menstruation, which results in longer interbirth intervals.

[21] We compiled data from 44 Demographic Health Surveys (DHS) conducted in 35 countries between 1985 and 1994 to examine urban/rural differences in childhood mortality, morbidity, and malnutrition (see Chapter 8), and in maternal breast-feeding patterns and use of health services (this chapter).

Although the percentage of children ever breast-fed (Figure 5) and the median duration of breast-feeding (Figure 6) tend to be lower in urban areas, the pattern is not fully consistent and differences are often of small magnitude. Urban mothers were found to initiate breast-feeding at a surprisingly high rate (greater than 90 percent, except in the Philippines, where the percentage was 82 percent). The median duration of breast-feeding, on the other hand, was consistently shorter in urban areas, with maximum urban/rural differences of 4–6 months (Figure 6). Exclusive and full breast-feeding duration was much shorter than the recommended 4–6 months for both urban and rural populations in all countries reviewed (not shown).

Some studies suggest that, in relation to breast-feeding and child care practices, the work-related variables, such as flexibility, number of hours, types of environment, and levels of stress, are more important than work per se or urban versus rural location (Uyanga 1980, cited in Schurch and Favre 1985).

Intrahousehold Allocation of Resources and Maternal Control over Resources

Several studies suggest that income earned by mothers and the autonomy that they have over this resource are among the most important factors that determine the health and nutritional status of their children (von Braun, de Haen, and Blanken 1991; von

Figure 5 Urban and rural differences in percentage of children ever breast-fed

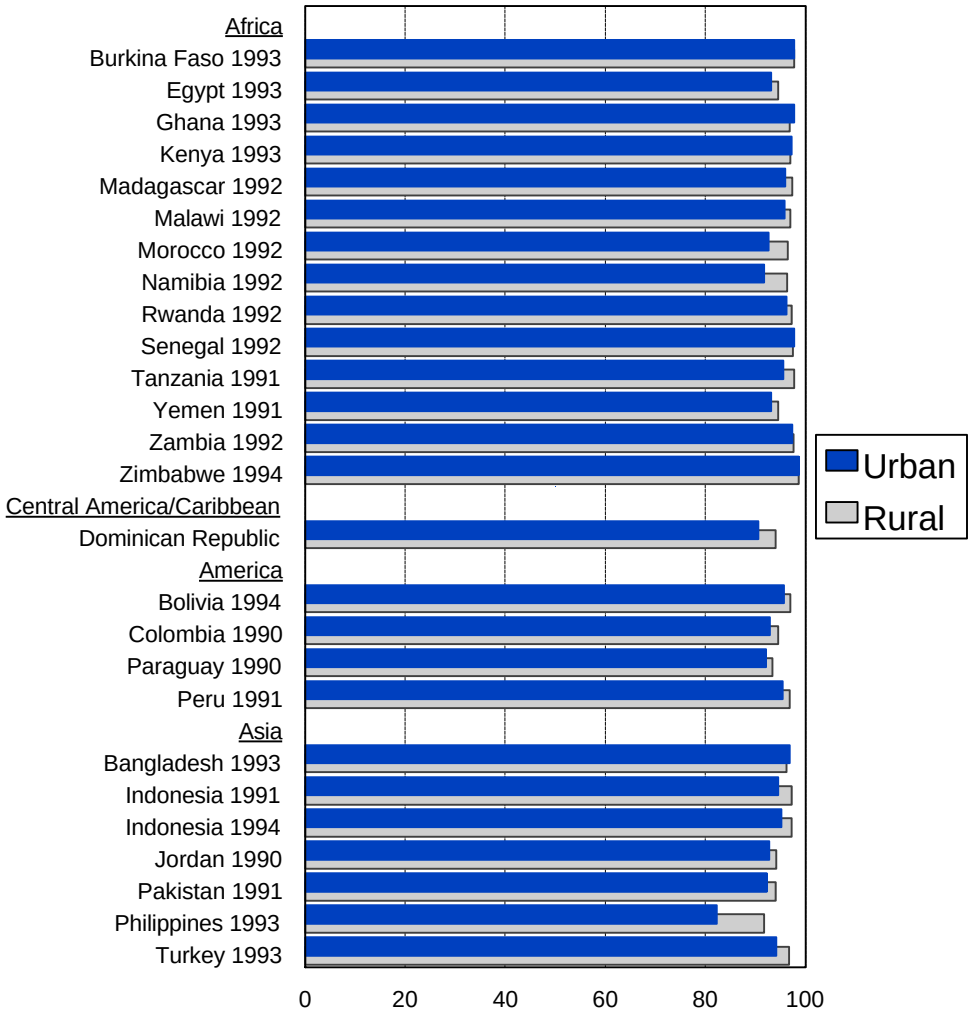
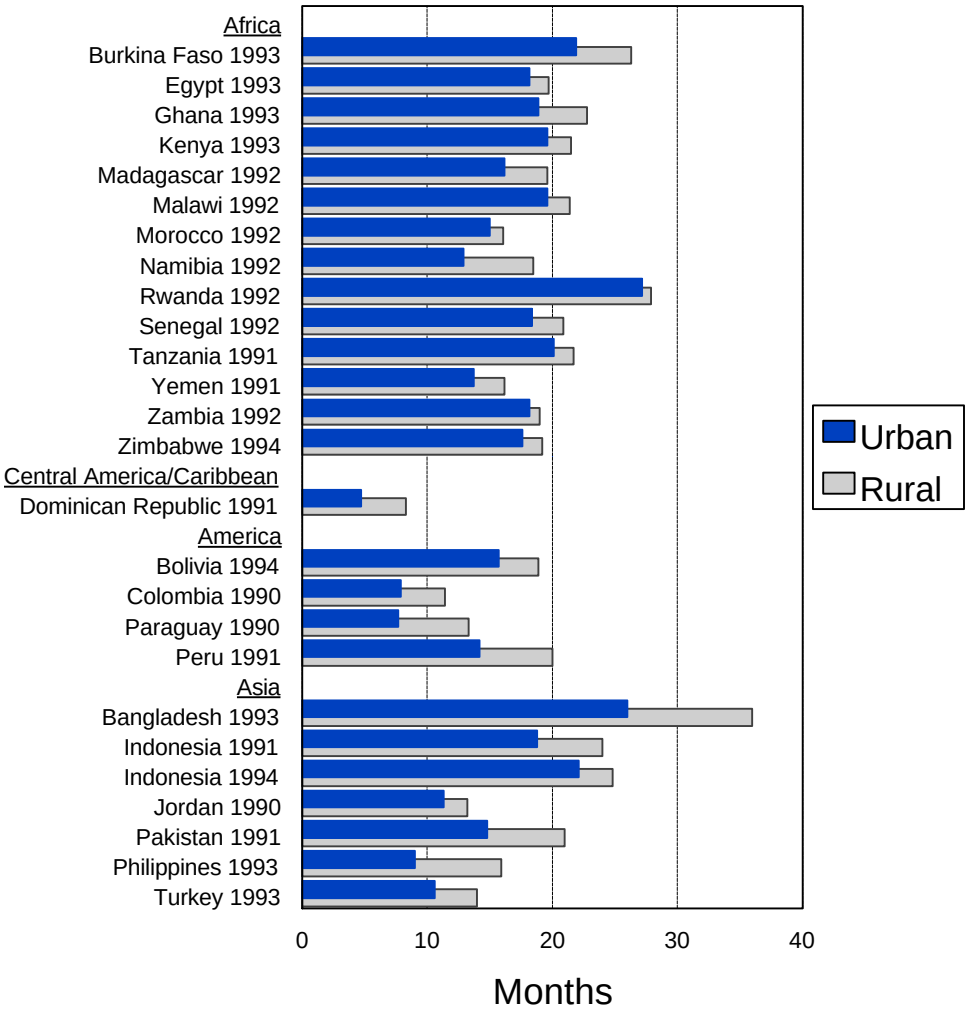


Figure 6 Urban and rural differences in median duration of breast-feeding



Braun and Wiegand-Jahn 1991; Haddad and Hoddinott 1998; Garcia 1991). These studies suggest that mothers are more likely than fathers to allocate resources under their domain to children. It is not surprising, therefore, that the children of female-headed households often do well in this regard. A study conducted in Jordan found that the degree of autonomy of mothers within households was the most significant factor associated with child nutritional status, after controlling for women's age, education, and household size (Doan and Bisharat 1990). In another study in Malawi, the author found that the most malnourished children were those of mothers with low status in the household (Castle 1995).

Residing in an urban area may influence a mother's autonomy and control over the resources available to her because of the increased probability that she will be an income-earner, which often goes hand in hand with an increase in her authority in the home. On the other hand, it may also be the case that the more traditional domains under a mother's control in the rural areas, such as child rearing and food provision through agricultural production, are weakened in the urban environment.

Health-Seeking Behaviors

Health-seeking behaviors include those practiced in the home, such as providing rehydration solution for a child with diarrhea, as well as those practiced outside of the home, such as taking a child to a health clinic for treatment of an illness. A great deal of care that falls under this heading occurs in the home by the household's primary caregiver. When attempts to reduce the symptoms of a child's illness or injury fail, the caregiver will often seek help outside the home and get assistance from traditional healers, local pharmacies and dispensaries, and hospitals (Martínez and Saucedo 1991). The options available in urban settings are generally different, and formal health care facilities are usually more accessible. The decision to use the facilities, however, will depend on a variety of factors such as the cost of transportation to and use of the clinic; the opportunity cost of time for traveling, waiting, and being treated; and the quality of

attention and the perceptions about the benefits of using the facilities. In Sierra Leone, distance was a common reason given by rural women for not attending immunization clinics, whereas urban women were more likely to report that they did not attend for lack of time (Atkinson and Cheyne 1994). In peri-urban areas of South Africa, a marked drop in immunization coverage between the second and third doses of DPT/oral poliomyelitis vaccine was associated with mothers' return to work when their children were between 5 and 8 months of age (Dammann and Solarsh 1992, cited in Atkinson and Cheyne 1994). Because of these time constraints, the so-called "supermarket" organization of health services, which consists of offering immunization coverage at all times instead of on special days, has proven particularly successful in urban areas (Cutts et al. 1989).

The availability of health care facilities is generally greater in urban rather than rural areas, and most immunization data indicate higher coverage in urban areas. Data compiled from the World Health Organization (WHO) for 56 countries (Atkinson and Cheyne 1994) as well as data we compiled from the DHS surveys (Figure 7) show that immunization coverages are generally higher in urban areas and that the urban /rural difference can be even larger than 100 percent (for example, Burkina Faso, Egypt 1988, Senegal 1986, Bolivia 1994).

Families in urban areas also tend to use health services more frequently than in rural areas for curative purposes—when children have acute respiratory infections (ARI), fever, or diarrhea, as revealed by our review of the DHS data (Figures 8 and 9). There is a consistently greater percentage of urban children taken to health services for diarrhea and ARI compared to rural children.[22]

These data, however, are city averages and pockets of undercovered population are known to exist in poor shantytowns, which also experience the greatest risk of infectious diseases (Atkinson and Cheyne 1994). Lower education levels and greater time constraints, combined with poorer knowledge and awareness of the availability and

[22] The limitations of urban/rural comparisons are discussed in Chapter 8.

Figure 7 Urban and rural differences in childhood immunizations

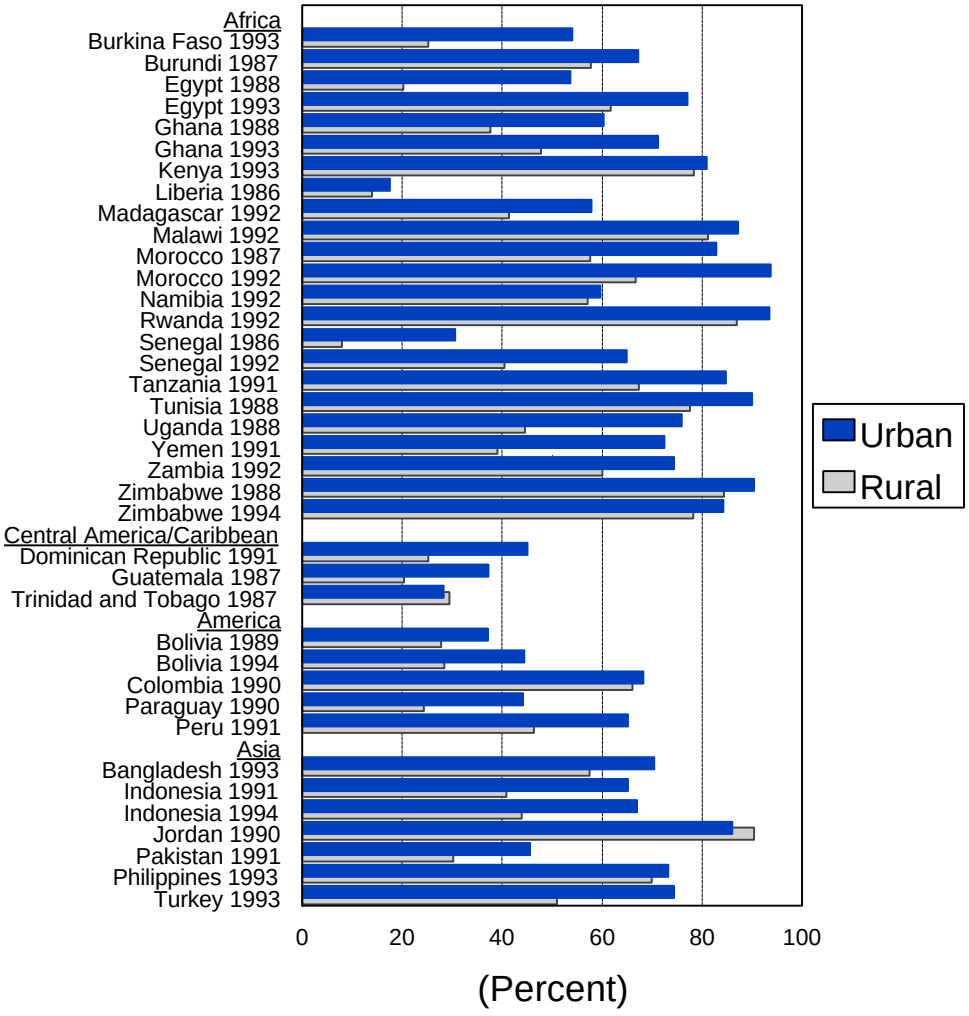


Figure 8 Urban and rural differences in the use of health clinics for childhood acute respiratory infections

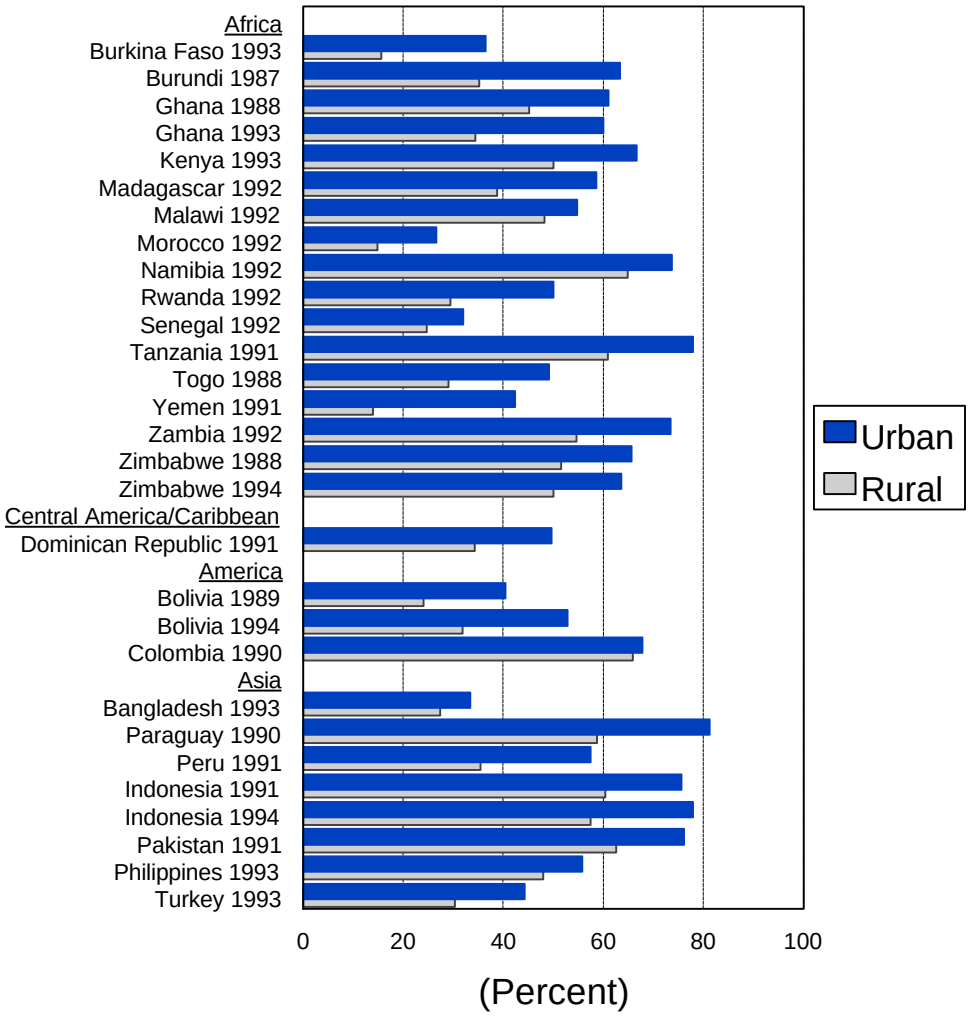
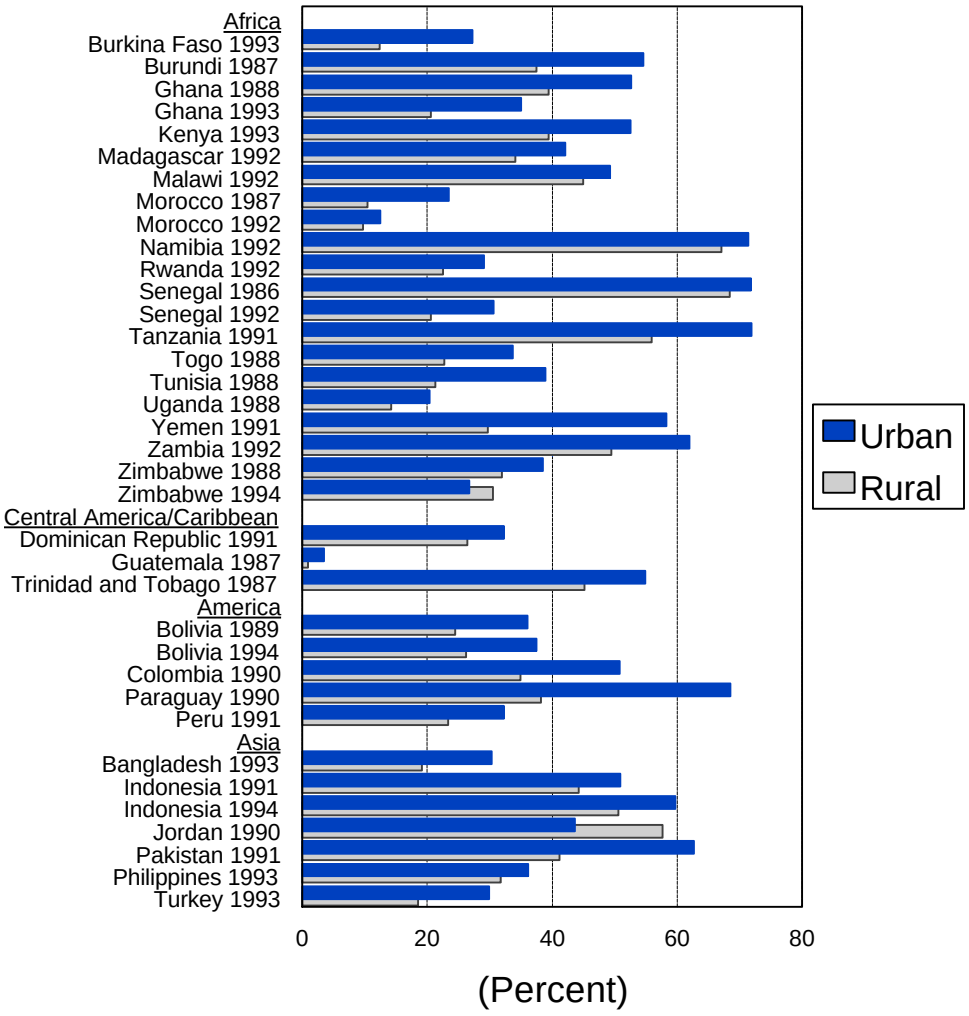


Figure 9 Urban and rural differences in the use of health clinics for childhood diarrhea



potential benefits of health services, make the urban poor less likely to use the facilities. Additionally, the lack of supplies, the unfriendly attitude of some health workers, the unsanitary conditions, and the overcrowding that plague many of the health services in urban slums may discourage any human being from using them.

