MALAWI SOCIAL INDICATORS SURVEY 1995

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MINISTRY OF ECONOMIC PLANNING AND DEVELOPMENT
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CENTRE FOR SOCIAL RESEARCH

MALAWI
SOCIAL INDICATORS SURVEY
1995

A Survey of the State of Health,
Nutrition, Water, Sanitation, and Education of Children
in Malawi

Ministry of Economic Planning and Development,
National Statistical Office, and the Centre for Social Research
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LIST OF ABBREVIATIONS

AFP	Acute Flaccid Paralysis
AIDS	Acute Immune Deficiency Syndrome
BCG	Bacillus Calmette Gufrin
CDD	Control of Diarrhoeal Diseases
CHSU	Community Health Sciences Unit
CSR	Centre for Social Research
DHS	Demographic and Health Survey 1992
DPT	Diptheria Pertussis Tetanus
EPI	Expanded Programme of Immunization
Ha	Hectare
HIV	Human Immuno-deficiency Virus
IBFAN	International Baby Food Action Network
IDD	Iodine Deficiency Disorders
IEC	Information, Education and Communication
IMPACT	Initiative for the Mobilization of Private Action
Km	Kilometre
MCH	Maternal Child Health
MSIS	Malawi Social Indicators Survey
MOHP	Ministry of Health and Population
MUAC	Mid-Upper Arm Circumference
NCHS	National Centre for Health Statistics
NSSA	National Sample Survey of Agriculture
NSO	National Statistical Office
OPV	Oral Polio Vaccine
ORS	Oral Rehydration Solution
ORT	Oral Rehydration Therapy
PPM	Parts per million
PPS	Probability Proportional to Size
SE	Standard Error
SRS	Simple Random Sampling
SSS	Sugar Salt Solution
TBA	Traditional Birth Attendant
TT	Tetanus Toxoid
UNICEF	United Nations International Children's Fund
VIP	Ventilated Improved Pit
WHO	World Health Organization

PREFACE

This report presents the findings of the Malawi Social Indicators Survey (MSIS). The preparation of the Survey took place in collaboration with the Technical Working Committee of the Poverty Monitoring System, with representation of all the line ministries. This Committee also verified the findings of the survey.

The MSIS fieldwork was undertaken in October 1995 by the National Statistical Office (NSO). The data were processed by the NSO and the Centre for Social Research (CSR) in October and November 1995. The first findings were provided by CSR in December 1995 and presented by the Ministry of Economic Planning and Development at the Consultative Group Meeting in Bournemouth, England.

The primary objective of the MSIS was to collect information on indicators that measure Malawi's progress in reaching the end-of-decade goals set by the World Summit for Children in New York in 1990 and the Malawi National Programme of Action for the Survival, Protection and Development of Children in the 1990's. The survey was also expected to provide a comprehensive picture of the general well-being of children in Malawi.

The data were collected from 6206 households throughout the country, and are presented at the district, regional and national level. The data were gathered on orphans, access to health services and education facilities, infant and child malnutrition and mortality, immunization coverage, the incidence and treatment of diarrhoea, Vitamin A, breast feeding, salt iodization, access to potable water and proper sanitation facilities, and primary education.

The study was not to focus solely on Malawi as a whole, but on the individual districts within the country. This information will help the government, donor and NGO programme designers and implementers as well as communities to target assistance more precisely in their effort to attain the goals as defined by the World Summit and the National Programme of Action (NPA). Information is provided on the way residential location, gender, level of educational attainment and other socio-economic factors influence the status of indicators.

Alex C. Gomani,
SECRETARY FOR ECONOMIC PLANNING AND DEVELOPMENT

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Our gratitude goes to the National Statistical Office for collecting the data, and to the Centre for Social Research for analysing it and producing this report. The National Statistical Office has shown professionalism in this undertaking through effective sampling, enumerator training, data collection and weighting. The Commissioner for Census and Statistics, Mr. L. Golosi, along with Messrs. S. Konyani, L. Kochelani, H.B. Moyo, G.T. Mazunda, M.J. Khwepeya, and R.S Mkandala, all of the National Statistical Office, deserve special thanks.

The Ministry of Agriculture and Livestock Development has provided enumerators and the Community Health Sciences Unit has analysed salt samples. Our gratitude goes to these institutions as well as to all the enumerators, data entry clerks and interviewees whose contributions made this report possible.

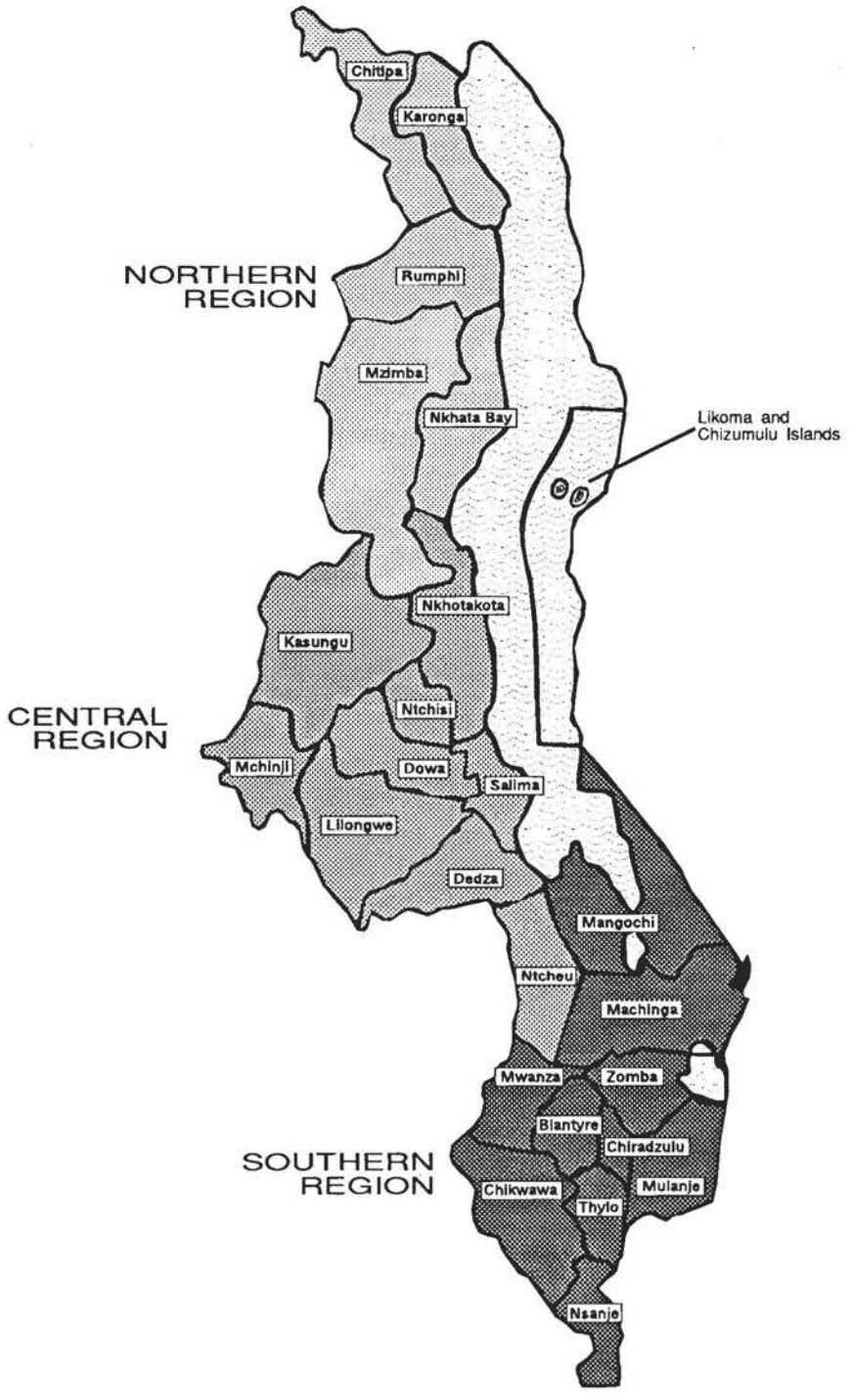
UNICEF has been very supportive of the project, especially Dr. Natalie Hahn, UNICEF Representative, Ms. Wia Berends, Monitoring and Evaluation Officer, as well as all Project Officers. UNICEF provided financial and technical assistance, and constructive comments in the preparation of the survey and this report.

The Director of the Centre for Social Research, Dr. Stanley Khaila, provided valuable comments and direction in the conduct of data analysis and report writing. Our appreciation goes to him and Mr. Nyson Chizani, the Centre's Data Analyst, and Ms. Sue Ridley (UNICEF Consultant) for their assistance in producing the data. Dr. Diana Cammack edited the text and production was completed by Mr. Abdi Edriss of Business Engineering and Computer Services International.

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Malawi

ADMINISTRATIVE REGIONS AND DISTRICTS



EXECUTIVE SUMMARY

The plight of children worldwide was recognized at the World Summit for Children in New York in 1990. High infant and under-5 mortality rates and high malnutrition levels, lack of education, safe water and sanitation were among the threats facing children. To help counteract these problems the Summit established a series of goals for children that are to be reached by the year 2000. A series of mid-decade goals were also developed so that progress towards the end-of-decade goals could be monitored.

The mid-decade was reached in 1995, and as a result, UNICEF commissioned the National Statistical Office and the Centre for Social Research to conduct a survey of the state of children in Malawi. Its objective was not merely to assess progress towards these goals, but to provide a comprehensive picture of the general well-being of children in Malawi. Of specific concern were the areas of mortality, immunization, diarrhoea, malnutrition, vitamin A, breast feeding, salt iodization, education, water, and sanitation. Moreover, the study was not to focus solely on Malawi as a whole, but on the individual districts within the country. This effort to obtain district level data is in line with government policy for decentralisation of planning, which will enable informed decision-making at the districts.

