Nutrition in Zimbabwe
AN UPDATE

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TED GREINER
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The World Bank
Washington, D.C.
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Foreword

A decade ago, shortly after Zimbabwe won its independence, I was
invited to Zimbabwe to assess its nutrition problems, policies, and pro-
gram needs. In our study, we determined that:

- Although Zimbabwe usually produces a substantial food surplus
  overall, the country had a major malnutrition problem.
- Families of commercial farm workers and people in communal
  areas had the most serious nutrition problems. Many people expe-
  rienced significant seasonal changes in their nutrition status.
  Micronutrient deficiencies, particularly pellagra and goiter, were
  much more prevalent than expected.
- The shifts in diet that accompany modernization were not always
  nutritionally advantageous.
- Rural women understood nutrition concepts and needs better
  than was expected.
- Infection did not play as large a role in malnutrition in Zimbabwe
  as it did in most other countries.

At the time of our study, a considerable number of nutrition-related
actions were being taken in Zimbabwe, both by the new government
and by nongovernment agencies. The lack of a policy and program
context and lack of coordination, however, limited their potential im-
 pact. There was then no effective focal point in the government for for-
mulating and pressing support for proposals that took into account the
critical link between production measures and consumption issues.

So, in reading this follow-up study, it is very heartening to see that
Zimbabwe appears to have succeeded in improving the nutrition of its
young children. This study attributes that success to a variety of fac-
tors. First is the government’s commitment to giving priority to vulner-
able groups. Another is the spirit of cooperation and community,
particularly evident in the first years of Independence, that brought
Zimbabwean society together to work on nutrition issues. Further-
more, nutrition projects received active and continued support at the
grass-roots level from a large number of nongovernmental organiza-
tions (NGOs), as well as donor support that was stable, yet flexible
enough to allow community-based efforts to evolve. Finally, there was
a core (albeit a small one) of trained and motivated staff—in the minis-
tries of Health and Agriculture, for example—who recognized the im-
portance of nutrition and made efforts to improve it within their own spheres at the national and local levels.

This study's findings are significant for a number of reasons. Among them:

- They show that even though poverty lies at the heart of most undernutrition and malnutrition, improvements in nutrition need not await economic growth; they can be made even in times of economic stagnation.
- The improvements in nutrition status were brought about by a variety of explicit nutrition programs aimed at vulnerable groups and by other, more general, efforts to prevent people from going hungry during drought.
- Targeting nutrition interventions at those most at risk worked well in this case.
- Zimbabwe's experiences in dealing with malnutrition over the last decade provide a good example for other countries. Clearly, the improvements in nutrition status achieved in Zimbabwe look good when compared with those in other Sub-Saharan African countries, as this report shows. Zimbabwe is leading the way in Africa for the changes reflected here.

This report is also significant because the study itself—its approach, its structure, and its insights—could serve as a model for such analyses in other countries. Most of the information in this report is from unpublished documents not readily available outside Zimbabwe. Many of the documents are carbon copies, and sometimes only two or three such copies exist. This study is valuable because it not only brings this information to light but also subjects it to an indispensable kind of assessment. Only by scrutinizing this type of information, by piecing it together again and again and discussing it with other knowledgeable people, can we who work on nutrition reach a deeper level of analysis. Only at that level can we begin to provide the kind of synthesis that may reveal the extent to which we are working in the right or wrong direction and the extent to which we have the right or wrong priorities.

For instance, it was realized for the first time as a result of this study that the nutrition situation of school-age children is more precarious than was previously thought. The concentration had been on younger children on the assumption that school-age children were in fairly good shape. Similarly, the study has shown that the switch from sorghum and millet to maize or cash crops has probably reduced the food security of many Zimbabwean families. The widespread adoption of hybrid maize (90 percent of maize production nationwide) has benefited households in some ways—for example, the maize requires less food preparation time than sorghum and millet—but it has left these households more vulnerable. Not only are the coarse grains that have
been displaced by maize more drought resistant, but they can also be
grown on poorer soils and can be stored longer than maize.

The study also reveals a shift in the nature of the nutrition problem
among Zimbabweans as the country pursues its goals of economic
growth and modernization. Although food shortages and malnutrition
in the old sense are likely to persist (if only because of possible recur-
rent droughts; there have been four droughts since Independence),
Zimbabwe needs to begin thinking about the problems of overnutri-
tion and about making the changes that were carried out, for example,
in the Caribbean ten to fifteen years ago. This has required Zimbabwe
to alter its training curriculum for district-level staff, who may be
unique in that they will be equipped to deal with problems of both
overnutrition and undernutrition.

Finally, one can draw from the work here insights on policy, organi-
zation, and staffing. Although malnutrition is a health problem, the so-
lution, as the report rightly notes, goes considerably beyond a health
delivery solution. Because nutrition cuts across government organiza-
tion charts, there is need for a broad range of actions.

Zimbabwe overcame the hurdles involved in establishing effective
intersectoral cooperation and developed a community nutrition pro-
gram that can be viewed as a model for the continent. The job might
have been easier if a national nutrition policy had been in place, but
then the intersectoral cooperation dictated by a policy drawn up in the
abstract might not have been as effective as that which has gradually
evolved as an outgrowth of practical project requirements. Now, how-
ever, review and formalization of institutional arrangements for nutri-
tion would seem to be desirable.

Reading between the lines of the study here, one also gets a sense
that staff resources may be insufficient for the ambitious program that
has been undertaken. The increase in staff and in related training since
Independence has not been commensurate with the increase in respon-
sibilities and initiatives. This does not bode well for the future and is a
key challenge for Zimbabwe if it is to continue its progress of the past
decade.

With this study, Julia Tagwireyi and Ted Greiner (with the managerial
support of Joy de Beyer) help us all understand the malnutrition prob-
lem and related needs in Zimbabwe. And because their work serves as
such a good model for other countries, they also make an important
contribution to the broader international nutrition community.

Alan Berg
Senior Nutrition Adviser
The World Bank
Acknowledgments

The authors are responsible for the opinions expressed and for any mistakes or errors of fact the reader may discover. Readers' comments and criticisms would be appreciated. They may be sent to Julia Tagwireyi, Nutrition Unit, Ministry of Health, P.O. Box 8204, Causeway, Zimbabwe.

We would like to thank those whose assistance and comments on earlier drafts have been crucial in molding this paper: our colleagues at the Ministry of Health, especially at the Nutrition Unit; Dr. M. Rukuni, dean of agriculture at the University of Zimbabwe; Professor David Sanders, head of the Community Medicine Department, School of Medicine, University of Zimbabwe; Duncan Thomas of Yale University and the Rand Corporation; and Alan Berg, Joy de Beyer, Joy Del Rosso, and others at the World Bank.

We particularly appreciated Joy de Beyer's work in patiently shepherding this paper through its various drafts and reviews and providing valuable support, advice, and encouragement throughout.

This report, a by-product of the preparation and appraisal of the nutrition component of the Second Family Health Project in Zimbabwe, was written in 1991 and revised in 1992. Both authors are nutritionists with many years' experience in international (developing country) nutrition. Julia Tagwireyi has been on the staff of the Nutrition Unit, Ministry of Health, Zimbabwe, for twelve years and has been director of the unit since 1983. Ted Greiner, a staff member at the International Child Health Unit, Uppsala University, has been nutrition adviser to the Health Division, Swedish International Development Authority (SIDA), since 1985 and has worked with the Nutrition Unit several times since 1987, with support from SIDA and the World Bank. The task manager was Joy de Beyer; Roger Grawe is the chief of the Population and Human Resources Operations Division, Southern Africa Department, in the World Bank's Africa Regional Office; and Stephen Denning is the director of the Southern Africa Department. Alan Berg was the reviewer and adviser. Secretarial assistance was provided by L. Timmerman, D. Trujillo, N. Moncada, and J. Whitington.
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ACC/SCN</td>
<td>Administrative Committee on Coordination/Subcommittee on Nutrition</td>
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<tr>
<td>approx</td>
<td>Approximately</td>
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<td>ARI</td>
<td>Acute respiratory infection</td>
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<td>BMI</td>
<td>Body mass index (weight/height$^2$)</td>
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<td>CBGM</td>
<td>Community-based growth monitoring</td>
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<td>CED</td>
<td>Chronic energy deficiency (as indicated by low BMI)</td>
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<td>CFNP</td>
<td>Community Food and Nutrition Program</td>
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<td>CHC</td>
<td>Child Health Card</td>
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<td>crit</td>
<td>Criteria</td>
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<td>CSFP</td>
<td>Child Supplementary Feeding Program</td>
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<td>CSO</td>
<td>Central Statistical Office</td>
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<td>DHS</td>
<td>Demographic and Health Survey</td>
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<td>DNN</td>
<td>Department of National Nutrition</td>
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<tr>
<td>dl</td>
<td>Deciliter</td>
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<tr>
<td>EPI</td>
<td>Expanded Programme on Immunization</td>
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<td>ESAP</td>
<td>Economic Structural Adjustment Program</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<td>FP</td>
<td>Family planning</td>
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<tr>
<td>g</td>
<td>Gram</td>
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<tr>
<td>GM</td>
<td>Growth monitoring</td>
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<td>GMB</td>
<td>Grain Marketing Board</td>
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<tr>
<td>Hb</td>
<td>Hemoglobin</td>
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<td>ht</td>
<td>Height</td>
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<td>I</td>
<td>Iodine</td>
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<tr>
<td>IBFAN</td>
<td>International Baby Food Action Network</td>
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<td>IDD</td>
<td>Iodine deficiency disorder</td>
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<tr>
<td>IEC</td>
<td>Information, education, and communication</td>
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<td>IMF</td>
<td>International Monetary Fund</td>
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<td>IMR</td>
<td>Infant mortality rate</td>
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<tr>
<td>IU</td>
<td>International Unit</td>
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<tr>
<td>KAP</td>
<td>Knowledge, attitudes, practices</td>
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<tr>
<td>kg</td>
<td>Kilogram</td>
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<tr>
<td>LB</td>
<td>Live birth</td>
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<td>LBW</td>
<td>Low birthweight</td>
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<tr>
<td>LSCF</td>
<td>Large-scale commercial farm</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<td>--------</td>
<td>---------------------------------------------------------------------------</td>
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<tr>
<td>Mash</td>
<td>Mashonaland</td>
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<td>Mat</td>
<td>Matabeleland</td>
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<tr>
<td>mcg</td>
<td>Microgram</td>
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<td>MCH</td>
<td>Maternal and Child Health</td>
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<tr>
<td>ml</td>
<td>Milliliter</td>
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<tr>
<td>MLARR</td>
<td>Ministry of Lands, Agriculture and Rural Resettlement</td>
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<tr>
<td>mo</td>
<td>Month</td>
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<tr>
<td>MOE</td>
<td>Ministry of Education</td>
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<td>MOH</td>
<td>Ministry of Health</td>
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<tr>
<td>MOH&amp;CW</td>
<td>Ministry of Health and Child Welfare</td>
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<tr>
<td>MUAC</td>
<td>Mid-upper-arm circumference</td>
</tr>
<tr>
<td>mu/l</td>
<td>Millunits per liter</td>
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<tr>
<td>N</td>
<td>Sample size</td>
</tr>
<tr>
<td>NCHS</td>
<td>National Center for Health Statistics (source of growth standard</td>
</tr>
<tr>
<td></td>
<td>recommended by WHO for international use)</td>
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<tr>
<td>NGO</td>
<td>Nongovernmental organization</td>
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<tr>
<td>NHIS</td>
<td>National Health Information System</td>
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<tr>
<td>nmol/l</td>
<td>Nanomoles per liter</td>
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<tr>
<td>NNS</td>
<td>National Nutrition Survey</td>
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<tr>
<td>NR</td>
<td>Natural region</td>
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<tr>
<td>NSC</td>
<td>National Steering Committee for Food and Nutrition</td>
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<tr>
<td>obs</td>
<td>Observation (sample size)</td>
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<tr>
<td>p</td>
<td>Probability</td>
</tr>
<tr>
<td>PAMM</td>
<td>Program Against Micronutrient Malnutrition</td>
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<tr>
<td>PHC</td>
<td>Primary health care</td>
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<tr>
<td>ppm</td>
<td>Parts per million</td>
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<tr>
<td>prev</td>
<td>Prevalence</td>
</tr>
<tr>
<td>SD</td>
<td>Standard deviation</td>
</tr>
<tr>
<td>SIDA</td>
<td>Swedish International Development Authority</td>
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<tr>
<td>SSCF</td>
<td>Small-scale commercial farm</td>
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<tr>
<td>TGR</td>
<td>Total goiter rate</td>
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<tr>
<td>TSH</td>
<td>Thyroid-stimulating hormone</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>VGR</td>
<td>Visible goiter rate</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>wt</td>
<td>Weight</td>
</tr>
<tr>
<td>Z$</td>
<td>Zimbabwe dollar</td>
</tr>
<tr>
<td>ZINN</td>
<td>Zimbabwe Infant Nutrition Network</td>
</tr>
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</table>
Summary

Nutritional Achievements and Status, 1980–92

Zimbabwe has successfully reduced the high levels of child malnutrition inherited at Independence in 1980, despite economic setbacks and recurrent drought. Nutritional wasting is seen only rarely nowadays, and stunting has declined dramatically, possibly by half. Zimbabwe has a particularly good record on the nutrition of children age 1 to 2 and, compared with thirty-three other countries, only Togo, São Tomé, and Principe do better. Zimbabwe is on a par with six other African countries and has significantly better nutrition indicators than twenty-five others.

Much of this substantial progress is attributable to improvements in public health care, particularly through better vaccination coverage; a huge expansion in rural health care services; a strong focus on primary health care, including water and sanitation and control of diarrhea and acute respiratory infections since Independence; and one of the most successful family planning programs in the developing world. Progress in growth monitoring since 1984 has been described as dramatic. Major efforts to educate mothers using a few simple, key nutrition messages (such as the importance of energy-dense foods), as well as the Community Food and Nutrition Program (CFNP), have also contributed to this improvement. Programs of food distribution, supplementary feeding, drought relief, and subsidies have helped prevent starvation in times of crisis, although they have been expensive. Zimbabwe’s nutritional improvements are particularly impressive viewed against the modest gains in real income since 1980 and the persistent highly skewed distribution of income.

There are two major threats that could jeopardize these achievements. First, the 1991–92 drought created a devastating food shortage and necessitated massive food distribution. Even if rainfall is good in the coming years, the effects of the drought will continue because subsistence farmers depleted their seed stock for the next year and huge numbers of draft animals starved or had to be slaughtered. The water crisis took an additional toll by increasing the prevalence of communicable diseases, which in turn worsened the population’s nutritional status, independently of the food shortage.
The second threat to nutritional improvements is AIDS. HIV-positive babies and young children (as well as adults) are vulnerable to disease, and this undermines their nutritional status. A large proportion of severe malnutrition seen in babies and children who are brought to health facilities is associated with HIV infection.

Notwithstanding the considerable achievements, and aside from the natural disaster and health threats mentioned above, malnutrition in children is still a problem, mainly because of food shortages in certain areas at certain times of the year and poor practices in the feeding of babies. Of particular concern is the disappearance of exclusive breastfeeding during the first four to six months and the increasingly common use of water and food as supplements before that age. Moreover, according to health professionals, low-birthweight incidence—as high as 10 to 15 percent—compounded by malnutrition, continues to be an underlying cause of a substantial proportion of child mortality.

*Infant and Child Malnutrition*

Stunting occurs very early, perhaps from birth, and most growth retardation occurs in the first year of life. Some additional stunting occurs during the second year of life, but most children between the ages of 2 and 5 continue on the growth track established early in life. In general, children's nutrition improves as they get older.

Geographic location can be related to malnutrition: stunting is worse among rural than urban children, but wasting is unusually high among urban children. The high prevalence of stunting in rural areas may reflect poor maternal nutrition during pregnancy and low birthweight, or gradual nutritional damage to infants during the first two years of life.

The nutrition of school-age children seems surprisingly poor in the limited areas in which it has been studied. Yet, since Independence there does appear to have been a gradual reduction in stunting among schoolchildren. Nevertheless, although nutritional problems among these older children have less serious implications for mortality, they could have a significant impact on learning.

*Micronutrient Deficiencies*

Too little is known about micronutrient problems. For example, it is not clear to what extent children suffer from vitamin A and iron deficiency. A study of vitamin A deficiency carried out in Matabeleland found that deficiencies were not so bad as to constitute a public health problem. In addition, not enough research has been done about whether nutritional anemia in women is an important public health
issue, and thought should be given to doing a study. Iodine deficiency is widespread: half the population lives in areas where goiter is severely or moderately endemic. Studies have found low levels of urinary iodine and abnormal thyroid hormone levels in some areas.

*Other Nutritional Problems*

Pellagra may be a seasonal problem among the very poor. Adult nutrition has received little attention but appears to be better than that of children. Overweight may be a bigger problem among adults than underweight, particularly for women. Chronic diseases, especially hypertension, are increasing, although it is not known to what extent diet and lifestyle changes are responsible.

*Causes of Malnutrition*

Poverty underlies most undernutrition and malnutrition. Poor soil, uneven and low rainfall, and the legacy of the War of Independence are also causal factors. The nutrition of children in resettlement areas—formerly underutilized parts of large commercial farms purchased by the government—has improved the least over the past decade. These children are now the worst-off group, suggesting that land redistribution is no simple panacea to achieving welfare and equity in Zimbabwe. Lack of access to clean water, health care, and markets is probably part of the explanation for the higher levels of acute malnutrition found among children in resettlement areas.

Along with poverty, the main underlying causes of malnutrition are lack of access to food and inadequate maternal and child care.

*Insufficient Food Availability*

Household food security—the availability of food for the family—is severely compromised during several months of the year for a substantial number of families despite success in increasing agricultural production. Drought, inequitable land ownership, crowding in communal areas, inadequate facilities in resettlement areas, and an inefficient grain marketing system have contributed to food shortages.

The change from small grains such as sorghum and millet to maize or cash crops has probably reduced food security for many families. Small grains can be grown on poorer soils, are more drought-resistant, and can be stored longer than maize. However, maize is less labor-intensive to grow and process and has higher yields if rainfall is adequate. Extension and research efforts have focused on maize, and attempts to breed improved small grain varieties have only just begun.
Inadequate Maternal and Child Care

The position of women in Zimbabwean society is key to the second underlying cause of malnutrition. The bulk of farming and the hard work that goes with it is done by Zimbabwean women, who are also the children's main caregivers. This heavy workload takes its physical toll and also reduces the time women have to feed their infants. (Infants' stomachs are too small to take in enough calories in only two or three meals unless they continue to be breastfed on demand throughout the day and night.)

Inadequate infant-feeding practices bear some responsibility for growth retardation, which mostly occurs in the first year of life. Many health workers and mothers appear to be unaware that exclusive breastfeeding during the first four to six months of life is important. Babies are being fed breast milk plus water, or breast milk with some other supplement. According to one survey, 82 percent of infants under 4 months old had been given water the previous day. Many tiny babies are receiving semisolids. The disappearance of exclusive breastfeeding may have been caused by health workers' overzealous promotion of food complements for children who are too young. The common use of water and gruel to feed tiny babies may account for the very early decline in the growth rate for infants. Yet virtually no research has been done on these issues.

Causes of Other Nutrition Problems

Maternal Malnutrition

Undernutrition in some women may be caused by the stress of having many children close together and by heavy manual labor during pregnancy. Women themselves attribute their ill health and exhaustion to overwork and too many children; some women are under pressure from their husbands to bear a child every year.

Micronutrient Deficiencies

The Zimbabwean diet is fairly healthful, composed mainly of maize, with relishes of vegetables, peanuts and other legumes, and sometimes meat. But the quantity of food is often inadequate, and lack of food is a major contributory factor to iron and vitamin A deficiencies. The increased use of highly refined maize flour also reduces the intake of vital micronutrients. Goiter is a result of poor iodine in soils, and hence in the crops grown in those soils. It can be combated by iodating salt, and after considerable delay, this has begun.
Institutional Framework for Tackling Nutrition Problems

Nutrition is the responsibility of the Unit (formerly Department) of National Nutrition within the Ministry of Health and Child Welfare. The department grew in strength during the 1980s and made its mark on maternal and child health. However, malnutrition is not just a health issue: it cuts across sectors and requires multisectoral action. The Nutrition Unit's status and position within the Ministry of Health and Child Welfare undermines its own ability to negotiate with other government departments to achieve recognition of the importance of nutrition and to take appropriate actions. Even within these limitations, progress is being made toward the development of a comprehensive National Nutrition Policy (see below), in part thanks to increasingly good contributions from other ministries.

The Nutrition Unit is small and is overwhelmed with requests for technical support. It is struggling to meet these requests with the staff it was given when it was set up. Few new nutritionists have been trained, and no new posts have been established in recent years. Terms and conditions for nutritionists remain uncompetitive despite recent improvement. Thus there are too few dieticians to help doctors in the dietary management of disease. Negotiations are continuing to increase the staffing, but the Economic Structural Adjustment Program makes this difficult.

National Food and Nutrition Policy and Program

Policy

A national food and nutrition policy has yet to be formulated, but steps toward developing one have been taken. A team from the Health, Agriculture, and Economic Planning ministries attended the International Conference on Nutrition in Rome in 1992. To follow up, in January 1993 an interministerial National Food and Nutrition Committee was established, and a national food and nutrition plan of action is in preparation. The effects on vulnerable groups of the 1991–92 drought and of the Economic Structural Adjustment Program have made the government and donors more sensitive to nutrition issues. This awareness may have spurred the process of formulating a policy.

A national food and nutrition policy would help guide the implementation of a balanced, intersectoral set of programs and policies, to include (1) focusing nutrition education messages on exclusive breastfeeding for the first four to six months and on frequency of feeding and energy density once other foods are introduced; (2) implementing widespread community-based growth monitoring, linking it to the
Community Food and Nutrition Program; (3) improving grain marketing mechanisms; (4) placing greater emphasis on drought-resistant crops; (5) focusing more on land redistribution and follow-up of resettled families; (6) reducing the work burden of women and their time constraints regarding child care and feeding; and (7) strengthening nutrition surveillance so that the impacts of structural adjustment and of nutrition projects and policies on the nutritional situation are monitored adequately and provide feedback.

Programs

The Nutrition Unit has developed a Five-Year Plan for combating malnutrition in Zimbabwe. Nutrition studies are being undertaken, and a national surveillance system has been evolving since 1987. The expanded monitoring of child growth and the shifting of this responsibility from health facility staff to communities themselves are integral parts of health care and an important focus of the program.

The Children’s Supplementary Feeding Program (CSFP) was replaced by the Supplementary Food Production Program to reduce dependence on government assistance and to encourage local cultivation of supplementary food. The latter, recently renamed the Community Food and Nutrition Program, encourages villagers to grow nutritious foods such as groundnuts, beans, and vegetables in community gardens. However, the severity of the 1991–92 drought forced the government to reintroduce the CSFP temporarily.

To combat iodine deficiency, use of iodated salt is being promoted. Iodized oil capsules are being used in areas of severe iodine deficiency until iodated salt is reliably available. A repeat goiter survey has been carried out on schoolchildren in Mrewa District. Research on salt consumption is ongoing, and legislation on salt iodation has been drafted.

Resources for Nutrition Activities

NGOs

Projects to address nutrition problems that are carried out by nongovernmental organizations (NGOs) are considered valuable, but there is a need for better coordination among projects, NGOs, and the government and for better monitoring and evaluation.

Donors

The Nutrition Unit has successfully attracted donor support, mainly from the Swedish International Development Authority (SIDA) and the United Nations Children’s Fund (UNICEF). The Five-Year Plan is being
supported as a component of the Ministry of Health (MOH) Second Family Health Project (FHP2), to which SIDA contributes. Since 1989, government funds have been allocated to nutrition, an indication of the growing recognition of its importance.

**Staffing**

The main obstacle to realizing plans for combating nutrition problems is the small size of the core of nutrition workers and a lack of nutrition expertise, field experience, and training. Additional nutrition coordinators were hired and trained during 1992 and will help to some extent. However, the ability of the government to maintain and strengthen its staff of nutritionists at central, provincial, and perhaps even district levels in key ministries, as well as to establish local training of nutritionists and dieticians to work at decentralized levels, will be an important determinant of continued improvement in nutrition in Zimbabwe.

**Conclusions**

The targeting of nutrition programs to preschool children since Independence appears to have brought relative improvements in the nutrition of this group. However, targeting strategies should be revised to take into account current and future data on the nutrition of all groups. Programs to address the nutritional problems of school-age children and the nutritional aspects of chronic diseases may now deserve higher priority. Programs that do focus on the under-fives must better target those geographic areas where problems are worst and also those population groups with the most severe nutrition problems, such as people living in resettlement areas.

Both the 1991-92 drought and the structural adjustment of the economy being undertaken by the government of Zimbabwe threaten to make nutrition problems worse among the poor. To avoid further negative impacts, a balanced and intersectoral set of programs and policies, guided by an improved system of nutritional surveillance, are required.

**Recommendations**

The following recommendations relate roughly to the health, education, and agricultural sectors, in that order. The Five-Year Program of the MOH Nutrition Unit (supported by FHP2) and the multisectoral activities underway are attempting to address them.

1. Greater attention should be given to the "underlying causes of malnutrition" (see Figure 3-1) linked to "inadequate maternal and child care." Priority should be given to improving the information, ed-
ucation, and communication (IEC) skills and capacity of the relevant units in the Ministry of Health and Child Welfare. Relevant messages need to be disseminated in ways that will empower the most vulnerable groups, particularly women.

2. The community-based growth monitoring (CBGM) program should be improved and expanded. Trials should be conducted in how to use CBGM better to stimulate and guide community nutrition activities.

3. Similarly, better use should be made of growth-monitoring data and other indicators in nutrition surveillance systems to guide resource allocation at each level of government, as well as to monitor the effects of structural adjustment on the poor.

4. Nutrition IEC programs must focus not only on the need for frequent feeding with energy-dense complementary foods from about six months onward but also on the importance of avoiding all supplementary food and water in the first four to six months of life. Mothers should be encouraged to use breastfeeding alone. Training of health workers must be revised and maternity ward routines reformed where needed.

5. Ways must be found to enable women employed in jobs away from home to achieve the important goal of exclusive breastfeeding. More attention should be given to protecting traditional Zimbabwean breastfeeding expertise from the expanding baby food industry.

6. Qualitative research and, eventually, field trials need to be done on the use of traditional fermented and germinated foods, as these might allow busy mothers to store energy-dense and contamination-resistant complementary foods made in the morning for use throughout the day.

7. All salt for human and animal consumption should be iodated. Until this is achieved, iodized oil capsules should be distributed to vulnerable groups in the most severely affected districts to provide temporary protection (for up to two years). Monitoring of the iodine status of the population must be instituted to guide future planning efforts and to ensure that, iodated salt, when it is universally available, continues to prevent iodine deficiency disorders in the country.

8. High priority must be given to implementing MOH Nutrition Unit plans to train dietetic technicians, to train and hire more ward-level nutrition coordinators, and to train key staff at the district level so they can bear more responsibility for nutrition and support and supervise the work of the nutrition coordinators. The transport budgeted for provincial nutritionists is necessary to enable them to support planned training and activities in their districts.

9. Research priorities should include:

- Maternal nutrition. Height and weight are measured at prenatal visits in many urban health care institutions. The relatively simple
task of collating such data should receive priority, as should research to determine the extent of under- and overnutrition among women, causes of these problems, and possible approaches for alleviating them.

- The prevalence of nutritional anemias, vitamin A deficiency, and pellagra among vulnerable groups.
- Height and weight of Zimbabwean infants at birth, as well as infant feeding and infant growth in the first months to determine why growth appears to be faltering so early in life.
- Reanalysis of data from past surveys to allow trends to be identified. Surveys should be done locally to determine how representative clinic-based and community-based nutrition surveillance data are.
- How to use rapid appraisal methods rather than large national surveys for community assessments. The Nutrition Unit, and others in Zimbabwe, need to learn more about these methods. There should also be much more attention to using qualitative data for understanding problems, their causes, and possible solutions rather than continuing to rely on quantitative surveys.

10. Priority should be given to following up pilot studies and preliminary plans being developed by the Ministry of Education, with support from the Ministry of Health and Child Welfare, to improve the health and nutrition of schoolchildren.

11. Technologies for reducing the work burden of rural women must be pilot-tested, and ways to increase the quality of care that children receive from both men and women must be emphasized.