The issue of autonomy and control over resources is also important with respect to the discussion of health-seeking behaviors. Thomas (1993) reports that “income in the hands of women is associated with increases in the share of the household budget spent on health, education and housing as well as improvements in child health" (Thomas 1993, cited in Strauss and Thomas 1995). A study in South India showed that children were more likely to receive medical attention if the mother had more assets (Duraisamy 1992, cited in Strauss and Thomas 1995). It is unclear, however, whether differentials in resource allocation between men and women hold true across income groups and cultural boundaries.

Hygiene-Related Behaviors

Household hygiene and maternal hygiene behaviors are strong determinants of childhood infectious diseases, including diarrhea, and malnutrition (Bertrand and Walmus 1983; Maxwell et al. 1998). Maternal hand-washing behavior, and the use of soap in particular, is also recognized as an important factor in the incidence of diarrhea and nutritional status of children (Begum 1990). The median reduction in diarrheal rates achieved with hygiene education interventions is 26 percent, while hand-washing interventions alone reduced diarrheal morbidity by 35 percent (median value) (Huttly, Morris, and Pisari 1997).

It is clear that hygiene and sanitation are pervasive problems in much of the developing world's urban areas. What is less clear, however, is the degree to which the specific actions of a caregiver can reduce the exposure to certain pathogens and, hence, protect the health and nutritional status of young children, given the fundamentally unhygienic environments in which they live. The literature on water and sanitation

interventions, although largely from rural areas, suggests that maternal behavior related to the use, maintenance, or enhancement of the new technologies for improving water and sanitation conditions is likely to be the key determinant of whether an intervention is successful. An intervention in rural Bangladesh that combined the introduction of hand pumps and hygiene education showed a larger decrease in diarrhea incidence among children of mothers who used at least three of the four hygienic practices taught, compared to those who received the hand pumps but did not change their hygiene practices (Alam et al. 1989). Reductions in diarrheal morbidity and mortality following water and sanitation interventions are on the order of 27 to 30 percent (Esrey, Feacham, and Hughes 1985). It is estimated that combining these interventions with hygiene education could achieve reductions in diarrheal morbidity of 35 to 50 percent (Martines, Phillips, and Feachem 1993).

Emotional Support of the Child

This category of caring behaviors relates to the emotional support provided by caregivers to the child (Engle et al. 1996). It is well-known how important positive interactions are, both emotionally and physically, to the overall development of children, especially with respect to the child's mother or primary caregiver. Some of the specific caring behaviors that have been found to influence children's nutrition include frequent physical contact, a consistent responsive reaction to the child's needs, and showing affection to the child (Engle 1992). Changes in the sources of support for and interaction with children, such as transformations in family structure due to migration from rural to urban areas, are important to consider for their potential health and nutritional consequences.

SUMMARY

The community structure and the opportunities and resources available for care are different in urban and rural areas. In particular, maternal employment outside the home is

more common in urban areas, and this may result in lower breast-feeding rates and inadequate complementary feeding practices. At this point, one cannot conclude whether, overall, the potential costs to a child's health and nutritional status of reduced maternal time for care (and for breast-feeding in particular) are outweighed by the additional income generated by the working mother. Maternal malnutrition and poor health may reduce mothers' capacity to perform caregiving activities, respond to children's demands for attention and care, and interact with other family members to seek assistance. Finally, the general lack of public services such as water, sanitation, and refuse disposal in urban areas is likely to represent an important physical barrier to good caring behaviors.

8. CHILDHOOD MORTALITY, MORBIDITY, AND MALNUTRITION: ARE URBAN POPULATIONS BETTER OFF? (ISSUE 6)

Urban/rural comparisons regarding food consumption, nutritional status, mortality, and prevalence of disease are often used as evidence of urban bias and the rationale for a focus on rural, not urban poverty. Indeed, most simple comparisons of energy intake and prevalence of childhood malnutrition or infant mortality indicate that, on average, urban populations are better-off than rural populations. A summary of the literature on urban/rural comparisons in selected health and nutrition indicators is presented below, followed by a compilation of data from the demographic health surveys conducted in 35 countries between 1985 and 1996. Finally, the limitations of using urban/rural comparisons for policy purposes are discussed.

URBAN/RURAL DIFFERENCES

Urban/rural differences in infant and child mortality have been analyzed by Viteri (1987) for 64 countries (including both developing and developed countries), and by Gilbert and Gugler (1992) for 24 countries, using data from DHS. Overall, approximately 75 percent of the countries had lower infant and child mortality rates in urban areas.

Viteri (1987) points out that the range of infant mortality rates in less developed countries is approximately 12 times greater than in developed countries, that the overall mean is 5 to 8 times greater, and that urban/rural differences are much greater than in developed countries.

Data on the prevalence of infectious diseases among preschoolers are scarce, but information from four countries suggests greater prevalence of diarrhea, fever, and other illnesses in urban areas (Viteri 1987), although the magnitude of the rural/urban differences is generally small.

Relative to childhood malnutrition, Hussain and Lundven (1987) examined urban/rural differences using survey data from FAO in 11 countries, most of which were in Africa. Data were from the late 1970s and early 1980s. They found that chronic malnutrition (low height-for-age, or stunting) was generally greater among rural populations. The prevalence of stunting in urban areas was between 55 and 78 percent of the rates found in rural areas, except for Mauritius, where it was 32 percent. With respect to acute malnutrition (low weight-for-height, or wasting), however, differences between urban and rural samples were generally small and the overall prevalence in both areas were either equal or lower than expected in a normal population (2.3 percent).

Von Braun et al. (1993) also summarized urban/rural differences in malnutrition using data from the 1970s and the 1980s that were compiled by the United Nations Children's Fund (UNICEF) for 33 countries in Africa, Asia, and the Americas. Stunting and low weight-for-age (underweight) were consistently higher among rural children, and were on average 1.6 and 1.5 times greater, respectively, than in urban areas. Wasting was higher in urban areas in 9 of the 33 countries studied, but the prevalence of wasting was generally low and urban/rural differences were of small magnitude.[23]

---

[23] Atkinson (1993a) also reviewed urban/rural differences in the nutritional status of preschoolers from several countries and found that malnutrition was worse in rural areas for half of the countries, whereas it was worse in urban areas for the other half. No information was provided, however, on the specific anthropometric indicator used for the comparison, which makes the results difficult to interpret.

Analysis of DHS Data from 35 Countries

Data from 44 DHS conducted in 35 countries between 1985 and 1994 were examined for urban/rural differences in childhood mortality, morbidity, and malnutrition patterns. Eight countries had data at two points in time, which were used to look at changes over time within urban and rural areas.

Tables 2, 3, and 4 present data on urban/rural differences in infant, child, and under-five mortality, childhood malnutrition, and morbidity from respiratory infections, fever, and diarrhea by region, country, and year of survey. The main findings are as follows: *infant, child, and under-five mortality rates* were generally larger among rural populations except for five countries (on one or more indicators). When urban populations had higher mortality rates, however, the percentage difference between urban and rural samples was generally small (less than 12 percent, except for Paraguay, where the difference was 30 percent) (Table 2). Note that the magnitude of the urban advantage was greater for child (1–4 years) than for infant (0–1 year) mortality, suggesting that children between 1 and 4 years of age are more sensitive to the negative factors associated with life in rural areas than during their first year of life. It is likely that breast-feeding plays a major role in protecting rural infants during their first year of life. The prevalence of *stunting and low weight-for-age* among preschoolers was consistently lower among urban samples, and the percentage difference between urban and rural ranged from 16.5 percent to 100 percent for weight-for-age and from 0 to 53 percent for stunting (Table 3). Urban/rural differences in wasting, however, were inconsistent and of small magnitude—three countries showed no difference, and 8 had higher and 21 had lower prevalence of wasting in urban areas.[24] Differences in *childhood morbidity* from

[24] It is important to note that the age groups included in the samples often differ between countries. Statistics that include all children below 60 months are likely to provide higher estimates of stunting than those that include only children below 36 months, because stunting is cumulative and increases with age up to approximately 36 months, when it tends to stabilize. Wasting, on the other hand, is likely to be higher if only the 0 to 36 months-old children (or 3 to 36 months, as is often the case) are included, because the usual peak prevalence of wasting is between 18 and 36 months. Thus, statistics will look better or worse, depending on the anthropometric indicator used and on the age group sampled.

Table 2 Urban/rural differences in infant, child, and under-five mortality rates

Country	Year		Infant mortality rate			Child mortality rate			Under-five mortality rate		
			Urban	Rural	Percent difference	Urban	Rural	Percent difference	Urban	Rural	Percent difference
Africa											
Burkina Faso	1993	76.40	113.00	-32.39	78.00	114.40	-31.82		148.40	214.40	-30.78
Burundi	1987	84.60	87.50	-3.31	85.70	108.20	-20.79		163.00	186.30	-12.51
Egypt	1988	65.60	114.80	-42.86	24.80	55.50	-55.32		88.80	163.90	-45.82
Egypt	1993	54.40	96.20	-43.45	17.60	39.10	-54.99		71.10	131.60	-45.97
Percent difference		-17.07	-16.20		-29.03	-29.55			-19.93	-19.71	
Ghana	1988	66.90	86.80	-22.93	68.80	82.90	-17.01		131.10	162.50	-19.32
Ghana	1993	54.90	82.20	-33.21	37.00	73.00	-49.32		89.90	149.20	-39.75
Percent difference		-17.94	-5.30		-46.22	-11.94			-31.43	-8.18	
Kenya	1993	45.50	64.90	-29.89	31.30	32.80	-4.57		75.40	95.60	-21.13
Liberia	1986	140.00	161.00	-13.04	89.00	93.00	-4.30		216.00	239.00	-9.62
Madagascar	1992	74.70	106.80	-30.06	72.80	85.60	-14.95		142.10	183.20	-22.43
Malawi	1992	118.10	138.00	-14.42	98.90	122.90	-19.53		205.40	243.90	-15.79
Morocco	1987	66.10	91.00	-27.36	16.40	51.00	-67.84		81.40	137.30	-40.71
Morocco	1992	51.90	69.30	-25.11	7.20	30.70	-76.55		58.70	97.80	-39.98
Percent difference		-21.48	-23.85		-56.10	-39.80			-27.89	-28.77	
Namibia	1992	63.10	60.70	3.95	24.80	35.70	-30.53		86.30	94.20	-8.39
Rwanda	1992	87.50	90.30	-3.10	73.60	79.70	-7.65		154.60	162.80	-5.04
Senegal	1986	69.80	102.30	-31.77	70.60	164.10	-56.98		135.40	249.60	-45.75
Senegal	1992	54.50	86.70	-37.14	50.00	106.80	-53.18		101.80	184.20	-44.73
Percent difference		-21.92	-15.25		-29.18	-34.92			-24.82	-26.20	
Tanzania	1991	108.30	97.20	11.42	57.10	61.00	-6.39		159.20	152.20	4.60
Togo	1988	72.80	86.90	-16.23	62.70	89.30	-29.79		130.90	168.50	-22.31
Tunisia	1988	49.90	64.10	-22.15	12.90	25.50	-49.41		62.20	88.00	-29.32
Uganda	1988	103.10	106.60	-3.28	67.60	94.00	-28.09		163.70	190.60	-14.11
Yemen	1991	88.90	99.80	-10.92	29.90	47.00	-36.38		116.10	142.10	-18.30
Zambia	1992	78.00	115.80	-32.64	78.90	96.60	-18.32		150.80	201.20	-25.05
Zimbabwe	1988	37.80	64.50	-41.40	17.80	36.40	-51.10		54.90	98.60	-44.32
Zimbabwe	1994	44.30	53.60	-17.35	19.50	28.20	-30.85		63.00	80.30	-21.54
Percent difference		17.20	-16.90		9.55	-22.53			14.75	-18.56	
Central America and the Caribbean											
Dominican Republic	1986	69.20	65.80	5.17	*	*			*	*	
Dominican Republic	1991	37.20	54.60	-31.87	10.10	31.30	-67.73		46.90	84.20	-44.30
Percent difference		-46.24	-17.02								
El Salvador	1985	47.4	80.90	-41.41	*	*			*	*	
Guatemala	1987	65.30	84.50	-22.72	35.60	49.30	-27.79		98.60	129.60	-23.92
Trinidad and Tobago	1987	65.30	84.50	-22.72	35.60	49.30	-27.79		98.60	129.60	-23.92

(continued)

Table 2 (continued)

Country	Year		Infant mortality rate			Child mortality rate			Under-five mortality rate		
			Urban	Rural	Percent difference	Urban	Rural	Percent difference	Urban	Rural	Percent difference
South America											
Bolivia	1989	78.60	112.00	-29.82	38.60	63.00	-38.73		114.00	168.00	-32.14
Bolivia	1994	60.00	92.00	-34.78	30.00	59.00	-49.15		88.00	145.00	-39.31
Percent difference		-23.66	-17.86		-22.28	-6.35			-22.81	-13.69	
Brazil	1986	76.00	107.00	-28.97	*	*			*	*	
Colombia	1990	29.10	22.80	27.63	7.10	10.50	-32.38		36.00	33.00	9.09
Ecuador	1987	52.50	63.70	-17.58	11.20	38.00	-70.53		63.10	99.30	-36.46
Paraguay	1990	32.00	38.20	-16.23	12.30	9.40	30.85		43.00	46.60	-7.73
Peru	1991	48.00	90.00	-46.67	21.00	45.00	-53.33		67.00	131.00	-48.85
Asia											
Bangladesh	1993	80.90	102.90	-21.38	36.30	56.40	-35.64		114.30	153.20	-25.39
Indonesia	1991	57.20	81.00	-29.38	28.10	38.50	-27.01		83.70	116.40	-28.09
Indonesia	1994	43.10	75.20	-42.69	16.20	33.00	-50.91		58.50	105.70	-44.65
Percent difference		-24.65	-7.16		-42.35	-14.29			-30.11	-9.19	
Jordan	1990	37.1	39.20	-5.36	3.4	8.40	-59.52		40.3	47.30	-14.80
Pakistan	1991	74.60	102.20	-27.01	20.60	33.00	-37.58		93.60	131.90	-29.04
Philippines	1993	31.90	44.30	-27.99	21.50	30.50	-29.51		52.70	73.40	-28.20
Turkey	1993	44.00	65.40	-32.72	6.80	11.80	-42.37		50.50	76.40	-33.90

Source: Data from the Demographic Health Surveys for each country and year.

Notes: Infant mortality: mortality among 0-1 year old; child mortality: mortality among 1-4 year olds; under-five mortality: mortality among 0-5 year olds; percent difference is percent difference calculated as follows: [(urban-rural) ÷ rural] x 100%; a negative percent difference means that urban is lower and a positive percent difference means that rural is lower. For countries with data at 2 points in time, a positive percent difference means that the second year is higher and a negative percent difference means that the second year is lower.

* No data available.

Table 3 Urban/rural differences in children's nutritional status

Country/difference	Year	Weight-for-age (percentage below –2 S.D.) Urban	Rural	Percent difference	Height-for-age (percentage below –2 S.D.) Urban	Rural	Percent difference	Weight-for-height (percentage below –2 S.D.) Urban	Rural	Percent difference	Age group (months)
Africa											
Burkina Faso	1993	20.00	31.30	-36.10	19.00	31.40	-39.49	10.10	13.90	-27.34	<60
Burundi	1987	20.20	38.90	-48.07	27.10	48.80	-44.47	6.50	5.60	16.07	3 to 36
Egypt	1988	8.90	17.00	-47.65	25.50	35.10	-27.35	1.30	0.90	44.44	3 to 36
Egypt	1993	6.80	10.60	-35.85	18.80	27.80	-32.37	3.30	3.20	3.13	<60
Percent difference		-23.60	-37.65		-26.27	-20.80		153.85	255.56		
Ghana	1988	25.60	32.80	-21.95	25.60	31.70	-19.24	7.10	8.30	-14.46	3 to 36
Ghana	1993	17.50	31.40	-44.27	15.70	30.10	-47.84	8.60	12.60	-31.75	1 to 35
Percent difference		-31.64	-4.27		-38.67	-5.05		21.13	51.81		
Kenya	1993	12.60	23.50	-46.38	21.50	34.20	-37.13	5.20	6.00	-13.33	<60
Liberia	1986	*	*		*	*		*	*		*
Madagascar	1992	33.40	40.00	-16.50	44.00	52.30	-15.87	3.20	5.00	-36.00	<60
Malawi	1992	15.40	28.60	-46.15	35.00	50.30	-30.42	2.60	5.80	-55.17	
Morocco	1987	8.00	19.70	-59.39	17.20	29.80	-42.28	1.90	4.70	-59.57	3 to 36
Morocco	1992	3.30	12.00	-72.50	13.10	27.70	-52.71	1.90	2.40	-20.83	3 to 36
Percent difference		-58.75	-39.09		-23.84	-7.05		0.00	-48.94		
Namibia	1992	17.80	29.80	-40.27	21.80	31.30	-30.35	6.60	9.50	-30.53	<60
Rwanda	1992	17.80	29.80	-40.27	21.80	31.30	-30.35	6.60	9.50	-30.53	<60
Senegal	1986	15.20	25.20	-39.68	17.70	25.50	-30.59	3.50	7.20	-51.39	3 to 36
Senegal	1992	13.30	24.40	-45.49	7.10	9.70	-26.80	13.80	26.50	-47.92	<60
Percent difference		-12.50	-3.17		-59.89	-61.96		294.29	268.06		
Tanzania	1991	19.9	29.20	-31.85	28.5	48.10	-40.75	6.8	5.60	21.43	<60
Togo	1988	11.90	20.90	-43.06	15.60	21.70	-28.11	3.50	5.30	-33.96	0 to 36
Tunisia	1988	6.70	14.00	-52.14	11.80	24.60	-52.03	3.40	2.70	25.93	3 to 36
Uganda	1988	12.80	24.30	-47.33	25.60	46.30	-44.71	1.00	2.00	-50.00	<60
Yemen	1991	*	*		*	*		*	*		*
Zambia	1992	20.80	29.00	-28.28	32.50	46.00	-29.35	5.40	5.00	8.00	<60
Zimbabwe	1988	5.20	13.60	-61.76	14.30	33.60	-57.44	1.50	1.30	15.38	3 to 60
Zimbabwe	1994	12.50	16.60	-24.70	17.60	22.80	-22.81	6.10	5.30	15.09	0 to 35
Percent difference		140.38	22.06		23.08	-32.14		306.67	307.69		
Central America and the Caribbean											
Dominican Republic	1986	9.6	16.60	-100.00	15.10	28.80	-47.57	2.20	2.50	-12.00	3 to 36
Dominican Republic	1991	7.70	14.30	-46.15	14.60	26.30	-44.49	1.10	1.00	10.00	<60
Percent difference		-19.8	-13.86		-3.31	-8.68		-50.0	60.0		
El Salvador	1985	*	*		*	*		*	*		*
Guatemala	1987	25.70	36.50	-29.59	47.20	62.10	-23.99	1.30	1.30	0.00	3 to 36
Trinidad and Tobago	1987	5.00	8.20	-39.02	5.00	5.00	0.00	2.70	4.60	-41.30	3 to 36