Infant and child mortality are often used as key indicators of the state of children within a particular country. According to this survey, infant mortality now stands at 133 deaths per thousand children, with under-5 mortality at 211 deaths per thousand. This current estimate is not surprising, given the economic conditions within Malawi, the sustained drought, the AIDS epidemic, the extent of environmental degradation, and the high rate of inflation -- all of which have contributed to keeping the mortality rates high. Additionally, rising rates of malnutrition, in the urban areas, themselves a product of current economic conditions and poor health, have also contributed to current mortality rates.

District Summary

Various districts have performed poorly, not just in one sector, but in several. *Ntchisi* has significantly lower than average indicators for education, chronic malnutrition, access to safe water, and vaccinations for DPT, polio and measles. *Salima* has low net enrolment figures, low access to safe water, and high rates of *acute* malnutrition. *Mwanza* is low in net primary school enrolment, access to safe water and sanitation, and has high rates of *chronic* malnutrition. Mwanza is also the only district whose 1992 rate of new primary school enrolment has been almost totally unaffected by the abolition of primary school fees and uniforms. Other districts with low net enrolment figures in 1992 have significantly increased their net enrolment rates as a result of the free primary education initiative.

These individual problems within districts point to severe overall difficulties within these districts, which could be aggravated by a lack of access to services, and insufficient inputs into these districts to date. To counteract such problems, future programmes in these districts would need to be of an integrated nature rather than target isolated sectors.

Other districts proved significantly low for one or two indicators. *Lilongwe, Machinga* and *Mchinji* have low levels of immunization of at least one vaccine -- DPT in Lilongwe and Machinga, and polio in Mchinji. As a result, the former two districts also have low percentages of fully immunized children. A shortage of DPT vaccinations in early 1995 and logistical problems of vaccination delivery are the probable causes of the lower immunization rates.

Dowa, Chitipa, Zomba, Thyolo and *Mulanje* recorded higher levels of malnutrition than the country average. *Lilongwe urban* also recorded higher rates than other urban areas. The latter is seen as an effect of the increasing migration of poor people from rural areas to urban areas and of the drought, which resulted in severe water shortages in the Lilongwe area, and which may have resulted in higher disease incidence.

Conversely, there were districts which performed significantly above average in certain sectors. The Northern region has a tradition of performing well on education indicators. Three of its districts, *Mzimba, Rumphi* and *Nkhata Bay*, performed significantly better in this indicator, as did *Blantyre* in the south. Nkhata Bay also has high levels of BCG immunization as does *Chikwawa. Ntcheu* has high levels of measles immunization. *Nsanje*, probably as a result of its water programme, recorded a higher level of access to safe water, as did Rumphi in the north.

Very few districts that recorded significantly higher than the average in some sectors recorded significantly lower in others. Those that recorded low levels in one sector either recorded levels close to the average or low levels in other sectors as well. Conversely, this is true of sectors that performed well. This suggests correlations between the various sectors, and difficulties within certain districts that prevent them from developing in certain key sectors.

Sector Summary

Four major vaccinations can help prevent six major childhood killer diseases. Malawi has to date been justifiably proud of its records in ***immunization***. In 1995 *BCG* registered the highest rate of immunization at 91%, followed by *polio* at 80%, *DPT* at 76%, and *measles* at 70 percent. Sixty-one percent of children 12-23 months, who received all their vaccinations by their first birthday, were fully immunized. These figures, by antigen, with the exception of DPT and measles vaccinations, fall within the recommended goal of 80%. These rates differ according to region and to the education levels of mothers and heads of households.

The main cause for concern is the decline recorded in immunization levels since the 1992 DHS survey. DPT and polio have shown significant decreases, as has the percentage of those fully immunized. The former can be explained by a lack of vaccines in the country over a three month

period in early 1995. Other explanations include the logistical problems faced by the EPI in distributing vaccines, particularly to outreach clinics.

The prevalence of ***diarrhoea*** within Malawi has decreased from 22 to 15 percent, with more cases occurring in the Northern region than the Southern or Central regions. Prevalence of diarrhoea is heavily influenced by a child's age, with significantly more children aged 6 to 23 months having diarrhoea than older or younger children. This is attributed to the decline in exclusive breast feeding during that period and children starting to crawl and walk on their own., which leads them to put unhygienic items in their mouths.

The use of home-based solutions to combat diarrhoea has dramatically increased from 39 to 64 percent. This represents a dramatic improvement when it is considered that this increase has occurred over only a three year period. Treatment of diarrhoea has shown significant differences by region and mother's education. However, despite the fact that the message of treatment has reached those for whom it was intended, the instruction to continue feeding and to increase the amount of fluids given to a child with diarrhoea has not been absorbed. A massive 35 percent of mothers give their children with diarrhoea 'much less' fluids than they normally receive. Since dehydration is the main cause of death due to diarrhoea amongst children, this raises questions about the message campaign and about mothers' knowledge of diarrhoea generally.

Diarrhoea incidents proved higher among children who have access to a safe source of water within 500 meters of their dwellings. This raises serious questions about the quality of the 'safe' sources of water and about the handling of water. Additionally, the fact that only 36 percent of the population has access to these safe sources of water poses a threat to the containment of diarrhoea.

The positive link between breast feeding and control of diarrhoea was also confirmed by the survey. The increase in breast feeding in general, and of exclusive breast feeding in particular, has especially positive ramifications for a decrease in the rate of diarrhoea. However, it is not the only factor explaining the prevalence of diarrhoea.

This increase in the ***breast feeding*** rate in Malawi is one of the major achievements of the past few years. Significant improvements were made in all aspects of breast feeding. Exclusive breast feeding for those under 4 months of age increased from 3 percent in 1992 to 11 percent in 1995. Three-quarters of all 6-9 month olds are receiving breast milk and complementary foods, and over one-half of all children aged 22-23 months are still breast feeding. Although great strides have been made, much more remains to be achieved. Continued training and message campaigns are needed.

A particularly distressing result has been the lack of change in the ***malnutrition*** levels since the DHS survey in 1992. The stunting rate remains at approximately 48 percent, wasting is 7 percent, and the rate of underweight children is currently 30 percent. Mother's education has a significant impact on these indicators. The situation in urban areas has worsened considerably; urban wasting levels have increased from 2.6 % in 1992 to 8.7% in 1995. Lilongwe urban shows high rates of malnutrition in comparison to other urban areas. The rates in rural areas have not

changed significantly and remain high. Seasonal variations in the rate of malnutrition are expected. The survey was conducted in October 1995, in between the 1995 and 1996 harvests. The widespread poverty of many Malawians accounts for much of the lack of improvement. The continuing high rate of AIDS, leading to frequent infections and the insufficient intake of micronutrients, is also a contributing factor.

The lack of ***vitamin A*** can also be a contributing factor to malnutrition. Vitamin A capsule intake by mothers and children is quite low. Those who assist mothers at birth outside of health institutions should be trained about the need for mothers and children to take vitamin A capsules. Although about three-quarters of the population eat at least three vitamin A- rich foods a week, there is a low intake of oil or groundnuts necessary to aid absorption of vitamin A. This is caused by poverty, which makes certain vegetables and fruits, and oil, unaffordable. Seasonality also affects availability. This survey was conducted during the dry season when vegetables are less abundant and as such, different results could be expected at other times of the agricultural year.

Salt iodization is presently low within the country. Salt is an essential micronutrient for the normal growth and development of children, and for the normal physical and mental activity of adults. Currently fifty-eight percent of the salt consumed in Malawi is iodized. People in urban areas consume significantly more iodized salt than average, as is the case in the Northern region. Legislation was passed in 1995 making the iodization of salt compulsory within Malawi, which should result in an increase in the amount of iodized salt being consumed within the country. The current rate, while reaching over one-half of the population, is still far from the goal of universal salt iodization. However, as most activities were planned to take place after the salt iodization act comes into effect, significant improvements should be evident in the future.

Just over one-third of all individuals in Malawi have convenient access to *safe water* at a distance of less than half a kilometre. This increases to almost one-half of the population when the distance is increased to one kilometre. The most significant differences occur between urban and rural areas, with people in urban areas having over twice the access to safe water as those in rural areas. The important issues to be considered in the future development of the water sector include the education of individuals in the dangers of unsafe water, the correct handling of water once it has been drawn from the source, and the maintenance of water sources once they are established.

The separation of the water and sanitation sectors and their co-ordination by different ministries have been to the detriment of the ***sanitation*** sector. Although 72% of the population has access to some form of sanitation, these are predominantly traditional pit latrines, which are not considered 'safe' sanitation. Access to a safe means of excreta disposal within 50 meters of the dwelling is only available to 6% of the population. The Northern region has significantly lower access to safe sanitation than the other regions. There is an evident future need to harmonize the development of water and sanitation, and to mobilize more resources for sanitation efforts.

The sector showing the greatest achievements and changes over the past few years has been ***education***. The net primary school enrolment rate now stands at 83 percent, compared to 53 percent in 1990. The proportion of children starting at the correct age (six years) is now 51% and the continuation rate to Standard 5 is 86%. The Northern region has higher educational indicators. The

study has shown that the level of mother's education does have a significant impact on the education of children.

There remain, however, a few critical areas to address. The increase in the number of children in primary education should not be to the detriment of the quality of education. This should be monitored and assessed to ensure that the influx of new students due to free primary education has not resulted in a deterioration of the quality of education being received. High rates of repetition within primary schools could be an indication that students are not receiving an education of a sufficient standard to enable them to pass from one grade to the next. Repetition of such magnitude may indicate that students are ill prepared to enter primary school and that the schools have inadequate resources.