12. Household food security needs to be a clearly defined objective of agricultural policy. This would ensure that some attention is paid to households’ ability to acquire the right quantity and quality of food to meet their needs, at a price they can afford, throughout the year.

13. Greater attention must be given within the agriculture sector to other crops besides those intended for export. These other crops include legumes, vegetables, fruits, and drought-resistant grain for human and animal consumption.

14. Some kind of assistance will continue to be required to enable the poorest families to obtain enough food, not only in drought years but also more generally, if food prices continue to rise in relation to minimum wage levels. More targeted approaches, using nutrition surveillance systems, are needed to reach vulnerable families. A short-term subsidy on straight-run maize meal might be worth exploring, as it would presumably target itself automatically to poorer groups.

15. The development of a strong national food and nutrition policy would be valuable in allocating responsibility for the policies and programs recommended here, as well as in earmarking resources for these
programs. Such a policy could help key sectors, policymakers, planners, and project managers to understand better the broader food and nutrition context within which they are working. Synergistic effects appear to be achieved when several approaches are combined in the same area. A national food and nutrition policy could help not only to generate the momentum required but also to coordinate efforts on several fronts.
1. Introduction

The most comprehensive previous review of nutrition in Zimbabwe was written in 1982 by Alan Berg and was included as an annex in a World Bank report on population, health, and nutrition in Zimbabwe (World Bank 1983). The review was based on information from nutrition professionals and from health and agriculture workers with experience in the field of nutrition. Its methods included a mailed questionnaire, interviews, and a survey of a large number of documents and studies. The review was completed in about one month and was a forerunner to the rapid appraisal procedures that are now receiving so much attention.

The present report refers to the 1982 findings and updates them in the light of new information and experience. We focus on the period from Independence in 1980 to 1992 (although much of our “current” data comes from 1990 and 1991).

No new primary data were collected for this report. Key researchers and program managers were interviewed, and all recent available literature was reviewed. Topics include the state of nutrition in Zimbabwe (type and degree of problems, trends, and causes); the institutional, manpower, and resource base for dealing with these problems; a review of past and continuing nutrition programs as well as immediate future plans; and recommendations for research and action. Attention is given to the broad range of sectors involved, but this review reflects both authors’ closer links to the health sector than to other sectors.

Zimbabwe became an independent country in 1980. The 1992 Census estimated the population at 10.4 million, with a growth rate of 3.1 percent since 1982, unchanged from the previous thirteen-year period. For every 100 economically active people, there are 104 dependents, that is, children under 15 and elderly people 65 and over. If an urban area is defined as one with 2,500 or more inhabitants, then 73 percent of the population live in rural areas. Urban residents are concentrated in two of the eight provinces, Matabeleland North (hereafter, Mat North) and Mashonaland East (Mash East), which include the two largest cities, Bulawayo and Harare, respectively. These provinces and Mashonaland West (Mash West) are the areas of major economic activity, and their populations are rapidly increasing as migrants arrive from other areas of the country. About 60 percent of employed people work in agriculture.
Note

1. This is higher than the growth rate of 2.6 percent estimated by the Inter-censal Demographic Survey.
2. Nutrition Levels and Trends

Reducing malnutrition is an important goal of development because malnutrition leads to suffering and death. Malnutrition also slows development. For example, deficiencies of calories (too little food), iron, or iodine reduce the working capacity and productivity of working-age adults, and much of these adults' time and financial resources is diverted to combating malnutrition in their children. Nutritional deficiencies in children limit their capacity to learn and to develop, and temporary hunger during the school day hampers children's ability to concentrate. By affecting their capacity to learn, malnutrition reduces the return on investments in education.

Undernutrition (Growth Retardation)

To understand the use of anthropometric indicators of levels and trends of undernutrition in Zimbabwe, one must consider a number of methodological issues. (See the methodological notes in the appendix.)

Prevalence

The Shona peoples have suffered drought roughly one year in five since precolonial times (Iliffe 1990), and in response both the Shona and Ndebele peoples developed successful survival techniques to ensure that food shortages rarely caused death from starvation. (This does not take into account mortality from diseases that are caused by malnutrition.) When famine was associated with violence, however, there were many deaths, as was the case in the last "killing famine," which took place in 1896-97 (Iliffe 1990).

The little community-based information that is available for the period prior to independence suggests that malnutrition was rampant. One-third of the children admitted to Harare pediatric hospital in 1973 were diagnosed as having marasmus or kwashiorkor (extreme forms of malnutrition), conditions that were responsible for 31 percent of all hospital deaths. World Bank (1983) cited 1977 data showing 32 to 43 percent of children under age 5 to be stunted. A 1978 study found that 11 percent of children weighed less than 60 percent of the expected weight for their age.
In May–June 1980, OXFAM conducted a nutrition survey in five areas of the country. Of 607 children measured, 30 percent were below the third percentile in weight for age (Harvard standard). Forty percent of children age 1 to 5 years had a mid-upper-arm circumference (MUAC, a measure of wasting) of less than 13.5 centimeters; 15 percent had an MUAC of less than 12.5 centimeters (Sanders 1982).

A more extensive nutrition survey was conducted by the Ministry of Health (MOH) in September 1980 among 4,777 children age 1 to 5 selected as a representative sample from throughout Zimbabwe. Sixty-one percent had an MUAC of less than 13.5 centimeters and 29 percent, less than 12.5 centimeters (MOH 1980).

World Bank (1983), using data from several small studies conducted from 1980 to 1982, estimated that by 1982, 21 to 23 percent of under-fives had second- or third-degree malnutrition (were less than 75 percent of the median weight for their age), 28 percent were stunted (had a median height of less than 90 percent for their age), and 9 percent were wasted (were less than 80 percent of the median weight for their height).

A national survey later in 1982 estimated that about 10 percent of urban and 20 percent of rural children under 3 years of age were below 80 percent of the median weight for their age (MOH Nutrition Department 1982). About 16 percent of urban and 36 percent of rural children were below 90 percent of the median height for their age, and about 14 percent of urban and 9 percent of rural children were below 85 percent of the median weight for their height. Nearly 20 percent of urban infants below 6 months of age had low weight for their height.

According to Loewenson (1990), the 1984 national nutrition survey found that 14.5 percent of children age 1 to 5 suffered from undernutrition (less than 80 percent of the median weight for their age). The survey was repeated one year later and found that 11 percent were undernourished, 3 percent wasted, and 32 percent stunted (MOH Nutrition Department 1985).

In 1988 a national Demographic and Health Survey (DHS) was conducted in Zimbabwe using the same methods applied in DHS studies in more than twenty other developing countries (CSO and Institute for Resource Development/Macro Systems 1989). It estimated that 11.5 percent of children age 3 to 60 months were undernourished, 28.6 percent were stunted, 0.8 percent were wasted—less than −2 standard deviations (−2SD, NCHS standards)—and 0.5 percent were both stunted and wasted.

In the 3-to-11-month age group, 16 percent of infants were more than +2SD in weight for their age, while 17 percent were less than −2SD in height for their age. If these two values were derived from one group of the same infants, it would indicate that they were short and fat, but these extremes probably represented two different groups of infants.
Bivariate analyses of associated factors showed that overweight was more common in children of urban women with a secondary-level education while stunted children more often had less educated rural mothers.

Nutrition surveillance data on under-fives attending health facilities (mainly to obtain vaccinations) are reported through the national health information system (NHIS). Those identified as being “below the line” (below the third percentile) on the growth chart in 1988 constituted 11.4 percent of attenders (CSO 1988), equal to the proportion below the 2.3 percentile in the DHS (11.5 percent). This suggests that the surveillance data are reliable at the national level. However, at lower levels of aggregation, surveillance data do not agree very well with survey data. Surveillance data for 1989 showed a national level of 9.5 percent of under-fives below the line; for 1990 it was 9.0 percent. Surveillance data by province for these two years are presented in Table 2-1.

**Age Distribution**

The average Z-scores for all three anthropometric parameters from the DHS data are plotted in Figure 2-1. This shows that the average weight for height for babies age 3 to 11 months was higher than the median, while the average height for age was lower. Above 1 year of age, Zimbabwean under-fives followed closely the NCHS median in weight for height, but stunting increased to over 30 percent before decreasing again to 22 percent in the fifth year. It is important to note that most nutritional deprivation occurred before babies reached their first birthdays. After the age of about 20 months, all three indicators are static, and no further deterioration occurs.

In theory, the pattern of growth revealed in this cross-sectional study could reflect both aging effects and trends over time. However, Moy and others (1991a) found a nearly identical pattern of growth for all three parameters in a prospective study of growth in Shamva District that measured growth monthly in a sample of 204 infants under 1 year of age for the 22 months from September 1987 to June 1989. The DHS cross-sectional survey was also carried out during this time (late 1988). The major difference in the Shamva data was that weight for height declined gradually to about \( Z = -0.6 \) by the age of 16 months, after which all three anthropometric parameters leveled off.

Clearly, stunting begins early among Zimbabwean infants. The DHS data suggest that stunting has begun at 3 months of age and Moy and others’ (1991a) data reveal that infants are already stunted at 1 month. Barring measurement error (which is hard to avoid in young infants because it is difficult to straighten their legs completely), this suggests that Zimbabwean infants may be stunted at birth.
Table 2-1. Nutrition Surveillance Data on Under-Fives by Province, 1989–90: Percentage below the Line (< Third Percentile, Weight for Age)

<table>
<thead>
<tr>
<th>Province</th>
<th>Age 0–5 months</th>
<th>Age 6–11 months</th>
<th>Age 12–23 months</th>
<th>Age 24–59 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manicaland</td>
<td>3.3</td>
<td>3.9</td>
<td>6.9</td>
<td>7.1</td>
</tr>
<tr>
<td>Mash Central</td>
<td>6.5</td>
<td>6.0</td>
<td>9.4</td>
<td>9.4</td>
</tr>
<tr>
<td>Mash East</td>
<td>4.5</td>
<td>4.2</td>
<td>7.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Mash West</td>
<td>3.6</td>
<td>3.5</td>
<td>6.0</td>
<td>5.6</td>
</tr>
<tr>
<td>Masvingo</td>
<td>2.6</td>
<td>2.8</td>
<td>5.3</td>
<td>5.5</td>
</tr>
<tr>
<td>Mat North</td>
<td>6.8</td>
<td>6.8</td>
<td>12.0</td>
<td>12.5</td>
</tr>
<tr>
<td>Mat South</td>
<td>4.7</td>
<td>5.4</td>
<td>9.3</td>
<td>8.9</td>
</tr>
<tr>
<td>Midlands</td>
<td>3.1</td>
<td>2.7</td>
<td>6.3</td>
<td>5.7</td>
</tr>
<tr>
<td>Bulawayo</td>
<td>4.3</td>
<td>4.2</td>
<td>6.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Chitungwiza</td>
<td>0.4</td>
<td>0.6</td>
<td>1.1</td>
<td>1.7</td>
</tr>
<tr>
<td>Harare</td>
<td>3.2</td>
<td>3.3</td>
<td>2.6</td>
<td>2.9</td>
</tr>
<tr>
<td>National total</td>
<td>3.7</td>
<td>3.8</td>
<td>6.2</td>
<td>6.2</td>
</tr>
</tbody>
</table>

Sample size: 879,022 872,288 975,433 981,440 1,114,360 1,105,785 1,278,217 1,225,164

Source: National Health Information System (NHIS), Harare.
Results of the various national surveys reviewed above are summarized in Table 2-2. These data suggest that levels of stunting have remained constant in Zimbabwe since Independence and that wasting declined rapidly in the first years after Independence and has remained at very low levels since. The drop in wasting is thought to be due to the end of the war and a decrease in transient acute malnutrition from droughts and episodes of acute illness among children. The persistence of stunting may reflect poor maternal nutrition during pregnancy and low birthweight, or gradual nutritional damage to children over long periods from poor infant-feeding practices.

Given the dangers of comparing studies reported in such different ways, there is a need to recalculate some of them using identical standards and cutoff points. The only author to do this, as far as we know, is Thomas (1990). As shown in Table 2-3, he reanalyzed the DHS data using cutoff points identical to those used in the 1982 national survey. This analysis suggests that there have been substantial improvements in malnutrition in Zimbabwe, with values for wasting and stunting for rural and urban children in 1988 less than half those found in 1982.
Table 2-2. Trends in Malnutrition in Zimbabwe, Based on National Surveys from 1982 to 1990

<table>
<thead>
<tr>
<th>Date and source</th>
<th>Age (months)</th>
<th>Criteria</th>
<th>Weight for age (percent)</th>
<th>Criteria</th>
<th>Weight for height (percent)</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982 (World Bank 1983)</td>
<td>0–60</td>
<td>75% of median</td>
<td>23</td>
<td>80% of median</td>
<td>9</td>
<td>90% of median</td>
</tr>
<tr>
<td>1982 (MOH Nutrition Department 1982)</td>
<td>0–36</td>
<td>80% of median</td>
<td>18</td>
<td>85% of median</td>
<td>10</td>
<td>90% of median</td>
</tr>
<tr>
<td>1984 (ZNFPC 1985)</td>
<td>12–60</td>
<td>80% of median</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985 (MOH Nutrition Department 1987)</td>
<td>0–60</td>
<td>−2SD</td>
<td>11</td>
<td>−2SD</td>
<td>3</td>
<td>−2SD</td>
</tr>
<tr>
<td>1988 (MOH 1989)</td>
<td>3–60</td>
<td>−2SD</td>
<td>11.5</td>
<td>−2SD</td>
<td>1.3</td>
<td>−2SD</td>
</tr>
<tr>
<td>1988 (CSO and MOH 1988)</td>
<td>0–60</td>
<td>Third percentile</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1989 (MOH Nutrition Unit 1991b)</td>
<td>0–60</td>
<td>Third percentile</td>
<td>9.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990 (MOH Nutrition Unit 1991b)</td>
<td>0–60</td>
<td>Third percentile</td>
<td>9.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

— Not available.

These data also indicate that wasting is worse in urban than in rural areas.

Even better estimates of trends can be obtained from repeat surveys on the same population. This has been done at the household level by Kinsey (1992) on one of the most vulnerable groups in Zimbabwe, young children living in resettlement areas. His anthropometric measurements were taken during drought seasons (1983–84, 1986–87, and 1991–92) and were based on a random sample of villages and a complete census within villages in three resettlement schemes, one in each of the major agroecological zones in Zimbabwe suitable for cropping. The first three columns of Table 2-4 summarize his findings on children age 3 to 60 months.

The data in Table 2-4 are based on stable communities. There are fewer children under 5 at each round because the communities were aging over the decade. In the 1993 surveys, the age range was expanded to increase the sample size and to include children who had been under 5 during earlier survey rounds. It is difficult to know whether the drought in each of these years affected the communities equally. Despite these caveats, the sampling method was so good that it can be stated with an unusually high degree of confidence that there has been only minor, if any, improvement in the nutrition of children living in these areas during the past decade. Equally notable, however, is that wasting appears to have improved slightly despite the devastating drought. Stunting has increased after a possible reduction before 1993.

Nutrition surveillance data for children age 2 to 5 are available for 1987–90 by province (Figure 2-2), and, because this age group has the highest level of malnutrition, it is the most likely to show trends. There is a general trend toward improvement, except possibly in the worst-off areas, the Matabeleland provinces and Mash Central. (These trends reflect the situation before the 1991–92 drought.)

Nutrition Problems in the School-Age Population

Nutrition in school-age children has a significant impact on learning ability. In Zimbabwe, the only available study of this feature was by Theisen (1975), who found that 63 percent of stunted schoolchildren were in the lower half of their class compared with 44 percent of those above the tenth percentile in height for age ($p = 0.005$).

It is commonly assumed that in Zimbabwe, as elsewhere, levels of undernutrition decline from the preschool years to more acceptable levels in school-age children. Little attention has been paid to the nutrition of schoolchildren because growth retardation has less obvious effects at this age, whereas it is associated with high mortality in preschool children.

A survey of all schools in Kwekwe in 1972 found that 40 percent of children were below the tenth percentile in weight for height (using
Table 2-3. Child Nutritional Status by Age of Child and Sector of Residence, 1982 and 1988

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>Rural</th>
<th></th>
<th></th>
<th>Urban</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Height for age</td>
<td>Mean</td>
<td>Standard error</td>
<td>Number of observations</td>
<td>Less than 90 percent</td>
<td>Mean</td>
<td>Standard error</td>
</tr>
<tr>
<td>3–6</td>
<td>96.81</td>
<td>0.43</td>
<td>136</td>
<td>5.9</td>
<td>20.3</td>
<td>98.10</td>
</tr>
<tr>
<td>7–12</td>
<td>95.21</td>
<td>0.30</td>
<td>198</td>
<td>8.1</td>
<td>31.0</td>
<td>97.76</td>
</tr>
<tr>
<td>13–24</td>
<td>93.38</td>
<td>0.22</td>
<td>401</td>
<td>17.7</td>
<td>37.0</td>
<td>96.82</td>
</tr>
<tr>
<td>25–36</td>
<td>94.03</td>
<td>0.25</td>
<td>417</td>
<td>18.5</td>
<td>47.1</td>
<td>96.23</td>
</tr>
<tr>
<td>37–48</td>
<td>93.99</td>
<td>0.29</td>
<td>352</td>
<td>19.6</td>
<td>—</td>
<td>97.57</td>
</tr>
<tr>
<td>49–60</td>
<td>94.99</td>
<td>0.23</td>
<td>357</td>
<td>12.0</td>
<td>—</td>
<td>97.40</td>
</tr>
<tr>
<td>3–36</td>
<td>94.34</td>
<td>0.14</td>
<td>1,152</td>
<td>14.9</td>
<td>35.6</td>
<td>96.93</td>
</tr>
<tr>
<td>3–60</td>
<td>94.40</td>
<td>0.11</td>
<td>1,861</td>
<td>15.3</td>
<td>—</td>
<td>97.14</td>
</tr>
<tr>
<td>Age Group</td>
<td>Weight (kg)</td>
<td>Height (cm)</td>
<td>Stunting (BMI)</td>
<td>Wasting (BMI)</td>
<td>Underweight (BMI)</td>
<td>Malnutrition Risk (Risk Score)</td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
<td>-------------</td>
<td>----------------</td>
<td>----------------</td>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>3-6</td>
<td>113.77</td>
<td>1.24</td>
<td>136</td>
<td>0.7</td>
<td>11.8</td>
<td>117.27</td>
</tr>
<tr>
<td>7-12</td>
<td>104.51</td>
<td>0.80</td>
<td>197</td>
<td>1.5</td>
<td>11.8</td>
<td>108.22</td>
</tr>
<tr>
<td>13-24</td>
<td>99.04</td>
<td>0.51</td>
<td>401</td>
<td>3.5</td>
<td>9.7</td>
<td>102.63</td>
</tr>
<tr>
<td>25-36</td>
<td>100.15</td>
<td>0.51</td>
<td>415</td>
<td>3.8</td>
<td>5.3</td>
<td>102.35</td>
</tr>
<tr>
<td>37-48</td>
<td>99.98</td>
<td>0.49</td>
<td>351</td>
<td>4.0</td>
<td>—</td>
<td>101.85</td>
</tr>
<tr>
<td>49-60</td>
<td>98.62</td>
<td>0.44</td>
<td>355</td>
<td>3.9</td>
<td>—</td>
<td>100.09</td>
</tr>
<tr>
<td>3-36</td>
<td>102.12</td>
<td>0.35</td>
<td>1,152</td>
<td>3.0</td>
<td>9.1</td>
<td>150.41</td>
</tr>
<tr>
<td>3-60</td>
<td>101.05</td>
<td>0.25</td>
<td>1,855</td>
<td>3.3</td>
<td>—</td>
<td>103.60</td>
</tr>
</tbody>
</table>

— Not available.

Note: The 1982 NNS includes children age 0-35 months and so is not directly comparable with the 1988 DHS, Zimbabwe Demographic and Health Survey; NNS, National Nutrition Survey, at least for the first age group. Because height for age and weight for height tend to decline with age, the inclusion of 0-to-3-month-olds in the Zimbabwe DHS is likely to reduce the proportions of malnourished children and so increase the reduction in proportions of the children malnourished between 1982 and 1988.

Source: Thomas 1990.
Table 2-4. Anthropometric Measurements of Children in Resettlement Areas, Selected Years, 1983–93
(percentage < -2SD)

<table>
<thead>
<tr>
<th>Measure</th>
<th>1983-84 (age 3-60 months)</th>
<th>1986-87 (age 3-60 months)</th>
<th>1991-92 (age 3-60 months)</th>
<th>1993 (age 6-72 months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height for age</td>
<td>33.1</td>
<td>25.2</td>
<td>28.4</td>
<td>37.5</td>
</tr>
<tr>
<td>Weight for age</td>
<td>23.2</td>
<td>26.1</td>
<td>21.2</td>
<td>22.0</td>
</tr>
<tr>
<td>Weight for height</td>
<td>7.3</td>
<td>8.9</td>
<td>4.3</td>
<td>3.7</td>
</tr>
<tr>
<td>N</td>
<td>659</td>
<td>337</td>
<td>208</td>
<td>922</td>
</tr>
</tbody>
</table>


the Harvard standard), which suggests that levels of acute undernutrition were very high in the school-age population at that time (Theisen 1975).

In 1983–84 an anthropometric survey was undertaken among 6,867 schoolchildren age 6 to 17 in ten primary schools in rural communal lands in Masvingo District (Schuon and Fleischer 1988). As shown in Tables 2-5 and 2-6, 15.8 percent were stunted (defined as less than -2SD in height for age), but there was little wasting (2 percent were less than -2SD weight for height).

In the poorer, high-density areas of Harare, weights and heights of schoolchildren are measured at school entry, third grade, and seventh grade. In 1980, 33,000 schoolchildren were measured. According to World Bank (1983), the prevalence of second- and third-degree malnutrition decreased from 23 percent in the first grade, to 15 percent in the third grade, and to 9 percent in the seventh grade. Davies and Sanders (1987) reported that the proportion of first-grade pupils below the third percentile for weight and height gradually decreased from 29 percent in 1981 to 25 percent in 1984. They assume that these data, reported by the Harare City Health Department, refer to height for age. If their assumption is correct, this improving trend continues, as shown in Table 2-7: about 17 percent for 1988 and 7 percent for 1989.

The data in Table 2-7 come from annual reports for 1988 and 1989 of the City of Harare Health Department Nutrition Unit, which are based on measurements of about 42,000 children each year in high-density suburban schools. The City Nutrition Unit believes that the quality of height and weight data has greatly improved since 1986 (Zunguza, personal communication). Trends in such data reflect the effects of growing older, as well as changes in society that cause cohort effects and secular trends. In general there is an improvement from younger to older ages between 1988 and 1989, although there are some excep-
Figure 2-2. Percentages of 2-to-5-Year-Olds below the Third Percentile in Weight for Age by Province, 1987–90

<table>
<thead>
<tr>
<th>Location</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matabeleland South</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1987</td>
<td>1988</td>
</tr>
<tr>
<td>Midlands</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1987</td>
<td>1988</td>
</tr>
<tr>
<td>Masvingo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1987</td>
<td>1988</td>
</tr>
<tr>
<td>Mashonaland West</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1987</td>
<td>1988</td>
</tr>
<tr>
<td>Manicaland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1987</td>
</tr>
<tr>
<td>Mashonaland Central</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1987</td>
</tr>
<tr>
<td>Mashonaland East</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1987</td>
</tr>
<tr>
<td>Harare</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1987</td>
</tr>
<tr>
<td>Bulawayo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1987</td>
</tr>
</tbody>
</table>


Boys are consistently worse off than girls of the same age.

In the early 1970s, two studies (Davies 1971; Theisen 1975) concluded that there was a marked improvement in health and nutritional status from grade 1 through grade 7, an effect that could be due partly to a lower dropout rate for children with better nutrition (World Bank 1983).

Heights and weights of first graders in fifteen schools in Tsholotsho District (704 children) and thirteen schools in Makoni District (625 children) were measured in January and February 1991, near the begin-
Table 2-5. Stunting in Schoolchildren by Age Group and Sex, Using < 90 Percent of Mean and < –2SD for Height for Age of the NCHS Reference Population

<table>
<thead>
<tr>
<th>Completed years of age</th>
<th>&lt; 90 percent of mean</th>
<th>&lt; –2SD</th>
<th>Total number in each age group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
<td>Both sexes</td>
</tr>
<tr>
<td>6</td>
<td>29.3</td>
<td>21.3</td>
<td>25.6</td>
</tr>
<tr>
<td>7</td>
<td>45.1</td>
<td>35.9</td>
<td>40.5</td>
</tr>
<tr>
<td>8</td>
<td>36.1</td>
<td>40.5</td>
<td>38.5</td>
</tr>
<tr>
<td>9</td>
<td>46.0</td>
<td>44.6</td>
<td>45.3</td>
</tr>
<tr>
<td>10</td>
<td>49.7</td>
<td>63.9</td>
<td>56.5</td>
</tr>
<tr>
<td>11</td>
<td>64.6</td>
<td>00.0</td>
<td>64.6</td>
</tr>
<tr>
<td>Total</td>
<td>45.9</td>
<td>42.6</td>
<td>44.4</td>
</tr>
</tbody>
</table>


ning of the children's first school year (Madzima and others 1991b). About half these children were 6 years old; most of the others were a year older or younger. Stunting was greater among boys in Tsholotsho and Makoni. Girls had a slightly flatter distribution of weight-for-height values than boys in both areas, that is, more girls fell in the extremes of the distribution than did boys. Table 2-8 summarizes the findings using less than –2SD as cutoff points.

Table 2-9 compares school entrant data from three studies based on

Table 2-6. Wasting in Schoolchildren by Age Group and Sex, Using < 90 Percent of Mean and < –2SD for Weight for Height of the NCHS Reference Population

<table>
<thead>
<tr>
<th>Completed years of age</th>
<th>&lt; 90 percent of mean</th>
<th>&lt; –2SD</th>
<th>Total number in each age group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
<td>Both sexes</td>
</tr>
<tr>
<td>6</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>7</td>
<td>0.2</td>
<td>0.7</td>
<td>0.5</td>
</tr>
<tr>
<td>8</td>
<td>0.5</td>
<td>0.7</td>
<td>0.6</td>
</tr>
<tr>
<td>9</td>
<td>0.9</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td>10</td>
<td>1.6</td>
<td>0.7</td>
<td>1.2</td>
</tr>
<tr>
<td>11</td>
<td>1.7</td>
<td>0.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Total</td>
<td>0.9</td>
<td>0.6</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Table 2-7. Anthropometric Data for Harare High-Density Schools, 1988-89
(percentage of entry-level, third-grade, and seventh-grade schoolchildren below the third percentile

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Entry level</strong>a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight for age</td>
<td>27</td>
<td>14</td>
<td>25</td>
<td>9</td>
</tr>
<tr>
<td>Weight for height</td>
<td>—</td>
<td>12</td>
<td>—</td>
<td>11</td>
</tr>
<tr>
<td>Height for age</td>
<td>18</td>
<td>9</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td><strong>Third grade</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight for age</td>
<td>22</td>
<td>9</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Weight for height</td>
<td>—</td>
<td>9</td>
<td>—</td>
<td>7</td>
</tr>
<tr>
<td>Height for age</td>
<td>13</td>
<td>7</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td><strong>Seventh grade</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight for age</td>
<td>22</td>
<td>22</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Weight for height</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Height for age</td>
<td>12</td>
<td>17</td>
<td>7</td>
<td>10</td>
</tr>
</tbody>
</table>

— Not available.

a. Grade 1 (ages 5-7)

Source: Harare City Health Department, Nutrition Unit, 1988, 1989.

the less than −2SD cutoff points, as calculated by Madzima and others (1991b).

Ferro-Luzzi, Pastore, and Choto (1992) measured heights and weights of all residents of 23 villages in Chivi District in late 1990 and early 1991. Their findings, by age group, are shown in Table 2-10. These are the only data available that compare different age groups. For this population, it is clear that the nutritional status of children age 2 to 5 is not worse than that of older children.

Assuming the data (Tables 2-2 through 2-10) in these studies of rural and urban school-age children are valid and reliable, the following conclusions can be drawn:

1. Levels of growth retardation are unexpectedly high in certain geographic, sex, and age categories. Growth retardation seems to be worse in boys than in girls. Stunting appears to be worse among rural children and wasting unusually high among urban children.