(continued)

Table 3 (continued)

Country/difference	Year	Weight-for-age (percentage below –2 S.D.)			Height-for-age (percentage below –2 S.D.)			Weight-for-height (percentage below –2 S.D.)			Age group
		Urban	Rural	Percent difference	Urban	Rural	Percent difference	Urban	Rural	Percent difference	(months)
South America											
Bolivia	1989	10.70	15.90	-32.70	31.50	45.00	-30.00	9.30	9.40	-1.06	3 to 36
Bolivia	1994	11.60	20.40	-43.14	20.90	36.60	-42.90	3.30	5.60	-41.07	<36
Percent difference		8.41	28.30		-33.65	-18.67		-64.52	-40.43		
Brazil	1986	9.80	15.50	-36.77	21.30	35.20	-39.49	0.90	0.90	0.00	<60
Colombia	1990	*	*		*	*		*	*		*
Ecuador	1987	*	*		*	*		*	*		*
Paraguay	1990	2.80	4.30	-34.88	10.20	21.50	-52.56	0.10	0.10	0.00	<60
Peru	1991	6.40	17.70	-63.84	25.90	53.40	-51.50	1.30	1.70	-23.53	<60
Asia											
Bangladesh	1993										
Indonesia	1991	*	*		*	*		*	*		*
Indonesia	1994	*	*		*	*		*	*		*
Percent difference											
Jordan	1990	4.9	9.90	-50.50	14.1	27.30	-48.35	2.5	3.50	-28.57	<60
Pakistan	1991	32.50	44.60	-27.13	40.70	54.90	-25.87	8.10	9.80	-17.35	<60
Philippines	1993	*	*		*	*		*	*		*
Turkey	1993	8.50	13.20	-35.61	16.10	27.10	-40.59	2.90	3.00	-3.33	<60

Source: Data from the Demographic Health Surveys for each country and year.

Notes: Percent difference is percent difference calculated as follows: [(urban-rural) ÷ rural] x 100%. A negative percent difference means that urban is lower; a positive percent difference means that rural is lower. For countries with data at 2 points in time, a positive percent difference means that the second year is higher and a negative percent difference means that the second year is lower.

* No data available.

respiratory infections and diarrhea show inconsistent patterns (Table 4),[25] but overall childhood morbidity was greater in urban areas in approximately 25 percent of the countries studied. In general, however, the magnitude of the urban/rural differences in morbidity were smaller than the differences in infant and child mortality or malnutrition among preschoolers.

Eight countries had data from DHS surveys at two points in time, usually four or five years apart. Differences in the percentage change over time were examined for these countries. Infant and child mortality decreased much more over time in the urban than the rural areas in Ghana, Bolivia, and Indonesia (Table 2). Cities in Zimbabwe experienced an increase in infant, child, and under-five mortality over time, whereas rural populations had decreasing patterns. For other countries, the percentage change over time was comparable between urban and rural areas.[26]

Except for Ghana, the data on changes in nutritional status over time cannot be interpreted because the age groups differed from one period to the other. In Ghana, the reduction in the percentages of underweight or stunted children were much larger in urban areas than in rural areas (Table 3). Wasting, on the other hand, increased between 1988 and 1993 in both rural and urban areas, with larger increases among the rural sample.

---

[25] Nine of the 33 surveys (27 percent) for which data were available indicated higher respiratory infections among children from urban areas; 12 of the 43 (28 percent) with data on diarrheal diseases showed higher rates in urban areas; and 6 of the 24 (25 percent) with data on fever had higher rates in urban areas.

[26] Statistics on changes in mortality rates must always be interpreted with caution, because there is a possibility that changes occur in the percentage of deaths registered. Rural/urban differences may be particularly affected by this potential bias because underregistration could change differently over time in the two areas.

Table 4 Urban/rural differences in childhood morbidity

Country/difference	Year		Percentage of children with acute respiratory problems: Urban	Rural	Percent difference	Percentage of children with a fever: Urban	Rural	Percent difference	Percentage of children with diarrhea two weeks before survey: Urban	Rural	Percent difference
Africa											
Burkina Faso	1993	11.30	11.20	0.89	27.80	36.30	-23.42		18.70	20.60	-9.22
Burundi	1987	32.00	39.80	-19.60	24.10	7.40	225.68		20.70	17.30	19.65
Egypt	1988	22.60	23.80	-5.04	*	*			15.60	16.30	-4.29
Egypt	1993	8.00	8.40	-4.76	*	*			13.40	13.40	0.00
Percent difference		-64.60	-64.71						-14.10	-17.79	
Ghana	1988	18.10	20.70	-12.56	32.20	36.50	-11.78		27.00	26.10	3.45
Ghana	1993	7.00	11.30	-38.05	21.80	30.20	-27.81		17.60	21.30	-17.37
Percent difference		-61.33	-45.41		-32.30	-17.26			-34.81	-18.39	
Kenya	1993	14.80	18.90	-21.69	38.80	42.20	-8.06		11.90	14.20	-16.20
Liberia	1986	35.40	38.30	-7.57	45.50	55.20	-17.57		36.30	41.10	-11.6
Madagascar	1992	16.90	15.60	8.33	22.90	27.70	-17.33		11.10	12.60	-11.90
Malawi	1992	14.90	14.50	2.76	37.00	41.00	-9.76		19.30	22.30	-13.45
Morocco	1987	*	*		*	*			29.00	28.80	0.69
Morocco	1992	11.80	17.20	-31.40	25.70	28.10	-8.54		10.50	13.90	-24.46
Percent difference									-63.79	-51.74	
Namibia	1992	13.10	20.50	-36.10	28.70	37.00	-22.43		13.50	24.10	-43.98
Rwanda	1992	18.10	33.40	-45.81	32.20	42.10	-23.52		21.60	21.80	-0.92
Senegal	1986	*	*		*	*			30.60	42.00	-27.14
Senegal	1992	12.50	14.80	-15.54	32.10	41.20	-22.09		15.50	23.30	-33.48
Percent difference									-49.35	-44.52	
Tanzania	1991	11.40	7.40	54.05	38.9	29.40			12.0	12.60	
Tunisia	1988	*	*		*	*			16.60	25.00	-33.60
Uganda	1988	*	*		*	*			20.10	24.80	-18.95
Yemen	1991	17.70	26.10	-32.18	38.80	47.60	-18.49		26.30	36.00	-26.94
Zambia	1992	10.20	15.00	-32.00	34.00	52.40	-35.11		20.00	25.30	-20.95
Zimbabwe	1988	42.20	48.00	-12.08	*	*			15.30	21.40	-28.50
Zimbabwe	1994	15.20	29.00	-47.59	34.50	41.50	-16.87		17.90	25.50	-29.80
Percent difference		-63.98	-39.58						16.99	19.16	
Central America and the Caribbean											
Dominican Republic	1986	*	*		*	*			13.80	13.10	5.34
Dominican Republic	1991	19.20	24.80	-22.58	27.80	25.80	7.75		16.80	16.40	2.44
Percent difference									21.74	25.19	
El Salvador	1985	*	*		*	*			30.4	37.70	-19.36
Guatemala	1987	*	*		*	*			17.40	16.40	6.10
Trinidad and Tobago	1987	*	*		*	*			6.40	5.80	10.34

(continued)

Table 4 (continued)

Country/difference	Year		Percentage of children with acute respiratory problems: Urban	Rural	Percent difference	Percentage of children with a fever: Urban	Rural	Percent difference	Percentage of children with diarrhea two weeks before survey: Urban	Rural	Percent difference
South America											
Bolivia	1989	21.20	19.60	8.16	*	*			27.40	28.60	-4.20
Bolivia	1994	18.60	17.40	6.90	*	*			30.90	28.70	7.67
Percent difference		-12.26	-11.22						12.77	0.35	
Brazil	1986	*	*		*	*			15.00	20.60	-27.18
Colombia	1990	16.00	15.40	3.90	20.60	16.40	25.61		12.20	12.60	-3.17
Ecuador	1987	55.30	57.20	-3.32	*	*			35.00	42.70	-18.03
Paraguay	1990	17.40	17.30	0.58	26.50	35.70	-25.77		8.20	8.10	1.23
Peru	1991	21.90	25.70	-14.79	*	*			16.20	22.00	-26.36
Asia											
Bangladesh	1993	24.80	23.90	3.77	*	*			10.80	12.80	-15.62
Indonesia	1991	8.90	10.10	-11.88	26.30	27.20	-3.31		12.00	10.70	12.15
Indonesia	1994	9.30	10.30	-9.71	29.80	27.10	9.96		12.40	12.00	3.33
Percent difference		4.49	1.98		13.31	-0.37			3.33	12.15	
Jordan	1990	*	*		*	*			8.7	7.90	10.13
Pakistan	1991	13.80	17.00	-18.82	30.90	29.70	4.04		15.00	14.30	4.90
Philippines	1993	7.40	9.90	-25.25	24.40	26.60	-8.27		9.70	10.50	-7.62
Turkey	1993	10.30	15.70	-34.39	*	*			22.70	28.00	-18.93

Source: Data from the Demographic Health Surveys for each country and year.

Notes: Percent difference is percent difference calculated as follows: [(urban-rural) ÷ rural] x 100%. A negative percent difference means that urban is lower; a positive percent difference means that rural is lower. For countries with data at 2 points in time, a positive percent difference means that the second year is higher and a negative percent difference means that the second year is lower.

* No data available.

INTRA-URBAN DIFFERENCES

Simple comparisons between urban and rural areas, however, may be misleading. Basta in 1977 first highlighted the fact that statistics of cities as a whole mask important differences between social classes.

> City health statistics usually tend to look much better than rural ones. The reason is either because the squatter or slum inhabitants do not appear in the statistics (they are not 'official' residents of the city in many cases), or else because their inclusion is obscured by the enormous difference that exists between their status and that of the middle-to-high income parts of the city. Thus, a very misleading average becomes the city's statistics, and averages are, unfortunately, what many look at (Basta 1977, 114).

To illustrate his point, Basta gathered data on health and nutrition outcomes and compared squatter and nonsquatter urban areas, or squatter and whole city averages. He demonstrated that the overall prevalence of most diseases, such as typhoid, diphtheria, and measles, was 50 percent greater in squatter areas than for the city as a whole; average death rates from dysentery were three times larger in squatter areas; energy intake was one-half to two-thirds that of city averages; health coverage was sometimes two to ten times worse; anemia was twice as prevalent; and malnutrition was three times greater in squatter areas. In most cases for which data were available, it was also clear that intra-urban differences were of much larger magnitude than urban/rural differences.

A review of the literature by Bradley et al. (1992) also shows that the urban poor have a health profile different from other urban groups both in terms of mortality and morbidity. Similar to the findings published by Basta, Bradley et al. report that infant mortality rates in squatter areas of Latin American cities are often up to three times larger

than among higher income groups. They present similar data for malnutrition, morbidity from diarrheal diseases, and the prevalence of parasitic infections. Even the causes of death are strikingly different between poorer and wealthier segments of the urban population. Harpham and Stephens (1991) cite an example from Porto Alegre where postneonatal, as opposed to neonatal mortality, was found to predominate in squatter areas, whereas the opposite was true for wealthier urban areas. Among the poor, 51 percent of infant deaths were caused by infectious diseases, whereas deaths among the wealthier group were largely due to problems of gestation, delivery, or the early postnatal period, as found in more developed countries (Guimaraes and Fischmann 1985, cited in Harpham and Stephens 1991).

Timaeus and Lush (1995) used DHS data to compare differentials in child mortality, morbidity, and anthropometry within the urban sector of four countries (Ghana, Egypt, Brazil, and Thailand). The authors found that there were major socioeconomic differentials in child health and mortality within the urban sector of all four countries, and that except for Egypt, mortality rates among the urban poor were at least as high as those of the rural population. The authors also showed that the patterns of within-urban differences vary between countries according to the overall degree of national development and the particular history of urban development. For instance, while socioeconomic differentials in child mortality within the urban sector of Ghana are moderate, they are large in Egypt and very large in Brazil.

A representative survey of Accra revealed that the prevalence of underweight children among households from the lowest income quintile (23 percent) was three times higher than that in the highest income quintile (6 percent) (Maxwell et al. 1998). The difference in stunting was twofold. The proportion of children who had diarrhea in the two weeks prior to the survey was also larger among the poorest income quintile (32 percent) than among the wealthiest group (22 percent).

Recent analysis of DHS data from 20 countries shows a clear relationship between childhood mortality and access to piped drinking water (Bicego and Ahmad 1996). In all

countries studied, all four types of childhood mortality (neonatal, postneonatal, child, and under-five) were higher among rural households, followed by urban residents without piped water, and finally urban residents with piped water. In some countries and at certain ages, mortality rates were higher among poor urban groups than among the rural group. Overall poor urban children had a 57 percent greater under-five mortality rate than wealthier urban children, and a 17 percent lower mortality rate than rural children.

SUMMARY

The results from the earlier and more recent data sets reviewed lead to surprisingly similar conclusions, namely that childhood mortality, stunting, and underweight are generally lower in urban than rural areas, whereas wasting and morbidity from infectious diseases are often higher in urban areas. The consistency of these findings across data sets is impressive, considering that different combinations of countries were represented and that the studies covered two decades. Caution is needed when comparing urban and rural areas, however, because city averages do not capture the large heterogeneity in poverty, morbidity, mortality, and nutritional status found within urban areas. There are often enormous differences between poor and middle-to-high income parts of the city. Generally the intra-urban differences are of a much larger magnitude than urban/rural differences. Thus, the issues to emphasize are that the levels of childhood mortality, morbidity, and malnutrition in poor urban areas around the world are still unacceptably high and that a policy and programmatic response is urgently required.

9. HEALTH: WHAT ARE THE DETERMINANTS OF ILL HEALTH IN URBAN AREAS? (ISSUE 7)

The present review does not pretend to cover all the issues related to health in cities, many of which have already been summarized by others.[27] Rather, the main focus is on maternal and child health as inputs into child nutritional status, on the one hand, and the determinants of maternal and child health in urban areas on the other. The review emphasizes the various poverty-related diseases, rather than chronic diseases such as cancers and cardiovascular diseases. Thus, diarrhea, respiratory infections, and malaria are emphasized because they play a crucial role in the etiology of malnutrition and because they are important causes of death among young children. Nutritional deficiencies such as protein-energy malnutrition, and deficiencies in vitamin A, iron, and zinc, which are associated with reduced immunity and increased vulnerability to infections, are also discussed.

MORTALITY AND MORBIDITY AMONG CHILDREN UNDER FIVE

Infectious Diseases

Acute Respiratory Infections (ARI). Acute respiratory infections are the leading cause of death among children under five years and are also important causes of morbidity (WHO 1995). ARI are responsible for the deaths of between 4 and 4.3 million children under five years of age each year—this represents 25 to 30 percent of all child deaths (Lopez 1993; Stansfield and Shepard 1993; Leowski 1986; WHO 1995). Almost all of these deaths are due to pneumonia, and children under 3 years of age are the most affected.

---

[27] There are several reviews of urban health and its determinants (Atkinson 1993b; Basta 1977; Rossi-Espagnet 1984; Harpham, Lusty, and Vaughn 1988; Tabibzadeh, Rossi-Espagnet, and Maxwell 1989; Rossi-Espagnet, Goldstein, and Tabibzadeh 1991; Bradley et al. 1992; Satterthwaite 1993; Harpham and Tanner 1995; Stephens et al. 1996).

Little information exists on ARI morbidity and mortality in urban areas, but it is generally believed that ARI in urban areas are more severe and more prevalent than in rural areas, mainly as a result of outdoor and indoor air pollution and crowding (WHO 1992a). An analysis of infant mortality in Porto Alegre, Brazil, found that 21 percent of all deaths were due to pneumonia, with mortality from pneumonia six times higher in the shantytowns than in other areas. Pneumonia was the leading cause of infant deaths in the slum areas of the city, whereas it was third in other areas of Porto Alegre (Guimaraes and Fischmann 1985; Rossi-Espagnet, Goldstein, and Tabibzadeh 1991).

Diarrheal Diseases among Preschoolers. In 1985, diarrhea caused 5 million deaths in developing countries, 80 percent of which were among children under 5 years of age (Lopez 1993).[28] Recent data reveal some improvement, but diarrheal diseases are still estimated to have caused 3.2 to 3.3 million child deaths in 1990 (Bern et al. 1992; Lopez 1993) and 3 million in 1993 (WHO 1995). About 80 percent of these deaths occurred in the first two years of life. Although no information is available on the percentage of diarrheal deaths that occurred in poor urban areas, it is generally recognized that severe diarrhea is among the most serious and prevalent health risks faced by children exposed to unsanitary and contaminated environments such as urban slums. Estimates from the early 1980s suggested that in one year alone, more than 2 million urban preschoolers died as a consequence of diarrhea-related dehydration (Assignment Children 1983, in Harpham, Lusty, and Vaughn 1988).

Global estimates derived from surveys coordinated by WHO in 60 developing countries indicate that, on average, children suffer 3.5 episodes of diarrhea per year, with higher incidences found in Latin America (average of 4.9) and Sub-Saharan Africa (average of 4.4) (Martines, Phillips, and Feachem 1993). Highest incidence rates are

[28] Caution is required in interpreting childhood mortality statistics. Childhood mortality is often the result of multiple infections, frequently aggravated by malnutrition. Since diarrhea may be only one of several symptoms, estimates of diarrhea as a cause of death may represent an overestimate of true values.

found among 6-to-11-month-old children, who experience a median of five episodes per year (Bern et al. 1992). Poor urban slums, however, may have diarrhea incidence rates[29] as high as 8 to 13 episodes per year (Benicio et al. 1987 and Bhatnegar and Dosaij 1986, both cited in Bradley et al. 1992). Each episode of diarrhea has the potential to contribute to malnutrition, and the longer the episode, the larger the negative impact on growth (WHO 1995).