The gender differences within the various sectors need further investigation. In the education sector enrolment figures historically have shown a gender bias. In this survey, the national net enrolment didn't show a difference between girls and boys. Only two districts recorded significantly more males than females between 6 and 13 years of age, enrolled at school, while one district, Salima, recorded the reverse. The survey assessed the attainment rate until Standard 5 and found that 89% of boys reach Standard 5 against 83% of the girls. Gender differences are even more likely to occur after Standard 5, when girls and boys are maturing and girls marry early. Furthermore, it has to be noted that the survey was undertaken in October, just after the start of the school year, and outside the planting and harvesting seasons. Usually these seasons have more of a negative impact on the attendance of girls than boys. Figures at the national level tend to obscure the existing gender differences at district level.

Levels of immunization and prevalence of diarrhoea reflected no significant differences for males and females. With respect to malnutrition, boys in different age groups below the age of five years are worse off than girls. Statistically significant differences with higher rates for boys were found in the rate of severe and moderate ***stunting*** in the age group 6-11 months. The moderate stunting level for boys in this age group stands at 35.2% against 22.6% for girls. High rates of moderate ***wasting*** were recorded for boys aged 12-23 months. Also statistically significant are the differences in the rates of severe and moderate ***underweight*** in the age group 24-35 months, boys 38% against girls 28.6% for moderate underweight, and boys 15.5% against girls 9.2% for severe underweight. Finally male children aged 48-59 months have significantly higher rates of moderate underweight measurement, 34.6% against 23.2% for girls in the same age category.

CHAPTER ONE

INTRODUCTION

In 1990 more than 150 governments from around the world came together to discuss the state of children world-wide. This World Summit for Children formally adopted a set of measurable goals to be achieved by the year 2000. These goals included a one-third reduction in under-five death rates, support for breast feeding by all maternity units, a reduction of under-five malnutrition rates by one-half, the achievement of a 90% immunization rate for under-ones and a 90% reduction of measles cases, the eradication of polio and neonatal tetanus, completion of primary education for 80% of children, and universal access to clean water and safe sanitation for all communities.

An intermediate set of social development goals was also established for 1995. Reaching these will demonstrate progress toward achieving the end-of-decade goals. The mid-decade goals include realizing an 80% immunization rate for the six major vaccine-preventable diseases of children, virtual elimination of both neonatal tetanus and vitamin A deficiency, the reduction of measles cases by 90%, the elimination of polio in selected countries, the achievement of both a 'baby-friendly' status for all major hospitals and an 80% ORT use, and the universal iodization of salt.

To measure progress towards reaching both sets of goals and to assess the state of children in Malawi in 1995, this report was commissioned by UNICEF. Data were collected in a survey done in October 1995 by the National Statistical Office (NSO). The data were processed and the report was written by the Centre for Social Research. Similar reports were commissioned in other countries to measure progress towards the same goals and they provide a basis for comparison. However, this report is primarily a report about the state of children in Malawi.

A total of 6206 households were included in the survey. The households included 8175 females over 10 years of age. In urban areas 86% of households were male headed while in rural areas the figure was 69%. The proportion of households headed by men varied considerably for each district, with the lowest number in Chiradzulu (52%) and the highest number in Dowa (86%). A total of 11,776 children under the age of five were included in the survey, of which 48.4% were boys and 51.6% were girls.

Some of the indicators assessed in this study were reported in the 1992 Demographic and Health Survey produced by the NSO and Macro International Inc. These include rates of infant mortality, immunization, breast feeding, diarrhoea, water and sanitation, and malnutrition. Data on other indicators -- e.g., salt iodization and vitamin A deficiency -- have not been collected before in any detailed format and thus there is a limited basis for comparison over time.

Collecting data for analysis at the national and regional level was deemed to be inadequate. Instead the sample was designed for analysis at district level. This report identifies districts with the most severe problems, and it should, therefore, help decision-makers target their resources effectively. The most significant differences revealed by the report are those at district level.

Malawi has made significant strides in the area of primary education, where enrolments have substantially increased. However, one area of concern is child malnutrition, where figures have not improved in recent years. The overall drop in immunization levels is also worrying. Where before the immunization programme in Malawi was very successful, now rates of immunization show a tendency to decline. High rates of infant mortality remain, and proper measures must be taken to address this problem as well. Safe water at a reasonable distance from dwellings is only available to a minority of the population, while improvements in sanitation facilities are also needed.

The report indicates that Malawi still faces serious problems in the social sector. However, efforts are being made to reach the goals established by the World Summit for Children. In order to do so resources are needed that will match the commitment evidenced daily in the field by social development workers throughout the country.

CHAPTER TWO

PROFILE OF MALAWI

Malawi is a landlocked country in southern Africa, bordered by Tanzania, Zambia and Mozambique. Situated mostly on a plateau of 750-1500 meters, with mountains reaching to 3000 meters, the verdant northern part of the country is dominated by Lake Malawi, which comprises 20% of Malawi. The Shire River drains the Lake and winds through the low lying and arid landscape south of the escarpment. Administratively Malawi is divided into the Northern, Central and Southern regions, which are further sub-divided into 24 districts. There are four major urban centers, in which reside approximately thirteen percent of the population.

2.1 *Demography*

The country has some eleven million people, and a population growth rate of 3.1% per annum (6% in towns). According to the World Bank, this means that the population will double in the next twenty years. Almost all people marry -- half by the age of 18 years -- and about one-fifth of men over forty have more than one wife. One-third of women become mothers while still teenagers. In fact, Malawi's fertility rate of 6.7% is one of the highest in the world -- as are its current rates for under-5 mortality (211/1000) and maternal mortality (620/100,000).

Life expectancy at birth stands at 48 years -- up from 37 years in the late 1950s -- and reflects normal global gender differentials from birth. At the same time Malawi has a young population and it is getting younger, with half its citizens expected to be under 15.5 years by the year 2000.

Malawi's land mass is small and as a result Malawi has one of the highest population densities in Africa. This creates tremendous pressure on the land, with 56% of the land under cultivation, representing most of the cultivable land. Land holdings are divided into small holdings and estates (tea, tobacco and sugar). Some fourteen hundred estates cover 9% of Malawi's land area (850,000 ha.) of which a third is reportedly under cultivation. Meanwhile some 1.6 million smallholder families occupy 1.8m ha. of customary land. While some of the poorest people in Malawi live and work as labourers on the estates, the vast majority of poor people in Malawi are smallholders.

In fact, over one-half of rural households farm less than 1 ha., while one-quarter cultivate less than a half-hectare. Due to the low level of farm technology, inadequate irrigation, and a shortage of cash and credit to buy hybrid maize seed and fertilizer, those with between one-half and one hectare can produce only 40-70% of their staple food requirement, and by June (only a few months after harvesting) most rural people are reduced to eating two meals per day. In some districts 70-80% of households run out of food by December. As a result, in 1992 and still in 1995, over a quarter of its under-5s were underweight, and more than one-half were stunted by long-term malnutrition. In 1990 the World Bank estimated that over one-half of the population lived below the poverty line, estimated at an annual income equivalent of US$40/adult.

Particularly hard hit are female headed households, which comprise about one-quarter of households nationally. Importantly, female headed households are both smaller and have fewer adults, and therefore less labour power -- an important factor during labour-intensive periods of the agricultural calendar. Moreover, women are handicapped by a higher rate of illiteracy, less skills training, and traditions that discourage female business initiatives. Almost all female headed households are in the rural areas, though in the Northern and Central regions they make up one-fifth of all households, and in the Southern region (where poverty is more prevalent) they comprise nearly a third.

2.2 *Economy*

The reasons for Malawi's continuing high level of poverty are complex. In part it is the result of insufficient good agricultural land made worse by rapid population growth and environmental degradation. Malawi is not endowed with mineral wealth and there is little mining. There is very little fishing for export, and relatively little industrial production.

Moreover, the economic policies adopted by the former government favoured commercial farmers, providing them with land, labour, credit, extension and marketing services, and with favourable pricing policies. The peasant majority was left to grow subsistence crops with relatively little technical or financial assistance. As a consequence, in the twenty years following independence in 1964, estate production (tea, tobacco and sugar) rose at an average annual rate of 17%, while smallholder production grew by only 3.2% per annum -- hardly sufficient to keep pace with population growth. These policies have had a devastating effect on rural well-being, and especially on the social development of children.

Since 1992, just as pressure for multi-party democracy became a potent political force, the economy has been eroded by a series of shocks, including three years of successive drought, temporary suspension of non-humanitarian aid in 1992, the flotation of the Kwacha, an increase in government expenditure and a contraction of revenues. The annual inflation rate has skyrocketed from 12% in 1991 to more than 50% currently, while subsidies on fertilizer and maize have been removed, privatization and public service retrenchment have begun, and other structural adjustment measures that at least initially, impact negatively on the poor have been implemented.