2. There has been a gradual reduction in stunting among urban first-graders since Independence.

3. Improvement in nutrition occurs as schoolchildren get older, but this may simply reflect higher dropout rates among more malnour-
Table 2-8. Percentage of Stunting and Wasting in Schoolchildren, Tsholotsho and Makoni Districts, 1991

<table>
<thead>
<tr>
<th>Category</th>
<th>Tsholotsho</th>
<th>Makoni</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stunted and wasted</td>
<td>1.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Stunted but not wasted</td>
<td>13.4</td>
<td>7.5</td>
</tr>
<tr>
<td>Wasted but not stunted</td>
<td>2.9</td>
<td>2.4</td>
</tr>
<tr>
<td>Not wasted and not stunted</td>
<td>82.4</td>
<td>89.9</td>
</tr>
</tbody>
</table>

Source: Madzima and others 1991b.

ished children. The data from Ferro-Luzzi, Pastore, and Choto (1992) strengthen the likelihood that this is indeed the case.

Adult Nutrition Problems

As in other countries, the nutrition of Zimbabwean adults has rarely received the attention of researchers. (There have been some studies of women but these studies are usually linked to their offspring, pregnancy, and lactation.)

Underweight and Overweight

Gwebu and Mtero (1983) measured weights and heights of 595 pregnant women between their first and last visits to prenatal (antenatal) services. The women were attending one rural and five urban clinics and hospitals in Harare and Bulawayo, mostly in high-population-density areas. They were, on average, 26 weeks pregnant at the first visit and 38 weeks at the last. The average percentage weight for height at each center varied from 90 to 100 percent of median, and there was

Table 2-9. Nutritional Status of School Entrants in Four Districts, 1988–91
(pervalance as percentage)

<table>
<thead>
<tr>
<th>District</th>
<th>Wasting</th>
<th>Stunting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masvingo (1984, N = 1,171)</td>
<td>1.6</td>
<td>14.6</td>
</tr>
<tr>
<td>Harare (1989, N = 42,000)</td>
<td>9.3</td>
<td>5.9</td>
</tr>
<tr>
<td>Tsholotsho (1991, N = 618)</td>
<td>4.4</td>
<td>14.7</td>
</tr>
<tr>
<td>Makoni (1991, N = 546)</td>
<td>2.6</td>
<td>7.7</td>
</tr>
</tbody>
</table>

Source: Schuon and Fleischer 1988; Harare City Health Department, Nutrition Unit 1989; Madzima and others 1991b.
Table 2-10. Age Comparison of Nutritional Status, Chivi District, 1990–91

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Number</th>
<th>Height for age</th>
<th>Weight for age</th>
<th>Weight for height</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>691</td>
<td>-1.06</td>
<td>-0.88</td>
<td>-0.26</td>
</tr>
<tr>
<td>5–10</td>
<td>735</td>
<td>-0.91</td>
<td>-0.95</td>
<td>-0.51</td>
</tr>
<tr>
<td>10–18</td>
<td>904</td>
<td>-1.15</td>
<td>-1.20</td>
<td>-0.51</td>
</tr>
</tbody>
</table>

<sup>a</sup> 2–5 years for height for age and weight for height.


No difference between first and last visits. Average total weight gains between the two visits varied from 4.4 kilograms to 10.9 kilograms. In three of the six clinics, this was significantly below the recommended weight gain of 10.3 kilograms. Between 3 and 16 percent of these women were below 80 percent of the reference weight for height. The proportion that weighed more than 120 percent of the reference value for their height ranged from 1 to 13 percent of those weighed at the various clinics.

The Ferro-Luzzi, Pastore, and Choto (1992) study cited above also reported data on the nutritional status of men and of nonpregnant women. These data are presented in Table 2-11 according to the body mass index (BMI), a measure of chronic energy deficiency (CED).

The data in Table 2-11 show low levels of chronic energy deficiency in this sample. There is little evidence that women suffer more than men from energy deficiency. Levels of overweight are much higher than those for CED, and women are affected much more than men. Although Chivi may not be representative of the country, it was chosen as an area likely to have higher average levels of undernutrition. Ferro-Luzzi, Pastore, and Choto state: “The average BMI of the Zimbabwean adults measured in this study appears to be remarkably higher than that found in some other Third World rural populations such as Ethiopia.

Table 2-11. Adult Nutrition, Chivi District, 1990–91

<table>
<thead>
<tr>
<th>Nutritional status</th>
<th>BMI</th>
<th>Males (percent)</th>
<th>Females (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight</td>
<td>&gt; 25</td>
<td>5.6</td>
<td>17.4</td>
</tr>
<tr>
<td>Normal</td>
<td>18.5–24.9</td>
<td>80.1</td>
<td>70.8</td>
</tr>
<tr>
<td>Mild CED</td>
<td>17–18.4</td>
<td>12.6</td>
<td>8.7</td>
</tr>
<tr>
<td>Moderate CED</td>
<td>16–16.9</td>
<td>0.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Severe CED</td>
<td>&lt; 16</td>
<td>0.8</td>
<td>1.1</td>
</tr>
</tbody>
</table>

*Note: BMI, body mass index; CED, chronic energy deficiency.*

pia or India but rather similar to that reported [for Benin].” While caution should be used in comparing these data with those that Gwebu and Mtero (1983) gathered on pregnant women, there would appear to be a reduction in the number of underweight women and an increase in the number of overweight women in the past decade.

Data on maternal mortality rates are scarce and are not reliable, but they are worth citing because they may be linked to nutrition. By 1983, maternal mortality rates were estimated to have decreased by 28 percent from the 1980 level of 144 per 100,000 (Sanders and Loewenson 1988). The figures for 1988 and 1989 were 81.5 and 68.8 percent, respectively.

**Low Birthweight**

Direct measurements of maternal nutrition are rarely made, but the prevalence of low birthweight (LBW), defined as an infant weighing less than 2.5 kilograms at birth, is a useful indicator, particularly among infants who are born “small for date.” Using multiple regression analysis, Andrén and Jacobson (1986) found that variables derived from data in clinic records could explain about 15 percent of the variation in birthweights. Of these variables, the following accounted for about half the explained variation: the sex of the child, parity of the mother, educational level of the parents, and whether the family income was above or below Z$150 per month. The mother’s weight (only a rough indicator of nutritional status) accounted for the other half, suggesting that LBW is a fairly good indicator of maternal nutrition in Zimbabwe.

Unfortunately, population-based statistics on LBW are virtually impossible to obtain. All of the available data are flawed in some way, which makes it difficult to obtain unbiased estimates. Data from communities that have well-functioning referral facilities are particularly difficult to interpret. LBW statistics from maternity wards at higher levels in the referral system tend to overestimate LBW rates, those at local centers at lower levels in the referral system tend to underestimate them.

There are two pre-Independence estimates of LBW. Houghton and Ross (1953), in a study of live-born singleton deliveries in the Government African Hospital in Harare, reported a mean birthweight of 2,860 grams. Although they did not provide data on the distribution of birthweights, a mean that is so close to the 2,500-gram cutoff used to define LBW suggests that a significant proportion were low-weight births. (See below for later studies with much higher means.) The second study, UNICEF (1991a), cited a 15 percent LBW for Harare from 1972 to 1973.

Zunguza (1984) analyzed the birthweight records of all 7,406 singletons born alive during 1982 and 1983 at Mbare Clinic in Harare, which serves a wide spectrum of socioeconomic groups. LBW rates were 4.9
percent for male infants and 6.8 percent for females. Mean birthweights were 3,171 grams and 3,075 grams, respectively. Nearly 90 percent of the LBWs were small for date.

Fawcus and Sanders (personal communication 1991), in a study of nearly 400 women who delivered in Harare Central Hospital in early 1986, found an LBW incidence of 13 percent among those who had attended prenatal clinics earlier in the pregnancy and 44 percent among those who had not (two-thirds of whom were from rural areas). These data must be analyzed in conjunction with data from the nearby health facilities from which many of these patients were referred because it is likely that many of these women were high-risk referrals. For example, the Harare City Health Department, Nutrition Unit (1988) reported 2.1 percent LBW for 13,510 deliveries in health centers in high- and low-density areas. Such health centers refer up to 50 percent of prenatal attenders to Harare Central.

In a 1986 study in greater Harare, Fawcus and Sanders (personal communication 1991) measured birthweights of all deliveries in Highfield, Glenview, and Glen Norah (relatively well-established high-density suburbs, chosen because they were likely to have low levels of attendance by rural women), even those referred to Harare Central Hospital. This yielded an LBW incidence of 10.5 percent.

More than 90 percent of pregnant women in Zimbabwe attend prenatal clinics, and they may be more likely to choose to deliver in modern health facilities if they have been told at the clinics to expect a high-risk delivery. On the other hand, women in isolated areas or those who cannot afford transport to a health facility may have a higher risk of giving birth to LBW babies, so data may underestimate true LBW incidence.

Andrén and Jacobson (1986) studied low birthweight in Harare and in Marondera and Mutoko rural districts by examining all birthweight records for 1985 from eight city medical clinics in Greater Harare, three hospitals in Mutoko, and two hospitals in Marondera (see Table 2-12). Data on LBWs began to be collected from health facilities in 1987 via the National Health Information System (NHIS). About 72 percent of

Table 2-12. Selected Birthweight Data, Harare and Two Rural Districts, 1985

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Harare</th>
<th>Mutoko</th>
<th>Marondera</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean birthweight (grams)</td>
<td>3,211</td>
<td>3,166</td>
<td>3,034</td>
</tr>
<tr>
<td>Percentage LBW (&lt; 2,500g)</td>
<td>—</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>N</td>
<td>1,044</td>
<td>802</td>
<td>531</td>
</tr>
</tbody>
</table>

— Not available.
Source: Andrén and Jacobson 1986.
Zimbabwean women delivered in hospitals and health centers, according to the October 1988 PHC/MCH/EPI survey (N = 2,329). The Maternal and Child Health (MCH) Annual Report for 1990 gives figures of 82 percent for 1988 and 66 percent for 1989. LBW rates recorded at health facilities were 4.9 percent for 1987, 6.9 percent for 1988, and 5.6 percent for 1989 according to the CSO and Ministry of Health (1989). The provincial LBW distribution for 1989 is shown in Figure 2-3. The provinces with the highest prevalence are Mash Central and Manicaland.

**Figure 2-3. Provincial Distribution of Low Birthweights, 1989**

Percentage

![Bar chart showing the percentage of low birthweights by province in 1989.]

**Location:**
1. Manicaland
2. Mashonaland Central
3. Mashonaland East
4. Mashonaland West
5. Masvingo
6. Matabeleland North
7. Matebeleland South
8. Midlands
9. Bulawayo
10. Chitungwiza
11. Harare
12. National

**Source:** Ministry of Health, NHIS.
rates are lower in the data reported for Harare, which exclude data from the central referral hospital.

The 1991 MCH/FP Survey (MOH 1992) found that birthweight was recorded on 64 percent of child health cards (there were cards for 86 percent of children under 5). For 8.4 percent of these children, birthweights were less than 2.5 kilograms, varying from a low of 5.2 percent in Matobo District to a high of 12.5 percent in Bubi District. Mazur and Sanders (1988) found an average birthweight of 3.1 kilograms in a probability sample of 277 under-fives in periurban Chitungwiza, only 12 percent of whom were born at home. This is not far below the international standard of about 3.3 kilograms for mixed sexes. (Levels of LBW were not given in the report.) Moy and others (1991a) recorded birthweights of a sample of children from poor commercial farm worker areas who had been born in hospitals or clinics (42 percent). These 85 infants had a mean birthweight of 3.0 kilograms, and 12 percent had LBW. A higher percentage of these children suffered from nutritional wasting than in the DHS survey that was conducted at about the same time, which suggests that they were indeed from a relatively underprivileged group and that the prevalence of LBW among them was unusually high.

Sanders (1989) estimated that the true incidence of LBW in Zimbabwe is 10 to 15 percent. The above analysis, along with the data shown in Figure 2-3, suggests that LBW incidence may be as high as 10 percent in urban areas and 15 percent in rural areas. This, unlike the data from Ferro-Luzzi, Pastore, and Choto (1992), suggests that maternal undernutrition may be a problem. Better assessment of women's nutrition is needed, as is research on the true prevalence of LBW and its causes.

Anthropometric data from very young infants could also give an indirect indication of whether children are born small. As illustrated in Figure 2-1, the DHS study showed that stunting was already common by 3 months of age. The data from Moy and others (1991a) found only small weight deficits at 1 month of age, whereas height deficits by that age were already substantial. However, height at birth among Zimbabwean newborns does not appear to have been studied by any investigators.

Micronutrient Deficiencies

An initial survey of major micronutrient deficiencies in Zimbabwe was contained in World Bank (1983); see Table 2-13.

Iodine Deficiency Disorders (IDD)

Goiter surveys conducted for different segments of the population in various parts of Zimbabwe since 1966 show that, at least in certain
areas, IDD was a problem, with goiter rates of 25 to 75 percent (Marangwanda 1989). A national survey (MOH Nutrition Unit 1989b) of schoolchildren in 1988 showed that total goiter rates (TGRs) for the provinces varied from 52 percent in Mash Central to 17 percent in Mat South, and the more severe visible goiter rates (VGRs) varied from 7 percent in Mash East to 0.7 percent in Mat South. Every province in the country had at least a mild level of endemic goiter among their schoolchildren. The district of Murewa was most affected, with a TGR of 78 percent and a VGR of 24 percent. The overall national rates were 44 percent TGR and 4 percent VGR, although the Ministry of Health and Child Welfare (MOH&CW) questioned these results and the reliability of the survey methodology. In 1990, a careful study was undertaken in Murewa to verify the data from the 1988 survey. It found lower, but still high, goiter prevalence rates of 65.1 percent TGR and 5.6 percent VGR, which were substantiated by urine iodine level measurements. These levels indicate that there is an urgent need for a prophylactic program. The discrepancy with the earlier national survey was attributed to observer variation, differences in iodine intake, or survey bias because of a correlation of absenteeism from school with IDD (Mutamba 1993).

Recent studies provide biochemical confirmation that the high levels of goiter seen in Zimbabwe are associated with IDD. Todd and Bourdoux (1991) showed that high goiter rates were correlated with low iodine intake as indicated by median urine iodine values of 1.0 mcg/dl in Wedza and 1.65 mcg/dl in Chiweshe. Todd and Sanders (1991) have confirmed that high goiter rates are also associated with altered levels of thyroid hormones. In schoolchildren in Chinamora, the 44 percent TGR and 4 percent VGR were associated with a 35 percent

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Table 2-13. Frequency of Cases of Micronutrient Deficiencies in Health Facilities, 1982

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Pellagra</th>
<th>Goiter</th>
<th>Vitamin A deficiency</th>
<th>Iron deficiency anemia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often</td>
<td>50</td>
<td>42</td>
<td>5</td>
<td>42</td>
</tr>
<tr>
<td>Sometimes</td>
<td>33</td>
<td>33</td>
<td>44</td>
<td>40</td>
</tr>
<tr>
<td>Rarely</td>
<td>12</td>
<td>22</td>
<td>49</td>
<td>16</td>
</tr>
<tr>
<td>Never</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
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<td>100</td>
</tr>
<tr>
<td>Total facilities surveyed</td>
<td>42</td>
<td>55</td>
<td>39</td>
<td>43</td>
</tr>
</tbody>
</table>

prevalence of abnormally high levels of thyroid-stimulating hormone (TSH). TSH levels were above normal (5 μU/l) in 66 of 188 subjects, of whom 39 were goitrous. Of the 36 with TSH levels above 7 μU/l, 19 had thyroxine levels below 60 nmol/l. In addition to this evidence for biochemical hypothyroidism, Thomas and Bwakura (1990) recently described a case of clinical hypothyroidism leading to pericardial effusion.

Goiter levels in Zimbabwe are higher in females and tend to increase with age. Monstrous goiters occur in some areas of the country. They can interfere with breathing, cause other complications—possibly a predisposition to thyroid cancer (Muguti and Mtandwa 1990)—and at times require surgical removal. This procedure is expensive and somewhat dangerous but is performed commonly in many hospitals in the country.

Hearing was not found to be impaired in one study of schoolchildren in a high-endemic area (Todd, Sanders, and Chimanyiwa 1988). Despite the high levels of goiter in Zimbabwe, cretinism of the myxedematous type (which does not include deaf-mutism) has rarely been documented (Todd, Arthur, and Keeley 1988; Todd, Sanders, and Chimanyiwa 1988; Todd and others 1989), and neurological cretinism has never been documented.

Todd, Sanders, and Nielson (n.d.) administered iodated oil or sterile water injections to 100 mildly iodine-deficient (median 85 μg I/g creatinine) schoolchildren in a matched, double-blind, randomized study. Two follow-up studies four months later and twenty months later noted a reduction in goiter size. No differences in cognitive or psychomotor function were detected after correction of this mild deficiency.

**Nutritional Anemia**

There have been few studies on the extent and causes of nutritional anemia in Zimbabwe (apparently none on folic acid and vitamin B12 deficiencies). Buchanan (1968), in a survey of 341 adult outpatients at Harare Hospital, found that 30 percent of men and 22 percent of women had anemia but that only 3 percent of the men and 8 percent of the women had iron deficiency anemia. Gillespie, Kevany, and Mason (1991) (apparently on the basis of information from a questionnaire sent to the Ministry of Health) state that in Masvingo in 1988 the prevalence of moderate anemia (<10 g Hb/dl) was 3 percent and that of severe anemia (< 7 Hb/dl) 1 percent. Neither maternal malnutrition nor anemia are listed by the MOH&CW among the factors that contributed to maternal mortality.

In 1985 Nemapare (1989) studied anemia in 500 pregnant and 300 lactating women selected from health centers in all districts of Masvingo Province. She reported that 50 percent had Hb levels below 10g/dl.
Anemia was also found in 30 percent of the 635 children from a few months to 4 years of age who accompanied these women.

Nemapare (ca. 1986) also studied anemia among 585 pregnant women (half in the third trimester and many with health complaints) who were attending six prenatal clinics in high-density suburbs of Harare and Chitungwiza. These women were not especially deprived. They had an average of 4.8 children each, a median income of just under Z$200 per month and had attended school for a median of about seven years. However, only 4 percent of these women had an Hb of more than 10g/dl. Ninety percent had 9–10g/dl and 6 percent had 6–9 g/dl. Blood slides were examined for every fourth woman, and 41 percent had microcytic hypochromic red blood cells. All of these women also had Hb of less than 10 g/dl.

**Vitamin A Deficiency**

MacManus (1968) found high levels of vitamin A deficiency in Matabeleland, particularly between May and December when cow’s milk and green leaves are unavailable and measles is more prevalent. However, severe xerophthalmia was almost never seen unless connected with measles or protein-energy malnutrition. World Bank (1983) cites several sources of evidence (mainly unpublished small-scale studies) that indicate vitamin A deficiency in various parts of the country. WHO AFRO (1989b) lists Zimbabwe as a country where vitamin A deficiency occurs but where it is not a public health problem. Clinicians continue to observe clinical eye signs of vitamin A deficiency, mainly in Matabeleland. A survey of vitamin A deficiency was conducted in Mat North in August 1991 (Provincial Medical Officer, Matabeleland North, 1991). About 6,000 children between 6 months and 6 years of age were weighed, measured, and examined for eye signs in fifty villages randomly chosen from all districts. A qualitative dietary survey was also conducted. The study confirms the WHO AFRO categorization in finding that vitamin A deficiency is not severe enough to be considered a public health problem.

**Other Micronutrient Deficiencies**

Earlier reports of high levels of pellagra, mainly in adults from August to November (Gelfand 1971), were confirmed in an informal survey of forty-two health centers, as shown in Table 2-13. However, pellagra has received so little attention since then that it is difficult to determine whether it is still a significant enough problem to require a survey, let alone whether corrective action is needed (for example, maize flour fortification or changes in milling practices). Published data on pell-
gra are generally unavailable, but there are occasional anecdotal reports of cases. As with vitamin A deficiency, pellagra is likely to increase during severe drought. For example, Dr. G. Shaw reports from the health center in Buhera that one-fifth of children and one-third of adults showed signs of pellagra during the 1991–92 drought (Sayagues 1993).

World Bank (1983) reviewed early studies that showed scattered deficiencies of vitamins C and D, sometimes occurring in mining areas. Nothing is known about levels of riboflavin and folic acid, but it is unlikely that there are serious deficiencies.

Diet-Related Chronic Diseases

Zimbabwe is undergoing a “nutrition transition,” a large shift in diet that is reflected in a shift in nutritional outcomes and disease patterns. Between 1980 and 1987 there was only a 1 percent increase in the number of deaths due to nutritional deficiency and a 32 percent decline in the number of deaths due to infective, parasitic, and respiratory diseases (CSO and MOH 1989). On the other hand, incidence of diet-related chronic diseases is increasing, and these diseases are beginning to cause substantial morbidity and mortality in Zimbabwe. Concern has also been expressed about obesity in urban infants (Mathe, Matovu, and Mossop 1985).

Diet-related chronic diseases include heart and circulatory diseases, cancer of the liver and stomach, diabetes, chronic liver diseases and cirrhosis, ulcer of the stomach and duodenum, and dental problems. Between 1980 and 1987, there was a 36 percent increase in the number of deaths from cancer of the liver and stomach, a 13 percent increase in deaths from diseases of the circulatory system, a 35 percent increase in deaths from diabetes, and a 43 percent increase in the relatively small number of deaths due to ulcers. In 1986, more than 30 percent of all reported deaths in people age 45 and over were due to cardiovascular diseases.

The prevalence of hypertension is also increasing. A 1986 survey found that 24 percent of 200 adults had a diastolic blood pressure reading of more than 90 mm Hg (Bassett and others 1990). In recent years, hypertension and dental problems have been two of the top ten health problems of people age 5 and over.

Treatment of most degenerative diseases is much more costly than treatment of infectious diseases. Thus, the nutrition transition could greatly increase the strain on health care resources and divert funds from preventive programs. Changes in eating habits need to be promoted vigorously. This could be highly cost-effective and could increase disability-free, healthful life.
Mortality and Morbidity among Young Children

At Independence, the infant mortality rate (IMR) was 17 for every 1,000 live births (LB) for whites and 120 for every 1,000 for the black majority. There was a 1:3.5:10 ratio in IMR between the whites, urban blacks, and rural blacks (Sanders and Davies 1988b). The 1988 DHS (CSO and Institute for Resource Development/Macro Systems 1989) estimates that mortality rates among young children in Zimbabwe declined substantially (see Table 2-14).

The direct estimate for infant mortality from preliminary 1987 demographic survey data is 48 for every 1,000 live births, but the Brass method gives a figure of 81 for every 1,000. The CSO considers the latter more accurate (CSO 1991), a fact that suggests the DHS data cited in Table 2-14 are also underestimates. Lower levels of child mortality are found among mothers with higher education and longer birth intervals, and in urban settings.

Nutrition is correlated with mortality, especially young child mortality (1 to 4 years). According to MOH data summarized by Loewenson (1990), infant mortality (deaths under 1 year of age) resulting from malnutrition decreased from 3 percent of deaths in 1980 to 2 percent in 1987. In 1985, malnutrition was the third largest cause of infant mortality; by 1988 it was the primary cause (MOH 1990b). This suggests that health sector efforts to control infectious diseases were well ahead of efforts to control malnutrition. Even in hospitals, fatality rates for malnutrition cases continue to be high. The average case fatality rate for malnutrition nationally is 7.6 percent for infants under 1 year of age; Masvingo, at 16.3 percent, has by far the worst rate (Mason 1990).

In the case of mortality for 1-to-4-year-olds, nutritional deficiencies caused 27 percent of deaths in 1983 and 26 percent in 1987, although the number declined from 862 in 1983 to 571 in 1987. (The decline in measles deaths from 522 in 1980 to 16 in 1989 was the main achievement during this period.) In 1989, malnutrition still caused 360 deaths, by far the largest reported cause of death in this age group. In second place was respiratory infection, which caused 135 deaths (MOH 1990b).
Nationally, the average case fatality rate for malnutrition in the 1-to-4-year age group was 10 percent compared with 3.8 percent for diarrhea, 2.1 percent for measles, and 2.0 percent for acute respiratory infections. Again, Masvingo, with 25.8 percent, was by far the worst off.

Malnutrition was responsible for 3.5 percent of outpatient attendances in 1987, 3.3 percent in 1988, and 2.1 percent in 1989, the seventh highest category in each year. Numbers have fluctuated from about 80,000 in 1987 to 106,000 in 1988 to 84,000 in 1989 (MOH 1990b). Hospital stays for malnutrition are longer than for most other diseases, and this imposes a large economic burden on hospitals and families.

Notes

1. About half the children were measured at home and half at health facilities. There was no difference between the two groups.

2. Of 3,098 eligible children, according to the probability sample drawn, data were obtained and analyzed for only 2,485. Nearly 60 percent of children who were missed were not at home and another 5 percent were sick. Children were excluded if their mother was dead or institutionalized. Missed children were more likely to be older, to be from urban areas, and to have mothers with a secondary education. Thus there is a risk that the DHS data somewhat overestimate the prevalence of growth retardation in Zimbabwean under-fives.

3. Z-scores are simply standard deviation scores. At +1SD, Z = +1.

4. Standard deviations are usually calculated around a mean, but the NCHS standard deviations are calculated separately for children above and below the median.

5. This is because children tend to follow the “channel” of growth they have reached during active growth retardation. A “normal” child growing at the third-percentile rate, for example, continues to “lose ground” compared with one growing at the fiftieth-percentile rate. In this sense some authors such as Moy and others (1991a) are correct in stating that deterioration in growth velocity continues.

6. The sample was complete for infants of this age at one moment in time in seven farm compounds (N = 151). Then a sample of 53 infants born during the next four months was added, so the sample was biased in age distribution toward younger infants. This in turn means that measurements reported for older ages (22–30 months, especially) are based on much smaller sample sizes, probably less than 50 each month. Overall an average of 94 infants was measured each month.

7. This paper is an unpublished draft focusing on econometric analyses. The curves presented in Figure 3-2 in the paper are congruent with our own in Figures 2-1 and 3-2. Nevertheless, further such analyses must be done before we can be certain that levels of stunting have declined this dramatically in Zimbabwe. For readers who would like to obtain a copy of this paper, the author’s address is: Duncan Thomas, Department of Economics, Box 1987, Yale Station, New Haven, CT 06520, USA; or Rand Corporation, Box 2138, Santa Monica, CA 90407-2138.
8. Kinsey followed up the same households over a ten-year period. During each of three rounds or surveys, he conducted anthropometry on children under 5 years old. Thus, in most cases, the children's weights in each round were different, even though they came from the same households.

9. At this age, trends are less affected (or, more accurately, less “buffered”) by breastfeeding or by the mother's knowledge about and time for infant feeding. Thus the relative role of household food security will be greater in this age group than among younger infants.

10. Svedberg (1988) reviewed fifty data sets from twenty Sub-Saharan African countries and found that, with the exception of Nigeria, boys have higher mortality rates and worse anthropometric measurements. He hypothesizes that this is because girls are more involved in food production and therefore have preferential access to family food. Alderman (1989) also found higher rates of malnutrition among boys in Ghana.

11. Of course, low birthweight is associated in its own right with health problems for a child. Mazur and Sanders (1988) found that birthweight correlated with levels of young child wasting and underweight. In Mat South, small for date was reported as the major cause of neonatal death (MOH 1987a).

12. Parity of the mother means the number of children born to her.

13. Even the worst areas had only 3.4 percent LBW, suggesting that screenings and referrals function efficiently in the Harare area.

14. Iodine deficiency disorders (IDD) cause a range of physical, motor, and learning problems; miscarriages; and cretinism (which causes dwarfism, deafness, and mental retardation). Iodine deficiency is found in areas with soils deficient in iodine, often in mountainous areas. In such areas, a high proportion of the population develops goiter, an enlargement of the thyroid gland on the front of the neck. Some also develop hypothyroidism, which may impair mental function, school performance, and work capacity. This has enormous implications for development in the country.

15. An earlier report by Todd, Sanders, and Chimanyiwa (1988) of higher urine iodine levels in a nearby area used a method now known to yield an overestimate.

16. In none of the reports and proposals submitted to the MOH have Nemapare's data been properly presented. Those unpublished reports provided so far to the MOH were not written in a detailed or scientific manner, so caution to the point of doubt should be exercised in interpreting them.