Malaria. Recent estimates suggest that malaria is probably responsible for between 1 and 2 million deaths in developing countries each year, 75 percent of which are among children under five (Lopez 1993).[30] Data on childhood mortality from malaria in urban areas were not found, but it is widely recognized that malaria is an urban problem, mainly because the breeding of the *Anopheles* mosquito, the carrier of malaria, is facilitated by the pools of stagnant water commonly found in slums. Similarly, dengue and dengue hemorrhagic fever (other mosquito-borne diseases), which are also associated with poor sanitation, overcrowding, and inadequate water storage, are highly concentrated in urban areas of the developing world. Dengue, which affects millions of people yearly and is responsible for thousands of deaths, tends to affect disproportionately young children and the elderly (WHO 1995).

Parasitic infections. Parasitic infections are rarely fatal in themselves, but they are responsible for a large burden of morbidity. Data on parasitic infections are not usually disaggregated by age group, but a high prevalence of a variety of parasites is documented

[29] Incidence rate equals the number of new episodes of illness per individual per unit of time.

[30] Of these, 500,000 are estimated to occur among children in Africa. Malaria is one of the leading causes of death in some areas. In Kenya and Nigeria, malaria was responsible for 20-30 percent of the infant mortality in the 1970s (WHO 1992b). More recent data from The Gambia (1987) reveal that malaria mortality was 6.3 and 10.7 per 1,000 among infants and 1–4-year-old children, respectively (WHO 1992b).

in the urban studies summarized by Bradley et al. (1992). The authors highlight the magnitude of intra-city differences between poorer and wealthier groups.

Nutritional Deficiencies as Determinants of the Health of Children

The malnutrition-infection-malnutrition deprivation cycle, first described by Scrimshaw and colleagues (Scrimshaw, Taylor, and Gordan 1968), describes the synergistic effect of malnutrition and infectious disease. The cycle is particularly acute in its effects on young children living in poor environments (Martorell and Habicht 1986). The phenomenon can be summarized as inadequate nutrient intake leads to malnutrition, which results in increased vulnerability to infectious diseases as a result of a depressed immune system; infections, in turn, further exacerbate poor nutritional status as a result of reduced appetite and food intake, increased intestinal losses of nutrients, and increased nutrient requirements (Martínez and Tomkins 1995). This phenomenon is true both for rural and urban populations, and for areas with different levels of diarrhea and malnutrition (Lutter et al. 1992).[31]

Micronutrient Deficiencies. No data were found on global estimates of micronutrient deficiencies among urban children from the developing world. Various urban case studies from countries in Asia, Africa, and Latin America, however, report high prevalences of iron-deficiency anemia and vitamin A deficiency (Sánchez-Castillo et al. 1994; Nago et al. 1993; Pongpaew 1992). In Sao Paolo, Brazil, the prevalence of severe anemia in 1984 was 22 percent among children living in slum areas compared to 13 percent among those who lived in residential areas (Gross and Monteiro 1989). In Guatemala, no significant

[31] Similar deprivation cycles have been described for specific micronutrient deficiencies such as vitamin A, iron, and zinc, which all affect the integrity of the immune system. Marginal zinc status, for instance, has been associated with increased diarrheal incidence and poor growth (Hambidge 1992). Both mild and severe vitamin A deficiency are associated with increased morbidity and mortality from diarrhea (Beaton et al. 1993; Huttly, Morris, and Pisari 1997), and measles are known to precipitate vitamin A deficiency and xerophthalmia (Barclay, Foster, and Sommer 1987).

differences were found in mean hematocrit (packed red cell volume) or low hematocrit values (< 38 percent, corrected for altitude) between rural and urban samples of both preschool and school-age children (Romero-Abal et al. 1995). Only a small predominance of low ferritin levels (an indicator of iron reserves) was found among preschoolers from rural areas, compared to children from the city.

MATERNAL MORTALITY, MORBIDITY, AND NUTRITIONAL STATUS

Mortality and Morbidity

Every year, approximately half a million women die from causes related to pregnancy and the birth process (Walsh et al. 1993). Maternal mortality rates in developing countries are, on average, 450/100,000 live births, in sharp contrast to the 30/100,000 found in developed countries. Although less emphasized, maternal morbidity is also highly prevalent in developing countries and includes problems such as anemia, hypertension, eclampsia, hemorrhage, sepsis, abortion-related infections, reproductive tract infections, and acquired immune deficiency syndrome (AIDS). No data were found on maternal morbidity and mortality in urban areas.

Iron-Deficiency Anemia

Iron-deficiency anemia is the most widespread nutritional problem among women.[32] Estimates from UN ACC/SCN (1992) indicate that the highest prevalences of anemia among adult women of reproductive age (15–49 years old) are found in South Asia (64 percent), followed by Southeast Asia (48 percent), Sub-Saharan Africa (42 percent), Near East/North Africa (33 percent), Middle America/Carribean (28 percent), China (26 percent), and South America (23 percent). Overall, half of all pregnant women and 41 percent of nonpregnant women in the developing world are anemic. Prevalences of anemia are generally at least 20 percent higher among pregnant than among nonpregnant

[32] Anemia is defined as hemoglobin < 11 g/dL and 12 g/dL for pregnant and nonpregnant women, respectively.

women, except for South Asia, where both groups have equally high prevalences. No data were found on global estimates of maternal anemia in urban areas.

At the microlevel, a study in Guatemala in 1984 showed lower prevalences of low hemoglobin values among urban women (7.6 percent), compared to two rural samples (12.5 percent and 45.4 percent, from the southern coast and the poor highlands, respectively) (Franzetti et al. 1984). Differences in ferritin levels showed similar patterns (15 percent among urban women, compared to 26 percent and 47 percent for the two rural samples). Recent estimates among lactating women (between 3 and 10 months postpartum) from poor urban areas of Guatemala city revealed prevalences of low hemoglobin values as high as 35 percent (< 12.8 g/dL, corrected for altitude) (Allen and Ruel 1997).

Nutritional Status of Mothers

Data on the nutritional status of women of reproductive age (assessed by anthropometry) are also available from the data sets compiled by UN ACC/SCN (1992). Maternal stunting (height < 145 cm), which is associated with high reproductive risks and low birth weight, is particularly prevalent in Asia and Central America ($\geq$ 15 percent). Women in Africa are significantly taller (averaging 154 to 158 centimeters) compared to the Middle and South Americas (152 to 154 cm) and Asia (150–151 cm). The prevalence of underweight follows the same regional patterns, but is much higher: 60 percent in Southeast Asia, 45 percent in South Asia, and 20 percent in Sub-Saharan Africa and Middle America. Body-mass index, used to measure adult wasting, is highest in South and Southeast Asia (around 40 percent), followed by Africa (20 percent). No data were found on maternal anthropometry for urban areas (UN ACC/SCN 1992).

THE ENVIRONMENT: A THREAT TO HEALTH IN URBAN AREAS

Recent reviews of the environmental determinants of health in cities have emphasized the importance of assessing both the *physical* environment (such as the quality

of air, water, food, and housing), and the *social* environment (such as alienation, unemployment, ethnic tensions, violence, and stress) (Stephens et al. 1996). It is likely that the health of young children will be affected more directly by characteristics of their physical environment, whereas the social environment will affect them indirectly, mainly through the impact on the mental health, physical health, and caring ability of their main caregiver. This review focuses mainly on factors related to the physical environment.

Tanner and Harpham (1995) have summarized urban health problems, their determinants, the risk groups most affected, and the actions that should be undertaken by each sector to alleviate the problems. Table 5 presents an adaptation of their approach.[33] As indicated by the authors (Tanner and Harpham 1995), poverty and the lack of formal education are determinants of all the illnesses listed and, therefore, are not repeated for each illness separately. The following discussion is based on this table.

Crowding, Pollution, and Acute Respiratory Infections

Few relevant population-based studies are available to evaluate the causal factors of ARI, but a number of risk factors have been suggested, with overcrowding and urban pollution (both indoor and outdoor) being the most frequently mentioned. High levels of outdoor pollution, especially suspended respirable particles like sulphur dioxide, nitrogen dioxide, and ozone, are possible factors causing ARI. Exposure to indoor air pollution from coal and biomass combustion for cooking and/or heating has also been associated with pneumonia in children (Campbell, Armstrong, and Byass 1989; Collings, Sithole, and Martin 1990; Kossove 1982; Morris et al. 1990; Pandey et al. 1989a, 1989b). Studies in Nepal have also shown an association between time spent in proximity to wood stoves and symptoms of chronic bronchitis and impaired lung function in women (Pandey 1984; Pandey et al. 1985).

[33] The table excludes the categories of illnesses mostly restricted to adults (and not specifically to women of reproductive age), such as tuberculosis, sexually transmitted diseases, chronic diseases, general violence-related problems and mental and behavioral diseases, including drug and alcohol addiction.

Table 5 Urban health and hypothesized risk factors

Conditions	Determinants
Children	
Diarrheal diseases	• Water, sanitation • Hygiene behavior • Nutritional deficiencies • Poor immune status
Parasitic infections	• Water, sanitation • Hygiene behavior
Acute respiratory infections	• Indoor and outdoor air pollution • Crowding/poor housing quality • Nutritional deficiencies(?) • Poor immune status
Measles	• Crowding • Poor immune status • Lack of immunization (inadequate access or use of health services)
Malaria	• Housing • Stagnant water (poor drainage) • Climate
Malnutrition (Protein energy malnutrition (PEM) and micronutrient deficiencies)	• Food availability, food access • Household behaviors related to food acquisition, feeding practices, breast-feeding practices, intrahousehold allocation of resources, food hygiene • Infectious diseases
Mothers	
Diarrhea	• Same as for children
Acute or chronic respiratory infections	• Indoor air pollution (from cooking stove)
Malaria	• Greater exposure to water sources through water collection, washing clothes, etc.
Occupational	• Chemical exposure and increased vulnerability during pregnancy
Malnutrition and specific micronutrient deficiencies	• Same as for children • Repeated pregnancies, lactation, short inter-birth intervals • Higher requirements of iron due to menstrual losses

Source: Adapted from Tanner and Harpham 1995 (Table 3.6, page 42).

Overcrowding, inadequate ventilation, and dampness are also thought to be associated with the incidence and severity of respiratory infections. High population density and the concentration and proximity of infective and susceptible people in urban areas promote the transmission of infectious agents (Satterthwaite 1993). Crowding is a potentially important risk factor for ARI mortality (Tupasi et al. 1990, cited in Rossi-Espagnet, Goldstein, and Tabibzadeh 1991; Victora et al. 1987), measles (Aaby 1988, cited in Rossi-Espagnet, Goldstein, and Tabibzadeh 1991), and tuberculosis (Stein 1952, cited in Rossi- Espagnet, Goldstein, and Tabibzadeh 1991). Attendance at day-care centers, an increasingly common phenomenon in many urban areas of the developing world, has also been linked to increased respiratory morbidity in young children (Fonseca et al. 1996; Victora et al. 1994).

Water, Sanitation, Diarrhea, and Parasitic Infections

The most important factor in the etiology of diarrheal diseases and helminth (worm) infections in urban areas is water (access and availability, quality, and quantity used). The predominant infectious agents responsible for diarrhea are transmitted by fecal contamination. As indicated by Stephens et al. (1996, 39–40): "human feces remain one of the world's most hazardous pollutants, and related water and sanitation inadequacies still constitute one of the world's most serious health problems." The ingestion of contaminated water, the use of insufficient amounts of water for personal and domestic hygiene, and the inadequate disposal of feces, all characteristics of urban environments, are the most effective routes of transmission of diarrheal pathogens. Waterborne diarrheal diseases are estimated to be highly prevalent in urban areas, mainly as a result of contaminated water and food, crowding, limited access to water, and poor food and household hygiene (Bradley et al. 1992).

It is important to note, however, that on average, households in urban areas have better access to potable water and appropriate sanitation facilities than households in rural areas. This was generally true for the 35 countries included in the DHS data series

referred to in previous chapters, except for a few African countries and Paraguay, where sanitation facilities were more widely available in rural areas (Figure 10).

A number of urban studies have shown a strong association between morbidity and mortality from diarrheal diseases, on the one hand, and the quality of the water consumed and the quantity available for personal and domestic needs on the other (Bradley et al. 1992). Similarly, evidence of reductions in morbidity and mortality from diarrheal and parasitic infections following water and sanitation interventions is widely documented, although mainly in rural areas (Esrey, Feacham, and Hughes 1985; Burger and Esrey 1995). A review of the impact of water and sanitation interventions indicates a median reduction in diarrheal morbidity and mortality of 27 and 30 percent, respectively (Esrey, Feacham, and Hughes 1985). More recent reviews have confirmed these findings (Esrey et al. 1991).

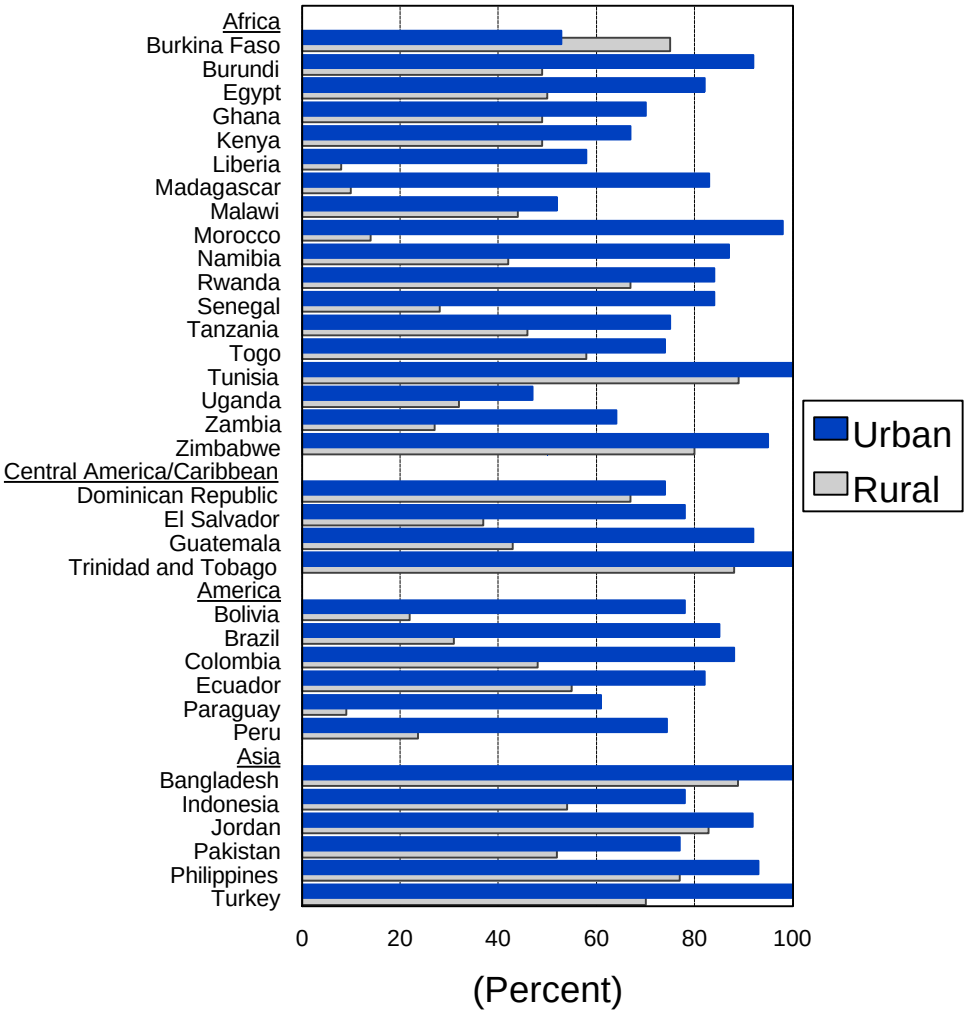
The Determinants of Nutritional Deficiencies

The determinants of nutritional deficiencies are those identified previously as playing a key role in the malnutrition-infection deprivation cycle, including inadequate nutrient intake and poor utilization of nutrients due to ill-health.[34] It is generally believed that malnutrition and micronutrient deficiencies are less prevalent among children in urban areas because of increased incomes, food access, and household food availability. However, very little is known about how these various factors interact in urban areas and how they affect the nutritional status of the vulnerable groups.

Child feeding practices, including breast-feeding, during the first two years of life are particularly important for the growth and development of the child. The concentration

[34] The inadequate intake of nutrients by young children in developing countries is due to a combination of poverty and household food insecurity, inappropriate feeding practices, (including breast-feeding, complementary feeding, and intrahousehold allocation of resources), and poor appetite, which may be due to malnutrition, infections, and/or micronutrient deficiencies. The factors that affect the utilization of nutrients are related to the health and nutritional status of the individual. They include poor absorption of nutrients due to diarrhea and/or parasitic infections, and increased requirements due to poor absorption and intestinal losses, or to catabolic processes associated with fever.

Figure 10 Urban and rural differences in access to safe drinking water, 1980 1995



of iron in breast milk is not sufficient to prevent anemia beyond 6 months of age, but the contribution of *bioavailable* iron from breast milk may be important.[35] Breast-feeding also protects the child against vitamin A deficiency, even in areas where vitamin A deficiency is a public health problem (Cervinskas and Lofti 1996). Thus, continued breast-feeding beyond the period of exclusive breast-feeding is important for the child, but may be difficult for working urban mothers to practice.

The high rates of diarrhea and other infectious diseases documented in urban areas are another factor that may predispose children to malnutrition and micronutrient deficiencies. It may be that even though children's diets in urban areas are better overall than rural diets, the high rates of infections do not allow children to maintain optimal nutritional status. The burden of parasitic infections in urban areas may also exacerbate malnutrition (Sivakumar and Reddy 1975; Chavalittamrong, Suntornpoch, and Siddhikol 1980, cited in Taren and Crompton 1989).[36]

The Determinants of Maternal Mortality, Morbidity, and Malnutrition

The four main causes of maternal mortality related to child bearing in developing countries are hemorrhage, infections, obstructed labor, and eclampsia (UN ACC/SCN 1992). The first three are caused or exacerbated by poor maternal nutrition. The severity of postpartum hemorrhage, for instance, is aggravated by maternal iron-deficiency anemia. Poor iron status reduces immunocompetence, which, in turn, increases maternal susceptibility to infections. And short maternal stature (a reflection of past, childhood malnutrition) is associated with obstructed labor. Teenage pregnancies are also associated

[35] The iron contained in breast milk is more bioavailable to the child than the iron contained in many weaning foods used in developing countries. These foods are often the same staple foods consumed by the rest of the family and are high in factors that inhibit iron absorption.

[36] Hookworm infections, for example, which cause chronic hemorrhage and iron losses, may be particularly detrimental for young children who have low iron reserves and therefore are more susceptible to iron deficiency anemia. Ascaris infections also reduce the absorption of vitamin A by 20 percent in children (Sivakumar and Reddy 1975), and treatment of ascaris improves vitamin A status (Chavalittamrong, Suntornpoch, and Siddhikol 1980, in Taren and Crompton 1989).

with higher risks of maternal mortality, mainly because of the competition for nutrients for growth between mother and fetus. Thus, nutritional stress plays an important role in causing or aggravating maternal mortality in developing countries.

There are a number of reasons for supposing that maternal health may be better in urban than in rural areas. Diets in urban areas may be higher in energy relative to requirements and may be higher in bioavailable iron than in rural areas (see Chapter 6). Prenatal care is also usually more widely available and mothers are more likely to deliver in health facilities as opposed to at home with the assistance of midwives. At the very least, health care facilities are easier to reach in situations of emergencies, and this may reduce the risks of maternal mortality related to complications of pregnancy or childbirth.