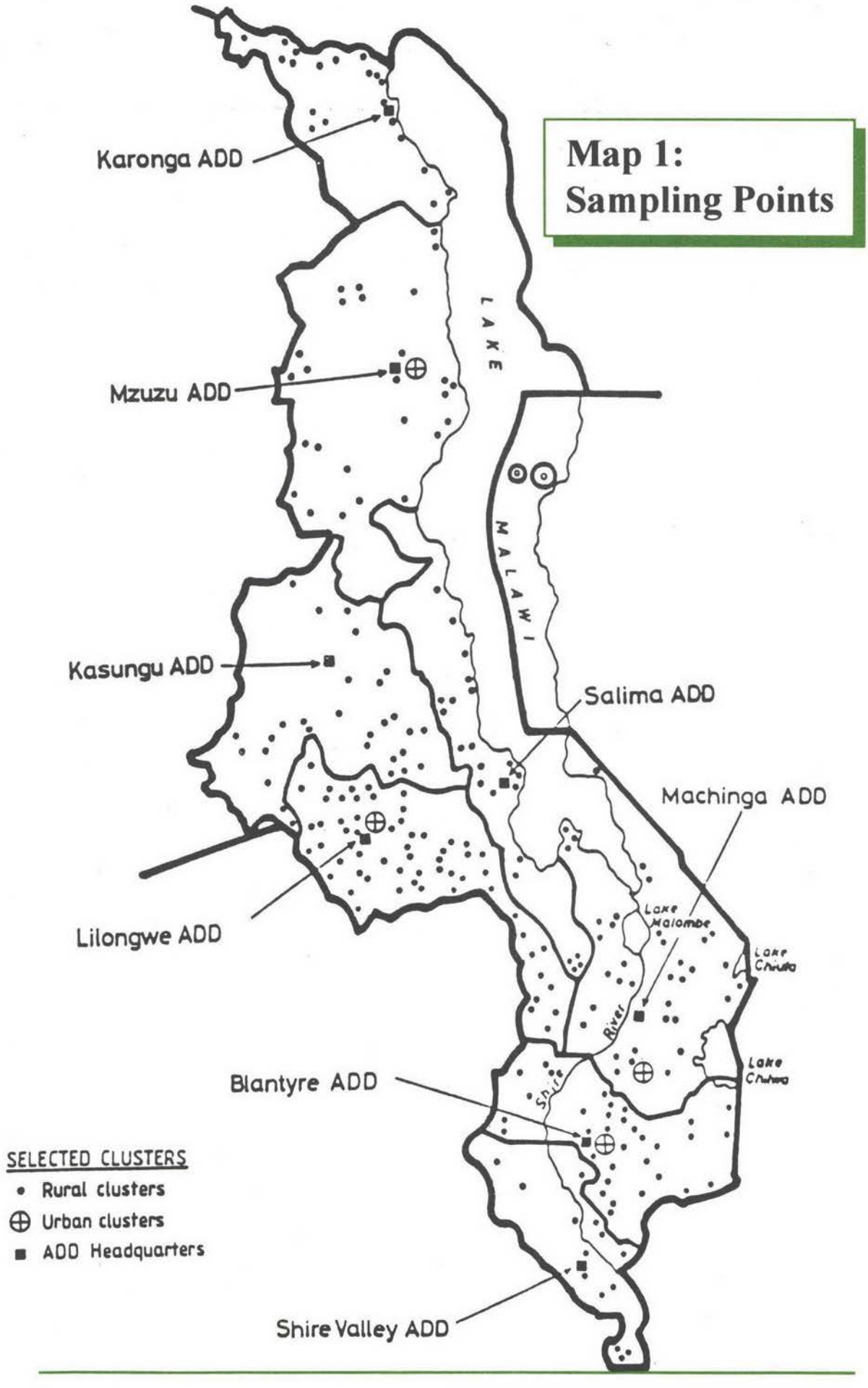
2.3 *Policy Environment*

Since 1990 Malawi has seen many changes. After thirty years of single-party rule, the new government under the leadership of H.E. President Bakili Muluzi immediately set new priorities, including the expansion of primary education to include all Malawian children.One of President Muluzi's first acts as president was to lead a march to raise public awareness of HIV/AIDS. These two events demonstrated a new era of reform and openness in Malawi.

Though the democratic transition has been relatively smooth, the new government continues to face a wide range of economic and social problems that were not sufficiently addressed during the previous thirty years. In addition to the problems enumerated above, this list includes a high rate of unemployment, deforestation, food insecurity at the national level, discrimination

against women, and the need to retrench a portion of the large civil service while at the same time committing additional human and financial resources to education and health.

A lack of resources at the household and national levels hampers government initiatives to address these wide ranging problems. But the cycle of poverty will be broken by a combination of political will and appropriately targeted human and financial resources. This report assists this process by identifying problem areas where policy-makers and development workers can focus their energies and resources.


Map 1:
Sampling Points
Karonga ADD
Mzuzu ADD
Kasungu ADD
Salima ADD
Machinga ADD
Lilongwe ADD
Blantyre ADD
Shire Valley ADD
LAKE
MALAWI
Lake Malombe
Lake Chilwa
Lake Chiuta
Shire River
SELECTED CLUSTERS
• Rural clusters
⊕ Urban clusters
■ ADD Headquarters

CHAPTER THREE

SURVEY METHODOLOGY

The data presented in this report are drawn from the Malawi Social Indicators Survey (MSIS) of 6206 households that was carried out between 12 and 30 October 1995 for the purpose of ascertaining the social indicators in the areas of health, nutrition, education, water and sanitation.

The sample selection of this survey was based on the National Sample Survey of Agriculture (NSSA) of 1992/93. For the purposes of this survey, the NSSA strata were then allocated according to ecological features, such as rainfall and soil type. District divisions were then considered, and ecological strata that crossed over district boundaries were assigned to the district that contained the largest area of the stratum.

A sample total of 600 enumeration areas or clusters were selected for the NSSA according to probability proportional to population size, with each stratum containing a full set of enumeration areas. The sample was divided among the strata based on the population size of each stratum.

It was decided that a sub-sample of the NSSA sample be selected for the purpose of this survey. At least 200 households were needed in each district to ensure that the results were accurate at district level. These households were selected randomly from sub-sample enumeration areas within each stratum. The number of households selected varied according to the number of sub-sample enumeration areas selected within each district.

As the NSSA only covered the rural areas of the country, the MSIS developed a sample for the urban areas. Each of the four urban areas of Lilongwe, Blantyre, Mzuzu and Zomba was considered as an independent stratum. A list of enumeration areas/clusters was drawn up for each stratum, and ten were selected according to probability proportional to population size.

The sample size was designed to be large enough for results to be valid at district level. However, in order for all indicators to have been accurately presented at district level, the sample size would have been too large for available financial resources. This is why it was decided that the indicators on Vitamin A supplementation, tetanus coverage and the use of ORT would be reported at the national and regional levels, but not the district level.

For the other indicators in the design of the sample, the assumption was that there would be no variability within the cluster. For some of the clusters this assumption proved to be invalid, and this is expressed by means of the standard error. The authors decided to include the standard errors in parentheses throughout the report.

The questionnaire used in the field was based on the standard Multiple Indicator Cluster Survey questionnaire developed by UNICEF in collaboration with the World Health Organization (WHO), United Nations Statistical Office, United Nations Population Fund (UNFPA) and the

Centres for Disease Control of the U.S. Public Health Service. It was then modified to reflect the national situation after consultation with the various ministries. Within each of the households selected, both the head of the household and the women in the household were interviewed. An additional questionnaire was used for each village to record the availability and proximity of services in the district.

Training of enumerators took place in September 1995, during which time the questionnaire was pre-tested. After revisions, a second training session was held on October 5. Listing of households was done shortly thereafter. By the end of October data collection was complete. The main problems faced during the survey were transport and the quality and quantity of equipment.

The questionnaire was divided into sections on health, nutrition, education, and water and sanitation. It was designed to present an overall assessment of social indicators, and especially of the state of children under 5 years old in Malawi.

CHAPTER FOUR

HEALTH DELIVERY

It is widely recognized that the health status of a population is the result of various social, political and environmental factors, although the exact impact of these on the health situation is not always clear nor acted upon. Principal elements beyond the health sector, as normally defined, which affect health status include the economic situation, political and social changes, rapid population growth and urbanization, ecological and environmental deterioration, nutritional issues, safe water and sanitation, provision of basic education, especially to women, and the status of women.

The *economic situation* has a profound impact on every aspect of life. It determines investment in the social sectors, including health. By lowering purchasing power, it also affects the ability of families to maintain their health. The exact causal linkages between the national economy and the population's health status are complex. In Malawi public expenditure on health has risen. The social sector, of which health is part, has enjoyed increased government budgetary allocations.

However, there is still an acute shortage of appropriately trained health staff. Lack of career structure and lack of access to further training are factors often cited as contributing to reduced morale and an inability to provide quality and user-friendly care. Moreover, there have been acute shortages of drugs and essential supplies.

Political and social changes affect the environment in which the health sector operates. For instance, the previous government's reluctance to discuss HIV/AIDS made it difficult for health workers to inform people about the disease, or to take steps to halt its spread. Similarly, an inability to openly discuss hunger and its causes made it hard to tackle malnutrition and its relationship to morbidity and mortality in this country. After the transition to democracy a refreshing sense of openness became evident. Difficult issues, such as AIDS and hunger, birth control and sexuality, are for the first time on the public agenda, where politicians, health workers, the media, and the population can analyse causes and debate options.

Population growth in Malawi continues at the very high annual rate of 3.1%. The total fertility rate in Malawi is 6.7, in contrast to the global average of 3.5. The increase in the number of women of child bearing age (15-49 years) will influence population growth, even if family planning activities are successful and result in women having fewer children. The influence of the increase in population on development is likely to remain very strong and will have serious implications for health, social development, and economic progress.

Infant and childhood mortality rates have remained high, as a result of high rates of malnutrition and poor health generally, and inadequate health and education services, and sanitation and water supply. Recent increases in the rate of inflation and of prices have reduced more families to penury.

The AIDS epidemic has affected mortality rates, both directly and indirectly -- directly, due

to the death of infants born with HIV, and indirectly, through the deaths of parents who leave orphans, who are economically and socially disadvantaged.