17. Nutrient deficiencies, particularly vitamin A deficiency, reduce resistance to infection, especially among young children. Strong evidence has emerged in recent years that overcoming vitamin A deficiency, even when it is only mild to moderate, can greatly reduce infant mortality. Increased infant and young child mortality caused by all forms of malnutrition is a big hindrance to development. Each child who dies represents a large loss in family investment of money, time, and the mother's own nutritional stores. High mortality rates hinder the acceptance of modern attitudes toward family planning.

18. Clinical signs of vitamin A deficiency include dryness of the eye surface, Bitot's spots, and corneal scarring.
19. The “transition” concept is used to explain demographic changes when a country moves from a pattern of high fertility and high mortality to one of low fertility and low mortality. The change in epidemiology from a disease pattern of high prevalence of infectious diseases and malnutrition to one of high prevalence of chronic and degenerative diseases associated with lifestyle was first described by Omran in 1971. The correlated shifts in diet, nutrition, food and agricultural technology, food supply and choice, and sociological factors such as family structure and the role of women are elaborated by Barry Popkin (1992 preliminary draft, “The Nutrition Transition,” University of North Carolina, Chapel Hill).

20. Blood pressure (BP) readings were taken only once for each adult. BP can vary widely for any individual; more reliable data would include several BP readings, taken at different times, for each person surveyed.
3. Causes of Undernutrition

Lenneiye and Lue (1987) produced an annotated bibliography of some of the relevant literature. The UNICEF situation analyses (Government of Zimbabwe and UNICEF 1985; Loewenson 1990) are more comprehensive. Many of the findings in World Bank (1983) on the causes of growth failure still hold and are included in the summary here.

The conceptual framework in which causes of childhood malnutrition are often viewed is given in Figure 3-1. Underlying causes are divided into three categories and show the links between inadequate basic health services, insufficient household food security, inadequate child care and feeding, and malnutrition. Basic causes involve formal and informal institutions, the political, ideological, and economic structure, and political resources. Basic causes have an impact on the underlying causes. Poverty is common throughout the framework and will be discussed separately. Discussion of institutional issues is confined mainly to organizations that have been dealing with the country's nutrition problem. We begin with an overview of the geographic distribution of growth retardation.

Geographic Differences

Almost all studies that compare the nutrition of urban and rural preschool children find that urban children do better, even in high-density areas. The 1988 DHS survey found 14 percent stunting among urban under-fives compared with 34 percent in the rural sample (CSO and Institute for Resource Development/Macro Systems 1989). Figure 3-2 includes two of the three curves drawn in Figure 2-1, separated into rural and urban samples. (The shape of the curves is the same, although percentage of median is used rather than Z scores and the curves are smoothed by using six-month averages.) This shows that there is substantially more stunting in rural areas but not much wasting in either urban or rural areas. The surveillance data in Table 2-1 suggest that undernutrition in Bulawayo is worse than in the other two large cities. DHS data do not confirm this, however, which suggests that higher rates of stunting balance lower rates of wasting, with weight for age about the same in Bulawayo as in the other cities.

In the 1980 survey, the worst arm circumference measurements occurred in Mat South Province, with 51 percent less than 12.5 cm. Mas-
vingo was close behind with 49 percent and Mat North next with 44 percent. Best off were Manicaland with 0 percent and Mash Central with 6 percent.

Figure 3-3 illustrates the provincial distribution of stunting, comparing survey data from 1985 and 1988. It seems that improvements occurred in all but two provinces: Mash East, the best-off, and Mat North, where there was actually an increase in stunting during the period. These data identify Masvingo as by far the worst-off province. The nutrition surveillance data, based on weight for age rather than height for age (Figure 3-4 and Table 2-1), show Mat North as the worst off for the proportion of infants below the third percentile of weight for age.
Poverty

At Independence, there was a problem of poverty among blacks, especially in rural areas. Poverty remains largely a rural phenomenon in Zimbabwe, with 90 percent of the poor in communal or resettlement areas (Stenflo 1992). Poor farmers have difficulty escaping the cycle of poverty even if they are healthy and well-nourished enough to work hard all year because they tend to have poorer land and less access to credit and lack sufficient draft animals (Rukuni 1985). Household food security (defined below) cannot be separated from poverty. Malnutrition among the poor may be related to household food security and access to health care. Those with adequate funds—for example, the larger commercial farmers—have access to food and to adequate health care in virtually all circumstances.2
Average real incomes in Zimbabwe increased substantially in 1981-82. Minimum wages were established, food subsidies were introduced, land resettlement began, and there was investment in health, education, and water development. Drought and international recession, however, led to a decreasing per capita gross national product in 1982 and 1983. After 1982, wages decreased to the levels at Independence and remained at those levels in real terms until 1988 (Loewenson 1990). Overall private consumption fell from 1979 to 1986 (Loewenson 1989). Income distribution has not become less skewed in Zimbabwe, which has one of the most unequal income distributions in Africa (Moyo, Loewenson, and Moyo 1985). Half of all households earn 90 percent of all income (Stenflo 1992, using the CSO Income, Consumption and Expenditure Survey of 1990-91 as a source).

Structural problems in the economy, including high levels of inflation and government deficits, already existed before Independence. In

Figure 3-3. Provincial Distribution of Height-for-Age Malnutrition, 1985 and 1988

Percentage

![Bar chart showing provincial distribution of height-for-age malnutrition in 1985 and 1988.]

Location:
1. Manicaland
2. Mashonaland Central
3. Mashonaland East
4. Mashonaland West
5. Masvingo
6. Matabeleland North
7. Matabeleland South
8. Midlands

Source: Ministry of Health, national surveys.
late 1982, the government, under the stimulus of an IMF standby credit, began to implement a series of economic stabilization and adjustment measures. These continue today and include devaluation of the Zimbabwe dollar, attempts to restrict government spending, and removal of subsidies. Davies and Sanders (1987) argue that these measures have wide-ranging effects on much of the population because they lead to price increases and to cuts in government services.

Families in all regions of Zimbabwe make a living from many sources, although subsistence and market agriculture predominate, supplying 65 to 80 percent of income in a recent study by Stack and Chopak (1990). The informal sector is pervasive, and data on it are difficult to

Figure 3-4. Provincial Distribution of Weight-for-Age Malnutrition, 1989 and 1990

<table>
<thead>
<tr>
<th>Location</th>
<th>1. Manicaland</th>
<th>7. Matabeleland South</th>
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<tbody>
<tr>
<td></td>
<td>2. Mashonaland Central</td>
<td>8. Midlands</td>
</tr>
<tr>
<td></td>
<td>4. Mashonaland West</td>
<td>10. Chitungwiza</td>
</tr>
<tr>
<td></td>
<td>5. Masvingo</td>
<td>11. Harare</td>
</tr>
<tr>
<td></td>
<td>6. Matabeleland North</td>
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</table>

Source: Ministry of Health, NHIS.
obtain. In the formal employment sector, Loewenson (1989) estimates that the proportion of wage earners below the poverty line was 40 percent in 1982 and 1987 but fluctuated during that period. Formal estimates of unemployment range from 10 to 20 percent but are probably an underestimate. Formal sector employment has increased by about 1 percent annually, but population growth has been around 3 percent.

**Links with Malnutrition**

Nutrition problems in Zimbabwe can be partly blamed on poor soil and a lack of rainfall in much of the country, but a large part of the blame must be placed on man-made factors. Many years were required to repair the harm done to nutrition during the War of Independence because the Rhodesian regime used food as a weapon, creating "protected villages," destroying food stores, and killing draft animals to reduce guerrilla fighters' access to food (Sanders 1982).

Malnutrition is higher in households headed by females, in those without remittances from workers in the urban and formal sectors, in those without land, and in those without livestock (Loewenson 1990). This points up the relationship between poverty and malnutrition. A detailed study of the association between socioeconomic status and nutritional status (using anthropometric indicators) was conducted on a sample of 277 children under 5 in 179 households (Mazur and Sanders 1988). The study site was the new and rapidly expanding periurban Seke section of Chitungwiza Township south of Harare. A systematic sample was taken during the 1985 rainy season from a small area that contained many resettled squatters. It found better growth in children whose fathers had higher-status occupations. Thomas (1990) found generally positive associations in the DHS data between ownership of assets and nutritional status. In multivariate analyses, both Mazur and Sanders (1988) and Thomas (1990) found positive correlations between young child growth and education of both parents, although the relationships were not always straightforward (that is, they depended on what variables were looked at; sometimes the relationship was reversed for some subgroups).

Ferro-Luzzi, Pastore, and Choto (1992) related height and weight in adults to an index of socioeconomic status and to educational attainment. Richer women weighed more than poorer ones and had a higher BMI but were no taller. There was no significant correlation between women's BMI and education. Men with more than five years of schooling were taller and heavier than other men, but the differences were not significant, and there was no difference in BMI.

The three major underlying causes of malnutrition—ineffective basic health services and unhealthy environment; insufficient household food security; and inadequate maternal and child care (as illustrated in Figure 3-1)—are discussed next.
Inadequate Basic Health Services
and an Unhealthy Environment

Disease contributes to growth failure in several ways. A sick child usually requires more food because of the needs caused by fever and the higher losses from diarrhea. Yet intake is often reduced by loss of appetite. If a child has enough time for rehabilitation and an adequate diet, catch-up growth usually occurs. If not, malnutrition occurs gradually and puts the child at even greater risk of contracting new infections, creating a vicious cycle. Cross-sectional surveys tend to "capture" a certain proportion of children during acute growth failure from severe infections. Such children are categorized as "nutritionally wasted."

Causal Aspects

Mazur and Sanders (1988) found that children with more siblings or with a lower proportion of adults in the household had higher levels of malnutrition. The 277 children in Mazur and Sanders' sample had good vaccination coverage, but those who had contracted measles or whooping cough were more likely to be underweight or stunted. Wasting was also associated with having had diarrhea in the past two weeks and with crowded housing conditions.

Chisvo and Jayne (1991) found that the average under-five in Gokwe had suffered diarrhea for nine days in the past year if the child's height for age was more than -2SD. For those with -2SD to -3SD, the average was fifteen days, and for those with a height for age of less than -3SD, it was sixty-six days. In turn, a multiple regression model showed that absence of a latrine was associated with sixteen more days of diarrhea than where there was a latrine during the previous year, and "excessive drinking by the parents" (not defined) was associated with sixty-four extra days.

Short intervals between births are also associated with higher levels of malnutrition. Allaart (1985) believed that "successive (close) pregnancies" were the major cause of malnutrition in rural Zimbabwe. She listed as other important causes parasitic and infectious diseases, lack of care within broken families or by unmarried or teenage mothers who leave their children with the grandmother, and use of powdered milk to feed an infant. She felt that food taboos played no role and that a major hindrance to increasing the frequency of feeding was the time required for women to collect water and firewood.

Progress

In 1980–81, the average per capita annual expenditure on private sector health care plans was Z$144, compared with Z$31 for urban public
health care services and Z$4 for the rural population (Sanders and Davies 1988b). Many improvements in health care for the poorer segments of society have been introduced since 1980 as the government adopted and began to implement vigorously the Primary Health Care strategy for health care delivery. Health care was made free for those earning less than Z$150 per month, the majority of the population (Davies and Sanders 1987). Although government spending on health care has risen or fallen according to the prevailing economic climate (for example, a 47 percent increase in 1981–82 was followed by a 9 percent decrease the following year), access to modern health facilities has expanded dramatically in Zimbabwe since Independence. By early 1987, 274 new rural health centers had been built and 7,000 village health workers had been trained. Rural health infrastructure has improved further since then, with more clinics being built and district hospitals being built or upgraded. All urban families and 62 percent of rural families have access to health care facilities (in less than one hour by public transport; UNICEF 1990a).

The proportion of the health budget spent on preventive services increased from 6.7 to 14 percent soon after Independence and has remained at the higher level. Health sector programs for improved management of diarrhea and acute respiratory infections, in the home and at primary health care levels, have been vigorously pursued. There has been an increase in the availability of essential drugs; vaccination coverage increased from 25 percent fully immunized in 1983 to 80 percent in 1988 (MOH 1990b); and the percentage of outpatient attendance for diarrhea declined from 33 percent in 1980 to less than 10 percent in 1988 (UNICEF 1990a).

Effective promotion of the use of sugar-salt solution may account for much of the reduction in diarrhea-related fatalities, from 1,226 in 1979 to 886 in 1987. Much of the population in Zimbabwe is protected from malaria and other tropical diseases by living at high altitudes, and people who live in dry areas are protected from some parasitic diseases.

Contraceptive use in Zimbabwe is among the highest in Africa south of the Sahara. Usage increased rapidly in the late 1980s, and birthrates have declined rapidly (Loewenson 1990). The 1991 MCH/FP survey of 2,263 women found that 72 percent had used contraception at some time and that 48 percent were using it at the time of the survey. In a sample of 179 urban households with children under 5 in 1985, Mazur and Sanders (1988) found an average birth space of thirty months.

Access to sanitary facilities (such as Blair toilets) has also expanded substantially in rural areas. By 1984, 35 percent of the population in the communal areas had access to protected water sources in the wet season and 42 percent in the dry season. Approximately 15 percent of rural households had access to adequate sanitary facilities. Soap was present in 82 percent of communal households and hand-washing is widely practiced before meals (Government of Zimbabwe and UNICEF 1985).
Insufficient Household Food Security

"Household food security" is the continuous availability of food for the household. It is ensured by adequate purchasing power and well-functioning markets for food and through adequate household capability to grow, store, and process needed food. The distinction between household-level and national-level food security is particularly important in Zimbabwe. In one global cross-country comparison of food security, Zimbabwe is ranked fifty-eighth from worst on a National Food Self-Reliance Index but much more poorly—thirty-ninth from worst—on a Household Food Access Index (Galloway 1991).

Access to food is severely constrained at times in many parts of Zimbabwe. In most years, households in at least some parts of the country are short of food between November and March. It is estimated that an average of about one-quarter of rural farming families run out of food stocks before each harvest (National Steering Committee on Food and Nutrition 1990). In an April 1990 study of households in three communal areas in natural regions (NRs) III, IV, and V, 38 percent said that their grain stocks from production and carryover stocks had been depleted by December 1989 (Jayne and others 1990b). The mass media carry sporadic stories of individuals in isolated areas who, it is said, literally starve to death for lack of food, although these stories have not been corroborated when investigated.

Immediately after Independence, a massive food relief program was mounted, funded by the United Nations High Commission on Refugees and administered first by NGOs and later by the Department of Social Services. In the drought years of 1982–83, 1983–84, 1984–85, 1986–87, and 1991–92, large areas of the country lacked access to food through normal channels for several months at a time. From 1 million to 2 million people were registered as requiring drought relief during those years. In 1983–84, drought relief consumed slightly more than 2.3 percent of the entire government budget (Sanders and Davies 1988b), in 1992–93 about 5 percent (World Bank data).

Although it is difficult to report scientifically on levels of household food security, one valuable indicator is whether levels of food consumption (quality as well as quantity) are adequate over time. The following sections summarize the food consumption and related data that are available for Zimbabwe.

Food Consumption

Tables of nutritive values of Zimbabwean foods are available (Chitsiku 1989), but data on food consumption are rare. According to World Bank (1983), a 1981 Bindura study found that 97 percent of under-fives ate sadza (stiff maize porridge) and vegetable relish (sauce) twice per
day. Milk, eggs, and beans were never eaten by 65, 87, and 84 percent, respectively, of children on large-scale commercial farms (LSCFs), compared with 12, 9, and 16 percent, respectively, in the urban population. Meat was seldom eaten by either group, and less often by the rural group.

A food frequency study was conducted from December 28, 1987, to January 5, 1988, on 172 households selected randomly from eleven villages in the rural district of Mutambara. It was based on 24-hour recalls done on seven consecutive days. On average, three meals (including “casual meals”) were eaten each day. The foods consumed (as a proportion of the total meals) were cereals (84 percent), leafy vegetables (42 percent), dairy products (26 percent), animal products (21 percent), legumes (4 percent), and edible insects (3 percent).

The twenty most frequently consumed food items are listed in Table 3-1, which shows the substantial amount of food that is bought rather than grown (pumpkin leaves, beans, and mangoes were the only foods grown more often than purchased), the importance of several types of wild leaves, and the importance of refined wheat flour in the diet. Most meals included sadza made from roller meal (commercial maize meal). A large proportion of meals included tomato and cooking oil, sometimes combined with onions, beef, or both, and often with one of a wide variety of leafy vegetables. Care must be used in interpreting this table, however, because quantities are not given and many more food items were used than are mentioned. For example, six types of insect and nineteen types of leafy vegetable were recorded, and they were second in importance after cereals in the diet. Sterilized milk was used only in tea and in small quantities (Benhura and Chitsiku 1988, 1990).

Compared with earlier reports cited by Benhura and Chitsiku (1990), mainly from the 1950s, wild animals were consumed less, but consumption of insects remained high. This presumably reflects environmental changes—there are fewer wild animals but no fewer insects. Wild vegetables are usually only eaten when relishes are not available. Insects are still considered delicacies, but many are available only during short seasons. Earlier reports showed that oils were extracted from sesame and melon seeds and from peanuts, but knowledge of extraction methods is being lost as commercial cooking oils become widely available. Leftover sadza was used in the production of nonalcoholic fermented mahewu along with finger millet, but millet and sorghum are no longer used to make sadza as they were according to reports from the 1950s.

Benhura and Chitsiku say that the heavy use of commercial roller meal may reflect the depletion of private stocks as a result of poor rainfall in previous years. High consumption levels of roller meal are also undoubtedly attributable to its subsidized price. Although increased use of such refined food is a concern (because of, for example, in-
Table 3-1. Most Frequently Consumed Food Items, Selected Rural Households, Mutambara District

<table>
<thead>
<tr>
<th>Food item, ranked by frequency of consumption</th>
<th>Number of householdsa</th>
<th>Percentage of meals in which food itemb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consuming</td>
<td>Growing</td>
</tr>
<tr>
<td>1 White flour</td>
<td>162</td>
<td>0</td>
</tr>
<tr>
<td>2 Tomatoes</td>
<td>161</td>
<td>22</td>
</tr>
<tr>
<td>3 Roller meal</td>
<td>158</td>
<td>0</td>
</tr>
<tr>
<td>4 Tea</td>
<td>156</td>
<td>0</td>
</tr>
<tr>
<td>5 Cooking oil</td>
<td>153</td>
<td>0</td>
</tr>
<tr>
<td>6 Sterilized milk</td>
<td>145</td>
<td>0</td>
</tr>
<tr>
<td>7 Covo</td>
<td>135</td>
<td>22</td>
</tr>
<tr>
<td>8 Beef</td>
<td>112</td>
<td>0</td>
</tr>
<tr>
<td>9 Cabbage</td>
<td>109</td>
<td>16</td>
</tr>
<tr>
<td>10 Margarine</td>
<td>102</td>
<td>0</td>
</tr>
<tr>
<td>11 Pumpkin leaves</td>
<td>100</td>
<td>172</td>
</tr>
<tr>
<td>12 Onions</td>
<td>93</td>
<td>22</td>
</tr>
<tr>
<td>13 Fish (dried)</td>
<td>87</td>
<td>0</td>
</tr>
<tr>
<td>14 Dererec</td>
<td>59</td>
<td>Wild</td>
</tr>
<tr>
<td>15 Soured milk</td>
<td>56</td>
<td>0</td>
</tr>
<tr>
<td>16 Runuc</td>
<td>51</td>
<td>Wild</td>
</tr>
<tr>
<td>17 Eggs</td>
<td>50</td>
<td>69</td>
</tr>
<tr>
<td>18 Mangoes</td>
<td>47</td>
<td>157</td>
</tr>
<tr>
<td>19 Ndakupukauc</td>
<td>32</td>
<td>Wild</td>
</tr>
<tr>
<td>20 Dried beans</td>
<td>31</td>
<td>161</td>
</tr>
</tbody>
</table>

* a. Total number of households, 172.
* b. Total number of meals, 3,582.
  c. Wild food.


creased risk of pellagra), Benhura and Chitsiku (1990) believe that the wide variety of other foods still consumed helps to protect against nutrient deficiencies.

Data on food availability are less accurate than data on food consumption. These data, compiled by the Ministry of Agriculture and the Food and Agriculture Organization (FAO) until 1987, were discontinued because of staff shortages but may be resumed in the near future. Data to 1987 are presented in Table 3-2. They show a gradual increase
in the per capita availability of calories but a slight decline in the availability of protein in Zimbabwe since 1961–63. The proportion of calories coming from fat appears to have declined in 1987, returning to 1961–63 levels. At this aggregate level, protein is sufficient for requirements, but calorie levels are marginal. During this period, the proportion of calories from cereals decreased because of the increased availability of sugars and oils. The proportion of protein in cereals has increased slightly because of the decline in the availability of pulses.

Table 3-2. Average Food Availability in Zimbabwe, 1961–87.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories (kcal per capita per day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage from</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cereals</td>
<td>70.7</td>
<td>66.1</td>
<td>64.5</td>
<td>61.4</td>
<td>63.3</td>
</tr>
<tr>
<td>Roots and tubers</td>
<td>1.9</td>
<td>1.5</td>
<td>1.3</td>
<td>1.6</td>
<td>1.5</td>
</tr>
<tr>
<td>Sugars and honey</td>
<td>5.8</td>
<td>8.3</td>
<td>11.1</td>
<td>12.4</td>
<td>12.7</td>
</tr>
<tr>
<td>Pulses, nuts, and oilseeds</td>
<td>9.6</td>
<td>8.6</td>
<td>6.1</td>
<td>7.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>1.5</td>
<td>1.3</td>
<td>1.3</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Meats, fish, dairy products, and eggs</td>
<td>5.0</td>
<td>4.9</td>
<td>4.1</td>
<td>3.7</td>
<td>3.8</td>
</tr>
<tr>
<td>Oils and fats</td>
<td>2.5</td>
<td>5.8</td>
<td>7.3</td>
<td>8.0</td>
<td>7.1</td>
</tr>
<tr>
<td>Other</td>
<td>3.0</td>
<td>3.5</td>
<td>4.3</td>
<td>4.7</td>
<td>4.4</td>
</tr>
<tr>
<td>Protein (grams per capita per day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage from</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cereals</td>
<td>66.8</td>
<td>66.2</td>
<td>70.3</td>
<td>68.7</td>
<td>70.3</td>
</tr>
<tr>
<td>Roots and tubers</td>
<td>0.7</td>
<td>0.6</td>
<td>0.6</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Pulses, nuts, and oilseeds</td>
<td>16.1</td>
<td>15.0</td>
<td>13.2</td>
<td>15.6</td>
<td>14.3</td>
</tr>
<tr>
<td>Fruits and vegetables</td>
<td>1.7</td>
<td>1.6</td>
<td>1.7</td>
<td>1.6</td>
<td>1.5</td>
</tr>
<tr>
<td>Meat, fish, dairy products, and eggs</td>
<td>13.3</td>
<td>15.0</td>
<td>13.2</td>
<td>12.1</td>
<td>12.1</td>
</tr>
<tr>
<td>Other</td>
<td>1.4</td>
<td>1.6</td>
<td>1.1</td>
<td>1.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Percentage calories from</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>11.6</td>
<td>11.0</td>
<td>10.1</td>
<td>9.8</td>
<td>10.0</td>
</tr>
<tr>
<td>Fat</td>
<td>16.3</td>
<td>18.6</td>
<td>17.4</td>
<td>18.0</td>
<td>16.5</td>
</tr>
</tbody>
</table>

and, since 1971–73, of animal foods. Availability of vegetables, fruits, and tubers has remained stable at fairly low levels.

Food Expenditure

Because there are so few data on food consumption, attention must focus on the variables that influence it. Amounts of food grown for own consumption are also difficult to measure, and data are equally lacking. Thus we will focus briefly on food prices and expenditure.

A large number of food prices were controlled or subsidized or both in Zimbabwe at independence. These controls and subsidies benefited mainly the urban consumer, were less well targeted to the poor than were other welfare approaches, and were a heavy burden on the Treasury. A policy of phasing them out gradually has been in place since 1983 (Davies 1988).

The proportion of household expenditure on food usually correlates negatively with income, controlling for own production. Loewenson (1990) cites comparative data on food expenditure from a 1985 national study (CSO 1988); see Table 3-3. It is difficult to draw many conclusions from the data in Table 3-3 because “percentage of consumption from own production” refers to total consumption, not only food consumption. Families working on large-scale commercial farms (LSCFs) may be at risk because they produce such a small amount of food. Families on small-scale commercial farms (SSCFs) are less at risk because they spend a low proportion of their income on food and produce more of their own. Urban families produce little and therefore must spend more of their income on food.

In 1990–91, 36 percent of monthly household expenditures in Zimbabwe were on food (Stenflo 1992). Those living on communal lands and in high-density urban areas spent close to this mean, those in resettlement areas spent 35 percent, and those in low-density urban areas spent only 28 percent (in keeping with their greater wealth). Home-produced food accounted for an average of 29 percent of income—51

### Table 3-3. Household Food Expenditure and Consumption in Zimbabwe, 1985

<table>
<thead>
<tr>
<th>Percentage of household expenditure spent on food</th>
<th>LSCF</th>
<th>SSCF</th>
<th>Resettlement</th>
<th>Communal</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>15</td>
<td>20</td>
<td>22</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of consumption from own production</th>
<th>LSCF</th>
<th>SSCF</th>
<th>Resettlement</th>
<th>Communal</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>31</td>
<td>28</td>
<td>26</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

percent for communal areas, 70 percent for resettlement areas, 11 percent for other rural areas, and only 3 percent for urban areas.

For the lowest income quartile in one communal area, 40 percent of total household expenditure went for grain and grain meal purchases alone during a year with good rainfall. This suggests that the risk of food shortage is quite high among the lowest income groups (Chisvo and others 1991). In a sample of 179 households in urban Chitungwiza in 1985, Mazur and Sanders (1988) calculated that household food expenditure during the preharvest season was about 40 percent of income. Per capita monthly family food expenditure was negatively correlated with height for age and weight for age in a multivariate analysis of variance.

Causal Factors

LAND QUALITY AND LAND TENURE. At Independence, the rural areas of Zimbabwe were almost equally divided between large commercial agricultural areas, which were typically white-owned, and communal areas inhabited by black smallholders, although there were about 100 times as many black farmers as white (Sanders 1982). Since 1980, some redistribution has taken place, reducing the large-scale commercial land (LSCL) from 42 to 29 percent of the total. About 45 percent of the better land (NRS I, II, and III) is still in the LSCF areas owned mainly by white Zimbabweans. About 3 million hectares of this land are underused (Stoneman 1988). Three million of Zimbabwe's people (approximately 30 percent) live in the drier communal areas. Some 60 percent of the communal population live in NRS IV and V. Decades of overcrowding in many communal areas have resulted in advanced environmental degradation, making agricultural progress even more difficult.

When asked whether food was scarce most years, 57 percent of households in NR V said it was, compared with 14 percent in NR II (UNICEF 1990b). In two communal areas in NRS III-V, 59 percent of farm households surveyed in a good harvest year had not produced enough food for family requirements, compared with 79 percent in the previous drought year (Chopak 1989). In NRS IV and V, low productivity also means that there are few opportunities for additional employment. That malnutrition is not worse under such conditions is partly attributable to temporary labor, migration and remittances, and “contributions from relatives.” Government drought relief and food distribution programs continue to be necessary to prevent periodic hunger and starvation.

After Independence a two-pronged government policy was put in place to redress these problems (Amin 1990). First, agricultural services to communal areas were extended to “technify” agriculture in the
peasant subsector. Second, land was redistributed. Redistribution of the best agricultural land to the large number of rural people with no land or small, poor-quality plots, however, has progressed slowly since Independence. Although some 52,000 families had been settled on 2.7 million hectares of land by the end of 1987, this was only 14 percent of the households that needed land in 1980. The pace of resettlement slowed from 7,000 households per year to less than 4,000 in the second half of the 1980s (Loewenson 1990).

The slow pace of resettlement was due in part to the high cost of purchasing land. Under the Lancaster House Agreement, the government agreed to buy on a "willing seller-willing buyer" basis, but the reluctance of white farmers to sell prime land affected the quality of resettled land. In addition, the relative success of other aspects of the government's agricultural policy may have reduced the felt need for land redistribution. Rukuni (personal communication 1991) points out that "land is only one of many resources necessary for surplus production. One could recast the whole issue of access to food in terms of jobs (agricultural or nonagricultural)."