Urban areas, however, expose women to different types of health hazards. Environmental pollution combined with indoor exposure to smoke from cooking stoves makes women more vulnerable to chronic respiratory infections (Pandey 1984; Pandey et al. 1985). Pregnancy may also make women more vulnerable to some chemical toxins that they may be exposed to at work, and to certain diseases such as malaria (Satterthwaite 1993). Prostitution, which is more common in urban areas, is associated with increased risk of sexually transmitted diseases including AIDS.[37] Teenage pregnancies are also thought to be more prevalent in urban areas (UN ACC/SCN 1992). Finally, violence against women may be exacerbated in urban areas by poor living conditions, unemployment, and stress.

SUMMARY

Poor urban communities suffer an alarming lack of access to basic water, sewage, and rubbish disposal services, which make it virtually impossible for them to reduce contamination of water and food, maintain adequate levels of hygiene, or control insect-vectors of disease. While infant and child mortality are generally lower in urban than in

[37] AIDS is not discussed in this review. For further information on this formidable health challenge, see Brown (1996) and the WHO/Global Program on AIDS World Wide Web site.

rural areas, the incidence of a number of common childhood diseases such as diarrhea and respiratory illness may actually be higher. However, nationally or regionally representative data on the distributions of these diseases are scarce. As in rural areas, infections may lead to malnutrition, which, in turn, may result in increased vulnerability to further infections. The precise levels of childhood malnutrition (and especially micronutrient malnutrition) in urban areas remain unknown. Similarly, the magnitude of maternal mortality, morbidity, and malnutrition in urban areas is undocumented, as are the specifically urban hazards that may predispose women to these outcomes.

10. SAFETY NETS AND FOOD AND NUTRITION PROGRAMS: HOW CAN THEY IMPROVE FOOD AND NUTRITION SECURITY IN URBAN AREAS? (ISSUE 8)

Safety net programs are usually designed to protect people who fall into two broad categories of poverty—those who suffer from "chronic poverty" and those who suffer from "transient poverty."[38] Countries have experimented with a wide range of interventions, from cash and in-kind transfers, price subsidies, and food stamps to income-generation programs (Cottam 1993; World Bank 1996a, 1996b). Table 6 provides an overview of specific program types as they relate to vulnerable groups and country conditions.

Formal safety nets, however, are not the only mechanism available for crisis management. Families and individuals often adopt their own coping and adaptive strategies, which are referred to as *informal safety nets*. The following sections briefly discusses formal and informal safety nets as they relate to the urban context.[39]

---

[38] The former refers to those who have a chronic incapacity to work and earn an income. This is usually the result of a physical or mental disability, long-term illness, or old age. Those suffering from "transient poverty" are faced with a temporary inability to provide for themselves, as a result of loss of employment, for example (World Bank 1996b).

[39] For a more complete discussion of safety nets, see Van de Walle and Nead (1995), Subbarao et al. (1997), and Haddad and Zeller (1996).

Table 6 Urban poverty, country conditions, and program choice

Who are the poor?	Why are they poor?	Country conditions	Program choice
Urban poor and unemployed	High income variability Low education and skills Lack of assets	Inadequate physical, social, and financial infrastructure, including roads, schools, and banks	Public employment and public works programs at below-market wages
		Widespread poverty, food insecurity, and malnutrition	Carefully designed food and nutrition programs
		Economic reform in progress with contraction of economic activity and government expenditures	Credit-based livelihood programs Severance payments where needed
Urban poor who are unable to work and who are without support, often the elderly and the disabled	Unable to work and no formal or informal social assistance scheme	Same as above	Targeted cash transfers, if information base is strong
Female urban poor	Discrimination in the labor market and in educational opportunities Discrimination in property rights and in access to credit	Sociocultural norms biased against women in addition to underdeveloped economy	Microcredit Childcare facilities Targeted cash transfers, if information base is strong

Source: World Bank 1996b.

strategies, which are referred to as *informal safety nets*. The following sections briefly discusses formal and informal safety nets as they relate to the urban context.[40]

[40] For a more complete discussion of safety nets, see Van de Walle and Nead (1995), Subbarao et al. (1997), and Haddad and Zeller (1996).

FORMAL SAFETY NETS

Although many formal safety net programs have been implemented in urban areas of the developing world, the literature on specific issues related to the effectiveness and impact of these programs on the urban poor is extremely scant.

Overall, however, governments and donors alike are renewing their interest in safety net programs as a way of protecting incomes and living standards, particularly when declines result from structural adjustment and macroeconomic stabilization measures (World Bank 1996b). There is also increasing pressure to ensure that social assistance programs are effective in reaching the needy and in reducing poverty, food insecurity, and malnutrition, while, at the same time, pressure exists to reduce overall costs of the programs. Often, the response of governments is to examine how targeting of the programs can be redirected from urban to rural areas. In many developing countries, however, conventional programs of social insurance and unemployment compensation are not fiscally feasible, or are unable to respond adequately to economies with large informal sectors and widespread open unemployment in urban areas.

In the late 1980s, structural adjustment programs began to incorporate specific measures to mitigate the impoverishment of vulnerable groups. The most prevalent interventions in Latin America and Africa have been social action programs, social funds, or social investment funds. These funds generally provide money for activities geared toward employment creation and social service delivery, including infrastructure development and support for microenterprises (World Bank 1994a). In South Asia, food subsidies and public employment programs have been the most notable forms of intervention.

INFORMAL SAFETY NETS

Although the urban poor may have better access to formal support networks, households often also use family support systems and private income transfers to cope with temporary economic distress or protect those who are permanently unable to help

themselves. In some cases, urban dwellers may rely on families in rural areas to supply them with food or income as they cope with the stress caused by rising food prices or loss of employment.

Vulnerability to food insecurity in cities is, first and foremost, vulnerability to fluctuations in the price of food and income. As a result, urban residents have developed strategies for reducing vulnerability that are markedly different from those of rural areas. Davies (1993) divides these into "adaptive" and "coping" strategies.

Adaptive Strategies

Adaptive strategies of low-income urban residents deal with longer-term changes in the economy and are generally attempts to diversify sources of either income or food to minimize the probability that at some point the household will have no food. Agricultural production by an urban household within or outside the city is one such strategy (see Chapter 6).

Increased female participation in wage labor and informal trade is another. A recent World Bank study that examined household responses to poverty and vulnerability in four poor urban communities in different regions of the world found that a frequent response to declining real incomes was for poor households to mobilize additional labor, usually women's labor, and, in the poorest households, children's labor as well. An increase in women's labor-force participation occurred in the areas of petty trading and services within the informal sector (Moser, Herbert, and Makonen 1993).[41]

Poor families have their children work because of the need for extra income. As parents' incomes rise, they are able to send their children to school rather than to work. In Egypt, a 10 percent increase in mothers' wages was found to result in a 15 percent decline

[41] In Lusaka, Zambia, the share of women working increased from 9 percent to 34 percent between 1978 and 1992, a period of economic stress. In Guayaquil, Ecuador, women's participation increased from 32 to 46 percent during the same period.

in labor among children ages 12 to 14, and a 27 percent decline among 6-to-11-year-olds (World Bank 1995).

The growth of the "petty commodity" food market is another adaptive strategy, as is reliance on nonmarket exchanges between the city and the countryside (Atkinson 1992). In Sub-Saharan Africa, urban residents often receive transfers of food from family members still living on the farm. Other long-term adaptations to food insecurity may involve changes in family or household composition, including fostering of children outside urban areas (Aguirre 1994).

Coping Strategies

Coping strategies, on the other hand, are short-term mechanisms for dealing with immediate insufficiencies of food or income. Strategies may include substitution of cheaper food, borrowing food or purchasing on credit, cutting nonfood expenditures or selling assets, sending household members elsewhere to eat, maternal buffering, and cutting back on the number of meals or rationing the amount of food apportioned (Leslie and Paolisso 1989; Aguirre 1994).

In other instances the urban poor may attempt to pool resources to make food available less expensively through community meals or communal kitchens. In some cases, community kitchens may be supported programmatically with food aid or other inputs (UNICEF 1994; Katona-Apte 1988); in other cases, these kitchens may be self-help efforts (Cottam 1993). In Peru (UNICEF 1994), the number of community kitchens grew from 100 in 1978 in the whole country to about 5,000 by 1991 in greater Lima alone.[42]

The community kitchen experience illustrates potential problems with programs that draw on community resources, especially women's participation. The costs of the

[42] The first kitchens were established as part of popular women's movements or by the efforts of parish priests and health workers. By 1984, the government became involved in supporting such programs. These kitchens will often provide free meals to those households considered to be the poorest in the community. Interviews indicated that the main reason women drop out of the kitchen group is because they need to earn an income, suggesting that it is the better-off in the community who participate (UNICEF 1994).

program in terms of foregone income, reduced time for child care, and less interaction with the family are not well understood.

URBAN-RURAL LINKS

The importance of urban ties to rural areas as an element of either adaptive or coping strategies of the poor is subject to some debate. Substantial literature exists on urban-rural links, and recent case studies provide good illustrations of different perspectives and city experiences. Krüger (1998) notes that in one settlement in Gaborone, Botswana's capital, half of all households retain land in the village from which they come and the proportion of households with such rural assets does not decline with length of stay in the city. He argues that rural ties and assets are valued in both social and monetary terms and provide a valuable safety net for poor urban households.

In contrast, qualitative interviews with poor households in Dar es Salaam suggest that for most households, ties to rural areas were, in fact, relatively weak. About 90 percent of these households, drawn from central as well as peri-urban areas, had been in Dar es Salaam for more than five years, which may have allowed them to form their own urban networks and reduce the strength of ties to rural areas, a point also made by Fall (1998). Generally, these households stated that they were too busy to go home to rural areas for short periods. "Going home" to rural villages seemed to be a strategy that served as an "ultimate safety net" or part of a way to deal with long-term crises or periods of unemployment. Reliance on rural ties for food or assistance was not part of a short-term or day-to-day coping strategy (CARE Tanzania 1998).

Smit (1998) provides a way to integrate these findings by arguing that households vary in the strength of their ties to rural areas. In Durban, South Africa, he found that some households continue to regard their rural homestead as their real home (48 percent of his sample), while others, over time, lose all links with rural areas (19 percent). The importance of urban ties to rural areas thus probably varies with conditions in the specific

city and country, as well as with the assets and ability of the household to form new support networks in urban areas.

THE INTERACTION BETWEEN FORMAL AND INFORMAL SAFETY NETS

Social assistance programs must also be careful not to inhibit private responses to crises. Haddad and Zeller (1996) provide several examples of situations where public programs negatively affected private coping strategies. With a school feeding program, for example, households may reduce the food given to a child at home and increase the allocation to other household members, thus defeating the purpose of the additional meal at school. Sahn and Alderman (1995) describe a situation in Sri Lanka where a food stamp scheme resulted in a two-to-three-day reduction in labor market participation per month, approximately one-third of the value of the original food stamp subsidy. In one urban community in Zambia, 90 percent of the women stopped other income-generating activities to work on a self-help project. Although it was their choice to work on the project, women supplanted their long-run coping strategies with the need to provide for their families in the short-run by taking the food-for-work job (World Bank 1994b). A critical issue, then, is how to ensure that public safety nets complement informal coping strategies rather than inhibit them. This question is relevant for both the urban and the rural contexts.

CHOOSING AND DESIGNING PUBLIC SAFETY NET PROGRAMS

Rogers (1988), in reviewing available information on the relative effectiveness and cost of direct feeding and food-related income transfers, indicated that it was not possible to characterize one program type as always preferable to another on the basis of its effectiveness, cost, or efficiency in the use of resources. Obviously, these considerations apply to the selection of programs for urban versus rural areas. Each individual program is unique in its design, environmental context, and objectives. Because few generalizations

are possible regarding the optimal intervention, local, situation-specific information is absolutely critical to the process of intervention selection and design. Grosh (1995) suggests five criteria for choosing which intervention will be the best choice in a given situation. These include (1) administrative feasibility; (2) political feasibility; (3) collateral effects, which can be positive or negative, and can include such things as changes in labor supply of participants or increased attendance at health clinics; (4) targeting; and (5) ability to tailor the solution to the problem.

The ability to measure poverty and identify the poor is often a crucial aspect of program design. There are three main types of targeting mechanisms: individual assessment; group or geographical targeting; and self-targeting. Two-stage screening is also used at times, whereby a geographical location is selected first (say, urban areas), and individual targeting (of poor households, for example) is done at a second stage. The more common criteria used for individual assessment include means testing (based on income) and the use of gender of household head or nutritional status. Group or geographical measures target beneficiaries who live in a particular area known to be poor or schools located in a particular region known to have high malnutrition rates. Self-targeting programs are usually designed in a manner to discourage participation of nonpoor individuals (food-for-work programs are one example) (Grosh 1994; World Bank 1996b).

Grosh (1994) argues that deciding on whether and how to target social programs depends on weighing the costs and benefits of doing so. Improving cost-effectiveness appears to be the main benefit of targeting.[43] While these programs can and have worked very well in various countries, the design of social assistance programs must also consider potential incentives or disincentives these programs create, which can reduce program

[43] Grosh's study of 30 Latin American countries shows that, generally, administrative costs are low in both absolute and percentage terms. While targeting mechanisms will influence the administrative costs, how high these costs will be also hinges on how accurate the targeting mechanism is, the size and type of the benefit provided, the quality of program administration, and sometimes even whether it is managed by the public or private sector (Grosh 1994).

effectiveness. The disincentive to work is one major problem associated with programs that use a means, or income, test to determine program eligibility (World Bank 1996b). With geographical targeting of benefits, people (not just the poor) may be encouraged to move to those areas in order to benefit from the program offered.[44]

Effectiveness and sustainability are key concerns of any safety net or social assistance program. Just as the causes of urban food insecurity and malnutrition are multisectoral, so must be the responses. Interventions may be part of a multisectoral program or may simply form part of a coordinated effort among programs in different sectors. Vertical as well as horizontal coordination among different agencies and actors operating in the area, including community-based organizations, nongovernmental organizations, and government agencies, should enhance efforts to improve food security and nutrition.

Effective interventions will also recognize the diversity of needs among the urban poor. Different neighborhoods can have different priorities. Even when priorities are similar, the causes and the resources available to address the problem can vary across communities and, so, effective sustainable responses will differ (CARE Bangladesh 1998; CARE Tanzania 1998). Increasing people's participation in the process will help ensure that community priorities are identified and intervention design is adapted to community idiosyncrasies and resources. Making people aware of their own capacities and resources can also lead them to provide important insights for program design and intervention regarding what works and what does not for their own community (Anzorena et al. 1998).

Success of an intervention also seems to presuppose that communities have the ability to come together and act, and this may not be the case. Donor agencies and governments may need first to work to improve the social capital in a community—the

[44] It happened several times in Zambia that a school would be upgraded within the slum settlements and the better-off from other communities would move in to take places in the school meant for the target community's children (World Bank 1996b).

level of trust and cooperation among households—before undertaking physical interventions (Anzorena et al. 1998).

Because program interventions often have limited outside funding, sustainability often depends on making sure that the program meets local needs and relies on local resources and capacities. Building the intervention around the capacities, skills, and knowledge of the community, keeping down costs, and striving to achieve cost recovery can enhance the prospects for sustainability, and can strengthen local ownership by reducing the power and control of external funders over the project. Credit and savings schemes are one way to enhance community organization while simultaneously providing a means for the community to fund its own projects in a sustainable way (Anzorena et al. 1998).

SUMMARY

Informal and formal safety nets are important elements of a comprehensive social strategy. The design of effective formal safety nets depends on external government, donor, or NGO assistance and must take into account the nature and determinants of poverty and food and nutrition insecurity in urban areas. Formal safety nets must also ensure that they do not undermine the household's own private logic and response as it deals with falls in income or threats to food and nutrition security.

A number of safety net programs exist, ranging from general price subsidies to cash transfers to specific nutrition interventions. Some general principles about what kinds of programs work best under what conditions do exist, but they are few and in most cases have not been adequately studied. Information on how programs work together to form a complete antipoverty or food and nutrition strategy is lacking. In any case, programs will have to be adapted to local conditions, so situation-specific information is critical to the process of program choice and design.

Community involvement in such identification of priorities and appropriate design and implementation is critical to sustainability and success. External support of a process

through which the poor can redefine the relationships among themselves and with local authorities may be just as important as support of a specific project intervention.

11. CONCLUSIONS

A summary of the main issues reviewed is presented first, followed by a summary of the main research and policy questions that need urgent attention.

SUMMARY

- **Issue 1 Food sources and costs: Where do the poor get their food and at what cost?**

  Fragmented food systems lead to inefficient marketing and increase the unit cost of food. The demand pattern of the poor, who can only afford to buy small amounts of food at a time, leads to a large number of sellers who sell small quantities of food, which subsequently may lead to higher prices per unit than bulk purchases. With economic development, supermarkets replace traditional street sellers and central markets. This leads to increased consumption of processed products and generally higher prices. Urban living also increases the amount of food prepared and eaten away from home. Urban agriculture and private and public transfers may be particularly important for urban dwellers who cannot afford to buy sufficient food.

- **Issue 2 Incomes: What are the constraints to earning an adequate income in urban areas?**

  Underemployment, rather than outright unemployment, is an important constraint to earning an adequate income in many urban areas. The urban poor often have low-paying, unstable jobs, leading to highly variable wages. The ability

of the poor to cope with the vagaries of the labor market depends critically on their own skills, their access to functioning labor markets, and partly on their nutritional and health status. Women often fare even worse than men in the labor market because they often have less access to better paying jobs in the formal sector and frequently have jobs as unpaid family workers or in the informal sector.

- **Issue 3 Urban agriculture: Can it improve food security, nutrition, and health and have a positive impact on the environment?**

  It seems clear that in some cities urban agriculture is an important coping strategy for households, and thereby can potentially make a significant contribution to improving food insecurity. Because women often have the responsibility for food procurement for the household, they are frequently involved in urban agricultural production and sales. Urban agriculture presents a number of challenges, from competition for scarce available land, to degradation of the soils, pollution, and increased poisoning and infectious diseases. At the same time, urban agriculture offers new potential for recycling urban wastes, saving on marketing transport costs, providing poor segments of the population with employment possibilities, alleviating poverty, and improving food and nutrition security.

- **Issue 4 Urban diets: Are they adequate (that is, nutritious, safe, and culturally acceptable)?**

  Urban diets, although not nutritionally adequate in general, seem better than rural diets. Major qualitative differences are seen between rural and urban diets, even within countries or defined geographic areas, and result in significant rural-urban differentials in intakes of many nutrients. Even those nutrients such as iron, which do not appear to be consumed at consistently higher levels in urban diets, may be better absorbed because they are obtained from animal foods rather than vegetable. Street foods are a major feature of urban eating, for reasons which are

not entirely clear. Some foods are especially susceptible to microbial contamination, creating the risk of epidemics of serious illnesses. The trade-off between greater convenience and perhaps also lower cost, on the one hand, and higher risks of contamination on the other hand, remains to be fully explored.

- **Issue 5 Child caregiving: What are the threats to adequate child care in urban areas?**

  There are a number of potential threats to adequate child care in urban areas, such as lack of public services, although such services are in general better in urban than in rural areas; decreased breast-feeding, resulting from maternal employment; maternal malnutrition and poor health, leading to reduced capacity to perform caregiving activities, reduced response to the child's demand for attention and care, reduced interaction with child and other family members, and, in severe situations, reduced capacity to breast-feed; single-parent households with lack of alternative caregivers; and inadequate complementary feeding. The relative importance of each of these threats to adequate child care remains to be examined.