Urbanization is of increasing importance. Although still a predominantly agricultural society, more Malawians have recently moved to urban and peri-urban areas. An estimated 13.3% of the population was urban based in 1995, compared to 11.9% in 1990. From a public health point of view, urbanization does not necessarily mean improved living conditions. The rapidly expanding settlements in Lilongwe, Blantyre and Zomba, for instance, have now exceeded the sanitary carrying capacity.

Environmental and ecological factors are important to Malawi. Rainfall is seasonal, extremely variable, not only within a year, but over the years. In the 1990s Malawi has experienced severe drought in succeeding years, which has seriously affected the health and nutrition of the society. Population pressure, the over-harvesting of fuel wood, run-off from heavy rains and erosion, and the lower water table all contribute to the loss of land for fruitful human use.

Nutritional factors, such as protein-energy malnutrition, nutritional anaemia, vitamin A deficiency and iodine deficiency disorders have been identified as the most serious health problems in Malawi. Malnutrition has a negative impact on the survival and development of children and women, and on work productivity. In addition, the practice of breast feeding is a crucial contributor to the survival and health of infants.

The problems of the provision of *safe water* and adequate disposal of garbage and excreta, and the maintenance of hygienic conditions in homes and surrounding neighborhoods are of great concern in the Malawian setting. The inadequacy of safe water and *sanitation*, and poor housing create conditions for the transmission of infectious diseases. In areas where communities have to fetch water from snail-infected streams and lakes, bilharzia is a danger. Overcrowding increases the chance of spreading airborne infections, such as tuberculosis.

The *low status of women, the relatively powerless roles adopted by women, and the lack of educated women in Malawi* diminish women's and girls' opportunities to obtain an adequate level of health knowledge, or to adopt healthy attitudes and practices. Of great significance is the number of girls who stay in school through Standard 5, at which point the beneficial effects of education are likely to have a life-long impact. Most families are deprived of the basic information needed for healthy living -- e.g., basic concepts of nutrition and of the cause of illness. To combat illnesses related to hygiene and hunger, initiatives have been taken to teach mothers about the three food groups; how to draw, carry and dispense clean water; and how to dispose of waste safely .

In general the status of women in Malawi is low and discrimination starts from early childhood. Some customs and cultural activities endanger the lives and health of children and women. These include early marriages, some initiation rites, female circumcision, some traditional methods of caring for the sick, food taboos, etc.

Table 4.1 Distribution of households by gender of head of household

Residence	Male	Female
National	70.4	29.6
Urban	86.0	14.0
Rural	69.0	31.0

According to the MSIS survey, in the rural areas the proportion of female headed households is 31% (Table 4.1). Most of these households are poorer and have lower levels of health. Traditions of inheritance unfavourable to women contribute to this situation, as does a lack of appropriate information.

To improve the health of children and women requires the involvement of all sectors of society. It is clear, however, that an adequately functioning health system, especially at district, health centre and community levels, is also a necessary condition for achieving child health goals.

The Government of Malawi is committed to Primary Health Care (PHC) in order to decrease childhood morbidity and mortality. The global goal of Health for All by the year 2000 was adopted by the Ministry of Health in 1979. Since then a strategy has been developed for strengthening Primary Health Care, which advocates community participation in the health delivery system.

The Ministry of Health and Population operates health facilities at three levels, with dispensaries, maternity units and health centres at the primary level, district hospitals at the secondary level, and central hospitals at the tertiary level. The PHC system has been extended to all districts throughout the country. The process of identifying health problems is initiated by using existing committees and leadership structures at the village, area and district levels. PHC teams have been set up at these levels; they are usually headed by the highest ranking health personnel at each level.

At the community level, an estimated 5000 traditional birth attendants (TBA) are usually responsible for antenatal care, nutrition surveillance, and other Mother Child Health (MCH) related activities, including deliveries. At this level outreach activities, such as under-five clinics and pilot PHC activities, are operated by health staff. Other community members, depending on problems and activities identified, are responsible for tasks like ensuring safe water and sanitation, and treating eye infections, malaria and diarrhoea.

In keeping with the mid-decade goals, the survey concentrated on those diseases that afflict children, but are preventable and/or curable. Data were also collected on Malawi's current child and infant mortality rates, but no information on AIDS and malaria, the two major killer diseases of children in Malawi, was gathered. To present an overall view of access to health care, the distances from villages to health centres and under-5 clinics were determined. In addition, the locations where deliveries take place, and the persons assisting at births were assessed.

4.1 *Access to Health Facilities*

As the transport sector is underdeveloped in Malawi and most rural people are required to walk to social service outlets, the distances to health centres and clinics affect both attendance and mortality figures. This is especially the case for over-worked mothers with small children, who generally must walk long distances with infants on their backs to reach health centres and clinics.

Table 4.2 Distances to health facilities, by district

Nation/ District	In village	< 1 km	1-3 km	3-5 km	> 5 km
Malawi	3.1	5.8	14.5	19.5	57.1
Chitipa	1.8	0.4	13.6	33.7	50.4
Karonga	11.0	4.3	6.0	46.5	32.2
Mzimba	-	13.0	15.1	22.5	49.3
Nkhata Bay	-	62.5	-	35.3	2.2
Rumphi	-	35.3	35.6	9.9	19.1
Dedza	0.8	5.3	23.0	23.0	61.9
Dowa	-	-	3.0	4.7	92.4
Kasungu	-	-	-	-	100.0
Lilongwe	-	3.8	17.7	13.3	65.2
Mchinji	-	-	20.1	8.2	70.8
Nkhotakota	-	16.9	40.0	5.7	37.3
Ntcheu	0.8	12.5	25.1	12.8	48.8
Ntchisi	-	-	24.7	43.8	31.5
Salima *	-	-	-	-	100.0
Blantyre	-	8.2	4.2	27.5	57.1
Chikwawa	-	22.2	34.6	0.5	42.6
Chiradzulu	-	-	21.5	0.5	57.6
Machinga	-	-	3.8	35.9	59.1
Mangochi	22.5	4.5	7.7	1.1	64.2
Mulanje	11.2	-	11.7	17.6	59.4
Mwanza	-	-	11.7	3.1	85.2
Nsanje	-	14.5	-	-	85.5
Thyolo	-	-	62.0	-	38.0
Zomba	-	1.7	2.2	54.8	41.3

* Small Sample Size

The survey found that over one-half (57.1%) of Malawian households are located over 5 kilometres from a health centre. Forty percent of the population walks between one and five kilometres to reach a centre -- 3-5 km. (19.5%), 1-3 km. (14.5%), less than one km. (5.8%). Only 3.1% of people live in a village where a health centre is located(Table 4.2).

Districts with higher proportions of households near health centres include Chikwawa, Mangochi, Thyolo and Nkhata Bay. Those that have lower proportions of nearby centres include Dowa, Kasungu, Mchinji, Mwanza, Nsanje and Salima.

The degree of access to under-5 clinics is slightly better, but a third (33.3%) of households within Malawi are still located over 5 kilometres from the nearest clinic(Table 4.3). Nearly one-half of the population must travel from 1 to 5 km. to reach a clinic -- 1-3 km. (25.3%) and 3-5 km. (22.0%). Only 11.2% of Malawians are less than one km. from a clinic, and 7.9% have a clinic within their villages.

Table 4.3 Distances to under-5 clinics, by district

Nation/ District	In village	< 1 km	1-3 km	3-5 km	> 5 km
Malawi	7.9	11.2	25.3	22.0	33.3
Chitipa	1.8	0.4	26.5	50.7	20.5
Karonga	44.9	4.3	6.7	38.3	5.8
Mzimba	7.8	15.7	26.4	35.2	7.8
Nkhata Bay	-	62.5	-	35.3	2.2
Rumphi	-	50.4	36.7	4.5	24.0
Dedza	4.9	7.2	16.4	25.8	45.7
Dowa	4.2	5.3	18.9	5.6	66.0
Kasungu	15.7	15.2	16.2	2.1	50.8
Lilongwe	11.0	7.5	32.8	9.1	39.6
Mchinji	9.4	3.2	26.6	27.7	33.1
Nkhotakota	-	31.2	29.0	5.7	34.1
Ntcheu	11.1	15.1	32.9	22.6	24.0
Ntchisi	3.3	2.2	24.7	45.8	24.0
Salima	-	-	76.0	-	24.0
Blantyre	3.0	18.4	34.6	9.4	34.7
Chikwawa	-	33.3	42.4	9.4	14.8
Chiradzulu	-	-	36.5	20.9	42.5
Machinga	12.8	17.9	10.4	37.5	21.4
Mangochi	22.5	4.5	7.7	14.1	51.2
Mulanje	11.2	2.2	25.2	38.9	22.5
Mwanza	9.0	-	11.7	7.0	72.4
Nsanje	-	15.9	78.4	-	5.7
Thyolo	-	17.7	44.3	-	38.0
Zomba	1.9	1.0	1.7	54.8	40.6

Districts that recorded higher proportions of nearby under-5 clinics included Chikwawa, Karonga, Nkhata Bay and Rumphi. Those that recorded lower proportions included Chiradzulu, Dowa and Mwanza.

An improvement in access to health facilities must be seen as necessary to improve the mortality and health statistics in Malawi.

4.2 *Assistance and Place of Delivery*

The survey assessed where the majority of mothers give birth and who assists them. Nationally, it was found that 40.5% of mothers have their babies at home. About one-half choose a hospital (29%) or a health centre (22.6%), while 7.8% prefer a TBA's house. District figures vary widely (Table 4.4).