Although important, land redistribution provides no simple solution to the problem of hunger and malnutrition in Zimbabwe. Resettlement may have actually led to household food insecurity when farmers were put on land they were not familiar with or when fishermen or other nonfarmers were resettled. The danger of viewing resettlement as simply providing land is illustrated in studies such as Kinsey's (1992), summarized above, which showed that the nutrition of young children in these areas has not shown the same improvement over the past decade as that of other groups. They suffer from far higher levels of acute malnutrition or wasting than other groups in the country (although stunting is not worse and may be slightly better). In the schemes Kinsey studied, individuals from many areas and social backgrounds were resettled together, and it took years to put in place many of the infrastructural necessities. Other needs such as clean water supplies, clinics, and shops are still inadequate or only accessible at great distances.

Amin (1990) recommended that land redistribution be accompanied by an integrated agrarian reform program that included increased access to nonland productive resources, agricultural support service schemes, and the formation of democratically organized peasant associations. Amin recommended further that female-headed households and households with migrant workers not be excluded from resettlement schemes.

After the Lancaster House Agreement expired, a new Land Acquisition Bill was passed and is in the process of being amended. Although the government is committed to continuing the resettlement effort, the form it will take is unclear. New guidelines are being considered, in-
cluding choosing candidates for resettlement on the basis of need and of demonstrated expertise in farming—those who have degrees (only about 100 per year graduate from Zimbabwe University) or are certified "master farmers" (through a Ministry of Agriculture program that has covered some 70,000 farmers). This procedure may avoid some of the problems encountered in previous resettlement efforts and help to ensure high agricultural productivity on the resettled lands. Some people are concerned, however, that it will simply lead to redistribution from one well-off group to another.

The current plan is to settle about 5,000 families per year and to provide them with better infrastructure. It will follow the model A family-type scheme because the model B, or cooperative resettlement, scheme was unsuccessful. Model C, in which family land surrounded a core of government land, was also a failure and will not be continued. The communal land vacated by farmers who are resettled will be redistributed among the remaining farmers in the communal lands to help overcome overcrowding and to decrease pressure on the land in these areas (Enochs 1992).

**CHOICE OF CROPS GROWN.** Household food security might be improved in Zimbabwe if more of the so-called "small" or "coarse" grains such as sorghum and millet were grown. These grains can be grown on poorer soils and are more drought-resistant. They can also be stored for two to three years, compared with six to twelve months for maize. Small grains used to be staple foods in Zimbabwe, but production has decreased in recent decades because of the increasing popularity of maize (Mudimu and others 1988).

Maize has increased in popularity for several reasons. In non-drought years, maize has a much higher yield than small grains, even on poor-quality land, and is less time-consuming to process. Maize is also more palatable than small grains when eaten alone or with salt only—a quality that became important in the 1920s when shortages of relishes occurred more and more frequently because of the increased use of land for cattle-raising by white settlers (Shopo 1985). Another factor that favors maize production is the increase in the number of mills for grinding. Until recently, there was no interest in breeding improved sorghum or millet or in promoting them in smallholder farming areas. This is changing (Rohrbach and others 1990), but it will take time to convince farmers to switch and will require demonstrations in dry years.

Another negative aspect of growing small grains is the extra time required for their home processing as against that necessary for maize. Increased migration of males to urban areas has led to a labor shortage in communal areas. Half of rural households are headed by women (Loewenson 1990). If agricultural extension had concerned itself more
with female farmers (only 27 percent of agricultural extension agents are women), better small-scale processing technology for small grains might have been developed and might have counteracted the trend toward maize. In NRS IV and V, per capita sales of small grains to the Grain Marketing Board (GMB) were about 30 kilograms from 1986 to 1988 (Jayne and others 1990b), but even within these NRS production levels are highly skewed, favoring a narrow segment of well-equipped farmers. For this reason, and because demand for small grains is already inadequate, prices alone cannot be used to stimulate increased production. (Prices are now too low to offer a sufficient incentive.)

Since the 1920s, when maize began to overtake millet and sorghum as the staple grain, there has been a dynamic balance in Zimbabwe between production of maize, tobacco, and cotton (Shopo 1985). A complex set of factors has affected relative levels of production, but producer prices have been a major factor. Poor households that invest heavily in nonfood crops are undoubtedly risking their food security. The security of food crops can be enhanced by good management of grain storage and other traditional mechanisms, such as cattle-raising. With nonfood crops, good management must focus on storage and careful use of lump-sum cash payments. Otherwise, even high and stable producer prices will fail to ensure household food security. The major reasons for heightened concern among policymakers on this issue are (1) the larger influence of world markets on local prices, which increases the risk of rapid changes in relative prices and the difficulty of small farmers in reacting to this; and (2) the increasing number of smaller farmers who are switching from grains to tobacco and cotton, which eliminates any possibility of their falling back on their own stocks of maize (personal communication from Dr. T. Stamps, Minister of Health, Zimbabwe, November 1991).9

GRAIN MARKETING. By African standards, agriculture has been a success story in Zimbabwe, which in many years is a net food exporter. During the 1980s, production of the staple cereal, maize, fell short of national needs only in the drought years of 1982–83 and 1983–84. Maize production by small farmers in 1988 was 600,000 tons, 7.5 times higher than the highest level before Independence (Morna 1989). The marketed grain output from the smallholder sector trebled during the 1980s (Chisvo and others 1991). This gain was achieved by assuring farmers a reasonable price for their crops, providing easier access to markets (for example, through depots in communal areas), increasing access to credit and inputs, and strengthening the agricultural extension service. The volume of credit from the Agricultural Finance Corporation increased from Z$1.6 million in 1979–80 to Z$57 million in 1986–87 (Mugabe 1989). Short-term loans had reached 95,176 communal farmers by December 1985.
The peak year for maize, however, was 1985, and production has been declining since (Jayne and Chisvo 1991). Jayne and others (1990b, p. 47) point out that “most smallholders appear unable to respond significantly to producer price incentives because of limited productive assets such as land, draft animals, nonfarm income to finance investments in improved technology, access to or willingness to accept credit, poor rural transport infrastructure, poor soil and erratic rainfall.” Credits were provided to only 15 percent of communal households, presumably mainly the better-off ones (Sanders and Davies 1988a). Jackson and Collier (1988) have shown that a small core of about 10 percent of the peasant farmers controls 40 to 60 percent of the marketed foods. Amin (1990) states that the wealthiest households in communal areas have benefited most from the small-farm development strategy.

Producer prices for maize in Zimbabwe have been gradually declining in real terms since 1981 (Jayne and Chisvo 1991) and were by far the lowest in Southern Africa by 1991 (Ziana/Business Herald 1991), but this has not resulted in lower consumer prices for maize meal. Jayne and others (1990b) suggest that one reason for this was that Zimbabwe made too few changes in the grain marketing system it inherited at Independence. Agricultural produce in Zimbabwe had always been sold almost exclusively through marketing boards or commissions, a system that was mainly concerned with moving rural surplus efficiently to regional storage and then to urban areas for sale or export. For maize, this had some advantages such as economies of scale and low storage losses (except where transport bottlenecks led to high losses before movement to silos). But the system was based on an assumption that rural areas were self-sufficient. Grain could legally be sold only to the GMB or its agents, and movement of maize was restricted. The result was that a communal area (CA) that produced a surplus could not sell it to a maize-deficit area. This inhibited the development of rural food markets, resulting in few selling locations and inadequate transport. GMB collection centers were allowed only to buy grain and ship it to Harare and other urban areas for processing but were not allowed to sell it locally. Thus, during times of drought, public money and scarce transport resources were required to truck some of the grain back to rural areas, sometimes as publicly purchased drought relief. “For example, the annual volume of drought relief maize distributed to communal areas in Masvingo Province was 86 and 58 percent of total GMB maize intake from all communal areas in the province during the 1986–87 and 1987–88 marketing years, respectively” (Jayne and others 1990b, p. 52).

There are now signs of increasing flexibility in grain marketing. An important change recently announced by the government (April 1992) allows maize to be bought and sold freely in NRS IV and V, with the
GMB providing a floor price. Additional changes in the grain marketing and pricing system, announced in July 1993, were aimed at improving the efficiency of marketing mechanisms, increasing the role of the private sector in marketing and processing, and providing incentives for increased production, especially by small-scale farmers. Marketing monopolies of the parastatal boards and many price controls are to be abolished. Virtually all price and marketing controls on maize have been eliminated.

There are a number of potential nutritional benefits from liberalized grain marketing. At present, much grain is refined in urban mills to a flour that is more expensive, less nutritious, and less well liked than what could be processed in rural areas. Rural purchasers, who tend to be the poor and disadvantaged, pay 10 to 80 percent more than it should cost under more flexible systems of marketing. Whereas only 15 percent of households in NR II are net buyers of grain, almost all households in NR V are net buyers. It has been estimated that the development of intrarural trade will increase real incomes among poor (lowest income quartile) grain-deficit households by 33 percent if they run out of their own grain supplies by September (several months before harvest)—as 25 percent of households did in one study in NRS IV and V. Reductions in the cost of grain will also increase consumption because, according to Jayne and others (1990b), consumers’ derived price elasticity of demand for grain is −1.23. (A 10 percent reduction in consumer maize prices would elicit a 12.3 percent increase in maize consumption.)

Overcoming the serious impediments to maize access and affordability that were exacerbated by the past grain marketing system will help to cushion vulnerable groups against the effects of other aspects of structural adjustment. To illustrate this, Jayne and others (1991) performed three econometric simulations. One illustrated the effects of elimination of the GMB subsidy (the GMB's selling price is increased to cover all costs of its domestic trading operations) combined with policy changes that would allow private informal traders to procure grain at GMB depots in unlimited amounts and deregulation of maize movements in the semiarid areas of the country. Despite the removal of the GMB subsidy, a 6 to 7 percent increase in rural maize consumption would occur, primarily in grain-deficit areas, and there would be a 12 to 14 percent increase in urban consumption, primarily among low-income groups. The latter would come about through increased availability of less expensive straight-run grain meal in periurban areas. However, some time will be required for the various policy changes and investments to take effect. For the short term, Jayne and Chisvo (1991) suggest that GMB subsidy elimination be linked to a short-term subsidy on straight-run maize meal, which would be targeted to protect the more vulnerable groups.10
CAUSES OF UNDERNUTRITION

In recent years, silos have been built to store surplus grain locally for distribution in times of drought. Although costly, this measure proved its worth in the severe drought of 1991–92. Distributing grain from the center to outlying areas afflicted with drought is enormously complicated and expensive. Decisions on how much grain to export and how much to store as a strategic reserve have been less successful. Given the enormous scale of the 1991–92 drought throughout Southern Africa, and the low level of its grain reserves, Zimbabwe had to scour the world in search of maize.

Link to Undernutrition

ACCESS TO LAND. Differences in levels of stunting among under-fives vary in ways that reflect socioeconomic factors as well as access to food. Stunting has generally been highest among families with the least access to and control over economic and land resources—workers in the LSCF areas (1985 national survey data; see Figure 3-5 and World Bank 1983). This level of stunting was attributable not only to poverty and restricted access to food but also to limited access to health care, education and other services, housing, and sanitation facilities. Communal and resettlement areas are also usually located on marginal land with poor productivity. By 1985, children in these areas suffered from stunting at nearly the same rates as LSCF children. Best off were those with relatively good-quality land—owners of SSCFs.

Thomas (1990) compared stunting and wasting in these groups using data from the 1988 DHS. Table 3-4 displays the results, reported as less than 90 percent height for age or 80 percent weight for height based on NCHS median values. (In the case of stunting, this is a more severe level of deficit than -2SD, and thus the proportions of children below that level are lower.) The numbers are small in some cells but nevertheless suggest two changes in ranking since 1985. Children living in resettlement schemes had become the worst off, and communal areas were no longer better off than the LSCF areas. SSCF areas continued to have far lower levels of malnutrition than all others, even urban areas. Wasting was actually slightly higher in urban than in most rural areas.

AGRICULTURAL PRODUCTIVITY. There is evidence that weight for age correlates with levels of agricultural productivity. A least-squares regression of per capita smallholder grain production per province on percentage of children under the third percentile in weight for age results in a negative coefficient statistically significant at the 0.1 level for 1988 and 1989 (Jayne and others 1990b). This analysis was extended to the district level using 1990 data by Jayne and others (1991) and yielded an $R^2$ of 0.21; the coefficient on per capita production was statistically significant at the 0.035 level.
DROUGHT. Chisvo (1991) states that there is no simple correlation between drought and nutrition in young children. He found malnutrition levels of 35 percent in the Zarova area of Gokwe District, compared with 11 percent in Gwave area, although rainfall characteristics were the same. Moreover, data from Kinsey’s sample show that even the 1991–92 drought was not associated with any increase in wasting. This is largely attributed to the governments’ food distribution program.

SEASONAL EFFECTS. World Bank (1983), citing a fourteen-year tabulation of monthly data on child hospitalization due to malnutrition in Gwanda District, found that November was the worst month and October the next worst. April and May were best, with April having 40 percent as many cases as November.
Table 3-4. Land Type and Nutrition Status, 1988

<table>
<thead>
<tr>
<th>Area</th>
<th>Number of observations</th>
<th>&lt; 90 percent height for age</th>
<th>&lt; 80 percent weight for height</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Zimbabwe</td>
<td>2,445</td>
<td>6.51</td>
<td>0.2</td>
</tr>
<tr>
<td>Communal farms</td>
<td>1,396</td>
<td>1,513.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Urban</td>
<td>584</td>
<td>0.2</td>
<td>1.0</td>
</tr>
<tr>
<td>LSCF</td>
<td>367</td>
<td>13.6</td>
<td>0.8</td>
</tr>
<tr>
<td>SSCF</td>
<td>23</td>
<td>4.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Resettlement</td>
<td>75</td>
<td>28.0</td>
<td>2.7</td>
</tr>
</tbody>
</table>

Source: Thomas 1990.

Moy and others (1991a) found no seasonal impact on anthropometric parameters in their longitudinal study of growth in farm worker areas. They hypothesize that this was because the families were not engaged in subsistence farming but were working for wages and were thus "immune" to harvest effects. The same authors found no seasonality in the incidence of diarrhea (Moy and others 1991b), presumably because boreholes were available and did not get contaminated during the rainy season.

Nutrition surveillance data for 1987–89, disaggregated to the province level, suggest that the proportion of children below the third percentile line on the growth chart shows quite different degrees of seasonal variation from year to year. Postharvest declines in proportions below the line vary from 10 to 30 percent of preharvest levels.

In the preharvest period people have difficulty obtaining access to food and suffer increased diarrheal disease as a result of the rainy season. Heavier work pressure on mothers' time is also associated with the rainy season. Moy and others (1991b) found that the highest levels of rain in Shamva District fell between December and February in 1987–88 and 1988–89. Women's workloads were heaviest between April and June and from September to November, just before and after the rains were heaviest.

Inadequate Maternal and Child Care

This category of underlying causes of malnutrition covers the way households use their access to food or to health services and includes the intrahousehold distribution of resources. This use is influenced by household knowledge, attitudes, and time allocation. Complex concepts are involved that have only recently begun to receive attention from researchers. So far, there is little evidence that intra-household
distribution of food in Zimbabwe is skewed in favor of any particular group on the basis of age or gender.

This category includes several social problems such as the increase in the number of orphans owing to the AIDS epidemic in Zimbabwe. Disruption in families is often mentioned as a cause of malnutrition. Such factors, even though they are hard to measure in studies, need to be addressed. The position of women in society requires particular attention in analyzing the impact of these factors on nutrition. For example, World Bank (1983) highlighted social problems as a major cause of kwashiorkor in Zimbabwe.

Position of Women in Zimbabwe

Households headed by women. Many rural households are headed by women because of male migration for employment. Batezat and Mwalo (1989) point out that this resulted from the expropriation of land by the early white settlers, which progressed to the point where the African population could no longer subsist on its own agricultural production. This, combined with the imposition of a hut tax for each adult male, forced men to sell their labor in the rapidly expanding modern sector. The authors cite a study showing that 235,000 of the approximately 780,000 peasant farming families used this split-family survival strategy at Independence.

Theisen (1975) cited data showing a 40 percent drop in crop yields when the male head of household was absent for more than nine months of the year. Rukuni (personal communication, 1991) believes that this is no longer true, stating that “net resources now move from urban to rural areas. There is evidence in Shumba and other studies of the mid-1980s that these households are doing better than those with a male present because it now pays more to remit fertilizers and other farm inputs than in the mid-1970s.” Of course the situation becomes critical for women if their husbands stop sending remittances. UNICEF (1985) cited data from a study in Gwanda showing that severe malnutrition was six times higher in such families than in those that received remittances.

Although the split-family survival strategy may put women and children under stress, their position may be better than in households in which the father is unemployed or underemployed. Adams (1991) points out that it is important, rather than focusing on “female-headed” households as such, to distinguish between those in which the female is alone because there is no male and those in which the male is away. Households with no male were “clearly inferior in terms of productive resources.” Thomas (1990) found that the DHS data show no reduction in anthropometric indicators of growth in de facto female-headed households.
STATUS OF WOMEN. Before colonization, men controlled the means and instruments of production in both Shona and Ndebele societies (Batezat and Mwalo 1989), and during the colonial period, the position of women was further weakened. For example, only men received training in modern agricultural methods because the contribution of women to agriculture was not recognized. Despite government efforts, improvements in the status of women since Independence have been limited to a very few areas such as the legal status of women and the availability of rural drinking water (Chinemana 1990). Women have less access to land, inputs, extension, credit, and income. Most household decisions are made by men; many women do not even have control over what they produce (Loewenson 1990).

Women tend to be employed as casual, seasonal laborers, receiving low wages and benefits. During seasons of high female workloads, attendance at health centers may not be possible, which contributes to worse health and nutrition during these seasons (Loewenson 1988). Adams (1991) cites data suggesting that children of mothers who were casual workers in Masvingo and Chipinge districts were more likely to be under the third percentile in weight for age than other children.

Zimbabwean men do only 27 percent of the farm labor, 38 percent of the livestock care, 19 percent of the fuel gathering and chopping, and 4 percent of the domestic tasks, including cooking, water collection, and child care (Johnson 1988). In one rural study, Mehretu and Mutambirwa (1990) focused on seven important routine household chores and found that women (and their daughters) do most of the walking and carrying and thus have the higher energy expenditure. Many of the trips needed for various activities were made by children. Of the rest, (husbands' data are in parentheses) wives made 62 percent (2 percent) of the trips needed for water collection, 57 percent (3 percent) for laundry, 63 percent (2 percent) for firewood, 29 percent (24 percent) for livestock watering and grazing, and 48 percent (25 percent) for visits to local and regional markets. The time spent by wives on these activities was, on average, 33 hours per week at an energy cost estimated to be 7,774 kcal a week.

Increased pressures on women's time have contributed to a reduction in the range of crops traditionally grown by women, particularly peanuts (Makombe, Bernsten, and Rohrback 1987) and other legumes. Because maize is less time-consuming to grow and is promoted by agricultural extension, and because families need the immediate cash that maize can help provide (partly for expenses such as school uniforms and books), other important contributions to the family diet may not be available much of the year. This is particularly important in regard to peanuts and other energy-rich foods that have long been promoted to mothers as complementary foods for young children. It is ironic that in a country with enough food overall and in which the nu-
trition education message has focused on energy-dense foods for young children, these foods simply may not be available much of the year for the 30 percent of under-fives who are stunted.

In a study of the social reasons for admission on hospital records, one-third of clinically malnourished children were from families with alcohol problems (World Bank 1983). Women are generally said to abuse alcohol less often than men, although World Bank (1983) found heavy beer-drinking among women as well as men.

World Bank (1983) cites several studies showing a positive correlation between a mother’s level of education and child nutrition. Stunting is more than twice as common among under-fives whose mothers have no education as it is among children whose mothers have secondary or higher education (36 percent as against 14 percent, according to the DHS, CSO, Ministry of Finance, and MOH 1989). Mazur and Sanders (1988) also found that secondary education for urban mothers was associated with less malnutrition, and this was apparently not as a result of its correlation with income, because mothers’ incomes did not have a clear effect. However, the children of women who worked full-time had more malnutrition than those whose mothers worked part-time. This suggests that the time pressures on women in full-time work may prevent them from providing enough care to their children to make up for the time away from them, despite the extra income. Many children in Zimbabwe are cared for much of the time by grandparents, although, again, this is not necessarily harmful to the child unless it is a young infant deprived of breast milk.

Chisvo and Jayne (1991) suggest that where agricultural productivity and employment opportunities are limited, “pressures on family members’ time in productive uses may be so severe as to reduce their ability to participate in child nutrition schemes. For example, of 94 children registered for supplemental feeding by a school in the Zarova area of Gokwe, households of only 35 of the children actually participated.” In the same area, travel times to the nearest health center were 9 to 10 hours. Growth retardation was higher than in other areas of Gokwe.

Chisvo and Jayne also found, in multiple regression analyses, that a distance of more than 2 kilometers to the nearest water source was associated with a 230-gram reduction in birthweight. This could be attributable to a combination of effects: longer distance to water requires more of the mother’s time, reducing her productivity; it uses more calories, reducing her nutritional status; and it results in less water for household hygiene (in some studies, quantity of water used is more strongly associated with diarrhea than is water quality).

If increased female education directly improves young child nutrition, improvements in both should become apparent as the present school-age generation matures. The number of children attending
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School more than tripled between 1979 and 1985 (Sanders and Davies 1988a). In 1987, 95 percent of both girls and boys between the ages of 10 and 14 attended school, although only 62 percent of girls attended school compared with 79 percent of boys age 15 to 19 (CSO 1991). Nevertheless, the fact that 14 percent of children are stunted, even those of women with higher education, suggests that specific nutrition education efforts and improvements in the status of women may be required in addition to improvements in education.

Research is needed to determine which messages are best communicated to women. The amount of time women have for childcare requires special attention. It may be necessary to promote technologies that save women's time and energy—for example, through increased availability of water for drinking and washing, fuel-saving stoves, and the production of low-cost fuels. In some settings, small-scale production of nutritious snacks from low-cost ingredients could benefit producers and consumers.

Infant-Feeding Practices

Infant-feeding practices deserve special attention, not because of a bias against infants in intrahousehold food allocation, but because of infants' dependence on the time, attention, knowledge, and skills of others, and their high nutrient requirements for growth. Whereas the nutrition of the whole family may suffer in times of special stress such as unemployment or drought, young children are also vulnerable during the first years of life to any lack of time or knowledge on the part of those who care for them. Too few feedings per day with food low in caloric density during the so-called weaning period is a common problem, presumably exacerbated when women are overburdened with work, cannot afford to buy special infant foods, fat, or sugar for use in infant foods, or have inadequate knowledge about infant feeding and hygiene.16


A thin gruel is commonly given during the first few days of life, and colostrum is said not to be given in some areas, although this has not been studied. The proportion of infants who receive no breast milk at all is very low in Zimbabwe—less than 2 percent in 1989—and 0.6 percent in 1991 (3.2 percent in Mash East). The duration of breastfeeding has remained stable, with mean values of 20 months in 1982, 18.5
months in 1989, and 19.2 months in 1991. However, 10 to 15 percent of Zimbabwean babies received breast milk for less than one year, and only about 10 percent in most studies received it for more than two years. More than 70 percent of breastfed infants in 1989 received breast milk on demand during the previous day, and an even greater percentage had slept at the breast the previous night (McMurray and Chimbwete 1991).

Older women breastfed for up to three months longer than younger ones, and rural women breastfed for up to three months longer than urban ones in some of the studies. Women who had completed secondary education breastfed five months less than women with no education in 1984, but in 1989 this difference was less than three months. (In some developing countries, breastfeeding rates are now increasing among well-educated women.) As in most other countries, formal employment had no effect on overall duration of breastfeeding in the 1984 study. But its impact on the duration of exclusive breastfeeding has not been measured. Work was given as the reason for the cessation of breastfeeding by only 6 percent of urban women in the 1982 study, 4 percent of periurban women in 1985 (Mazur and Sanders 1988), and 3.5 percent of all women in 1989 (McMurray and Chimbwete 1991).

Some women believe that diarrhea can be caused by “bad” breast milk, by having sex while still breastfeeding, or by continuing to breastfeed during a new pregnancy. In Chimanda, De Zoysa and others (1984) found that 17 of 110 households with whom diarrhea was discussed mentioned “bad” breast milk as a cause of diarrhea. However, this was mentioned by only a few households in three other rural areas. In several other studies, women stated that they stop breastfeeding when the infant gets diarrhea. This was the reason reported for cessation of breastfeeding by 9 percent of urban women and 12 percent of rural women in 1982 (MOH Nutrition Department 1982). Disease (mostly diarrhea) was given as the reason for stopping breastfeeding by 20 percent of mothers in a periurban area in 1985 (Mazur and Sanders 1988).

**EARLY, INAPPROPRIATE SUPPLEMENTS.** Exclusive breastfeeding should continue for four to six months. Water is not necessary (Almroth and Bidinger 1990) and is not desirable because it can be contaminated and because it reduces suckling and hence breast milk. Failure to breastfeed exclusively (and especially the use of bottle feeding) increases the infant’s exposure to pathogens at an age when the immune system is immature. High-priced infant formula may be overdiluted, as well.

Less than 10 percent of infants under 4 months of age in 1989 were exclusively breastfed. Another 40 percent were receiving breast milk plus water, and about half were receiving breast milk plus some other
supplement. All told, 82 percent of infants under 4 months of age had received water on the previous day.\(^1\)

Although urban women in 1989 breastfed only three months less than rural women, they experienced four months less lactational amenorrhea (9.6 compared with 13.4 months). The DHS report suggests that this is because urban women supplement earlier and more often per day. Among infants under 3 months of age in the 1982 study, 26 percent in urban areas and 51 percent in rural areas received nonmilk supplements. Supplements were mainly fruits, fruit juices, and porridges for urban infants and, for rural infants, family foods such as porridge, vegetables, and bread. Commercial weaning foods were used by only 6 percent of urban and 4 percent of rural families. An MOH study in August 1983 found that nearly 40 percent of rural infants under 3 months of age were already receiving solid foods (MOH 1984). The 1991 MCH/FP Survey found that the average infant within the 0–5 month age group was fed with semisolids 2.2 times per day.

The 1982 study reported that 19 percent of urban infants and 15 percent of rural infants under 3 months received milk-based supplements. Milk supplements were more often given by bottle in urban areas (84 percent of infants under 6 months got such supplements in urban areas, and 50 percent in rural areas). Milk supplements were given increasingly by cup and spoon as the child got older.

Data from the 1989 DHS study revealed that 8 percent of infants under 6 months of age (1.5 percent in rural areas, but 27.5 percent in urban areas) had received a bottle during the past 24 hours, although only about 1 percent were exclusively on the bottle (Boerma and others 1991). In 1991, 14.3 percent of young children had at some time been given the bottle, although there were large variations from province to province. The extremes were Masvingo with 7.5 percent and Mash Central with 65.9 percent. In periurban Chitungwiza, Mazur and Sanders (1988) found that about 25 percent of infants had received infant formula at some time in the past.

Bottle-feeding may explain why malnutrition (percentage “below the line” on the Child Health Card, or CHC) in Harare City, unlike anywhere else in the country, is higher in the 0–5 month age group than in the 6–12 month group, according to NHIS data for 1988, 1989, and 1990.

Postpartum abstinence in Zimbabwe is now only one-third as long as lactation amenorrhea. If the early addition of supplements becomes more common, declines in lactation amenorrhea and thus shorter birth spacing may occur among many women unless compensated for by contraception.

Research into the causes of the decline in breastfeeding is needed urgently. It is possible, for example, that health workers are continuing to promote earlier addition of semisolids to the infant diet. As described
below, this message is no longer necessary in Zimbabwe, but nutrition textbooks and teaching materials often advise health workers that it is an important message.\textsuperscript{20}

**COMPLEMENTARY FEEDING.** Undue delay in the introduction of complementary foods is not a widespread problem, even in rural areas. World Bank (1983) found that 72 percent of infants had received solids by 6 months of age and 98 percent by 12 months. MOH 1984 found figures of 85 and 94 percent, respectively. Both studies were in rural areas. The 1984 Primary Health Care (PHC) evaluation found that 63 percent of infants had begun receiving solid foods by 4 months of age. In 1989, 72 percent of infants between 4 and 6 months of age had received porridge on the previous day (McMurray and Chimbwete 1991).