- **Issue 6 Rural/urban, inter-urban, and intra-urban differentials in childhood mortality, morbidity, and malnutrition: Are urban populations really better off?**

  It can be concluded from available data that childhood mortality, stunting, and underweight are generally lower in urban areas than in rural, whereas wasting and morbidity from infectious diseases are often higher in urban areas. However, there is considerable heterogeneity in poverty, morbidity, mortality, and nutritional status in urban areas, such that there are often enormous differentials between the poor and the middle-to-high income parts of a particular city. Generally the intra-urban differences are greater than urban/rural differences. The issues to emphasize are that poverty, food insecurity, and malnutrition in poor urban areas around the

world are unacceptably high and that there is no indication of major global improvements over the past two decades.

- **Issue 7 Health: What are the determinants of ill health in urban areas?**

  Health conditions in urban squatter areas are appalling. Infant and child mortality are generally at least as high as in rural areas, and differences of more than threefold have been documented in the infant and child mortality rates of richer and poorer people in urban areas. Children in urban squatter areas die from the same diseases—diarrhea, acute respiratory infections, malaria, and measles—as their rural counterparts. Morbidities caused by these infections and by parasites and nutritional deficiencies are also high. Information on the micronutrient status of children living in poor areas is lacking. Many of these problems in poor urban squatter areas are caused by a lack of access to water, sewage, and rubbish services, which makes it difficult to maintain adequate levels of hygiene, prevent contamination of water and food, and control insect-vectors of disease. The magnitude of maternal mortality, morbidity, and malnutrition in poor urban areas is undocumented, as are the specifically urban hazards that may predispose women to these outcomes.

- **Issue 8 Safety Nets: Can they improve food and nutrition security in cities?**

  Both informal and formal safety nets are important elements of a comprehensive social strategy in urban areas. Formal safety net programs appear to be slightly more available in urban than in rural areas. And though kinship and community structures may be weaker in urban areas than in rural ones, urban households still seem able to form significant social networks. Informal safety nets in urban areas are thus not necessarily weaker, just different, from those in rural ones.

  The design of effective formal safety nets must take into account the nature of the poverty and the food and nutrition insecurity in urban areas. Formal safety nets

must also ensure that they do not undermine the household's own response as it deals with falls in income or threats to food and nutrition security. A number of safety net programs exist, such as general price subsidies, cash transfers, and specific nutrition interventions. Some general principles about what kinds of programs work best under what conditions do exist, but they are few, and in most cases have not been adequately studied. Situation-specific information is critical to the process of program choice and design. Community participation is essential to success.

RESEARCH AND POLICY QUESTIONS

An alarming lack of information on the patterns and determinants of food insecurity, malnutrition, and poor health in urban areas has been noted throughout this review. Hence, the data and analytical base for public policy formulation in urban areas are surprisingly weak. Table 7 presents a summary of the research and policy questions identified for each of the eight issues reviewed. The type of information needs that we have identified can be categorized into three groups: (1) *descriptive data* to document who are the poor, where they are, what are their main sources of income, what they eat, what are their purchasing patterns, what prices they pay for their food, what are their patterns of caregiving and dealing with diseases, and what are their coping/adaptive strategies; (2) *data about the determinants of their condition*: What are the specific characteristics of urban life that make poor urban dwellers more vulnerable to food insecurity, malnutrition, and poor health? Why are people poor, why are their incomes inadequate, what are the constraints they face relative to caregiving, food security, and health and nutrition? And (3) *data about programs, policies, interventions, and safety nets* in urban areas: what works and what does not work, how can programs be better designed, targeted, and implemented in order to address the real needs of the urban poor?

Table 7 Summary of research and policy questions: 7a. Research questions

1. Food sources and cost	2. Incomes	3. Urban agriculture (UA)	4.Urban diets
• Where do poor people get their food? What affects their choice of food sources? How do sources affect the cost of food?	• What is the nature of urban labor markets, especially informal markets? What are the constraints faced by women?	• What is the importance of UA (numbers employed, amounts produced, area cultivated)?	• What do poor urban dwellers eat? Do they meet their daily requirements in all nutrients? Are some age groups more at risk? Are energy expenditures lower than in rural areas?
• How is the urban food marketing system organized? How could its efficiency be improved to lower food costs for the poor?	• How do policies affect the demand for the skills of the urban poor? Do the poor have access to the labor market and the skills to meet the demands of the workplace?	• What is the contribution of UA to household employment, income, food security, food and nutrient intake, and nutritional status (for vulnerable groups in particular)? • Do different types of UA have differential impacts on intrahousehold relations and resource allocation?	• What is the magnitude of nutritional deficiencies (protein-energy, vitamin A, iron, B-vitamins)?
• What affects food purchasing decisions by the poor (choice of stores, amount, and frequency of purchases, types of foods bought)?	• What strategies do families adopt to increase income (raise number of family members working, increase number of jobs, etc.)?	• What benefits/risks does UA pose to the environment and public health?	• Are there different dietary patterns within cities that are associated with better intakes/absorption/nutrition? What determines the choice of dietary patterns?
• What affects the poor's decision to access public assistance programs, informal networks, and land for own-production?		• What are the legal and institutional constraints to increasing UA?	• Are street foods less safe than food prepared at home by poor urban dwellers? What is the importance and health impact of street foods for vulnerable groups?

5. Child caregiving	6. Childhood mortality, morbidity, and malnutrition	7. Health	8. Safety nets
• What are the patterns of care in urban areas? Who provides care? What is the quality? Are child-care alternatives available?	• What are the actual magnitudes of urban/rural and intra-urban differences?	• What are the disease patterns of the poor? How different are they from wealthier groups within urban areas?	• What are the constraints to good design, implementation, operation, and impact of safety nets in urban areas?
• Which care practices are more important for child nutrition and health? Or, which combination of practices?		• What are the main constraints to health: lack of basic services, environmental contamination, poor access to health care, poor quality housing, food insecurity, etc.?	• What information do policymakers need to effectively select the most appropriate safety nets for a given context?
• What are the constraints to care among the poor (maternal employment, time, inadequate child care and family/social support, poor maternal health, etc.)?		• Are health care facilities really more available in urban areas? What is the quality of services? What are the constraints to their use for the poor?	• How should income, food, and nutrition programs be coordinated to work together to reduce poverty, malnutrition, and food insecurity? • What informal coping and adaptive strategies do poor urban dwellers adopt to cope with food insecurity and malnutrition?

(continued)

Table 7 (continued) **7b. Policy questions**

1. Food sources and cost	2. Incomes	3. Urban agriculture (UA)	4.Urban diets
• Which policies could reduce the price poor people pay for their food? What are the alternatives? Better markets?	• What policies could generate sufficient demand for the skills of the urban poor and provide them with adequate access to the labor market? How could appropriate growth of the informal sector be encouraged?	• What policies could create an environmentally friendly and sustainable UA conducive to food security, adequate nutrition, and health of the poor? Should policies differ if UA is an income-generating activity rather than a subsistence activity?	• How can the beneficial impacts of urbanization on dietary adequacy be reinforced, and its deleterious effects mitigated?
• Could better design and targeting of transfer programs in urban areas make eating and infant feeding practices in them more appealing to governments?	• How should credit programs be designed and targeted to provide adequate financing for the income-generating activities of the poor?	• Should governments support UA as an explicit part of a safety net strategy? Under what conditions, for whom and with what types of policies?	• What can be done to promote healthy urban areas? What is the impact of nutrition programs on dietary adequacy? Are the most vulnerable groups reached?
• How can public strategies complement households' coping/adaptive strategies to reduce the price of food for the poor?	• What policies could prevent discrimination and provide equal opportunity for women to work?	• How can the environmental benefits of UA be encouraged and its potentially negative effects on health be prevented?	• Should the sale of street foods be regulated? What types of strategies could protect consumers' health from unsafe foods?

5. Child caregiving	6. Childhood mortality, morbidity, and malnutrition	7. Health	8. Safety nets
• How can programs be designed to encourage maternal employment as well as promote breast-feeding and adequate child care?	• How should resources be allocated to reach the poor, wherever the poor are?	• What can be done to improve health conditions in urban areas and how can it be done? Which policies/ programs should be prioritized?	• How could the design, management, and operation of safety net programs be improved in urban areas?
• Which programs would be most effective in improving the quality of life and facilitating the work of caregivers in maintaining a safe and hygienic environment in urban areas?	• How can the reliability and validity of statistics on mortality, morbidity, and malnutrition be improved in urban and rural areas?		• What tools should be developed to help policymakers understand and overcome the constraints to effective safety net programs?
• Could specific training programs improve knowledge and skills of caregivers and substitute caregivers?			• To what extent and how should formal safety nets complement private coping and adaptive strategies? To what extent should they encourage or replace them?

How can programs complement, as opposed to discourage or displace, the private coping and adaptive strategies adopted by the households?

Better understanding of these issues is needed to provide policymakers, development practitioners, and program administrators with the information they need to formulate an appropriate policy response to reduce food insecurity, malnutrition, and poor health in urban areas.

REFERENCES

Aaby, P. 1988. Malnutrition and overcrowding/intensive exposure in severe measles infection: Review of community studies. *Review of Infectious Diseases* 10 (2): 478–491.

Abbott, J., ed. 1993. *Agricultural and food marketing in developing countries*. Oxon, U.K.: C.A.B. International.

ADB (Asian Development Bank). 1994. *Asian development outlook 1994.* New York: Oxford University Press.

Aguirre, P. 1994. How the very poor survive—The impact of hyper-inflationary crisis on low-income urban households in Buenos Aires, Argentina. *Geojournal* 34 (2): 295–304.

Alam, N., and B. Wojtyniak, F. J. Henry, and M. M. Rahaman. 1989. Mother's personal and domestic hygiene and diarrhoea incidence in young children in rural Bangladesh. *International Journal of Epidemiology* 18 (1): 242–247.

Alarcón, J. A., and F. J. Adrino. 1991. Diferencias urbano-rurales en la ingesta de alimentos de familias pobres de Guatemala. *Archivos Latinoamericanos de Nutrición* 41 (3): 327–335.

Allen, L. H. 1993. The nutrition CRSP: What is marginal malnutrition, and does it affect human functioning? *Nutrition Review* 51 (9): 255–267.

Allen, L. H., and M. Ruel. 1997. Riboflavin supplements, with or without iron supplements, do not improve iron status of lactating Guatemalan women. *FASEB Journal* 11 (3): A654.

Amis, P. 1997. Indian urban poverty: Where are the levers for its effective alleviation? In Urban poverty: A new research agenda, ed. A. de Haan. *IDS Bulletin* 28 (2): 94–105.

Anzorena, J., J. Bolnic, S. Boonyabancha, Y. Cabannes, A. Hardoy, A. Hasan, C. Levy, D. Mitlin, D. Murphy, S. Patel, M. Saborido, D. Satterthwaite, and A. Stein. 1998. Reducing urban poverty: Some lessons from experience. *Environment and Urbanization* 10 (1): 167–186.

Arambulo, P. III, C. Almeida, J. Cuellar, and A. J. Belotto. 1994. Street food vending in Latin America. *Bulletin of the Pan-American Health Organization* 28 (4): 344–354.

Asaduzzaman, M. 1989. Feeding our future towns: Urbanization and food policy issues. In *Food strategies in Bangladesh,* ed. Bangladesh Planning Commission. Dhaka: University Press.

Assignment Children. 1983. Some facts and figures on ORT. *Editorial* 61/62: 69.

Atkinson, S. J. 1992. *Food for the cities: Urban nutrition policy in developing countries*. London: Urban Health Program, Health Policy Unit. Department of Public Health and Policy, London School of Hygiene and Tropical Medicine.

Atkinson, S. J. 1993a. Urban-rural comparisons of nutrition status in the Third World. *Food Nutrition Bulletin* 14 (4): 337–340.

Atkinson, S. J. 1993b. Urban health in the Third World: A guide to the literature. *Environment and Urbanization* 5 (2): 146–152.

Atkinson, S. J., and J. Cheyne. 1994. Immunization in urban areas: Issues and strategies. *Bulletin of the World Health Organization* 72 (2): 183–194.

Bairagi, R. 1980. Is income the only constraint on child nutrition in rural Bangladesh? *World Health Organization Bulletin* 58 (5): 767–772.

Baker, J. 1995. Survival and accumulation strategies at the rural-urban interface in Northwest Tanzania. *Environment and Urbanization* 7 (1): 117–133.

Baker, J., and P. O. Pedersen. 1992. *The rural-urban interface in Africa*. Uppsala: The Scandinavian Institute of African Studies.

Banguire, F. 1987. The impact of the economic crisis on fixed-income earners. In *Beyond crisis: Development issues in Uganda*, ed. C. P. Dodge and P. D. Wiebe. Kampala: Makerere Institute of Social Research.

Barclay, A. J., A. Foster, and A. Sommer. 1987. Vitamin A supplements and mortality related to measles: A randomized clinical trial. *British Medical Journal* 294 (6567): 294–297.

Bart, C. 1994. Urban food security: A guide to critical issues. CARE Food Security Unit, Atlanta. Photocopy.

Basta, S. S. 1977. Nutrition and health in low-income urban areas of the Third World. *Ecology of Food and Nutrition* 6: 113–124.

Battcock, M. 1992. Street foods and development in Bangladesh. *Food Laboratory News* 8 (2): 14–22.

Beaton, G. H., R. Martorell, K. J. Aronson, B. Edmonston, G. McCabe, A. C. Ross, and B. Harvey. 1993. *Effectiveness of vitamin A supplementation in the control of young child morbidity and mortality in developing countries*. UN ACC/SCN State-of-the-Art Series Nutrition Policy Discussion Paper No. 13. Geneva: United Nations Administrative Committee on Coordination/Subcommittee on Nutrition.

Becker, C. M., C. N. de Bodisco, and A. R. Morrison. 1986. *Urban Africa in macroeconomic and microeconomic perspectives: Issues and options*. World Bank Discussion Paper No. UDD-97. Washington, D.C.: Water Supply and Urban Development Department, World Bank.

Becker, C., A. Jamer, and A. Morrison. 1994. *Beyond urban bias in Africa*. Portsmouth, N.H., U.S.A.: Heinemann.

Begum, N. 1990. Selected environmental factors related to nutritional status of urban children in Bangladesh. Ph.D. dissertation. University of Colorado, Boulder, Colo., U.S.A.

Behrman, J., and B. L. Wolfe. 1984. More evidence on nutrition demand. Income seems overrated and women's schooling underemphasized. *Journal of Development Economics* 14 (1–2): 105–128.

Behrman, J., and B. L. Wolfe. 1987. How does mother's schooling affect family health, nutrition, medical care usage, and household sanitation? *Journal of Econometrics* 36 (1/2): 185–204.

Benicio, M. H., C. A. Monteiro, H. P. Zuniga, and E. M. Rio. 1987. Study of the health conditions of infants in the municipality of São Paolo, Brazil, 1984–1985. IV–Diarrheal diseases. *Revista de Saude Publica* 21 (1): 23–28.

Bern, C., J. Martines, I. de Zoysa, and R. I. Glass. 1992. The magnitude of the global problem of diarrheal disease: A ten-year update. *Bulletin of the World Health Organization* 70 (6): 705–714.

Bertrand, W. E., and B. F. Walmus. 1983. Maternal knowledge, attitudes and practices as predictors of diarrhoeal diseases in young children. *International Journal of Epidemiology* 12 (2): 205–210.

Bhatnegar, S., and U. Dosaij. 1986. Diarrhoeal disease morbidity in children below 5 years in urban slums of Delhi. *Indian Journal of Medical Research* 84: 53–58.

Bicego, G., and O. B. Ahmad. 1996. *Infant and child mortality*. Demographic and Health Surveys Comparative Studies No. 20. Calverton, Md., U.S.A.: Macro International Inc.

Birley, M. H., and K. Lock. 1998. Health and peri-urban natural resource production. *Environment and Urbanization* 10 (1): 89–106.

Bradley, D., C. Stephens, T. Harpham, and S. Cairncross. 1992. *A review of environmental health impacts in developing country cities.* Washington, D.C.: World Bank.

Braun, J. von, and G. Wiegand-Jahn. 1991. Income sources and income uses of the malnourished poor in northwest Rwanda. In *Income sources of malnourished people in rural areas: Microlevel information and policy implications*, ed. J. von Braun and R. Pandya-Lorch. Working Paper on Commercialization of Agriculture and Nutrition No. 5. Washington, D.C.: International Food Policy Research Institute.

Braun, J. von, H. de Haen, and J. Blanken. 1991. *Commercialization of agriculture under population pressure: Effects on production, consumption, and nutrition in Rwanda*. Research Report 85. Washington, D.C.: International Food Policy Research Institute.

Braun, J. von, H. Bouis, S. Kumar, and R. Pandya-Lorch. 1992. *Improving food security of the poor: Concept, policy, and programs.* Washington, D.C.: International Food Policy Research Institute.

Braun, J. von, J. McComb, B. Fred-Mensah, and R. Pandya-Lorch. 1993. *Urban food insecurity and malnutrition in developing countries: Trends, policies, and research implications*. Washington, D.C.: International Food Policy Research Institute.

Brink, E. L., H. E. Aly, A. M. Dakroury, A. K. Said, F. M. Ghoneme, M. A. Hussein, F. M. Shaheen, R. E. Peak, E. D. Gentry, and M. Z. Nichaman. 1983. The Egyptian national nutrition survey for 1978. *World Health Organization Bulletin* 61 (5): 853–860.

Brown, K. H., R. E. Black, G. Lopez de Romana, and H. Creed de Kanashiro. 1989. Infant feeding practices and their relationship with diarrhea and other diseases in Huascar (Lima), Peru. *Pediatrics* 83 (1): 31–40.

Brown, L. R. 1996. *The potential impact of AIDS on population and economic growth rates.* Food, Agriculture, and the Environment Discussion Paper 15. Washington, D.C.: International Food Policy Research Institute.

Burger, S. E., and S. A. Esrey. 1995. Water and sanitation: Health and nutrition benefits to children. In *Child growth and nutrition in developing countries. Priorities for Action*, ed. P. Pinstrup-Andersen, P. D. Pelletier, and H. Alderman. Ithaca, N.Y., U.S.A.: Cornell University Press.

Caldwell, J. 1979. Education as a factor in mortality decline: Evidence from Nigeria. *Population Studies* 33 (3): 395-413.

Campbell, H., J. R. M. Armstrong, and P. Byass. 1989. Indoor air pollution in developing countries and acute respiratory infection in children. *Lancet* 1 (8645): 1012.

CARE Bangladesh. 1998. Urban livelihood security assessment in Bangladesh. Report. Dhaka, Bangladesh. Photocopy.

CARE Tanzania. 1998. Dar es Salaam urban livelihood security assessment. Summary report. Dar es Salaam, Tanzania. Photocopy.

Castells, M., and A. Portes. 1989. World underneath: The origins, dynamics, and effects of the informal economy. In *The informal economy: Studies in advanced and less developed countries*, ed. A. Portes, M. Castells, and L. A. Benton. Baltimore, Md., U.S.A.: Johns Hopkins University press.

Castle, S. E. 1995. Child fostering and children's nutritional outcomes in rural Mali: The role of female status in directing child transfers. *Social Science and Medicine* 40 (5): 679–693.

Cebu Team (The). 1991. Underlying and proximate determinants of child health: The Cebu Longitudinal Health and Nutritional Study. *American Journal of Epidemiology* 133 (2): 185–201.