Table 4.4 Place of delivery, by district

Nation/ District	Home	TBA House	Health Centre	Hospital	Other
Malawi	40.5	7.8	22.6	29.0	0.1
Chitipa	32.6	19.0	22.7	25.2	0.5
Karonga	43.3	7.2	21.9	27.4	0.2
Mzimba	35.4	3.4	27.5	32.8	0.9
Nkhata Bay	28.7	2.0	29.7	38.0	1.7
Rumphi	19.5	1.5	53.7	24.5	0.8
Dedza	29.4	10.8	29.9	29.7	0.2
Dowa	58.4	7.7	1.9	31.8	0.2
Kasungu	50.2	15.2	21.0	12.5	1.0
Lilongwe	35.9	17.8	16.9	29.2	0.2
Mchinji	50.5	9.7	19.7	19.3	0.7
Nkhotakota	19.8	18.5	22.8	37.5	1.4
Ntcheu	33.2	10.3	28.4	27.3	0.9
Ntchisi	51.9	11.0	26.6	9.1	1.4
Salima	57.5	7.9	9.8	24.5	0.3
Blantyre	20.2	6.2	26.9	46.5	0.2
Chikwawa	52.6	1.7	27.8	17.6	0.4
Chiradzulu	34.5	10.2	23.0	32.2	-
Machinga	61.7	2.0	10.1	26.1	0.1
Mangochi	52.4	1.7	34.5	11.3	0.1
Mulanje	42.0	2.0	30.9	25.2	-
Mwanza	54.9	-	24.6	19.1	1.3
Nsanje	36.3	0.9	11.1	51.5	0.2
Thyolo	33.3	6.7	31.4	28.3	0.3
Zomba	40.9	6.7	5.5	46.9	0.0

Within urban areas, hospitals are the most common choice of birthplace (61.7%), with only 13.2% opting for a birth at home. The situation is reversed in rural areas, where 43% choose a home birth and 26.2% go to hospitals to give birth.

Almost one-half of births (48.2%) are assisted by a nurse or midwife. Family members assist in one-third of cases (33.8%). Nearly one-tenth (9.7%) are assisted by a TBA. Medical assistants/clinical officers and physicians attend 1.4% of births, while ward attendants assist with 1.2%. Nearly one woman in twenty (4.4%) has no one in attendance during births. Again, district figures vary widely (Table 4.5).

Table 4.5 Assistance at birth, by district

Nation/ District	Nobody	Family Member	TBA	Nurse Midwife	Ward Attendant	Med. asst., etc.	Other
Malawi	4.4	33.8	9.7	48.2	1.2	1.4	1.3
Chitipa	2.0	28.7	20.7	47.9	0.4	-	0.3
Karonga	5.3	33.0	12.6	46.2	0.6	1.5	0.7
Mzimba	9.6	23.6	5.2	54.5	3.0	1.1	2.7
Nkhata Bay	2.8	17.6	7.6	64.1	2.6	2.6	2.7
Rumphi	1.8	19.1	4.0	72.7	0.8	1.6	-
Dedza	1.6	26.2	12.9	55.4	0.7	2.0	1.0
Dowa	3.1	53.0	8.1	31.3	2.1	0.9	1.6
Kasungu	4.2	42.5	17.2	33.0	0.3	1.2	1.6
Lilongwe	3.0	31.8	18.5	41.3	1.5	1.8	2.0
Mchinji	4.2	42.2	12.9	35.6	2.9	1.3	0.9
Nkhotakota	2.1	19.9	19.1	55.6	1.0	1.8	0.6
Ntcheu	2.8	27.8	11.9	54.2	0.6	0.4	2.2
Ntchisi	7.3	44.0	12.7	27.1	7.0	0.6	1.3
Salima	1.2	49.1	12.5	34.0	0.7	1.7	0.7
Blantyre	4.0	15.7	10.0	67.5	0.2	2.7	-
Chikwawa	4.8	44.6	2.1	44.2	1.1	-	3.1
Chiradzulu	8.2	26.4	10.9	54.6	-	-	-
Machinga	9.2	49.0	3.7	36.3	-	0.5	1.2
Mangochi	4.4	39.1	9.7	45.6	0.7	-	0.6
Mulanje	6.7	34.0	2.2	51.1	-	5.3	0.7
Mwanza	6.5	26.6	4.9	39.9	2.8	0.5	18.8
Nsanje	2.4	30.9	2.3	61.7	1.4	0.3	1.1
Thyolo	4.2	29.4	8.1	54.0	3.6	0.7	-
Zomba	2.1	41.6	3.9	50.8	1.4	0.1	0.1

Table 4.6 Children (%) died or survived at birth for last three pregnancies, by place of delivery

	Child died at birth	Child survived birth
Home	24.6	75.4
TBA House	17.2	82.8
Health Centre	17.8	82.2
Hospital	16.1	83.9

A higher rate of use of nurses and midwives is registered in urban areas (73%) than in rural areas (46%), which corresponds to the reduction of family members in attendance in urban areas.

Again not surprisingly, there is a significant difference between the rate of deaths-at-birth when births are assisted by a family member as opposed to a nurse/midwife. The fact that nurses and other medical professionals have higher rates of children surviving is even more significant as it is probable that more complicated cases seek their care. Specifically, births assisted by family members have a proportionally higher number of deaths, while the opposite is true for births assisted by nurses or midwives. These figures emphasize the need to have trained personnel attend births(Tables 4.6 and 4.7).

Table 4.7 Children (%) died or survived at birth for last three pregnancies, by type of assistance at birth

Assistance at birth	Child died at birth	Child survided birth
Nobody	20.5	79.5
Family Member	25.2	74.8
TBA	18.0	82.0
Nurse/Midwife	16.7	83.3
Ward Attendant	27.6	72.4
Medical assistant /clinical officer /Physician	17.5	82.5

Findings on the relationship between birth attendants, places of delivery and survival rates should be emphasised in training programmes, and raised with mothers during antenatal care, along with issues such as breast feeding, immunization and the efficacy of vitamin A capsules and iodized salt.

CHAPTER FIVE

MORTALITY

5.1 *Infant and Child Mortality*

Infant mortality is the mortality of live-born infants who have not attained their first birth-day whereas under-5 mortality is the mortality of live births at ages younger than 5. Infant mortality is a major contributor to deaths occurring in communities with low expectations of life at birth. Many a study has unearthed the inverse relationship between indicators of infant mortality and socio-economic development. A decline in infant mortality is a mark of socio-economic development. For example, the infant mortality rate (IMR) like the under-5 mortality rate (U-5MR) decreases as the level of maternal education improves and the place of residence changes from rural to urban areas.

The MSIS included questions on the last three pregnancies that eligible female respondents had had. Thus, it generated data from which infant mortality as well as under-5 mortality could be estimated. Besides, it collected data on parity of eligible women and survivorship of their children thereby adding to the data inputs for estimating infant and under-5 mortality.

Data Quality and Estimation of Infant and Under-5 Mortality Rates

The infant mortality rate is conventionally defined as the number of deaths among infants below the age of one per 1000 births in the same period. However, the IMR thus defined suffers from end-effects. Refinement is achieved by calculating average infant mortality rates for periods of several years. This serves just as well if an annual estimate is not vital. This more refined definition appeared satisfactory for the purposes of this survey.

Digit preference, or the tendency of respondents to misreport age by showing preference for numbers ending in digits 5 and 0 , was not evident. The MSIS respondents did not show this preference as the clearly negligible age heaping detected in the data on age at death occurred at other unlikely digits.

Diagnostic application of the direct method of estimating the under-5 mortality rate in order to compare the resulting value to the one from the Brass Technique, showed that the survival status of live births was misreported to a considerable extent. For cultural and psychological reasons Malawian mothers tend to be reticent about providing details about their children who have died. There was no evidence to suspect that their reluctance was dependent upon the age at which their children died.

The data on parity and number of children having since died were not thoroughly edited. For example, few women in the 15-19 age bracket had implausible parity entries of up to 10 children. These data were therefore edited by fixing age-specific maxima for the first 4 age brackets for these variables. These maxima were 4, 8, 12 and 16 for the age brackets, 15-19, 20-24, 25-29

and 30-34 in that order.

Finally, the age distribution of under-5 deaths was adjusted within the constraints imposed by the total number of deaths implied by the under-5 mortality rate for the total number of reported live births. The reported number of births was found credible as facts of motherhood are a source of pride and hence tend to be freely and accurately reported. In view of the expected independence between the mother's reticence on details pertaining to her dead children and the children's age at death, proportionate adjustment of under-reported figures appeared defensible.

The U-5MR was estimated by using the Brass Technique. The IMR and the CMR were estimated by applying the refined definition of the IMR as well as that of the CMR to the adjusted age distribution of under-5 deaths.