The need for frequent feeding of young children was not widely recognized in 1982 according to a study done in connection with the Child Supplementary Feeding Program. Three meals per day were thought adequate by 44 percent of mothers, and one or two meals per day by 13 percent. Chikanza and others (1981) found that the diet of under-fives among commercial farm workers in the Bindura area consisted of sadza and vegetables twice daily in 97 percent of the cases.

Kinsey (1986) obtained food history data from mothers in three resettlement areas in 1983–84. The proportions of children who consumed selected high-energy or high-protein foods were as follows.

<table>
<thead>
<tr>
<th>Food</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundnuts</td>
<td>11</td>
</tr>
<tr>
<td>Beans</td>
<td>16</td>
</tr>
<tr>
<td>Cowpeas</td>
<td>7</td>
</tr>
<tr>
<td>Oil, margarine, or butter</td>
<td>42</td>
</tr>
</tbody>
</table>

Almost 30 percent of the children consumed oil, margarine, or butter daily, illustrating the importance of this source of energy in many children's diets. However, this was presumably among better-off families.

Trends in infant-feeding patterns are difficult to determine from the available studies because different definitions and methods of analysis were used. For most variables, however, one is struck by the similarity in the findings, rather than the differences. The overall picture is one of fairly long-duration breastfeeding, continuing for about one and a half years for the majority but supplemented too early in most cases with water, other fluids, and semisolids. The addition of solid foods is rarely delayed too long. It is difficult to determine whether complementary foods are adequate in energy density at later ages and whether older children are fed often enough or in large enough quantities at each meal (especially when the child is ill or recently recovered from illness) because this has not been sufficiently studied.
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IGNORANCE. Ignorance is often cited as a major cause of malnutrition in Zimbabwe, although World Bank (1983) points out that this may be a legacy from pre-Independence attitudes. Of the food taboos described by Gelfand (1971), few could be expected to have much influence on nutrition and most are no longer widely practiced. The assessment by World Bank (1983) that the mother’s knowledge of many aspects of nutrition is adequate still holds. The 1987 PHC evaluation said: “There is among people now an awareness of the importance of good nutrition. . . . It was also observed that generally the mothers were highly motivated towards nutrition for both children and adults” (MOH 1987a). Some of the possible gaps in knowledge have been referred to above, such as the importance of frequent feeding and the need to avoid water and other supplements at too early an age.

Maternal Malnutrition

Andrén and Jacobson (1986) found that birthweight among Harare infants was related to maternal weight according to the following regression equation: \[ BW = 2,416 + 11.65 \text{ maternal weight} \quad (R^2 = 0.076). \]

When fitted into a multiple regression equation along with the mother’s parity and the sex of the child, an equation was formulated that explained 16 percent of the differences in birthweight and had an F-value of 20. When other variables were taken into account, the relationship between mothers’ weight and babies’ birthweight remained very strong, whereas the effect of family income and parental education did not. In the following list of the relationships found, the numbers in parentheses are the multiple regression equation values. The second number is the simple correlation, ignoring all other factors. For every 10-kilogram increase in the mother’s weight, there will be an average 110-gram (96-gram) increase in birthweight. If the family income is less than Z$150 per month, the birthweight is 131 grams (76 grams) lower. If the father and mother have more than fourteen years’ education, birthweight increases 87 grams (59 grams).

Birth Spacing

Thomas’s (1990) analysis of DHS data failed to find an association between birth order and nutritional status. However, the DHS data did show that children born after a birth space of less than two years had lower height and weight for age.

Which Is the Major Underlying Cause?

Referring again to Figure 3-1, there is little doubt that almost all forms of malnutrition in Zimbabwe are related to poverty and inequity at the
"basic" level. Planners are increasingly interested in determining the relative importance of the three more proximal "underlying" causes of malnutrition in a given setting. Among the major underlying causes of malnutrition, the health-related causes in Zimbabwe are less important than household food insecurity and inadequate maternal and child care. However, the relative importance of these two is much less obvious. Perhaps the most relevant data are those obtained by Ferro-Luzzi, Pastore, and Choto (1992) in Chivi because they measured the nutrition of people of all ages. They state that "the distribution of moderate and severe forms of child malnutrition provides evidence that, while faring better than in many other African countries, they [the children] were in poorer condition than their parents. The poorer nutritional condition of these children suggests that, while access to food cannot be a limiting factor, given the satisfactory nutritional conditions of the adults, the latter may have been achieved at other costs such as, for example, the limitation of the time available for child care."

**Health**

The relatively low infant and young child mortality rates, combined with the dramatic decline in wasting at a time of economic stagnation but of steady improvement in health services, suggest that there has been progress toward eliminating the health-related causes of malnutrition in Zimbabwe. World Bank (1983) indicated that this was the case already in 1982, and Kinsey's (1992) data on children in resettlement areas strengthen this argument. These children may have lived on better land than the average for resettlement areas and had less stunting than the average for the country. However, they lacked adequate access to clean water and health clinics, and levels of wasting remained much higher than in the rest of the country.

**Household Food Security**

Much evidence suggests, but does not prove, that access to food is inadequate several months each year for a substantial proportion of families in Zimbabwe, despite the increase in overall agricultural production. Drought, inequity of land ownership and consequent crowding in many communal areas, the dislocation, lack of infrastructure, poor support given to resettled families, and an inefficient grain marketing system are all to blame, although there is no way to quantify their effects on nutrition. Zimbabwe is ranked as "borderline" in a Household Food Access Index (Galloway 1991) but has a lower proportion of children underweight for their age than most other borderline countries. This suggests that other causal factors are better dealt with in Zimbabwe. The laudable efforts of the government of Zimba-
bwe to ensure adequate access to food for the entire population (through food distribution) are an enormous drain on the country's resources, even if they have been largely successful in preventing wide-scale hunger and malnutrition.

**Maternal and Child Care**

Figure 3-6 shows 1988 nutrition surveillance data graphed by age, which leads to the common conclusion that malnutrition is a problem mainly among children age 2 to 5—the age when they tend to be most sensitive to any household limitations in access to food. (Food shortage has little direct impact on infants who are being largely breastfed. Shortages must reach almost famine levels before they affect breast milk production. However, food shortages may force women to spend less time with their infants.) This method of aggregating data across age groups in which rapid growth should be occurring hides the growth retardation that is taking place at much earlier ages (Figures 2-1 and 3-2). The average height for age declines rapidly during the first nine months of life in rural areas and reaches its low point by 20 months of age. Most of this retardation in linear growth rates occurs in the early months of life and is therefore missed when examining the data on malnutrition because it takes many months before these children begin to fall into the malnourished or severely stunted category. This early linear growth retardation suggests that while children age 2 to 5 are most vulnerable to malnutrition, it is during the 6-to-18-month period that active damage to nutrition occurs. At this young age it is the underlying causal factors that most affect nutrition. Factors that affect children at age 2 to 5 years may have more the quality of precipitating factors.

Early problems with infant feeding are among the many factors that contribute to malnutrition. Infants become susceptible to harm caused by household food insecurity when they no longer enjoy the cushion supplied by breastfeeding. Not until about age 5 does there appear to be a gradual improvement in stunting. Whether or not premature supplementing of breastfeeding is a major cause of retarded linear growth in the early months, it is not clear whether it is practiced because of traditional beliefs, lack of information, or misleading messages from the health professions or the infant food industry, or because women are forced to begin supplementing earlier than they would like by pressure of time.

In any case, it is not realistic to separate "household food security" and "maternal and child care" into separate categories. For example, mothers may be aware that breastfeeding protects babies and therefore may delay the introduction of supplementary food as the hungry season approaches. A study is planned by UNICEF (1991b) to examine the
Figure 3-6. Communal and Urban Weight-for-Age Malnutrition by Age Group, 1988

Percentage

Source: Ministry of Health data.

extent to which stunting is the result of each of the three potential underlying causes.

Notes

1. For an excellent discussion of nutrition-relevant actions based on this type of conceptual framework see Gillespie and Mason (1991). They use the following terms for the three factors included at the "underlying" level: "household food security," "nutrition and control of infectious disease," and "women's
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control of resources and caring capacity.” The third term indicates better than “maternal and child care” that something more than health care is involved. For example, mothers’ education is important.

2. In many contexts we use the term “access to food” rather than “household food security,” as is used in Figure 3-1. Often “access to food” is actually what is meant rather than anything related to “security,” which implies a specific concern for future access as well. “Access to food” suggests access at the level of the individual. The term is not used at the national level, as “food security” is.

3. The exemption threshold was raised to Z$400 in 1992.

4. At Independence, the budget for Parirenyatwa, the central teaching hospital, was as large as that of all the mission hospitals combined, although the latter provide 64 percent of all rural beds. This imbalance was gradually reduced through 1987–88, but then the trend reversed (Loewenson and others 1991).

5. Another antidiarrheal remedy is mapepe, a lactic acid-fermented maize gruel, given to young children. It is made with germinated flour and has a higher caloric density than other gruels.

6. Zimbabwe is divided into five agroecological natural regions (NRs), ranked I, II, III, IV, and V. NRs I and II (where 19 percent of small farmers live) receive more than 750mm average annual rainfall and are suitable for intensive farming. NR III (21 percent of small farmers) is transitional, receiving 650–800mm rainfall. NR IV (42 percent of small farmers) receives less than 650mm average annual rainfall and is drought-prone. NR V (18 percent of small farmers) is unsuitable for crop production due to limited and inconsistent rainfall (Rohrbach and others 1990).

7. Although progress in land redistribution in Zimbabwe has been much slower than planned, it has been much faster than in other African countries. For example, four times more land has been redistributed than in Kenya (Amin 1990).

8. The Lancaster House Agreement was the peace conference at the end of the civil war in Zimbabwe that resulted in conditions for independence.

9. Jayne and others (1990b) argue that most farmers will not risk greater food insecurity by switching to cash crops, even where it could bring increased returns; promotion of cash cropping benefits only those already well off enough to produce reliable surpluses of food crops. However, World Bank (1983) cites evidence of such switching to cash crops from 1978 studies in Gutu and Gwanda.


11. There is a big difference in the quality of land from one resettlement area to another, but this may not be a major cause of stress suffered by those who resettle (Kinsey 1986). In fact, they are placed often on relatively virgin land and can hunt and gather wild produce more easily than those in most communal areas.

12. Data such as these do not imply that living in resettlement areas is harmful to children’s nutrition. They could simply reflect successful targeting of land redistribution to the needy. However, data from the study referred to ear-
lier (Kinsey 1992) argue that, although resettlement may have successfully tar-
geted the poor, it had failed to improve the nutritional situation of their
children after a decade.

13. As noted in the many references that deal with household food security,
there is a growing awareness of the importance of nutrition among nonnutri-
tionists. There is a danger, however, that those new to the subject will assume
that relationships (and thus solutions to the problem) are simple, and it is cru-
cial that the national food and nutrition policy emphasize the complexity of
causes.

14. Mild to moderate health and nutrition problems among mothers will
damage the nutrition of infants through biological channels (lower birthweight
and less breast milk) only marginally. But the effect of maternal health and
nutrition problems on child health and nutrition may be substantial because
those problems reduce the mother’s energy levels and hence her ability to earn
money and to perform crucial domestic chores such as collecting water and
fuel. A mother’s death can have a dramatic effect on a child’s health and nutri-
tional status and reduces survival chances significantly.

15. This finding could also reflect a higher level of full-time work among
very poor women who have no alternative for family survival.

16. Ideally, breastfeeding should continue as long as the mother wants—“to
two years or beyond” according to the Innocenti Declaration on the Protection,
Promotion, and Support of Breastfeeding. This declaration, adopted at a 1990
conference sponsored by WHO and UNICEF, was signed by Zimbabwe’s current
minister of health and other health policymakers.

We avoid using the term “weaning” because it has several meanings. After
about 6 months of age, exclusive breastfeeding is inadequate to sustain infant
growth. Semisolid foods are needed in gradually increasing amounts, not
because breast milk is declining in quantity, but because the infant’s daily
nutrient requirements are increasing. This extra food should add to or “com-
plement” the nutrients provided by breastfeeding, which should be continued
at the same daily frequency as before complementary foods were added.

17. The McMurray and Chimbwete (1991) data cited in the text below are
based on the 1988 DHS data. They excluded 51 children (of the 3,578 sampled)
whose ethnicity was recorded as “European” or “colored.”

18. Sample size was 34,707 children under 5.

19. Compared with Burundi, for example, where only 7.6 percent received
water (McMurray and Chimbwete 1991).

20. Research is needed to determine why women give water to their children
at early ages. Research in Lesotho (Almroth, personal communication) sug-
ests that the message of the diarrheal disease control program is that con-
sumption of fluids should increase not just when the child has diarrhea but
routinely. That this may be occurring in Zimbabwe too is borne out by the fact
that Nkayi, the district in the 1991 MCH Survey (MOH 1992) with the highest
proportion—70 percent—of people who knew how to prepare sss (a salt and
sugar solution given to children with diarrhea who are at risk of dehydrating)
also had the most frequent use of semisolids for children under 5 (2.7 times per
day).
4. Causes of Other Nutrition Problems

Undernutrition of Mothers and Schoolchildren

Maternal undernutrition could result from the physiological stress caused by short birth spaces and by high energy expenditure by women who must work long hours at heavy physical tasks even during pregnancy. Gelfand (1971) disagreed with the common belief that intrahousehold food distribution is biased in favor of men, but there has been no research on this issue. Women themselves are said to attribute their general ill health and exhaustion to overwork and to having too many children, which results from husbands pressuring them to bear a child every year (Batezat and Mwalo 1989). The latter has been easing as attitudes to family size have been changing.

Theisen (1975) found that the differences in stunting in schoolchildren in Kwekwe were associated not so much with the age of the student as with the family’s agroeconomic status. Ownership of land and livestock and availability of water were associated with attained growth.

Micronutrient Deficiencies

Fresh vegetables and milk products, the major sources of vitamin A and its precursors, are seasonally in very short supply in dry areas of the country. Vitamin A deficiency is exacerbated by a lack of fat in foods for young children because a certain level of dietary fat is necessary for the absorption of carotene. Children received only about 8 percent of their calories from fat by the early 1980s (World Bank 1983), and cooking fats are still frequently in short supply. This fact also contributes directly to malnutrition through low caloric density of food.

Iron deficiency is caused partly by inadequate absorption of iron from food. It is assumed that many Zimbabweans are protected from iron deficiency because they cook in iron pots and drink beer high in iron; however, this protection may be eroding with changes in cooking and brewing practices. Tea drinking is common in Zimbabwe, and the tannins in tea inhibit the absorption of iron when meals are consumed within about one hour of drinking tea (or coffee). Vitamin C (mainly from fruit) enhances iron absorption when taken with meals but may be in short supply at least seasonally in the drier parts of the country.
Occasional consumption of meat and fish contributes to a better iron intake, but this will not be the case among the poorest segments of the community.

Another factor causing iron deficiency is iron loss, usually from blood loss, which occurs regularly through menstrual blood loss, as well as during delivery and from injuries. Although hookworm is prevalent in many parts of the country, infection rates are generally quite low (Chandiwana, Bradley, and Chombo 1989). Bilharzia (schistosomiasis) can contribute to anemia in cases of severe infection, and there are areas of mild to severe infection throughout Zimbabwe. *Schistosoma haematobium*, the type most likely to cause anemia, is most common in the northern and eastern parts of the country. MOH Department of Environmental Health Services (1990) says that some districts in Mash Central report an incidence of 90 percent, particularly in school-children, and that “it would appear that there is a need to improve the work in Schistosomiasis Control.”

Goiter, another potentially life-threatening consequence of micronutrient deficiency, has two main causes. One is iodine deficiency. The other cause is the consumption of certain foods, termed goitrogenic, that contain thiocyanate (the element in goitrogenic foods that leaches out iodine). Zimbabwean soils and water are deficient in iodine. Although cassava (a goitrogenic food) is rarely eaten anywhere in Zimbabwe, other widely consumed foods such as rape, onion, and brassicas have sometimes been suspected of contributing to goiter. However, goitrous subjects were not found to consume more of these foods than were nongoitrous subjects in Chinamora (Chinamora Research Team 1986). Thiocyanate levels and I/thiocyanate ratios in two endemic goiter areas (Wedza and Chiweshe) indicated that thiocyanate does not have a significant goitrogenic effect in those areas (Todd and Bourdoux 1991).

In Harare, goiter rates were somewhat greater in high-density than in low-density schools (Harare City Health Department, Nutrition Unit, 1988). This may be attributable to the greater likelihood of people having come recently from rural areas where they had a more deficient diet. Lower incomes in high-density areas could also result in higher intakes of certain goitrogenic foods, fewer purchases of the more expensive iodated salt, and lower intakes of imported foods, which have higher iodine levels. Despite improvements in the standard of living in Zimbabwe, goiter levels in 1986 were identical to levels found in the same schools in Wedza in 1968 (Todd and others 1989).

Many other nutrition problems result from the causes discussed above. For example, lack of adequate food is a major contributing factor to deficiencies in iron and vitamin A. The extent to which dietary “imbalances” cause additional harm is difficult to estimate because of the difficulty of determining exact dietary intakes and the require-
ments for differing ages, physiological states, genders, and levels of activity. Virtually no careful quantitative dietary assessments have been carried out in Zimbabwe.

Highly refined maize meal is low in niacin and tryptophan and is not fortified in Zimbabwe, thus increasing vulnerability to pellagra at times when adequate amounts of other foods are not consumed. Holton (1979) said that virtually all adult pellagra cases admitted to hospitals were alcohol-related.

Diet-Related Chronic Diseases

The Zimbabwean diet, which has been described in general terms in many papers (for example, Gelfand 1971; Ministry of Finance and others 1983, which also presents the food balance sheet for 1981), is considered relatively healthy. It is composed mainly of maize, with relishes of vegetables, sometimes peanuts and other legumes, and sometimes animal products, depending on region, season, and socio-economic status. However, as described by Benhura and Chitsiku (1990), traditional diet patterns are changing and there may be a reduction of legumes in the diet, as well as greater use of refined maize meal, white bread, soft drinks, and other foods that contain “empty calories.”

In 1976-77 low-income urban consumers spent 14.5 percent of their food budget on bread, and only 2 percent of this was for brown bread. Another 7.4 percent of their food expenditure was for sugar, more than 23 kilograms per capita annually, and 98 percent of the sugar sold was refined. The increased use of highly refined maize flour has been a concern of nutritionists for years because it contains one-third the fat, one-half the iron, one-quarter the riboflavin, and one-tenth the niacin of straight-run meal. The increase in Western diets was thought to be responsible for the increase in dental caries detected as early as the late 1970s (World Bank 1983). However, very little research has been carried out on the dietary causes of chronic disease in Zimbabwe.

Food Hygiene and Quality Control

Although Zimbabwe has been in the Codex Alimentarius Commission (a United Nations commission that establishes food quality standards) since 1985, its food safety and quality laws are still antiquated and are currently being reviewed. Food quality control and the labeling of packaged foods are deficient. Data are routinely collected on the incidence of food-borne diseases and food condemnations. Such data are gross underestimates of food poisoning, however, because adult diarrhea sufferers often suffer in silence unless diarrhea becomes chronic (Tagwireyi 1991b).
According to the 1990 MOH Department of Environmental Health Services Annual Report, some provinces complain of underreporting and a lack of food inspection, partly because of a scarcity of environmental health technicians. In 1990, three outbreaks of food poisoning in schools were reported for Mash East and one for Masvingo.

Aflatoxin levels in stored grains and legumes should be monitored. High levels of hepatocellular carcinoma have been reported, and aflatoxin was found in 6 percent of 2,553 urine samples collected from donors of all ages and both sexes from around the country (Nyathi, Hasler, and Chetsanga 1989).

Notes

1. Women who lose more blood in menstrual bleeding every month than the average are the ones most at risk of becoming anemic. For them, lactation amenorrhea saves much more iron than they lose in breast milk (Greiner 1991).

2. Adequate food safety and control offers potential economic benefits: it is easier to export food products when international safety levels are achieved; absenteeism caused by food poisoning is diminished; and health care costs are reduced (Tagwireyi 1991b). Urban populations and people in institutions are especially dependent on good food-handling practices.
5. The Institutional Framework for Tackling Nutrition Problems

Several ministries and institutions are concerned directly or indirectly with nutrition, and nutrition is integrated into the basic training of some health workers (and some, though fewer, agriculture and education staff). Some health workers and agriculture workers carry out tasks directly related to nutrition, and many perform jobs that indirectly affect nutrition. The absence of a national food and nutrition policy has made it difficult to decide how nutrition work should be organized in the country. So far, the only ministry to include nutritionists in its staff base is the Ministry of Health and Child Welfare (MOH&CW).

Establishment of the Department of National Nutrition

The MOH initially proposed that a Food and Nutrition Council be established under the Office of the Prime Minister to coordinate food and nutrition work. This proposal was rejected, and a Department of National Nutrition (DNN) was created within the MOH instead. As part of its primary health care policy, the MOH expanded the small Dietetics Unit that existed before Independence into the DNN. This department was given more staff and an expanded mandate to:

- Determine the magnitude and extent of malnutrition in Zimbabwe
- Implement a nutrition surveillance system to monitor nutrition
- Develop nutrition programs in line with the Primary Health Care strategy
- Use intersectoral cooperation to develop a National Food and Nutrition Policy
- Establish norms and guidelines for government institutional feeding
- Train institutional food service managers for government
- Provide technical expertise to other government agencies

The decision to place the DNN within the MOH reinforced the view that malnutrition was a health issue. Although the mandate given to the DNN was sufficiently broad to tackle the problems of malnutrition holistically, the parent Ministry of Health did not always understand
or appreciate the intersectoral aspects of this mandate. For example, a wide range of professionals was needed to fulfill the mandate adequately, but the health sector could only allow a staffing complement that fell within acceptable Health Ministry norms.

**Development of the DNN**

The DNN gradually grew stronger during the early and mid-1980s, with a central staff composed of four nutritionists and two dietitians and a full-time secretary, as well as two nutrition posts in each province and posts for dietitians in most large hospitals (Figure 5-1). It acquired an important place in the maternal and child health field through some of its activities and by incorporating nutrition concepts into health training programs. The DNN was a recognized resource for technical support for food and nutrition-related programs in other sectors, and it established mechanisms for intersectoral planning.

The DNN was demoted to the status of a unit under the Maternal and Child Health (MCH) Department as part of the internal restructuring of the MOH in 1988. However, the DNN's mandate, which is much wider than maternal and child health, remained unchanged. This placed nutrition activities at a further disadvantage, reducing the department's ability to undertake its role as Secretariat of the National Steering Committee for Food and Nutrition (described below).

The reduction in status increased demands on the department to focus on health sector and MCH-related activities. Coordination with other sectors was difficult enough when nutrition was a full department within MOH, and it became more difficult for the unit to negotiate from a level below that of departments in other ministries. This has increased the need for an institutional framework that provides for high-level dialogue and facilitates coordination of nutrition.

At the same time, the advocacy efforts of the department have resulted in increasing requests for technical support from other sectors, which threatens to overwhelm the capacity of this small unit. Discussions are underway in the Public Services Commission to review the Nutrition Unit and its staffing levels. However, under the Economic Structural Adjustment Program, the unit, like other government institutions, is struggling just to maintain its staff at the current level.

**Staffing of the Nutrition Unit (Formerly DNN)**

Four nutritionists work at the central level in the MOH&CW. Two provinces have their full complement of two nutrition professionals each, two have only one, and four have none.

Zimbabwe has very little capability in the field of dietetics. Only the four central hospitals and four of the provincial hospitals have posts
Figure 5-1. Operational Structure of the Nutrition Unit

- Minister of Health
- Permanent Secretary for Health
- Principal Medical Director (Health Care Services)
  - MCH Coordinator
  - Director of National Nutrition
    - Deputy Director of Nutrition
      - Chief Nutritionist
      - Senior Nutritionist
      - Nutritionist (Province)
      - COMMUNITY NUTRITION
        - Nutritionist Instructor
        - IDS Student Food Service Training
- Principal Medical Director
  - Others
- Chief Dietician
  - Senior Dietician
  - Dietician (Hospital)
  - Food Service Officers
  - Food Service Staff
- INSTITUTIONAL DIETETICS AND FOOD SERVICE
for dietitians, and only three of these posts are filled. There are only three dietitians in one central and two provincial hospitals. Since Independence, there has been no increase in the number of dietitians. There is no in-country training for dietitians, and none of the dietitians have been sent overseas for training.

Despite recent improvements, terms of employment have been poor for nutritionists. They are still not competitive with those of other potential employers. Dietitians and food service supervisors are particularly in demand in the private sector. The Nutrition Unit has rarely been fully staffed, and almost half the existing nutrition and dietetics posts are unfilled.

An unskilled post of nutrition coordinator was created soon after Independence to work mainly at the ward (subdistrict) level with the Child Supplementary Feeding Program. These coordinators have gradually been trained to work instead with the Community Food and Nutrition Program (described below). They have been accepted by the government but are still not established as a formal category of worker with a clear definition of tasks and qualifications and a career ladder. There are just over 120 nutrition coordinators, including 40 hired during the 1992 drought. They are all on temporary contracts, and their future is uncertain.

All the Nutrition Unit and provincial staff have bachelor of science degrees, most in home economics, and four have master's degrees. One more has begun part-time study toward a master's degree. Most of the staff need advanced training in international nutrition, either to complement or to update their existing knowledge. But this is not available in the country except for the six-week Eastern, Central, and Southern Africa (ECSA) course that has been held for the past six years in Harare and attended by several Zimbabweans. It is difficult to find funding for advanced training abroad. Even when it has been offered, the Public Services Commission has often refused permission. The MOH&CW conducts a two-year course for so-called institutional domestic services (that is, training for staff who supervise kitchens in hospitals and other large institutions).
6. National Food and Nutrition Policy and Programs

Food and Nutrition Policy Development

World Bank (1983) highlighted the need for a national food and nutrition policy to provide the framework for improving nutrition, and adequate nutrition for the population was a clearly stated goal in the transitional and the first five-year development plan. Although the policy framework to achieve this goal was not defined, the Department of National Nutrition was given the task of implementation.

Initially, policymakers did not understand the complexity of the nutrition problem and the need for action across sectors. Awareness of the need for comprehensive action had to be created. Without this awareness, a policy document would be inadequate—policy development is a gradual process and comes from struggling to solve the problems of malnutrition locally, not just from producing policy documents.

Thus the national nutrition programs have created intersectoral management structures that are now spearheading the development of a national food and nutrition policy. Two multisectoral consultative meetings have been held to discuss the food and nutrition situation, to review the current programs and policies relevant to nutrition, and to recommend ways of developing a National Food and Nutrition Policy. Data from the National Steering Committee on nutrition provided the much-needed impetus for policy formulation.

There is a general recognition even in MOH&CW that the Nutrition Unit is not well placed strategically to spearhead the development of a national food and nutrition policy. Several proposals have been advanced for an appropriate institutional framework, including the establishment of a national action committee in a key ministry such as the Ministry of Agriculture or the Ministry of Economic Planning. A recent consultative workshop provided the eleven ministries involved, NGOs, the food industry, and farmer organizations the opportunity to give their points of view on how to produce an integrated national food policy strategy (Wyckoff and Rukuni 1991).

It was proposed that a Food and Nutrition Coordinating Committee be formed with membership from each of these organizations and groups. The proposed form and functions of this committee are de-
scribed by Lenneiye (1991) in the context of an overall nutrition policy. It was agreed that the Ministry of Lands, Agriculture and Rural Resettlement (MLARR) would be the appropriate coordinating ministry for a National Food and Nutrition Policy. Although the Ministry of Finance and Economic Planning (the planning function is now the responsibility of a separate National Planning Agency) is normally the coordinating ministry, it was generally agreed that its structure and limited staffing prevented it from doing the job adequately. It was further agreed that a paper on the need for a national food and nutrition policy should be prepared by the MLARR with support from the National Steering Committee. This paper would go to the Cabinet via the existing Subcommittee on Drought Relief. All the key ministries dealing with food security and nutrition are already represented on this subcommittee, so it is a logical channel for the paper.