Cederblad, M., and S. I. A. Rahim. 1986. Effects of rapid urbanization on child behavior and health in a part of Khartoum, Sudan: II. Socioeconomic changes 1965–1980. *Social Science and Medicine* 22 (7): 713–721.

CEPAL (Comisión Económica para América Latina y el Caribe). 1997. *Panorama Social de América Latina 1996*. Santiago, Chile.

Cervinskas, J., and M. Lofti. 1996. *Vitamin A deficiency: Key resources in its prevention and elimination*. Ottawa, Ontario, Canada: The Micronutrient Initiative.

Chakraborty, A. 1990. *Social stress and mental health: A social-psychiatric field study of Calcutta.* New Delhi: Sage.

Chavalittamrong, B., V. Suntornpoch, and C. Siddhikol. 1980. Vitamin A concentration in children with giardiasis. *Southeast Asian Journal of Tropical Medicine and Public Health* 11 (2): 245–249.

Children in the Tropics. 1994. *Street food.* No. 213. Paris: International Children's Centre.

Cleland, J. C., and J. K. van Ginneken. 1988. Maternal education and child survival in developing countries: The search for pathways of influence. *Social Sciences and Medicine* 27 (12): 1357–1368.

Cochrane, S. H., J. Leslie, and D. J. O'Hara. 1982. Parental education and child health: Intracountry evidence. *Health Policy and Education* 2 (1): 213–250.

Colletta, N. and A. J. Reinhold. 1997. *Review of early childhood policy and programs in Sub-Saharan Africa*. World Bank Technical Paper No. 367. Africa Region Series. Washington, D.C.: World Bank.

Collings, D. A., S. D. Sithole, and K. S. Martin. 1990. Indoor woodsmoke pollution causing lower respiratory diseases in children. *Tropical Doctor* 20 (4): 151–155.

Coquery-Vidrovitch, C. 1991. The process of urbanization in Africa. *African Studies Review* 34 (1): 1–98.

Cottam, H. 1993. The use of social funds for improving the nutritional status of the urban poor during structural adjustment: A review of past experiences and future possibilities. Institute of Development Studies, University of Sussex, Brighton, U.K. Photocopy.

Cutts, F. T., L. C. Rodrigues, S. Colombo, and S. Bennett. 1989. Evaluation of factors influencing vaccine uptake in Mozambique. *International Journal of Epidemiology* 18 (2): 427–433.

Dammann, D. F., and G. C. Solarsh. 1992. The use of COSAS in the analysis of vaccination coverage in urban, peri-urban, and rural populations in Edendale/Vulindlela district of Kwazulu. *South African Medical Journal* 82 (2): 118–123.

Davies, S. 1993. Are coping strategies a cop out? *IDS Bulletin* 24 (4): 60–72.

deSouza, R.E.P., and G. Grein Santos. 1993. Brazil: Both quality and quantity in child care. *Bernard van Leer Foundation Newsletter* 71 (July), 10.

Doan, R. M. 1988. Class and family structure: A study of child nutritional status in four urban settlements in Amman, Jordan. Ph.D. diss., Cornell University, Ithaca, N.Y., U.S.A.

Doan, R. M., and L. Bisharat. 1990. Female autonomy and children's nutritional status: The extended family residential unit in Amman, Jordan. *Social Science and Medicine* 31 (7): 783–789.

Drakakis-Smith, D. 1991. Urban food distribution in Africa and Asia. *Geographical Journal* 157: 51–61.

Drakakis-Smith, D. 1992a. Strategies for meeting basic food needs in Harare. In *The rural-urban interface in Africa*, ed. J. Baker and P. O. Pedersen. Uppsala: The Scandinavian Institute of African Studies.

Drakakis-Smith, D. 1992b. And the cupboard was bare: Food security and food policy for the urban poor. *Geographical Journal of Zimbabwe* 23: 38–58.

Drewnowski, A., and B. M. Popkin. 1997. The nutrition transition: New trends in the global diet. *Nutrition Reviews* 55 (2): 31–43.

Duraisamy, P. 1992. *Gender, intrafamily allocations of resources and child schooling in south India*. Economic Growth Center Discussion Paper No. 667. New Haven, Conn., U.S.A.: Yale University.

Egziabher, A., P. A. Memon, L. Mougeot, D. Lee-Smith, D. Maxwell, and C. Sawio. 1994. *Cities feeding people*. Ottawa, Ontario, Canada: International Development Research Centre.

Engle, P. 1991. Maternal work for earnings and child care strategies: Nutritional effects. *Child Development* 62 (5): 954–965.

Engle, P. 1992. Care and child nutrition. Theme paper for the International Nutrition Conference (ICN), UNICEF, New York.

Engle, P., and M. Pedersen. 1989. Maternal work for earnings and children's nutritional status in urban Guatemala. *Ecology of Food and Nutrition* 22 (3): 211–223.

Engle, P. L., M. García de Sanchez, and B. Suarez. 1988. Options to mothers: A report on day care center programs in Guatemala. Report to UNICEF/Guatemala.

Engle, P., P. Menon, and L. Haddad. 1996. Care and nutrition: Concepts and measurement. Food Consumption and Nutrition Division Discussion Paper 18. International Food Policy Research Institute, Washington, D.C.

Engle, P., P. Menon, J. Garrett, and A. Slack. 1996. *Urbanization and caregiving: Evidence from South and Eastern Africa.* Paper prepared for the International Food Policy Research Institute, Washington, D.C.

Engle, P. L., P. Menon, J. L. Garrett, and A. Slack. 1997. Developing a research and action agenda for examining urbanization and caregiving: Examples from southern and eastern Africa. Food Consumption and Nutrition Division Discussion Paper 28. International Food Policy Research Institute, Washington, D.C.

E.P.O.C. 1983. *EPOC project notes: Street foods*. Washington, D.C.: Equity Policy Center.

E.P.O.C. 1984. *EPOC project notes: Street foods*. Washington, D.C.: Equity Policy Center.

Esrey, S., R. G. Feacham, and J. M. Hughes. 1985. Interventions for the control of diarrhoeal disease among young children: improving water supplies and excreta disposal facilities. *WHO Bulletin* 63 (4): 757–772.

Esrey, S. A., J. B. Potash, L. Roberts, and C. Schiff. 1991. Effects of improved water supply and sanitation on ascariasis, diarrhea, dracunculiasis, hookworm infection, schistosomiasis, and trachoma. *Bulletin of the World Health Organization* 69 (5): 609–621.

Fall, A. S. 1998. Migrants' long-distance relationships and social net works in Dakar. *Environment and Urbanization* 10 (1): 135–145.

FAO (Food and Agriculture Organization of the United Nations). 1990. *Street foods*. Report of an FAO expert consultation. Jakarta, Indonesia, 5-9 December, 1988. Food and Nutrition Paper No. 46. Rome.

FAO (Food and Agriculture Organization of the United Nations). 1994. *Low-cost urban food distribution systems in Latin America.* FAO Agricultural Services Bulletin 111. Rome.

Ferguson, E. L., R. S. Gibson, and C. Opare-Obisaw. 1994. The relative validity of the repeated 24h recall for estimating energy and selected nutrient intakes of rural Ghanaian children. *European Journal of Clinical Nutrition* 48 (4): 241–252.

Fonseca, W., B. R. Kirkwood, C. G. Victora, S. C. Fuchs, J. A. Flores, and C. Misago. 1996. Risk factors for childhood pneumonia among the urban poor in Fortaleza, Brazil: A case-control study. *Bulletin of the World Health Organization* 74 (2): 199–208.

Franzetti, S., L. A. Mejía, F. Viteri, and E. Alvarez. 1984. Body iron reserves of rural urban Guatemalan women of reproductive age. *Archivos Latinoamericanos de Nutrición* XXXIV (1): 69–82.

Freeman, D. 1991. *A city of farmers: Informal urban agriculture in the open spaces of Nairobi, Kenya*. Toronto, Canada: McGill University Press.

Funkhouser, E. 1996. The urban informal sector in Central America: Household survey evidence. *World Development* 24 (11): 1737–1751.

Garcia, M. 1991. Impact of female sources of income on food demand among rural households in the Philippines. *Quarterly Journal of International Agriculture* 30 (2): 109–124.

Gebre, S. 1993. Urban poverty and food insecurity: The case of Addis Ababa. Famine and Food Policy Discussion Paper 8. Food Consumption and Nutrition Division, International Food Policy Research Institute, Washington, D.C. Photocopy.

Gencaga, H. 1985. *Food consumption and nutrition in Turkey.* Publication 6. Ankara: Turkish Development Research Foundation.

Gilbert, A., and J. Gugler. 1992. *Cities, poverty, and development: Urbanization in the Third World*. Oxford: Oxford University Press.

Grimble, R. F. 1981. A study of the pattern of clinical protein energy malnutrition in Accra from 1970 to 1978. *Journal of Tropical Pediatrics* 27 (1): 12–14.

Grosh, M. 1994. *Administering targeted social programs in Latin America*. Washington D.C.: World Bank.

Grosh, M. 1995. Five criteria for choosing among poverty programs. In *Coping with Austerity*, ed. N. Lustig. Washington, D.C.: The Brookings Institution.

Gross, R., and C. A. Monteiro. 1989. Urban nutrition in developing countries: Some lessons to learn. *Food and Nutrition Bulletin* 11 (2): 14–20.

Gugler, J. 1991. Life in a dual system revisited: Urban-rural ties in Enugu, Nigeria, 1961–1987. *World Development* 19 (5): 399–409.

Guimaraes, J. J., and A. Fischmann. 1985. Inequalities in 1980 infant mortality among shanty-town residents and nonshanty-town residents in the municipalities of Pozto Alegre, Rio Grande do Sul, Brazil. *Bulletin of the Pan American Health Organization* 19 (3): 235–251.

Haddad, L. J., and H. E. Bouis. 1991. The impact of nutritional status on agricultural productivity: Wage evidence from the Philippines. *Oxford Bulletin of Economics and Statistics* 53 (1): 45–68.

Haddad, L., and J. Hoddinott. 1998. Household research allocation in the Côte d'Ivoire: Inferences from expenditure data. In *Poverty and rural development*, ed. T. A. Lloyd and W. O. Morissey. London. Forthcoming.

Haddad, L., and M. Zeller. 1996. *How can safety nets do more with less? General issues with some evidence from southern Africa.* Food Consumption and Nutrition Division Discussion Paper 16. International Food Policy Research Institute, Washington, D.C.

Haddad, L., M. Ruel, and J. Garrett. 1998. *Growing urban poverty and undernutrition and some urban facts of life: Implications for research and policy.* Washington, D.C.: International Food Policy Research Institute. Forthcoming.

Hambidge, K. M. 1992. Zinc and diarrhea. *Acta Pediatric* 381(Supplement): 82–86.

Harpham, T. 1994. Urbanization and mental health in developing countries: A research role for social scientists, public health professionals and social psychiatrists. *Social Science and Medicine* 39 (2): 233–245.

Harpham, T., and C. Stephens. 1991. Urbanization and health in developing countries. *World Health Statistical Quarterly* 44 (2): 62–69.

Harpham, T., and M. Tanner, eds. 1995. *Urban health in developing countries. Progress and prospects*. New York: St. Martin's Press.

Harpham, T., T. Lusty, and P. Vaughn, eds. 1988. *In the shadow of the city: Community health and the urban poor*. Oxford, New York, Delhi: Oxford University Press.

Hassan, N., and K. Ahmad. 1991. The nutrition profile of the slum dwellers: A comparison with the rural poor. *Ecology of Food and Nutrition* 26 (3): 203–214.

Hight-Laukaran, V., S. O. Rutstein, A. E. Peterson, and M. H. Labbok. 1996. The use of breast milk substitutes in developing countries: The impact of women's employment. *American Journal of Public Health* 86 (9): 1235–1240.

Hussain, A. M. 1990. Nutrition policy and the urban poor in developing countries. *Food Policy* 15 (June): 186–192.

Hussain, A. M., and P. Lundven. 1987. Urbanization and hunger in the cities. *Food and Nutrition Bulletin* 9 (4): 50–61.

Huttly, S. R. A, S. S. Morris, and V. Pisari. 1997. Prevention of diarrhea in young children in developing countries. *Bulletin of the World Health Organization*. Forthcoming.

ICN (International Conference on Nutrition). 1992. *Caring for the socio-economic deprived and nutritionally vulnerable.* Major Issues for Nutrition Strategies Theme Paper 3. ICN/92/INF/7. Rome: Food and Agriculture Organization of the United Nations/World Health Organization.

IICA (Instituto Interamericano de Cooperación para la Agricultura). 1995. *Problems and implications of new economic development models for agriculture, food, the environment, and rural poverty.* San José.

ILO (International Labour Organization). 1995. *Gender, poverty, and employment*. Geneva.

Immink, M., E. Kennedy, R. Sibrian, and H. Hahn. 1994. Food availability, water and sanitation and women' s time constraints as risk factors of poor health and growth failure of children in the Central Highlands of Guatemala. Washington, D.C.: International Food Policy Research Institute. Photocopy.

Jamal, V. 1985. *Structural adjustment and food security in Uganda*. World Employment Research Paper. Geneva: International Labour Organization.

Jayne, T. S., and L. Rubey. 1993. Maize milling, market reform, and urban food security: The case of Zimbabwe. *World Development* 21 (6): 975–988.

Katona-Apte, J. 1988. Food aid as communal meals for the urban poor. *Food and Nutrition Bulletin* 10 (1): 45–48.

Kelly, V., T. Reardon, B. Diagana, and A. Abdoulaye Fall. 1995. Impacts of devaluation on Senegalese households: Policy implications. *Food Policy* 20 (4): 299–313.

Kennedy, E., and T. Reardon. 1994. Shift to nontraditional grains in the diets of East and West Africa: Role of women's opportunity cost of time. *Food Policy* 19 (1): 45–56.

Khanjanasthiti, P., and P. Wray. 1974. Early protein-calorie malnutrition in slum areas of Bangkok municipality 1970–1971. *Journal of the Medical Association of Thailand* 57 (7): 357–366.

Kirksey, A., G. Harrison, O. Galal, G. McCabe, T. Wachs, and A. Rahmanifar. 1992. *The human costs of moderate malnutrition in an Egyptian village*. Final Report to the U.S. Agency for International Development. July.

Koo, D., A. Aragon, V. Moscoso, M. Gudiel, L. Bietti, N. Carrillo, J. Chojoj, B. Gordillo, F. Cano, D. N. Cameron, J. G. Wells, N. H. Bean, and R. V. Tauxe. 1996. Epidemic cholera in Guatemala, 1993: Transmission of a newly introduced epidemic strain by street vendors. *Epidemiology and Infection* 116 (2): 121-126.

Kossove, D. 1982. Smoke-filled rooms and lower respiratory disease in infants. *South African Medical Journal* 61 (17): 622–624.

Kulkarni, A. P. 1992. Food quality control and processing. Eating on the run. *Food Laboratory News* 8 (2): 10–13.

LaMontagne, J., P. L. Engle, and M. Zeitlin. 1998. Maternal employment and nutritional status of 12–18 month old children in Managua, Nicaragua. *Social Science and Medicine*. Forthcoming.

Lee-Smith, D., M. Manundu, D. Lamba, and K. Gathuru. 1987. *Urban food production and the cooking fuel situation in Urban Kenya*. Nairobi: Mazingira Institute.

Leowski, J. 1986. Mortality from acute respiratory infections in children under five years of age: Global estimates. *World Health Statistics Quarterly* 39 (2): 138–144.

Leslie, J. 1989. Women's work and child nutrition in the Third World. In *Women, work and child welfare in the Third World*, ed. J. Leslie and M. Paolisso. Boulder, Colo., U.S.A.: Westview Press for the American Association for the Advancement of Science.

Leslie, J., and M. Paolisso, eds. 1989. *Women, work and child welfare in the Third World*. Boulder, Colo., U.S.A.: Westview Press for the American Association for the Advancement of Science.

Lim-Quizon, M. C., R. M. Benabaye, F. M. White, M. M. Dayrit, and M. E. White. 1994. Cholera in metropolitan Manila: Foodborne transmission via street vendors. *Bulletin of the World Health Organization* 72 (5): 745–749.

Littman, H., S.V. Medendorp, and J. Goldfarb. 1994. The decision to breast-feed: The importance of fathers' approval. *Clinical Pediatrics* 33 (4): 214–219.

Lopez, A. D. 1993. Causes of death in industrial and developing countries: Estimates for 1985–1990. In *Disease control priorities in developing countries*, ed. D. T. Jamieson, W. H. Mosley, A. R. Measham, and J. L. Bobadilla. Washington, D.C.: Oxford University Press.

Lourenco-Lindell, I. 1995. The Informal food economy in a peripheral urban district: The case of Bandim District, Bissau. *Habitat International* 19 (2): 195–208.

Lutter, C. K., J. P. Habicht, J. A. Rivera, and R. Martorell. 1992. The relationship between energy intake and diarrhoeal disease in their effect on child growth: Biological model, evidence, and implications for public policy. *Food Nutrition Bulletin* 14 (1): 36–42.

Martines, J., M. Phillips, and R. G. Feachem. 1993. Diarrheal diseases. In *Disease control priorities in developing countries*, ed. D. T. Jamieson, W. H. Mosley, A. R. Measham, and J. L. Bobadilla. Washington, D.C.: Oxford University Press.

Martínez, H., and G. Saucedo. 1991. Mother's perceptions about childhood diarrhea in rural Mexico. *American Journal of Diarrheal Disease Research* 9 (3): 235–243.

Martínez, H., and A. M. Tomkins. 1995. Nutritional management of diarrhea. *Food Nutrition Bulletin* 16 (4): 349–355.

Martorell, R. 1993. Enhancing human potential in Guatemalan adults through improved nutrition in early childhood. *Nutrition Today* 27 (1): 6–13.

Martorell, R. and J. P. Habicht. 1986. Growth in early childhood in developing countries. In *Human growth: A comprehensive treatise*, Vol. 3, second edition, ed. F. Faulkner and J. M. Tanner. New York and London: Plenum Press.

Maxwell, D. 1995. Alternative food security strategy: A household analysis of urban agriculture in Kampala. *World Development* 23 (10): 1669–1681.

Maxwell, D. 1996. Highest and Best Use? Access to Urban Land for Semi-Subsistence Food Production. *Land Use Policy* 13 (3): 181–196.

Maxwell, D., and S. Zziwa. 1992. *Urban farming in Africa: The case of Kampala*, Uganda. Nairobi: ACTS Press.

Maxwell, D., C. Levin, and J. Csete. 1998. Does urban agriculture help prevent malnutrition? Evidence from Kampala. Food Consumption and Nutrition Division Discussion Paper 45. International Food Policy Research Institute, Washington, D.C.

Maxwell, D., C. Levin, M. Armar-Klemesu, C. Ahiadeke, M. Ruel, and S. Morris. 1998. *Urban livelihoods, food and nutrition security in greater Accra*. Research Report. Washington, D.C.: International Food Policy Research Institute. Forthcoming.

Mbiba, B. 1995. *Urban agriculture in Zimbabwe: The implications for urban management, urban economy, the environment, poverty and gender*. Brookfield, Vt., U.S.A.: Ashgate Publishing Co.