The Situation in Malawi

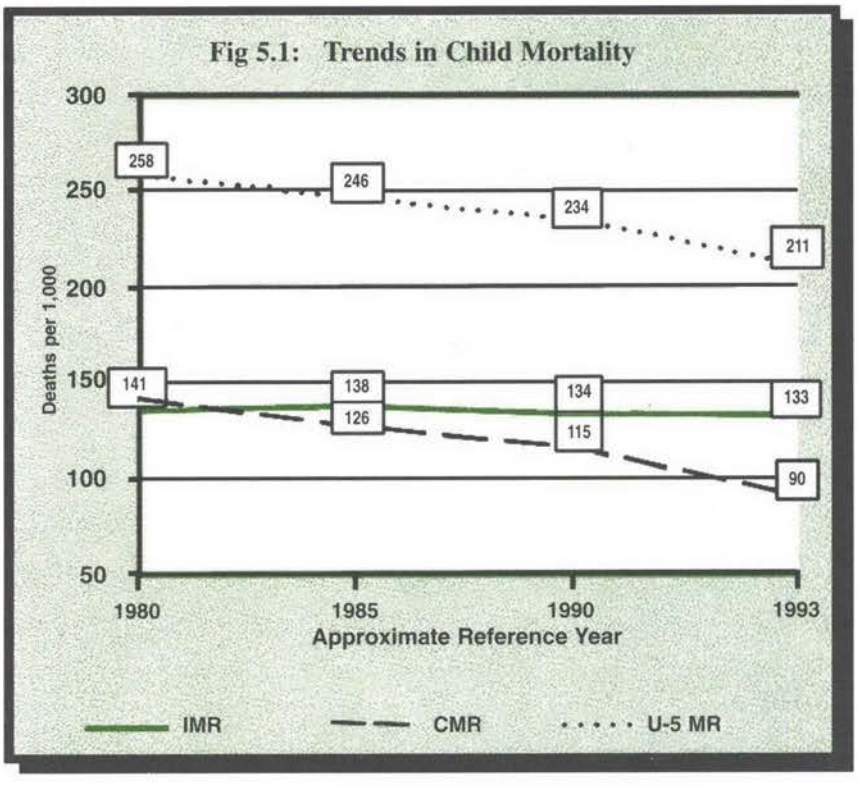
Table 5.1 and Figure 5.1 provide the findings of the MSIS survey. The infant mortality rate during the five year period prior to the survey in October 1995 was 133/1000 on average, which is virturally unchanged from the DHS figure in 1992 of 134/1000.

Table 5.1 Child Mortality Rates by 5-year Approximate Reference Periods Prior to Survey

Approximate Reference Period Prior to Survey	Infant Mortality Rate ($q(1)$)	Child Mortality Rate ($_4q_1$)	Under-5 Mortality Rate ($q(5)$)	Source
0-4	133	90	211	MSIS
3-7	134	115	234	DHS
8-12	138	126	246	DHS
13-17	136	141	258	DHS

The MSIS found that the child mortality rate was 90/1000 on average during the five year period proceeding the survey, which confirms the downward trend reported by the DHS survey in 1992. Therefore, it can be stated that a child's chance of survival is improved once he/she gets beyond the first birthday. It is likely that the rate of immunization at age 1 is a factor.

The MSIS found that the U5MR in the five years proceeding the survey has been 211/1000 on average. The corresponding figure from the 1992 DHS is 234/1000 which difference is statistically significant from the current figure. This indicates that under-five mortality is continuing to decrease.



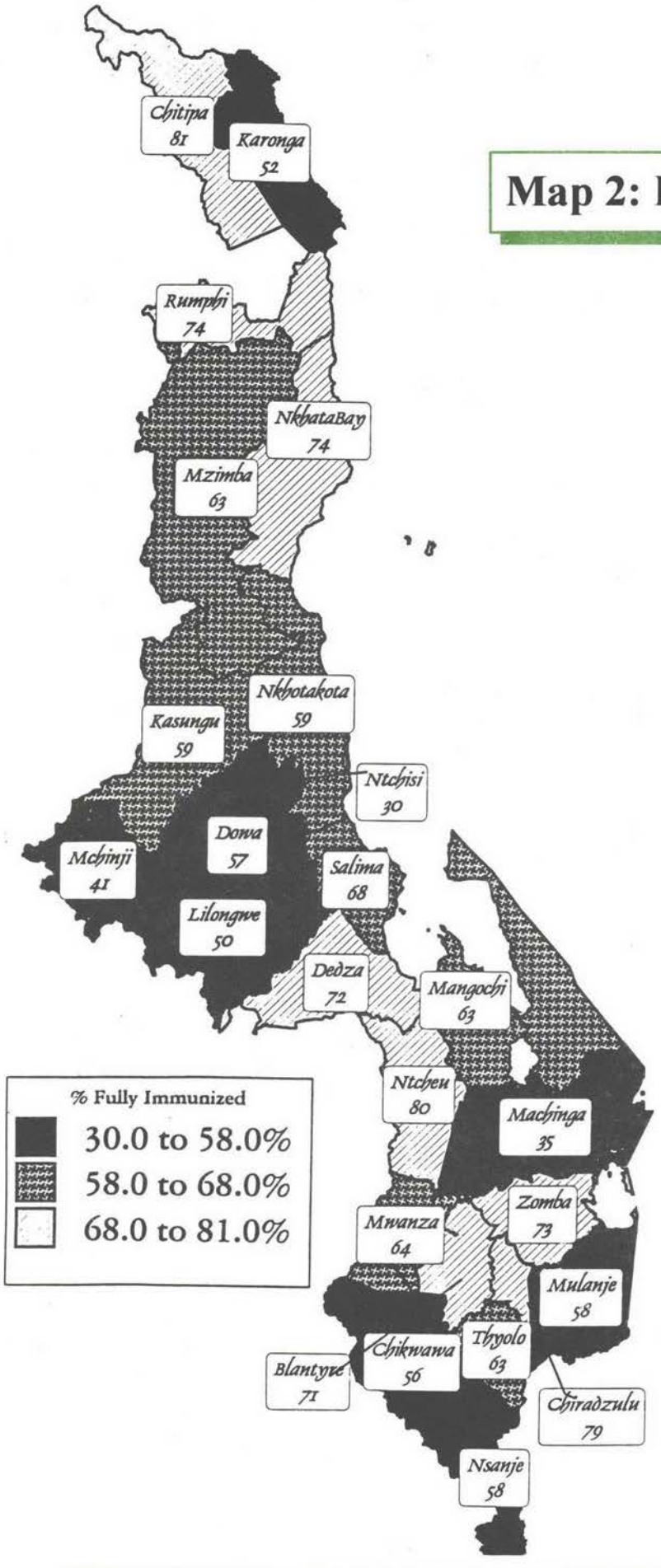
5.2 *Orphans*

In the survey an orphan was defined as a child whose two parents are dead. The number of orphans in Malawi at this time is directly related to the impact AIDS is having on the country. AIDS not only increases the number of orphans, but it also raises the dependency ratio -- the number of children compared to the number of economically active adults in a household -- which negatively affects productivity.

The MSIS estimates that the current number of orphans, both AIDS related and otherwise, is between 80-88,000 children under 15. As deaths from AIDS are obscured by ignorance and opportunistic diseases, it was not possible to determine which children were orphaned as a result of AIDS.

Projections for 1995 were 100,361 AIDS orphans, while the National Aids Secretariat at the beginning of 1996 estimated that there would be a cumulative number of 281,000 AIDS-related orphans by 2000. This figure did not take into account the number of children who will die as a result of AIDS.

Map 2: Fully Immunized



CHAPTER SIX

IMMUNIZATION

Globally, immunization has saved millions of young lives from the six 'Expanded Programme of Immunization' (EPI) diseases: polio, measles, tetanus, whooping cough, diphtheria and tuberculosis. Twenty-five years ago, less than ten percent of the world's children were immunized. But by 1990 over sixty developing nations had reached an 80% rate of immunization. This commendable achievement has been mostly due to serious and sustainable collaboration between governments, WHO and UNICEF.

At the World Summit for Children in 1990, the mid-decade target of 80% was established for childhood immunization for EPI diseases and tetanus toxoid vaccine for women of child-bearing age, for all countries that had not yet reached this rate of coverage. A target of 90% was set for all nations to be reached by the year 2000.

The EPI follows the World Health Organization guidelines for vaccinating children. In order to be considered fully vaccinated, a child should receive the following vaccinations: BCG evidenced by a scar (against tuberculosis), three doses of polio, three doses of DPT (against diphtheria, whooping cough and tetanus), and measles. DPT and polio vaccinations are usually given at the same time -- DPT as an injection and polio vaccine as drops taken orally. These are given at a minimum interval of four weeks. The last vaccination given is measles, after 9 months of age. WHO recommends that all children receive the complete set of vaccinations before their first birthday.

The MSIS collected information on vaccination coverage for all children born in the five years preceding the survey. The information on immunization coverage has been recorded by MSIS in two different ways. Children vaccinated in Malawi are normally given vaccination cards which indicate date of birth, vaccinations given, and the dates given. If the card was available to the surveyors, details were recorded from it. If not, the mother was asked to recall whether her child(ren) received the various vaccinations.

6.1 Situation in Malawi

According to the findings of the Malawi Social Indicators Survey the percentage of children 12-23 months who have been fully immunized by their first birthday is 61%.

The MSIS survey found that 61% of Malawian children aged 12-23 months were fully vaccinated by the time of their first birthday. The highest rate of coverage is for BCG at 91%, followed by polio at 80%, DPT at 76%, and measles at 70%.

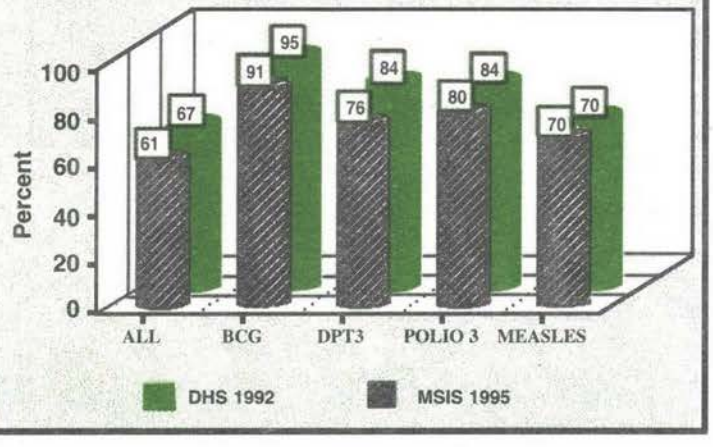
Three-quarters (75%) of children aged 12-23 months were immunized by the time of the survey, indicating that many children had been vaccinated after their first birthday. This implies that a considerable number of children complete the vaccination scheme.