Policy formulation has been given a new impetus by the attendance of a multisectoral delegation at the International Conference on Nutrition (ICN) in Rome in late 1992. In preparation for that conference, the National Steering Committee was strengthened to include representatives of several ministries, the university, farmers' groups, the consumer council, NGOs, and industry. The Nutrition Unit serves as secretariat. This group plans to develop a national food and nutrition plan of action to be submitted to the ICN before the end of 1994, once approved by the Cabinet.

Any policy must take into account the structural adjustment goal of reducing the civil service by 25 percent and the government budget deficit from 10 to 5 percent by 1995. It will be a challenge, given that many of the ministries told the Consultative Workshop that staff and resource constraints were major reasons for ineffective implementation and coordination of food and nutrition-related programs. Efforts should be made to find solutions linked to liberalized markets and the private sector wherever possible.

Ironically, the current drought, said to be one of the worst this century, and the Economic Structural Adjustment Program (ESAP) may make the process of policy formulation easier because the government is sensitive to the effects of both on vulnerable groups. Nutrition surveillance is expected to be strengthened as a way to monitor the impact of the drought and economic reform. Within the Framework for Economic Reform document, nutrition is singled out as a key indicator of the impact of the ESAP on vulnerable groups and is to be monitored over the five-year period of the ESAP. It is hoped this will increase the government's broad understanding of the role of nutrition in development and secure a place for nutrition on the development agenda. Again, it is uncertain whether staff resources will be adequate to achieve these high expectations.
Nutrition Programs in the Health Sector

To implement its mandate listed above, the MOH&CW Nutrition Unit, usually in cooperation with other government and nongovernmental organizations, has undertaken the following activities.

**Nutrition Surveys and Surveillance**

Nutrition studies were undertaken or commissioned to further define the problem of malnutrition in 1980, 1982, 1984, 1985, and 1988. A national goiter survey was conducted in 1988. A nutrition surveillance system has been under development since 1987 based on the routine collection of data on the proportion of young children age 0 to 5 months, 6 to 11 months, 12 to 23 months, and 23 to 59 months who are below the third percentile line on the growth card. Data recorded on a standard statistics record form filled in at health centers and hospitals as part of the National Health Information System are aggregated at district, provincial, and national levels. (The national data are used in Figures 2-2, 2-3, and 3-4 and in Table 2-1.) There is a need to strengthen the analysis and use of these data at all levels.

**Nutrition in Primary Health Care**

Both the 1984 and the 1987 PHC evaluations noted that nutrition was the aspect of PHC that had best succeeded in achieving the goals, articulated at the 1981 Alma Ata international conference on health, of mobilizing the community and working intersectorally. Growth monitoring (GM), an integral part of primary health care (PHC) delivery, is carried out as part of maternal and child health services at health centers and hospital outpatient services. The 1987 PHC evaluation called progress in growth monitoring since 1984 "dramatic."

The periodic evaluations, combined with efforts to use their findings to improve achievement, have helped achieve this progress.

The 1982 PHC evaluation noted that 58 percent of all children had at least two weight points plotted on the growth charts kept by their mothers; the 1984 PHC evaluation noted that this figure had increased to 83 percent. Analysis of data collected through interviews with 102 mothers as part of the 1985 evaluation found that three-quarters of rural mothers and an even higher proportion of urban mothers could correctly recognize signs of good growth or weight loss from a growth curve plotted on a growth chart (Dube, Madzima, and Woelk 1988). An MOH report (1988) noted that the proportion of children surveyed who had no weights plotted on their growth charts varied from 7 percent in Midlands Province to 28 percent in Manicaland. The latter appeared to
be the province where growth monitoring was least well developed. In the 1991 MCH/FP Survey, 86 percent of children under 5 had a child health card (MOH 1992) with an average of 6.6 weight points recorded during the first year.2

In 1983 the growth chart on the child health card was redesigned from a "road to health" style to one with only one line at the third percentile. It was redesigned again in 1990, and a line at the fiftieth percentile was reintroduced along with a number of other changes, on the basis of results of a consultative meeting (MOH Nutrition Unit 1990a). A training manual, reference material on how to use the new growth charts (MOH Nutrition Unit 1990c), and a procedure manual to guide basic-level health workers (MOH Nutrition Unit 1991a) were produced.

Community-Based Growth Monitoring

Planning for community-based growth monitoring (CBGM) began after a study tour to the Iringa Joint Nutrition Support Program in Tanzania. A task force was formed to plan for baseline studies and to develop training modules for use at the district level. Phased pilot studies were initiated in two wards each in Tsholotsho and Makoni Districts in 1992. One in Bubi District began earlier and continues to structure and standardize its procedures (MOH Nutrition Unit 1990b).

It is hoped that CBGM will increase the number of times children are weighed because in the health center-based system many children are weighed only when they are vaccinated. It is also hoped that CBGM will strengthen efforts to use growth monitoring to promote better growth by identifying growth faltering early, developing local solutions, and obtaining feedback on their effectiveness. A manual on growth monitoring is being produced. In areas with CFNP (see below) and other projects, CBGM will also serve as an evaluation and planning tool. It is intended to strengthen the capacity of the Food and Nutrition Management Teams to collect, interpret, and use nutrition surveillance data and to stimulate the use of such data in provincial and district development committee discussions.

Baseline studies have been conducted to provide an overview of current health and nutrition in the two pilot districts. This will allow quantifiable targets to be set before full-scale implementation begins and will make evaluation possible. It includes a review of existing statistical records and small-scale anthropometric surveys at school entrance and among parents and children (Madzima and others 1990).

Training at district and ward levels has been completed, using a training manual developed for the purpose (Madzima and others 1991a). Community-level training has also been conducted and quarterly or monthly weighing initiated with the help of volunteer mothers in the pilot wards. Coverage appears to have increased rapidly to very
high levels. Although community mobilization is time-consuming and gradual, the payoff seems high. Mothers find CBGM much more convenient because it is carried out at more locations that are closer to their homes rather than in health facilities, where staff may have a queue of other patients to attend to. CBGM also provides staff with an opportunity to deliver other PHC services (such as immunizations) because the mothers and children are all gathered.

Other provinces are expected to send teams on study tours once a midterm evaluation of CBGM in the pilot areas has been completed. This is intended to help spread it throughout the country. Educational materials, including a video, are being produced to support the program.

A recent consultant review of the program recommended that the priority in further development of the project be to strengthen village-level analysis, support, and counseling. In addition, methods need to be developed that focus more on surveillance of "nutrition problems." The more centralized levels might contribute best by spreading awareness of "inspired interventions" that are being tried in other areas rather than by funding new interventions and risking creating dependency (Ogle 1992).

**Supplementary Feeding Programs**

The national Children's Supplementary Feeding Program (CSFP) was established soon after Independence. It was initially run mainly by NGOs, and then by the MOH Nutrition Department with support from the Swedish International Development Authority (SIDA). A 1982 evaluation found that children attending the CSFP gained weight at two to three times the rate of better-nourished children, and nutrition education efforts were effective (World Bank 1983). By 1984, 250,000 children were being reached by the CSFP (Tagwireyi, Mason, and Sanders 1989). A 1984 UNICEF-supported evaluation of the program noted the following lessons:

- It was crucial to use local foods to avoid conveying the message that biscuits and other foods brought in by some NGOs were better than local foods.
- A mixture of local foods should be used (including beans or peanuts, not just maize) and should be kept uniform to reinforce the idea that these foods make children grow well.
- Community participation improved the functioning of the program, and village committees were formed to take care of local administration.
- Intersectoral committees were necessary above the village level (from ward to national) because each sector has something important to contribute, in technical terms and in assisting with transport or other matters.
• Children should be fed on site daily with food cooked by their mothers, which promotes nutrition education.
• In drought-stricken areas children should not leave the program as they gain weight because they quickly lose it again.
• Trucks were crucial for moving food out from district collection points (they were provided by UNICEF but used by the MOH&CW for other tasks when not needed for the program and were worn out in a short time).
• A manual was needed (and was later produced) to provide a standard approach to administration and training (Migogo 1988).

The CSFP attempted to avoid creating dependency with its supplementary feeding programs by using locally grown food and by including nutrition education. An even bigger step in this direction was the phasing out of the CSFP and its replacement by a program designed to encourage people to grow supplementary foods. Called the Supplemental Food Production Program, it was in place by 1982. In response to the 1991-92 drought, the CSFP was reinstated on a much larger scale than previously (MOH Nutrition Unit 1992).

Community Food and Nutrition Program

The Supplemental Food Production Program was renamed the Community Food and Nutrition Program (CFNP) in 1989. Until then it had been funded completely by SIDA. Government funding began in 1989 and two years later the government was responsible for all central funding. (Some NGOs contribute funds for CFNP projects in specific areas.)

The CFNP has been described in reports to SIDA and the Nutrition Unit by Jonsson (1986) and by Antonsson-Ogle and Greiner (1987), and in Tagwireyi, Mason, and Sanders (1989). An easily accessible if brief description is provided in Jennings and others (1991), which compares the management framework of CFNP (under the old name, Supplemental Food Production Program) with many other nutrition programs around the world.

Activities. The CFNP has evolved into a program that encourages villagers (usually women) to grow nutritious foods such as groundnuts and beans in a communal plot, as well as vegetables in a community garden. In areas where lack of water is a problem, some groups are rearing small animals such as indigenous chickens, rabbits, fish, and goats. Better-organized groups sell some of their produce to purchase maize meal, oil, and beans for communal feeding of children under 5. Funding for the start-up of projects is provided by the MOH&CW. It cov-
ERS items such as fencing material, seeds, and fertilizer. Technical support is supplied by Agritex (Ministry of Agriculture extension service) officers. Another aim is to improve village-level technologies for food processing, preservation, and storage, but progress in this area has been slow (Lenneiye and Muza 1986).

In many cases, projects are linked to day care, growth monitoring, and feeding for participants' children, sometimes including other village children identified as malnourished by the village community workers. More than 3,000 CFNP projects have been initiated, although most of them are concentrated in Mash West Province and many have not survived. There are 10 to 200 participants in each project.

The CFNP has made more land available to the poorest farmers and put them in contact with farmers with better skills. Agritex and other extension workers are attracted to the community plots because it is more efficient for them to work with existing groups. In some projects, each person has a private plot within the fenced area and benefits from communal facilities. Nevertheless, community decisionmaking and collective self-reliance are crucial components of all CFNP projects. It is hoped that this will gradually lead to the ability to identify the causes of undernutrition in each village and to find local solutions, guided by community-based growth monitoring.

MANAGEMENT. The CFNP benefited from the lessons learned from the CSFP. From the outset, the CFNP emphasized project management (MOF Nutrition Department 1987). It evolved a successful approach through an intersectoral National Steering Committee for Food and Nutrition (NSC) chaired by Agritex. At the provincial, district, and ward levels, similarly structured Food and Nutrition Management Committees are responsible for managing the program. At all but the national level, these committees have become development subcommittees and have placed nutrition on the development agenda, at least in the provinces.

These committees have functioned well because early in the program the roles of each sector were clearly identified, agreed to, and written up in a management handbook, which was the basic tool for intersectoral training of the committees. The CFNP does not get in the way of the ministry staff's other duties because it is seen as an integral part of each sector's work plans. At the ward level, contact with villages is maintained through a nutrition coordinator, although many more such coordinators are needed.

There is no development committee at the national level, but the National Planning Agency may fulfill this role eventually. In the meantime, the NSC does not have a forum for taking joint action but must depend on the goodwill of each sector and the personal commitment of the committee members.
EVALUATION. The CFNP has been improved gradually throughout the decade, partly in response to evaluations. Two were particularly important: a 1985 evaluation by a joint Zimbabwean-Swedish team (International Rural Development Centre 1985), and a 1989 process evaluation in which representatives from three ministries in each province evaluated the project in another province (MOH Nutrition Unit 1989c).

The 1989 evaluation found that a great deal of progress had been made since 1985 in developing a management system, in raising awareness of nutrition issues at all levels, and in securing community support and participation in projects. Weaknesses included the fact that only 70 percent of projects had registers on participants and produce, and less than half had registers on children in their groups, or information on their nutrition. One-third of projects had no nutrition education at the community level, and many of the others had only simplistic or somewhat irrelevant messages.

The following recommendations from the 1989 evaluation provide a good indication of the weaknesses of the program, but also the high level of staff interest in improving it. Each recommendation is followed by a comment on the extent to which it has been implemented.

- Focusing of feeding during preharvest times and more specific targeting of the program, including to workers on large-scale farms, with increased funding and other support to provinces with high malnutrition levels because they also tend to be those with fewer staff and poorer infrastructure development (much greater targeting to more needy areas has been achieved)
- Greater government funding to the CFNP to ensure sustainability (completely achieved)
- Inclusion of additional relevant ministries in the National Steering Committee (achieved) and making the Steering Committee a constituted body, for example, a subcommittee of the National Development Agency (has so far proved impossible), and broadening its functions to include the development of National Food and Nutrition Policy (achieved)
- Establishment of nutrition posts at the district level (has proved impossible because of the ESAP)
- Improved reporting and monitoring, with the provincial level taking major responsibility (has proved difficult: project monitoring forms were prepared and distributed but perhaps were too detailed, as provinces have not returned them)
- Increased applied and operations research at the provincial level (little progress made so far)
- Increased involvement of the ministries of education and local government at the provincial and district levels (partly achieved)
- Better integration of CFNP with water and sanitation (much progress
made), functional literacy (some progress), and preschool activities (some progress); inclusion of nutrition issues in land use planning (some progress)

- Strengthened training, both preservice and in-service, of extension workers, especially in Agritex (some progress)
- Production of a training manual (achieved)
- Strengthened nutrition education, including production of a newsletter (little progress)
- Regular growth monitoring of project children (some progress)
- Nutritional screening as part of the project proposal for communities that seek to participate in CFNP (some progress)
- Analysis of the nutrition situation by the Provincial Food and Nutrition Management Team to determine what other approaches are needed in addition to CFNP (some progress).

Beyond this, more attention should be paid to encouraging a wide range of flexible community responses to nutrition problems. This, as well as increasing the income-generating potential of the projects, may help to address their lack of sustainability.

In a review of efforts to address malnutrition in Africa, Levinson (1991) says that, “the central tenet of integrated programs recognizes that the malnutrition affecting extremely poor families, and most specifically young children and mothers within those families, is difficult to address effectively through nutrition or income generation efforts alone. . . . income generation sometimes has been the lever to elicit substantial community organization as well as participation in health and nutrition activities.” He considers Zimbabwe’s CFNP to be one of “the two most important African successes in such integrated programs. (p. 5)"

The impact of CFNP has not been evaluated, but in Mash West, which has many more CFNP projects than any other province, the relative reduction of stunting among under-fives was greater from 1985 to 1988 than for any other province (Figure 3-3). A national impact evaluation is scheduled for 1993 but may be delayed because of the current drought.

**Nutrition Education and Training**

The emphasis on curative approaches and “nutrition villages” (in which malnourished children were “treated” and their mothers educated in correct infant-feeding practices) declined in the early 1980s. Existing nutrition education efforts were strengthened. Recipes for adding peanut butter to children’s food were distributed to 4,000 women’s clubs (Allaart 1985). The 1987 PHC evaluation found that “there has been a great deal of progress with nutrition (education)
since 1984.” However, there have been many messages from different organizations; nutrition education activities have been fragmented and not sustained; and they have tended to be too general for tangible use. Families need better information to assist them to optimize the care and feeding of young children within their income and time constraints.

The fact that nutrition education was always integral to supplemental feeding programs in Zimbabwe has already been mentioned. Efforts have been made to promote complementary foods that are dense in energy, such as peanuts, and the use of oil and available seeds has been advocated. “Food days” are held in some rural areas to reawaken interest in nutritious traditional foods and to promote the use of wild foods that are unknown to young mothers. On these occasions prizes are awarded for the best meals prepared and displayed (Sanders 1989).

The need to promote national nutrition through the mass media was recognized at an early stage (Patsanza and Hove 1986), as was the need to use social marketing methods. The skills needed to identify and target appropriate messages, however, have not been readily available within the Nutrition Unit or the MOH&CW. The current Nutrition Unit Five-Year Plan includes measures to redress this deficiency.

The Nutrition Unit has reviewed and strengthened nutrition-relevant curricula in basic and post-basic nursing, environmental health, community development, and primary education. Staff constraints have prevented the unit from undertaking similar work for other types of training and education. The Nutrition Unit’s staff devotes much of its time to teaching nurses and to other training courses.

Breastfeeding Program Activities

CODE OF MARKETING. Zimbabwe began to participate in the World Health Assembly just as the International Code of Marketing for Breast-Milk Substitutes was being developed and passed and thus was aware of this issue from the outset. In 1981, the Ministry of Health published 29,000 copies of a brochure called “Baby Feeding, Behind and Towards a Health Model for Zimbabwe” that summarized the findings of a study showing that bottle feeding was widespread in the country. The brochure strongly castigated the baby food industry.

The Ministry of Health Circular Minute No. 80 of 1982 forbids health staff to receive free samples, gratuities, hospitality, calendars, or advertising materials from companies that promote breast-milk substitutes. A Zimbabwean Code was developed which was broader than the WHO Code because it included foods for young children. The 1984 PHC evaluation said that bad practices by commercial firms and health professionals concerning breastfeeding had been “corrected.” But this may have been more an expression of satisfaction that substantial progress
had been made. The Zimbabwean Code was incorporated into the Public Health Act and passed by Parliament in 1985. The MOH&CW is reactivating an intersectoral committee to recommend legislation to support the code.

Harare's Health Department issued a circular to all health institutions in its jurisdiction describing its breastfeeding policy (Harare City Health Department, Nutrition Unit, 1990). Among other things, it banned breast-milk substitute companies from talking with City Health Department health workers unless they have written permission from the City Medical Officer of Health. A study to monitor the implementation of the code was funded by the Nutrition Unit and conducted by the Zimbabwe Infant Nutrition Network (ZINN), a local group linked to the International Baby Food Action Network (IBFAN). No report has yet been provided to the Ministry of Health.

In Harare Hospital, relactation is being promoted to women who have stopped breastfeeding (usually because their children became ill with diarrhea). The success rate so far is about 50 percent (Sanders 1989). Sanders says that wet-nursing should be promoted in Zimbabwe because it is culturally acceptable to use relatives as wet nurses. This may become increasingly necessary as AIDS orphans become more common.

ROLE OF THE HEALTH CARE SECTOR. ZINN conducted a survey of the knowledge, attitudes, and practices of a wide range of health workers in the country concerning breastfeeding (MOH and ZINN 1988). This showed that health workers were enthusiastic about breastfeeding and promoted it strongly. However, much of their well-meaning advice was outdated and inappropriate. A national workshop was conducted to disseminate these findings (MOH Nutrition Unit 1989a). It concluded that lactation management training was needed, and in 1989 a seminar on this subject was held for a wide range of health workers to enable them to train others (MOH Nutrition Unit 1989e). Two teams have attended the Wellstart course in lactation management in the United States. The first team trained produced a draft national plan of action, which is under discussion by a national task force.

Other accomplishments include successful efforts to change practices in health institutions to make them more supportive of breastfeeding and to discourage the use of substitutes. Nineteen hospitals completed self-appraisals of the degree to which they are "Baby Friendly" (that is, follow the ten steps listed in the Innocenti Declaration) and are being supported by the Nutrition Unit in efforts to become more so. The nutrition component within the Family Health Project II (1992–96) will focus attention on breastfeeding, including its integration in the Family Planning Program.
Maternity benefits for employed women. Maternity benefits were instituted after Independence. A recent campaign successfully protected women's right to three months' maternity leave after a proposal to reduce it to two months. Women working in the formal sector have the right to take two half-hour breastfeeding breaks during the work day (recently increased to two hours per day). Creches are rarely provided at the workplace, but in any case, better transport is needed before many women would be willing to take their infants to work (Mutamba 1991b).

Research. In Zimbabwe, breastfeeding is widely practiced. The main problem is that water is given almost universally from the first weeks of life, which interferes with breastfeeding, replaces breast milk, or subjects the infant to contaminants in the water. Although studies in other countries have shown that exclusively breastfed infants do not need additional water, no matter how hot and dry the climate (Almroth and Bidinger 1990), health professionals in Zimbabwe find it hard to believe that water is not necessary. Therefore the Nutrition Unit is planning to mount a study of the water requirements of breastfed infants and to give it "high visibility" as a step toward changing professional opinion in the country. Studies are also planned to understand better why breastfeeding on its own is practiced so seldom and what approach might work best to promote it.

Nutrition Rehabilitation

World Bank (1983) cited a number of reviews showing that hospital-based nutrition rehabilitation and "nutrition villages" were expensive and not very effective. In subsequent years, MOH spending on these programs declined.

The focus of MOH&CW efforts has shifted in recent years to community-based rehabilitation through the CFNP. As soon as children are over the most severe stages of malnutrition, they are referred to a nearby CFNP project if there is one. The project is requested by letter to assist in feeding the child. This approach is sometimes successful (success is measured by the child's growth). It should be pointed out that in much of the country a substantial proportion of infants with malnutrition are suffering from AIDS.

Many hospitals still have nutrition rehabilitation wards or facilities, in some cases linked to "nutrition villages" or similar "halfway houses," which are cheaper, infection-free, and more home-like than hospitals. Malnourished children receive appropriate, inexpensive, high-energy food, and mothers learn about prevention of malnutrition. Sanders (1989) has provided guidelines for this approach.
Hospital Food Services

Before 1980, many hospitals did not provide meals for patients. The MOH&CW decided to provide meals and charged the Nutrition Department with the task of establishing norms and guidelines for food service for hospitals. Guidelines for therapeutic nutrition were also developed.

Micronutrient Programs

IODINE DEFICIENCY DISORDERS. After the 1988 national IDD survey was completed (MOH Nutrition Unit 1989b), a National Consultative Meeting was held to inform all relevant sectors and to discuss what steps should be taken to develop a national program to combat IDD (MOH Nutrition Unit 1989d). An intersectoral Committee for the Control of IDD was formed. Subcommittees were set up to deal with salt iodation, social mobilization, monitoring and research, and overall coordination. It was agreed at this meeting that iodated salt would be used to combat iodine deficiency but that iodated oil capsules might be used in areas of very high prevalence if iodated salt did not become available within a year. These capsules were to be distributed to females under the age of 45 and males under 18 in districts where the deficiency was endemic. Capsules were distributed to the worst-affected districts, beginning with Murewa District in October 1992. A series of workshops designed to raise awareness among all groups throughout the district was held. Careful attention is being paid to how the community responds to the capsules and to finding the best way to ensure acceptance and thus high population coverage.

The Intersectoral Committee decided that salt in Zimbabwe should be iodated at 50 parts per million (ppm) rather than at the currently specified 10–30 ppm, and draft legislation has been prepared for submission to Parliament. There does appear to be an increase in the availability of iodated salt, but much of this is packaged expensively and iodated at 10–30 ppm. It is hoped that salt iodated at 50 ppm will soon become available at slightly below the current market price of non-iodated salt from the Sowa Pan soda ash project in Botswana.

Plans are being made to establish systems for quality control of iodated salt and for surveillance of the iodine status of the population. Environmental health officers will report on the availability of iodated salt in local shops. Three schools in each of twelve districts will be used as sites for IDD surveys at three-year intervals, according to preliminary plans. Urinary iodine and goiter grades will be measured.

Several Zimbabweans have received training in aspects of IDD control including monitoring and project management at the 1991 courses
of the Program Against Micronutrient Malnutrition (PAMM) in Atlanta. The necessary laboratory capability to measure urinary iodine has been established in recent years. Soon after receiving the appropriate equipment, Zimbabwean researchers discovered that urinary iodine levels reported in previous studies in the country were inaccurately high, which masked the severity of the IDD problem (Hasler and Belling 1989).

The PAMM provided equipment to improve the capacity to measure thyroid hormone levels in the blood. Where this will be placed and how monitoring of thyroid hormone levels will be done are not yet decided. A pilot study will test the value and feasibility of taking TSH measurements on samples of school students or women attending prenatal clinics.

Research of various kinds has begun; completed studies have already been mentioned. These include a repeat goiter survey to determine whether schoolchildren in Murewa District really have seriously higher levels of goiter than schoolchildren in the rest of the country and how representative they are of their community. Plans are being made for research on salt consumption. There are further plans for a pilot project to study various aspects of iodated oil capsule distribution, and for a cretinism survey (cretinism is a result of severe iodine deficiency) (Mutamba 1991a).

The IDD problem has not yet been brought to people's attention adequately through the mass media and other channels. A logo that would provide easy public recognition was chosen from a number of suggestions, mainly by commercial firms, and informational materials have been prepared, as the first steps in the broader communication approach being planned. Specific recommendations for how the Zimbabwe program can achieve some of its priority goals were provided by the ICC/IDD (Bailey 1991).

**Nutritional Anemia.** Based on the information supplied to Gillespie, Kevany, and Mason (1991), more than 90 percent of pregnant women have at least one prenatal contact with the health services (average, two to three contacts). Blood hemoglobin levels are measured in district hospitals, and cases of anemia are monitored monthly and referred to a central hospital if necessary. A four-week supply of prophylactic iron sulphate and folate tablets is given to all pregnant women who attend prenatal clinics. In 1991, 50,000 units of 1,000 tablets were supplied through the Essential Drugs Program compared with the 80,000 ideally needed, and the 20,000 actually used in 1989. The cost in 1991 was Z$7.3 per 1,000 tablets. Although stocks may be low occasionally, no major constraints on the program have been noted. How-
ever, no studies have been conducted on the supply and demand of haematins, adherence to prescribed doses and schedules, or the impact of this supplementation program.

**Vitamin A Deficiency.** Vitamin A capsules (50,000 IU) have been included in the Essential Drugs Program in Zimbabwe. The manual says they are to be provided to children with measles, chronic diarrhea, and eye signs of vitamin A deficiency. It is not known how often eye signs of vitamin A deficiency are noted, nor how often these capsules are properly prescribed and taken for the indicated diseases. Because measles greatly depletes vitamin A, the high measles vaccination coverage (83 percent as of 1989) must have a positive effect on vitamin A deficiency in the country. The recent survey in Mat North confirmed that vitamin A deficiency was not severe enough to qualify as a public health problem (Provincial Medical Officer, Matabeleland North 1991). A national workshop in June 1993 discussed the study results and appropriate program responses.

*Control of Chronic Disease*

The treatment of chronic disease is a growing burden on urban health services. In anticipation of increasing health care demands from patients with chronic diseases, the Harare City Health Department established in 1980 a separate disease registry for patients with stable hypertension, diabetes, and congestive heart failure. More than 75 percent of the 3,000 patients registered during the 1980s were diagnosed as hypertensive. By 1986, there had been more than 10,000 return visits for blood pressure monitoring among adult patients in the municipal clinics of the City of Harare.

Unfortunately, in Zimbabwe there is a lack of dietitians and a lack of awareness of the importance of dietetics in the treatment of chronic disease. For example, the article on control of hypertension that provided the data for the paragraph above did not even use the words "obesity," "diet," or "salt" (Bassett and others 1990).

*Control of Food-Borne Disease*

Zimbabwe has a Food and Food Standards Act of 1971 administered by the MOH&CW and the Foods Division of the Government Analyst. The FAO has sponsored a project to amend and complement the act and has proposed the formation of a Food Control Board (Mpofu 1988). A government committee is planning a comprehensive overhaul of the food laws.
Nutrition Programs in Other Sectors

As mentioned above, the major community-based nutrition programs in Zimbabwe, first the CSFP and now the CFNP, have been administered by multisectoral committees at the national, provincial, and district levels. At the national level, ministries dealing with health, agriculture, community development (whose extension workers also act as primary health care workers), energy and water resources, local government, and finance and economic planning have been involved. Youth and culture and recently education have also been active. At the local level, the first three or four listed ministries above are usually the most active. The 1984 Primary Health Care Evaluation noted that 450 Home Extension Services demonstrators were disseminating nutrition education, mostly to women's clubs. Lenneiye (1991) has described in detail the nutrition-related activities of all major ministries. The following is a summary of the most important sectors involved in CFNP besides the MOH&CW.

Agricultural Sector

Since independence, the government's basic development policy has been growth with equity and transformation. Agricultural production was to be increased through the following policy incentives: guaranteed producer prices, resettlement, reconciliation, increased credit facilities and extension services, and improved market infrastructure in communal areas, including expanded irrigation. During drought years, farmers in affected areas are provided with crop packs that contain seed, fertilizer, and other items, and imports from the world market are used to cover national production shortfalls. On average, in nondrought years, 80,000 to 90,000 tons of wheat are imported, usually by swapping maize with donors. Some 15,000 tons of rice are imported annually.