McCullough, A. L., A. Kirksey, T. D. Wachs, G. P. McCabe, N. S. Bassily, Z. Bishry, O. M. Galal, G. G. Harrison, and N. W. Jerome. 1990. Vitamin B-6 status of Egyptian mothers: Relation to infant behavior and maternal-infant interactions. *American Journal of Clinical Nutrition* 51 (6): 1067–1074.

Meagher, K. 1995. Crisis, informalization and the urban informal sector in Sub-Saharan Africa. *Development and Change* 26 (2): 259–284.

Memon, P.A., and D. Lee-Smith. 1993. Urban agriculture in Kenya. *Canadian Journal of African Studies* 27 (1): 25–42.

Merrick, T. W., and M. Schink. 1976. Households headed by women and urban poverty in Brazil. In *Women in poverty in the third world*, eds. M. Buvinic, M. A. Lycette, and W. V. Geevey. Baltimore, Md., U.S.A.: Johns Hopkins University Press.

Mittendorf, H. J., and J. Abbott. 1979. Provisioning the urban poor: The new challenge in food marketing systems. *Ceres* 12 (6): 26–32.

Morris, K., M. Morganlander, J. L. Coulehan, S. Gahagen, and V. C Arena. 1990. Wood-burning stoves and lower respiratory tract infection in American Indian children. *American Journal of Diseases of Children* 144 (1): 105–108.

Moser, C. 1989. The impact of recession and adjustment policies at the micro-level: Low income women and their households in Guayaquil, Ecuador. In *The invisible adjustment: Poor women and the economic crisis*, second edition. Santiago, Chile: United Nations Childrens Fund, The Americas and the Caribbean Regional Office.

Moser, C., A. Herbert, and R. Makonen. 1993. *Urban poverty in the context of structural adjustment: Recent evidence and policy responses.* Transportation, Water, and Urban Development Department (TWU) Discussion Paper No. 4. Washington, D.C.: Urban Development Division, World Bank.

Mougeot, L. 1994. *Urban food production: Evolution, official support, and significance*. Cities Feeding People Report No. 8. Ottawa, Ontario, Canada: International Development Research Centre.

Musgrove, P. 1988. Basic food consumption in north-east Brazil: Effects of income, price, and family size in metropolitan and rural areas. *Food and Nutrition Bulletin* 10 (1): 29–37.

Mvena, Z. S. K., I. J. Lupanga, and M. R. Mlozi. 1991. *Urban agriculture in Tanzania: A study of six towns*. Morogoro, Tanzania: Sokoine University of Agriculture.

Nago, M. C., J. D. Hounhouigan, F. de Koning, and R. Gross. 1993. *La situation alimentaire et nutritionnelle dans les zones urbaines en Afrique*. Porto-Novo, Benin: CNPMS.

Naylor, R. L., and W. P. Falcon. 1995. Is the locus of poverty changing? *Food Policy* 20 (6): 501–518.

Oguntona C. R. B., and O. Kanye. 1995. Contribution of street foods to nutrient intakes by Nigerian adolescents. *Nutrition and Health* 10 (2): 165–171.

Oshaug, O. 1994. Nutrition security in Norway? A situation analysis. 1994. *Scandinavian Journal of Nutrition* 38 (Supplement. 28): 1–68.

Palmer, I. 1991. *Gender and population in the adjustment of African economies: Planning for change*. Women, Work, and Development Working Paper 19. Geneva: International Labour Organization.

PAHO (Pan American Health Organization). 1992. *Caracterización de los alimentos de riesgo expendidos en las vías públicas de Santa Fe de Bogotá, Colombia*. Washington, D.C.

Pakistan. 1979. *Household income and expenditure survey*. Karachi: Statistics Division, Federal Bureau of Statistics.

Pandey, M. R. 1984. Prevalence of chronic bronchitis in a rural community of the hill region of Nepal. *Thorax* 39 (5): 331–336.

Pandey, M. R., J. S. M. Boleij, K. R. Smith, and E. M. Wafula. 1989a. Indoor air pollution in developing countries and acute respiratory infection in children. *Lancet* 1 (8635): 427–429.

Pandey, M. R., H. N. Regmi, R. P. Neupane, A. Gautam, and D. P. Bhandari. 1985. Domestic smoke pollution and respiratory function in rural Nepal. *Tokai Journal of Experimental Clinical Medicine* 10 (4): 471–481.

Pandey, M. R., P. R. Sharma, B. B. Gubhaju, G. M. Shakya, R. P. Neupane, A. Gautam, and I. B. Shrestha. 1989b. Impact of a pilot acute respiratory infection (ARI) control programme in a rural community of the hill region of Nepal. *Annals of Tropical Paediatrics* 9 (4): 212–220.

Pearce, R. 1991. Urban food subsidies in the context of adjustment. *Food Policy* 16 (6): 436–450.

Périssé, J., and A. Kamoun. 1987. Trends in urban and rural food consumption and implications for food policies in Tunisia. *Food and Nutrition Bulletin* 9 (4): 21–32.

Pinstrup-Andersen, P. 1986. Changing patterns of consumption underlying changes in trade and agricultural development. Paper presented at the International Agricultural Trade Research Consortium, El Batan, Mexico.

Pongpaew, P., ed. 1992. Asian workshop on nutrition in the metropolitan area. *Southeast Asian Journal of Tropical Medicine and Public Health* 23 (Supplement 3).

Popkin, B.M. 1994. The nutrition transition in low-income countries: An emerging crisis. *Nutrition Reviews* 52 (9): 285–298.

Popkin, B. M. 1998. The nutrition transition and its health implications in lower-income countries. *Public Health Nutrition* 1 (1): 5–21.

Popkin, B. M., and E. Z. Bisgrove. 1988. Urbanization and malnutrition in low-income countries. *Food and Nutrition Bulletin* 10 (1): 3–23.

Popkin, B. M., L. Adair, J. S. Akin, R. Black, J. Briscoe, and W. Flieger. 1990. Breast-feeding and diarrheal morbidity. *Pediatrics* 86 (6): 874–882.

Prudencio-Bohrt, J. 1993. *Urban agriculture research in Latin America: Record, capacities and opportunities*. Cities Feeding People Report No. 7. Ottawa, Ontario, Canada: International Development Research Centre.

Pryer, J. 1993. The impact of adult ill health on household income and nutrition in Khulna, Bangladesh. *Environment and Urbanization* 5 (2): 35–49.

Pryer, J., and N. Crook. 1988. *Cities of hunger. Urban malnutrition in developing countries*. Oxford: OXFAM.

Rahim, S. I. A., and M. Cederblad. 1986. Effects of rapid urbanization on child behavior and health in a part of Khartoum, Sudan - II. Psychosocial influences on behavior. *Social Science and Medicine* 22 (7): 723–730.

Rakodi, C. 1988. Urban agriculture: Research questions and the Zambian evidence. *Journal of Modern African Studies* 26 (3): 495–515.

Rogers, B. L. 1988. Design and implementation considerations for consumer-oriented food subsidies. In *Food subsidies in developing countries: Costs, benefits, and*

policy options, ed. P. Pinstrup-Andersen. Baltimore, Md., U.S.A.: Johns Hopkins University Press.

Romero-Abal, M. E., J. Bulux, I. Mendoza, C. Grazioso, and N. W. Solomons. 1992. Haematological status of preschool and school-age children in urban and rural areas of Guatemala. *Food and Nutrition Bulletin* 16 (1): 60–66.

Rondinelli, D., and J. D. Kasarda. 1993. Job creation needs in Third World cities. In *Third World Cities*, ed. J. D. Kasarda and A. M. Parnell. London: Sage Publications.

Rosado, J. L., P. Lopez, M. Morales, E. Munoz, and L. H. Allen. 1992. Bioavailability of energy, fat, zinc, iron and calcium from rural and urban Mexican diets. *British Journal of Nutrition* 68 (1): 45–58.

Rossi-Espagnet, A. 1984. *Primary health care in urban areas: Reaching the urban poor in developing countries*. Geneva: United Nations Childrens Fund/World Health Organization.

Rossi-Espagnet, A., G. B. Goldstein, and I. Tabibzadeh. 1991. Urbanization and health in developing countries: A challenge for health for all. *World Health Statistics Quarterly* 44 (4): 185–244.

Ruel, M., J. Habicht, P. Pinstrup-Andersen, and Y. Grohn. 1992. The mediating effect of maternal nutrition knowledge on the association between maternal schooling and child nutritional status in Lesotho. *American Journal of Epidemiology* 135 (8): 904–914.

Sahn, D. E., and H. Alderman. 1995. Incentive effects on labor supply of Sri Lanka's rice subsidy. In *Public spending and the poor: Theory and evidence*, ed. D. van de Walle and K. Nead. Baltimore, Md., U.S.A.: Johns Hopkins University Press for the World Bank.

Sahn, D., and H. Alderman. 1997. On the determinants of nutrition in Mozambique: The importance of age-specific effects. *World Development* 25 (4): 577–588.

Sánchez-Castillo C. P., P. J. Dewey, H. Bourges, and W. P. James. 1994. Dietary fibre: What it is and how it is measured. *Archivos Latinoamericanos de Nutrición* 44 (2) (Supplement): 68–75.

Sanyal, B. 1985. Urban agriculture: Who cultivates and why? *Food and Nutrition Bulletin* 7 (3): 15–24.

Sanyal, B. 1986. *Urban cultivation in East Africa*. Paris: UN University, Food/Energy Nexus Project.

Satterthwaite, D. 1993. The impact on health of urban environments. *Environment and Urbanization* 5 (2): 87–111.

Satyanarayana, K., et al. 1980. Agricultural employment, wage earnings, and nutritional status of teenage rural Hyderabad boys. *Indian Journal of Nutrition and Dietetics* 17.

Sawio, C. 1993. Feeding the urban masses? Towards an understanding of the dynamics of urban agriculture in Dar es Salaam, Tanzania. Ph.D. diss., Clark University, Worcester, Mass., U.S.A.

Schejtman, A. 1994. *Economía Política de los Sistemas Alimentarios en América Latina.* Santiago: Food and Agriculture Organization of the United Nations.

Schippers, R., and C. Lewcock. 1994. A case study of urban and peri-urban agriculture in Tanzania. Discussion document. Project A0148. Natural Resources Institute, London.

Schurch, B., and A. Favre. 1985. *Urbanization and nutrition in the Third World*. Switzerland: Nestle Foundation for the study of problems of nutrition in the world.

Scott, G., ed. 1995. *Prices, products, and people.* Boulder, Colo., U.S.A.: Lynne Rienner Publishers.

Scrimshaw, N. S., C. E. Taylor, and J. E. Gordan. 1968. *Interactions of nutrition and infection.* World Health Organization Monograph Series No. 57. Geneva: World Health Organization.

Senauer, B., D. Sahn, and H. Alderman. 1986. The effect of the value of time on food consumption patterns in developing countries: Evidence from Sri Lanka. *American Journal of Economics* 68 (4): 920–927.

Sivakumar, B., and V. Reddy. 1975. Absorption of Vitamin A in children with ascariasis. *Journal of Tropical Medicine and Hygiene* 78 (5): 114–115.

Smit, J., and J. Nasr. 1992. Urban agriculture for sustainable cities: Using waste and idle land and water bodies as resources. *Environment and Urbanization* 4 (2): 141–151.

Smit, W. 1998. The rural linkages of urban households in Durban, South Africa. *Environment and Urbanization* 10 (1): 77–87.

Stansfield, S. K., and D. S. Shepard. 1993. Acute respiratory infections. In *Disease control priorities in developing countries*, ed. D. T. Jamieson, W. H. Mosley, A. R. Measham, and J. L. Bobadilla. Washington, D.C.: Oxford University Press.

Stein, L. 1952. Tuberculosis and "social complex" in Glasgow. *British Journal of Social Medicine* 6 (1).

Stephens, C., G. McGranaham, M. Bobak, A. Fletcher, and G. Leonardi. 1996. Urban environment and health. In *World Resources Institute. A guide to the global environment. The urban environment 1996 97*, ed. World Resource Institute. New York and Oxford: Oxford University Press.

Steyn, N. P., C. L. Wicht, J. E. Rossouw, T. J. van Wyk Kotze, and M. van Eck. 1989. Nutritional status of 11-year-old children in the Western Cape. I. Dietary intake. *South African Journal of Food Sciences and Nutrition* 1 (1): 15–20.

Strauss, J., and D. Thomas. 1995. Human resources: Empirical modeling of household and family decisions. In *Handbook of development economics*, Vol. 3A, ed. J. Behrman and T. N. Srinivasan. Netherlands: Elsevier Science B.V.

Strauss, J., and D. Thomas. 1996. Wages, schooling, and background: Investments in men and women in urban Brazil. In *Opportunity foregone: Education in Brazil*. Washington, D.C.: Inter-American Development Bank.

Subbarao, K., A. Bonnerjee, J. Braithwaite, S. Carvalho, K. Ezemenari, C. Graham, and A. Thompson. 1997. *Safety net programs and poverty reduction.* Washington, D.C.: World Bank.

Subcommittee on Nutrition During Lactation, Committee on Nutritional Status During Pregnancy and Lactation, Food and Nutrition Board, Institute of Medicine and National Academy of Sciences. 1991. *Nutrition during lactation*. Washington, D.C.: National Academy Press.

Tabatabai, H. 1993. *Poverty and food consumption in urban Zaire*. Working Paper 47. Ithaca, N.Y., U.S.A.: Cornell Food and Nutrition Policy Program.

Tabibzadeh, I., A. Rossi-Espagnet, and R. Maxwell. 1989. *Spotlights on the cities: Improving urban health in developing countries*. Geneva: World Health Organization.

Tanner, M., and T. Harpham. 1995. Features and determinants of urban health status. In *Urban health in developing countries. Progress and prospects,* ed. T. Harpham and M. Tanner. New York: St. Martin's Press.

Taren, D. L., and D. W. T. Crompton. 1989. Nutritional interactions during parasitism. *Clinical Nutrition* 8 (6): 227–238.

Thomas, D. 1993. The distribution of income and expenditure within the household. *Annales d' Economie et de Statistique* 29: 109–136.

Timaeus, I. M., and L. Lush. 1995. Intra-urban differentials in child health. *Health Transition Review* 5 (2): 163–190.

Tinker, I. 1997. *Street foods: Urban food and employment in developing countries*. New York: Oxford University Press.

Tripp, A. 1990. The urban informal economy and the State in Tanzania. Ph.D. diss., Northwestern University, Evanston, Ill., U.S.A.

Tupasi, T. E., N. V. Mangubat, M. E. Sunico, D. M. Magdangal, E. E. Navarro, Z. A. Leonor, S. Lupisan, F. Medalla, and M. G. Lucero. 1990. Malnutrition and acute

respiratory tract infections in Filipino children. *Review of Infectious Diseases* 12 (8): S1047–S1055.

UN ACC/SCN (United Nations Administrative Committee on Coordination-Subcommittee on Nutrition). 1991. Brief on policies to alleviate underconsumption and malnutrition in deprived areas. Draft. Revised 12 February. Geneva.

UN ACC/SCN (United Nations Administrative Committee on Coordination-Subcommittee on Nutrition). 1992. *Second report on the world nutrition situation*. Vol. 1, *Global and regional results.* Geneva.

UNDP (United Nations Development Program). 1996. *Urban agriculture: Food, jobs and sustainable cities*. New York.

UNICEF (United Nations Childrens Fund). 1990. *Strategy for improved nutrition of children and women in developing countries*. UNICEF Policy Review Paper. New York.

UNICEF (United Nations Childrens Fund). 1994. *The urban poor and household food security*. New York.

United Nations. 1998. *World urbanization prospects: The 1996 revision*. New York.

Uyanga, J. 1980. Rural-urban differences in child care and breast-feeding behaviour in Southeastern Nigeria. *Social Science Medicine* 14D (1): 23–29.

Van de Walle, D. and K. Nead, ed. 1995. *Public spending and the poor.* Baltimore, Md., U.S.A.: Johns Hopkins University Press.

Victora, C. G., F. C. Barros, J. P. Vaughan, and A. M. B. Teixeira. 1987. Birth weight and infant mortality: A longitudinal study of 5914 Brazilian children. *International Journal of Epidemiology* 16 (2): 239–245.

Victora, C. G., S. C. Fuchs, A. Flores, W. Fonseca, and B. R. Kirkwood. 1994. Risk factors for pneumonia among children in a Brazilian metropolitan area. *Pediatrics* 93 (6): 977–985.

Victora, C. G., P. G. Smith, J. P. Vaughan, L. C. Nobre, C. Lombardi, A. M. B. Teixeira, S. M. C. Fuchs, L. B. Moreira, L. P. Gigante, and F. C. Barros. 1989. Infant

feeding and deaths due to diarrhea. A case-control study. *American Journal of Epidemiology* 129 (5): 1032–1041.

Viteri, F. E. 1987. Nutrition-related health consequences of urbanization. *Food and Nutrition Bulletin* 9(4): 33–59.

Walker, A. R. P. 1995. Nutrition-related diseases in southern Africa: With special reference to urban African populations in transition. *Nutrition Research* 15 (7): 1053–1094.

Walsh, J. A., C. M. Feifer, A. R. Measham, and P. J. Gertler. 1993. Maternal and perinatal health. In *Disease control priorities in developing countries*, ed. D. T. Jamieson, W. H. Mosley, A. R. Measham, and J. L. Bobadilla. Washington, D.C.: Oxford University Press.

Walton, J., and D. Seddon. 1994. *Free markets and food riots: The politics of global adjustment*. Oxford: Blackwell.

Webb, R. E., and S. A. Hyatt. 1988. Haitian street foods and their nutritional contribution to dietary intake. *Ecology of Food and Nutrition* 21 (3): 199–209.

WHO (World Health Organization). 1985. *The quantity and quality of breast milk. Report on the WHO collaborative study on breast-feeding*. Geneva.

WHO (World Health Organization). 1992a. *Our planet, our health*. Geneva: WHO Commission on Health and Environment.

WHO (World Health Organization). 1992b. World malaria situation in 1990. *Weekly Epidemiological Record* 67 (22): 161–168.

WHO (World Health Organization). 1995. *The world health report 1995. Bridging the gaps*. Geneva.

WHO (World Health Organization). 1998. *Obesity. Preventing and managing the global epidemic.* Geneva.

WHO/IAEA (World Health Organization/International Atomic Energy Agency). 1989. Minor and trace elements in breast milk. Report of a joint WHO/IAEA collaborative study. Geneva.

Winikoff, B., M. A. Castle, and V. Hight Laukaran. 1988. *Feeding infants in four societies.* Contributions in Family Studies, Number 14. New York, Westport, Conn., U.S.A., London: Greenwood Press.

World Bank. 1994a. *Adjustment in Africa: Reforms, results and the road ahead*. New York: Oxford University Press.

World Bank. 1994b. *Zambia poverty assessment.* Southern Africa Department. Washington, D.C.

World Bank. 1995. Workers in an integrating world. *World Development Report 1995*. Washington, D.C.

World Bank. 1996a. Best practices on social assistance and poverty-targeted programs. Poverty and Social Policy Department, World Bank, Washington, D.C. Photocopy.

World Bank. 1996b. Social assistance and poverty-targeted programs. Poverty and Social Policy Department, World Bank, Washington, D.C. Photocopy.

Yamada, G. 1996. Urban informal employment and self-employment in developing countries: Theory and evidence. *Economic Development and Cultural Change* 44 (2): 289–314.

Yeung, Y. 1985. *Urban agriculture in Asia*. Tokyo: UN University.

Young, M. E. 1995. *Early child development: Investing in the future.* Washington, D.C.: World Bank.