Efforts toward achieving the goals of rural development have included development of cooperatives, a policy of decentralization, and minimum wage laws. The development of a population policy to deal with problems such as unemployment exacerbated by rapid population growth can also be seen as a long-term contribution to household food security. Future efforts to ensure that production increases as fast as the population will need to focus on improved husbandry, use of appropriate technology, and use of hybrid varieties (Takavarasha and Rukovo 1990).

Food subsidies and transfers have been used but have been decreasing in recent years. Food for work is increasingly preferred because it improves rural infrastructure and avoids food dependence. Families without able-bodied workers are given food, but those with workers in
urban areas are expected to manage on their own through remittances. Drought relief has been financed partly by levying a drought tax. An intersectoral Early Warning Unit has been set up to improve the country’s ability to predict drought and harvest failure, which should enable the country to be better prepared for drought in the future.

The Ministry of Agriculture has always concentrated on maize and cash crops, especially for export. More needs to be done to assist farmers to grow other food crops, particularly sorghum and millet, which are more likely to benefit poorer rural families on marginal land. Improvements are also needed in food processing, preservation, and storage, in improved horticulture, and in ways of meeting the needs of rural women.

The Ministry of Agriculture is planning to include a nutrition component in its extension in-service training program with technical support from the MOH&CW Nutrition Unit and financial support from FINNIDA, the Finnish Development Agency. The Department of Extension Services planned to recruit two nutritionists/home economists with Kellogg Foundation funding in 1992-93 and 1993-94. If they prove effective, the Ministry of Lands, Agriculture and Rural Resettlement (MLARR) would consider hiring such staff on a permanent basis.

Cooperation between Agritex and the MOH&CW has greatly improved in the past three years. In addition to cooperating with CFNP (Agritex representatives chair the intersectoral steering committees at every level), parastatals and other government bodies in the agricultural sector have given much attention to food security, showing interest even at the household level in recent years.

The MLARR Policy Department is expected to prepare a Cabinet paper to justify its involvement in the formulation of food and nutrition policy. This marks a recent increase in awareness about the importance of the agricultural sector in nutrition policy.

**Educational Sector**

The Ministry of Education (MOE) has incorporated nutrition into its science and social studies program. Few feeding and other health and nutrition activities have concentrated on school-age children in Zimbabwe, but a school feeding program in Kwekwe in 1976 was effective in improving child growth and school performance (World Bank 1983). The City of Harare began a school supplementary feeding program in July 1989 funded from its own resources (with assistance from parent teacher associations and volunteer mothers) in sixteen primary schools where poor nutrition was common. All students in these schools receive 200 milliliters of a commercial soy- and peanut-based soup to which iodated salt has been added. (This costs one-fifth as much as milk and poses less danger of contamination.) The soup had an imme-
Immediate effect in improving health, nearly eliminating fainting spells, and increasing attentiveness in class, as well as attendance (Harare City Health Department, Nutrition Unit 1989; Van der Vynckt and Nkinyangi 1991). Since 1986, one NGO (Christian Care) has assisted in setting up a school feeding and garden project in Binga District (Laman, Vlaar, and Mellink 1991). The Red Cross, the Lutheran World Federation, and the Catholic Development Commission (CADEC) have also been involved periodically in school feeding in Zimbabwe (Van der Vynckt and Nkinyangi 1991).

The MOE has become interested in recent years in increasing the learning capacity of students by investing in their health and nutritional status. Former Minister of Education and Culture F. Chung emphasized that improved health of schoolchildren is “a right in itself, irrespective of whether it improves learning or mental functioning.” She also emphasized that school feeding and other school-based interventions for school health and nutrition must fully involve parents from the beginning and not treat them as passive recipients (Van der Vynckt and Nkinyangi 1991). With technical support from the MOH&CW Nutrition Unit, a pilot project in four provinces was planned in cooperation with UNESCO and funded by SIDA. The objectives of this project are to examine the extent to which common health and nutrition problems affect pupil participation and achievement in school, to make recommendations, and to provide policy guidelines. A national workshop was held in June 1990 to plan the project. A pilot project in one district in Masvingo was to have begun recently, but the 1991–92 drought brought many education projects to a halt. Many schoolchildren in this hard-hit province were unable to go to school because of hunger.

Food science training at the University of Zimbabwe was discontinued several years ago. Most food science and technology capacity in the country is in the private food industry. The creation of a new Institute of Nutrition, Food Science and Family Science at the University of Zimbabwe has been under negotiation for six years. The University of Zimbabwe Faculty of Agriculture, Department of Agricultural Economics and Extension, has been actively involved in food security research at the national, regional, and household levels. It has taken part in consultations on food and nutrition policy formation. The Zimbabwe Institute of Development Studies has also been involved in food security research.

Labor, Manpower Planning, and Social Welfare

The Ministry of Labor, Manpower Planning, and Social Welfare administers drought relief and food-for-work programs to assist families in
eventually the national level. Food is requisitioned from the GMB by the National Drought Relief Coordinator and sent to district distribution points for further distribution to the villages. A comprehensive ration scale was recommended by the MOH&CW Nutrition Unit, but the cost was too high and now only maize is provided.

Food-for-work projects are intended to prevent the creation of dependency and at the same time strengthen rural infrastructure. Eventually a public works program will be established that provides cash instead of food. Because of the lack of work projects, food relief has had to continue in most drought-stricken areas to prevent starvation. In addition, small grants of Z$30/month are given to the destitute. A national social security scheme is beginning to take shape.

The number of individuals who have needed assistance under these programs from 1982 to 1988 is shown in Table 6-1, along with the costs to the government.

**Local Government, Urban and Rural Development**

The Ministry of Local Government, Urban and Rural Development chairs the intersectoral development committees that coordinate development activities at the provincial and district levels. These committees have subcommittees that address various development issues. Among these official subcommittees are the Intersectoral Food and Nutrition Committees at the provincial and district levels, which report to the Development Committees. The presence of these subcommittees has put nutrition on the development agenda at the provincial and district levels in a unique way. Unfortunately, there is no analogous structure at the national level, and thus the National Steering Committee continues to have a sort of ad hoc status.

**Table 6-1. Government Assistance Provided by the Ministry of Labor, Manpower Planning, and Social Welfare, 1982-83 to 1987-88**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number needing assistance</th>
<th>Drought relief (Zimbabwe dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Funds spent</td>
</tr>
<tr>
<td>1982–83</td>
<td>1,528,631</td>
<td>19,005,000</td>
</tr>
<tr>
<td>1983–84</td>
<td>2,000,000</td>
<td>55,000,000</td>
</tr>
<tr>
<td>1984–85</td>
<td>1,566,487</td>
<td>9,488,588</td>
</tr>
<tr>
<td>1985–86</td>
<td>1,039,319</td>
<td>4,952,407</td>
</tr>
<tr>
<td>1986–87</td>
<td>2,019,218</td>
<td>12,000,000</td>
</tr>
<tr>
<td>1987–88</td>
<td>2,500,000</td>
<td>23,000,000</td>
</tr>
</tbody>
</table>

gous structure at the national level, and thus the National Steering Committee continues to have a sort of ad hoc status.

**Community Development and Cooperatives**

The Ministry of Community Development and Cooperatives has extension workers at the community level whose extension responsibilities include nutrition-related tasks. These Village Community Workers, formerly Village Health Workers, have been the mainstay of nutrition activities at the village level. Their work includes day-to-day nutrition education activities, community mobilization, monitoring, and supervision.

**Notes**

1. The feeling was that drought relief should be viewed in any case in the broader context of a national food and nutrition policy framework, addressing national food security and nutrition needs.

2. It seems that the rapid pace of increase in growth monitoring has slowed. The 1987 primary health care evaluation found that more than half the children had been weighed six times during their first year of life.

3. This strategy was recommended at the 1991 annual meeting of the United Nations Administrative Committee on Coordination/Subcommittee on Nutrition (ACC/SCN) and was recently employed in Cameroon.
7. Resources for Nutrition Activities

Many local and international NGOs have played an important role in implementing nutrition projects at the grass-roots level. They formed an NGO Task Force in 1980, which organized and managed the CSFP until it was handed over to the government in 1982. Many NGOs are still active members of the intersectoral food and nutrition committees and make substantial contributions to the CFNP, complementing and supporting the work of the government. These contributions often include income-generation project efforts, which help to overcome an additional constraint on good nutrition and increase community interest and participation in the CFNP and other nutrition programs.

Coordination among and between NGOs and the government has long been a matter of concern. The Netherlands government funded reviews of NGOs' involvement in nutrition activities in Zimbabwe in 1989 and again in 1991. Van der Poort (1989) concluded that the role of NGOs in nutrition was generally positive, responding well to community needs. A follow-up meeting was held in 1989 at which recommendations to establish an NGO coordinating mechanism for nutrition activities were made and later acted upon. Laman, Vlaar, and Mellink (1991) agreed with van der Poort's conclusions about the value of NGO projects and about the need for better coordination among them. They also pointed out that project monitoring and evaluation were inadequate and that it was not possible to determine how successful the NGOs had been in achieving their objectives.

The government provides administrative support to the Nutrition Unit and other government departments involved with nutrition, paying salaries, travel costs, and so forth. It provided direct support to the CSFP for one year during the 1983-84 drought and direct support to drought relief food distribution, food-for-work, and public assistance to the destitute. The Nutrition Unit's ability to attract donor support for all its work meant that government commitment was not tested in its early years. In 1989, as donor support began to wane, the Ministry of Health requested funding from general government revenues and was granted Z$750,000 for the CFNP. In 1990 the government allocated Z$1 million for nutrition programs in the MOH&CW budget. Further evidence of government willingness to fund nutrition activities was the inclusion of a sizable nutrition component in the Second Family Health Project (FHP2), with the government standing as residual funder if donors did not come forward.
As for other external assistance, the MOH&CW Nutrition Unit has received support from SIDA and UNICEF since Independence. UNICEF has consistently provided about US$100,000 per year, often assisting with training needs and the purchase of weighing scales and other equipment.

SIDA support, which has varied in recent years from US$300,000 to US$500,000 annually, has been aimed mainly at “institution building” and has provided the flexibility and continuity required for development of community-based strategies. Such strategies need innovation and modification, which are not usually possible when donor support is given only to preplanned projects. The SIDA money has also included support for long-term staff training at advanced levels, as well as long-term links with Swedish institutions to provide technical support. In addition, SIDA recruits and supports local and non-Swedish expatriate consultants as needed.

Nutrition has been included in the Second Family Health project, which runs from 1992 to 1996 and is funded by a consortium of donors, led by the World Bank. The nutrition component is budgeted at US$3.5 million for the five-year period, much of which is covered by SIDA, with the Norwegian Agency for International Development (NORAD) providing some funding and the Zimbabwean government providing the residual.
8. Summary and Conclusions

Zimbabwe’s success in improving the nutrition of its young children since Independence in 1980 can be attributed to the following:

- The government was committed to improving the health and education of its poorer citizens and was willing to give priority to vulnerable groups such as young children.
- A spirit of cooperation and community spirit brought Zimbabwean society together and was particularly evident in the first years after the War of Independence.
- There was active and continued support for nutrition projects at the grass-roots level from a large number of NGOs.
- A core of highly trained and motivated staff in ministries, including Health and Agriculture, recognized the importance of nutrition and made efforts to improve it within their own spheres of influence at the national and local levels.
- Donor support was stable, long-term, and flexible enough to allow community-based nutrition projects to evolve.

Zimbabwe has suffered numerous economic setbacks since Independence in 1980, and real incomes for the majority of its residents have not increased much, if at all. Yet substantial advances have been made in reducing malnutrition (based on anthropometric indicators) in young children. Nutritional wasting is seen only rarely nowadays, and levels of stunting appear to have declined by about one-half, although better analyses of existing data are needed to confirm this.

WHO AFRO (1989a) presents comparative anthropometric data from thirty-four African countries for children age 1 to 2. Only Togo and São Tomé and Principe appear to be substantially better off than Zimbabwe. Another six countries have similar levels of growth retardation. The other twenty-five countries appear to have worse problems with young child malnutrition.

The incidence of low birthweight may be as high as 10-15 percent. The growth of infants during the first three months has not been studied adequately, but it appears that stunting occurs very early, perhaps from birth. The vast majority of growth retardation occurs in the first year of life in Zimbabwe. Some additional stunting occurs during the second year of life, but average child growth stays on about the same percentile from age 2 to 5 years.
The nutrition of school-age children in areas where it has been studied has been surprisingly poor. This includes the high-density suburbs of Harare. Several studies have found substantial levels of nutritional wasting among school-age children, so there may actually be a decline in nutrition once children begin attending school. The few data available do not indicate that nutrition improves for school-age children. Clearly, the policy of targeting nutrition resources almost exclusively to the preschool age is no longer appropriate in Zimbabwe.

Research on the nutrition of Zimbabwean adults is even more scarce. It appears that they have better nutrition than children, and in fact, overweight may now be a greater problem than underweight, especially among women. Chronic diseases, particularly hypertension, are increasing in Zimbabwe, although there is little research on the extent to which dietary and other lifestyle changes are to blame.

Regarding micronutrient deficiencies, it is unclear to what degree young children suffer from iron deficiency, but neither it nor vitamin A deficiency is likely to be severe. There has not been enough research to determine whether nutritional anemias in women are an important public health issue. Iodine deficiency, however, is widespread throughout the country, with more than half the population living in areas where goiter is severely or moderately endemic. Urinary iodine levels appear to be low, probably affecting thyroid function widely across the population. Most research in this area has focused on schoolchildren. Pellagra may be a seasonal problem among the poorest groups.

Poverty continues to be the basic factor behind most undernutrition and malnutrition in Zimbabwe. Of the "underlying" causes (Figure 3-1), those relating to health care have probably been greatly reduced by progress in health care delivery and improvements in the control of infectious diseases during the past decade. Land redistribution may have helped raise incomes, but the nutrition of children in resettlement areas has failed to improve during the past decade, and they are now the worst-off group. This suggests that redistribution of land alone is not sufficient to achieve welfare and equity in Zimbabwe. In resettlement areas attention must be given to complementary support measures such as the development of infrastructure and easy access to health care. Lack of access to clean water and to health care may account for the higher levels of acute malnutrition found among children in resettlement areas.

Household food security has largely been maintained since Independence due to successful, but very expensive, government food distribution, drought relief, and food subsidization. In today's climate of structural adjustment and especially in the light of the very severe 1991-92 drought, household food security requires continued vigilance.

The lack of attention to the care mothers give to their children, particularly when feeding infants, is probably responsible for much of the re-
mainly malnutrition. This may be linked to the inferior status of women in Zimbabwean society, which has received too little attention in research, programs, and policies.

Health workers and mothers have been unaware that exclusive breastfeeding during the first four to six months of life is important. It is rarely practiced in the country, although the majority of women breastfeed for an extended period. The disappearance of early exclusive breastfeeding may have been caused partly by health workers' overzealous promotion of frequent complementary feeding at too early an age. The common use of water and gruels to feed infants from the early months of life may account for the very early decline in the growth rate of infants in Zimbabwe. However, virtually no research has been done on these issues in the country, although there are plans to do so.

Government commitment to drought relief and supplementary feeding of children has probably been successful in preventing a worsening in nutrition despite the five drought years that have occurred since Independence. Although they have been extremely expensive, the efforts to ensure adequate access to food for the entire population at all times appear to have been successful. This conclusion is supported by Ferro-Luzzi, Pastore, and Choto (1992), who wrote that the BMI distribution they found "clearly indicates that these adults cannot be considered nutritionally at risk. This finding was unexpected, given the marginal, drought-prone habitat of this community, and implies that the community had developed and implemented successful avoidance strategies."

Substantial efforts to educate mothers with key nutrition messages—for example, on the use of energy-dense complementary foods—may have contributed to the improvement in nutrition in Zimbabwe since Independence. The expansion of the Community Food and Nutrition Program may have contributed also, especially in Mashonaland West, but an impact evaluation of the program has not been carried out.

Nutritional stunting among young children continues to be a problem although there have been improvements. Malnutrition remains an underlying cause of a substantial proportion of young child mortality, according to health professionals.

Other nutrition problems have received far less attention in Zimbabwe. The efforts of the government and NGOs to target the preschool-age child almost exclusively have succeeded, but improvements in nutrition among nontargeted groups have lagged behind and must be redressed. Lack of nutritional research or surveillance of any other groups in society has left policymakers unaware of the possible need to shift priorities.

Zimbabwe has so far managed its nutrition programs with the staff and Nutrition Unit it created at Independence within the MOH&CW. Few new nutritionists have been trained and no new posts have been
established in recent years. This lack of trained staff at the right levels has inhibited the development of a national food and nutrition policy and slowed the pace of development and expansion of such crucial national programs as the Promotion of Adequate Infant and Child Feeding Practices and a community-based nutrition surveillance system. Trained staff are only now becoming sufficient in number to implement the Elimination of Iodine Deficiency Disorders Program. The Community Food and Nutrition Program has its own intersectoral management structure, which ensures that it continues to operate and expand even with too few qualified staff. However, a scarcity of qualified staff has limited the extent to which the CFNP can take advantage of the process evaluation conducted three years ago to improve its quality. It has not been able to improve its targeting, and the development of teaching materials has been inhibited. This has constrained the government from undertaking an impact evaluation.

There are too few dietitians to assist doctors in the dietary management of disease, let alone to plan and implement programs for reducing diet-related causes of the chronic diseases that are on the rise. Zimbabwe will pay a high human and economic price in the future if this new “epidemic” is allowed to grow with no investment in prevention in these early stages.¹

Plans to combat many of the remaining nutrition problems in Zimbabwe over the next five years have been made by the MOH&CW Nutrition Unit as part of the overall Five-Year Plan and included in the Second Family Health Project (FHP2). The major obstacle to realizing these plans is the lack of nutrition expertise and field experience at appropriate levels and the lack of training programs to build it. In addition, there needs to be a strengthened coordinating mechanism to ensure that all sectors play their part. Monitoring, surveillance, and evaluation systems (and the expertise to make optimal use of them) are still underdeveloped. This reduces the government’s ability to target its limited resources and to improve project quality.

Note

¹. The Ministry of Health produced a poster for the 1992 World Health Day that focused on the importance of heart disease. Three of its five illustrations concerned diet and exercise. Ironically, virtually nothing has been invested since Independence to promote dietary improvements that would prevent heart disease and other chronic diseases.
9. Recommendations

General recommendations:

- Because the targeting of nutrition programs to pre-school-age children since Independence appears to have improved nutrition of this group, targeting strategies should be revised to take into account current and future data on the nutrition of all groups. Programs to address the nutritional problems of school-age children and the nutritional aspects of chronic diseases may now deserve higher priority. Programs that do focus on pre-school-age children must better target the geographic areas where the problems are worst. They must target population groups such as those living in resettlement areas with the most severe nutrition problems.

- Recurrent drought, as well as the structural adjustment of the economy being undertaken by the government of Zimbabwe, threatens to make nutrition problems worse among the poor. To avoid this, so that further progress can be made to reduce nutrition problems in the country, a balanced and intersectoral set of programs and policies, guided by an improved system of nutritional surveillance, will be required.

- Technologies that reduce the work burden of rural women must be pilot-tested. Attention should be given to how to increase the quality of care received by children from both men and women.

Sectoral recommendations:

The five-year program of the MOH&CW Nutrition Unit and multisectoral activities are attempting to act on the following recommendations.

Health sector:

- Greater attention should be given to the “underlying causes of malnutrition” (see Figure 3-1) linked to inadequate maternal and child care. Priority should be given to improving the information, education, and communication (IEC) skills and capacity of the relevant units in the Ministry of Health and Child Welfare. Relevant messages need to be disseminated in ways that will empower the most vulnerable groups, particularly women.
• IEC messages should be linked to increased efforts to mobilize communities for nutrition-related income-generating programs such as the Community Food and Nutrition Program (CFNP).

• The community-based growth monitoring program should be improved and then expanded. Trials should be conducted in how to use CBGM better to stimulate and guide community nutrition activities.

• Better use should be made of growth-monitoring data and other indicators in nutrition surveillance systems to guide resource allocation at each level of government, as well as to monitor the effects of structural adjustment on the poor.

• Nutrition IEC programs must focus not only on the need for frequent feeding of energy-dense complementary foods between the sixth and twelfth months of life but also on the importance of exclusive breastfeeding (avoiding all supplementary food and water) during the first four to six months of life. Health worker training must be revised and maternity ward routines reformed where needed.

• Ways must be found to enable formally employed women to achieve the important goal of exclusive breastfeeding. More attention should be given to protecting traditional Zimbabwean breastfeeding from the expanding baby food industry.

• Qualitative research and field trials need to be done on the use of traditional fermented as well as germinated foods.¹

• All salt for human and animal consumption should be iodated. Until this is achieved, iodated oil capsules should be distributed to vulnerable groups in the most severely affected districts to provide temporary protection (for up to two years). The iodine status of the population must be monitored to guide future planning efforts and to ensure that iodated salt, once universally available, continues to prevent iodine deficiency disorders in the country.

• High priority must be given to implementing the plans of the MOH&CW Nutrition Unit to train dietetic technicians, to train and hire more ward-level nutrition coordinators, and to train key staff at the district level to enable them to bear more responsibility for nutrition and to support and supervise the work of the nutrition coordinators. Funds must be available for transport of provincial nutritionists to enable them to support planned training and activities in their districts.

**Research priorities:**

• More work on maternal nutrition is needed. Height and weight are measured at prenatal visits in many urban health care institutions. The relatively simple task of collating such data should
receive priority, as should research to determine the extent of undernutrition and overnutrition among women, causes of these problems, and possible approaches for alleviating them.

- The prevalence of nutritional anemias and pellagra among vulnerable groups needs to be investigated.
- Height and weight of Zimbabwean infants at birth need to be studied, as well as infant feeding and infant growth in the first months to determine why faltering linear growth appears to start so early in life.
- Data from past surveys should be reanalyzed to identify trends. Surveys should be conducted locally to determine how representative the data from clinic-based and community-based nutrition surveys are.
- The Nutrition Unit, like others in Zimbabwe, needs to learn more about how to use rapid appraisal methods rather than large national surveys for community assessments. Much more attention should be given to using qualitative data for understanding problems, their causes, and possible solutions rather than continuing to rely on quantitative surveys.

Education sector:

- High priority should be given to following up the pilot studies and the preliminary plans that are being developed to improve the health and nutrition of schoolchildren by the Ministry of Education with support from the Ministry of Health and Child Welfare.

Agriculture sector:

- Household food security throughout the year needs to be a clearly defined objective of agricultural policy. This would ensure that some attention is paid to households' ability to acquire the right quantity and quality of food to meet their needs at a price they can afford.
- Greater attention must be given to crops other than those intended for export. These include legumes, vegetables and fruits, and drought-resistant grain for human and animal consumption.
- Nutrition surveillance and programming must target families in resettlement areas.
- Assistance for the poorest families to obtain enough food will still be required, not only in drought years but also more generally, if food prices continue to rise in relation to minimum wage levels. More targeted approaches that use nutrition surveillance systems are needed to reach vulnerable families. A short-term subsidy on straight-run maize meal would be worth exploring, as it would presumably target itself automatically to poorer groups.
National nutrition policy:

- The development of a strong national food and nutrition policy would be valuable in allocating responsibility for the policies and programs recommended here as well as in the allocation of resources to these programs. It could help key sectors, policymakers, planners, and project managers to understand the broader food and nutrition context within which they are working. Synergistic effects appear to be achieved when several approaches are combined in the same area. A national food and nutrition policy could help generate the momentum required as well as coordinate efforts.

Note

1. Fermented or germinated foods may allow busy mothers to store energy-dense and contamination-resistant complementary foods made in the morning for use throughout the day.
Appendix. Methodological Notes

Prevalence

Malnutrition and undernutrition are difficult concepts to define, let alone measure. It is common to estimate prevalence in infants and young children by using attained growth as an indicator. Most commonly, weights and heights are related to age and to each other and compared with international standards. Low height for age is an indicator of chronic growth retardation and is referred to as “stunting”; low weight for height is an indicator of acute growth retardation, referred to as “wasting.” Weight for age, the indicator used in ongoing monitoring of growth in health centers, measures a combination of stunting and wasting. For convenience, children low in weight for age are sometimes referred to as “undernourished.” This term is also used more generally to refer to growth retardation. But it should be kept in mind that growth deficits are only indicators of nutritional status and that there are many factors, some unrelated to diet, that can cause growth retardation.

Data on undernutrition in Zimbabwe are often reported with sexes combined. This appears to be justifiable because no differences in the nutritional status between boys and girls have been identified among under-fives (World Bank 1983; CSO and Institute for Resource Development/Macro Systems 1989; Moy and others 1991a).

Trends

In Zimbabwe, several national surveys conducted since Independence allow for reasonably reliable estimates of levels of growth retardation that are internationally comparable. It is difficult to judge what changes have occurred in nutrition because survey reports have used different definitions, anthropometric standards, and cutoff points as well as different age groups. Only when data from one survey are recalculated to match standards and cutoff points used by another can judgments be made. (Even then, possible seasonal effects must be considered when making comparisons.)

In contrast, nutrition surveillance data based on growth monitoring in health centers, available since 1987, may not give accurate estimates of prevalence in the community, especially at lower than national level.
However, it probably provides a reasonably accurate way to measure trends in the proportion of children who are low in weight for age.

One danger involved in analyzing trends is that most data are based on the proportion of children falling below a lower cutoff point (usually −2SD), not on an analysis of how the entire sample changed. Only in the case of Kinsey (1992) were data presented so that both approaches could be compared, including graphs showing how the population curves changed. In this case, little bias appeared to have been introduced by using the simpler approach, that is, using the proportion less than −2SD.

By its very nature, wasting is an acute phenomenon and does not last very long in an individual. It is likely to be much higher in the pre-harvest season, but surveys are not usually conducted then because of transport and other logistical difficulties caused by rains. Another factor that masks true levels of wasting is mortality; acutely malnourished children either get better or die within a short time. Case fatality rates for malnutrition are still high, and malnutrition is still the number one killer of young children. Thus policy and program conclusions based on survey evidence that nutritional wasting is no longer of public health importance in Zimbabwe must be drawn with great caution.

Recent malnutrition data are very likely affected by AIDS. The disease especially increases the incidence of wasting. Most infected infants die before reaching school age. During 1991, blood tests of pregnant women tested for the HIV virus provided the data in Table A-1. Reported AIDS cases in the age group 0 to 4 years increased from about 300 in 1989 to 880 in 1990 but then declined slightly to 716 in 1991 (MOH Health Information Unit and AIDS Control Program 1992). However, this may involve significant underreporting, and the prenatal HIV infection rates in Table A-1 suggest that the numbers will become much larger in the future. Because infants with AIDS are undernourished for some time before they die, the improvement achieved in reducing undernutrition from other causes may be underestimated. This bias would presumably be less for nutrition surveillance data based mainly on “well baby” clinic visits.

Table A-1. HIV Incidence among Women Attending Prenatal Clinics, 1991

<table>
<thead>
<tr>
<th>Province</th>
<th>Percent HIV positive</th>
<th>Number in sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manicaland</td>
<td>26.0</td>
<td>639</td>
</tr>
<tr>
<td>Mat North</td>
<td>25.0</td>
<td>208</td>
</tr>
<tr>
<td>Mat South</td>
<td>12.9</td>
<td>630</td>
</tr>
<tr>
<td>Bulawayo</td>
<td>17.1</td>
<td>304</td>
</tr>
</tbody>
</table>

Note

1. The differences between prevalence estimates caused by any of these factors can exceed the differences likely to occur as a result of socioeconomic differences, geographic differences, or trends over time. For example, Schuon and Fleischer (1988) compared cutoff points of less than \(-2SD\) and less than 90 percent of mean height for age in rural schoolchildren age 6 to 11 years and found that the former gave estimates of stunting one-half to one-quarter as large. Harare City Health Department, Nutrition Unit (1989) compared two cutoff points very close to each other, less than the third percentile and less than \(-2SD\) \((-2SD = 2.3\) percentile), for urban schoolchildren. The use of the third percentile gave a 31 percent higher estimate of the proportion of children low in weight for age (11.3 percent compared with 8.6 percent using less than \(-2SD\)). Thus the type of comparison of different studies in Table 2-2 can easily be misleading about trends.
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