The coverage for each antigen differs. Of those who have been fully immunized by their first birthday, the highest proportion is for BCG (91%), while polio (80%), DPT (76%) and measles (70%) follow. (See Table 6.1 and Figure 6.1).

Comparisons with coverage recorded in the DHS survey in 1992 indicate that apart from measles, whose rate has been maintained at 70%, the rates of immunization for all the other antigens is now lower, with DPT and BCG showing significant drops.

One explanation is undoubtedly the unavailability of some vaccines, especially DPT and measles, in 1995 as a result of logistical problems and a reduction in funding for operational costs.

Fig 6.1: Percentage of Children 12-23 Months Vaccinated by 12 Months of age, DHS 1992 and MSIS 1995



Seventy-five percent of children in Malawi are still immunized before 18 months of age. However, this survey has found that the coverage by 12 months of age has dropped for DPT and measles to less than 80%, and for polio to 80%. As the impact of vaccinations on child survival is higher when immunizations are given before the first birthday, this trend is worrying.

Furthermore, the percentage of fully immunized children is also showing a downward trend, for only 61% of the children were fully immunized by 12 months of age. This is a significant drop from the 1992 DHS figure of 67%.

These results are the first evidence of a downward shift in EPI performance in the last decade, and they have to be taken as a warning sign.

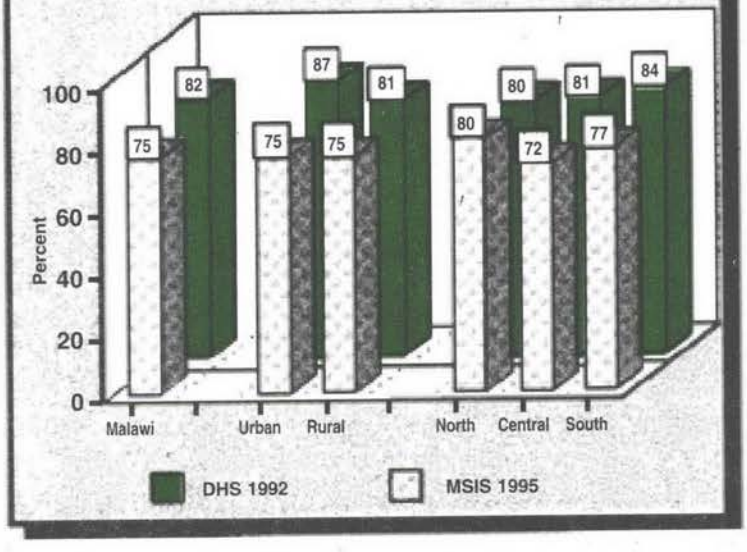
Apart from measles, whose rate has been maintained, the rates of immunization for all the other antigens is now lower than at the time of the DHS survey in 1992.

The downward trend in EPI performance appears to be, at least in part, a result of the imposition by central government of the cash budget system, where ministries are not allowed to over-spend. Anecdotal evidence of the negative impact this is having on immunization has been collected during EPI field monitoring trips.

Measles is the most likely to have lower coverage by 12 months of age because the window of opportunity to have this vaccination completed before the first birthday is narrow even under the best of circumstances. Thus, any decrease in the number of possible contacts (such as decreased outreach clinic visits) is likely to affect measles coverage first.

The fact that DPT coverage is lower than oral polio vaccine coverage is undoubtedly due to the three month-long DPT vaccine shortage that occurred in early 1995, a shortage caused by late planning in vaccine procurement and by constraints in the production of DPT vaccine world-wide.

Fig 6.2: Percentage of Children 12-23 Months who were Fully Vaccinated by the Time of the Survey



The survey also reveals that 77% of mothers of 0-11 month olds had at least 2 doses of tetanus toxoid vaccine within 3 years of their child's birth, which protected their newborns against neonatal tetanus.

Not surprisingly, the rate of coverage differs according to whether families live in rural, or the better provided urban areas. The full coverage rate for urban areas is 69%, compared to the rural figure of 60%. However, this difference cannot be considered statistically significant.

Immunization coverage differs at the regional level. The coverage rates of children 12-23 months old who have been fully immunized by their first birthday are higher in the Northern region (at 67% coverage) compared to the Southern (62%) and Central (58%) regions.

The Central region has the lowest rate of complete coverage of all vaccinations by the second birthday, at only 72% compared to 77% for the Southern, and 80% for the Northern regions.

Moreover, coverage at the district level varies significantly, and ranges from less than one-third to over four-fifths of children being vaccinated before their first birthday. (Table 6.1).

Coverage for Ntchisi (30%), Machinga (35%) and Lilongwe (50%) districts are significantly lower than the national average. On the other hand, coverage in Chitipa (81%) and Ntcheu (80%) districts is significantly higher (with a 95 percent confidence level).

The survey results reveal, then, that only Chitipa and Ntcheu districts have achieved the mid-decade goal of 80% coverage. On the other hand, neither are anywhere near the 90% goal set for the end of the decade. The Ntchisi results seem to point to a generally lower coverage for all antigens compared to the national figure.

Table 6.1 The percentage of children 12-23 months who have received specified vaccines by 12 months of age.

	Fully Vaccinated	BCG	DPT*	OPV*	Measles	Number of Children in the Sample
Malawi	61 (2.3)	91 (1.1)	76 (1.8)	80 (1.7)	70 (2.1)	975
Region						
North	67 (4.5)	93 (2.4)	83 (3.0)	81 (3.4)	71 (4.7)	186
Centre	58 (2.9)	91 (1.5)	71 (2.9)	78 (2.5)	71 (2.6)	438
South	62 (4.0)	92 (1.7)	80 (2.8)	83 (2.7)	69 (3.7)	351
District						
Chitipa	81 (7.6)	92 (4.7)	93 (3.9)	89 (4.6)	84 (7.2)	33
Karonga	52 (11.6)	100 (0.0)	78 (8.2)	74 (7.4)	59 (8.7)	24
Rumphi	74 (5.0)	88 (7.0)	87 (7.3)	86 (7.7)	67 (8.9)	29
Mzimba	63 (7.0)	91 (4.3)	78 (3.7)	77 (5.5)	71 (9.1)	72
Nkhata Bay	74 (13.1)	98 (2.7)	90 (8.4)	90 (8.4)	81 (9.1)	28
Kasungu	59 (10.3)	97 (2.2)	78 (8.6)	87 (4.7)	66 (7.4)	35
Mchinji	41 (12.3)	89 (5.1)	62 (7.2)	62 (8.7)	51 (14.2)	34
Lilongwe	50 (4.8)	86 (4.1)	62 (5.5)	71 (5.4)	69 (4.7)	127
Dowa	57 (6.8)	91 (3.6)	71 (11.5)	80 (8.9)	75 (4.4)	47
Nkhotakota	59 (12.6)	88 (4.5)	77 (7.7)	73 (10.5)	68 (9.6)	33
Salima	68 (6.0)	98 (1.9)	70 (5.0)	85 (1.6)	74 (6.8)	43
Dedza	72 (5.8)	89 (2.7)	80 (4.7)	85 (2.4)	80 (2.9)	36
Ntcheu	80 (6.8)	97 (0.9)	87 (5.4)	88 (4.2)	83 (6.4)	40
Ntchisi	30 (8.0)	88 (4.1)	59 (5.7)	67 (3.4)	50 (8.7)	43
Mangochi	63 (9.6)	94 (3.8)	88 (7.0)	77 (10.1)	69 (7.8)	37
Machinga	35 (10.6)	89 (4.9)	54 (6.8)	77 (8.5)	48 (12.9)	37
Zomba	73 (7.2)	91 (5.3)	80 (2.5)	77 (4.7)	81 (2.5)	49
Mwanza	64 (11.4)	92 (4.2)	72 (8.2)	83 (4.9)	78 (6.9)	41
Blantyre	71 (6.4)	94 (3.3)	91 (4.6)	89 (5.1)	74 (6.1)	53
Mulanje	58 (12.9)	87 (7.4)	78 (8.4)	81 (7.9)	58 (12.9)	23
Thyolo	63 (13.9)	87 (5.3)	83 (11.3)	86 (10.6)	72 (14.9)	23
Chiradzulu	79 (10.3)	100 (0.0)	87 (8.9)	93 (7.2)	82 (8.6)	22
Chikwawa	56 (10.7)	98 (2.1)	78 (10.2)	91 (4.4)	80 (5.8)	30
Nsanje	58 (21.3)	83 (3.6)	71 (10.1)	78 (5.0)	56 (17.4)	36
Residence						
Urban	69 (7.6)	86 (5.8)	78 (7.4)	79 (7.5)	78 (7.6)	108
Rural	60 (2.4)	92 (1.0)	76 (1.9)	80 (1.7)	69 (2.1)	867
Gender						
Male	59 (2.9)	90 (1.8)	75 (2.6)	80 (2.5)	68 (2.7)	482
Female	62 (2.8)	93 (1.4)	76 (2.3)	80 (2.0)	72 (2.5)	491

*Three doses of DPT and oral polio vaccines
Standard errors in parentheses

If the World Summit Goal is to be reached, resources should be concentrated on raising levels in the districts with the lowest rates of coverage, while at the same time, not neglecting the other districts.

Finally, the gender differential in immunization coverage is slight. Fifty-nine percent of males 12-23 months old have been fully immunized by the age of one, compared to 62% of females.

In order to assess rates of coverage, the enumerators asked to see health cards. They discovered that under-5 cards are retained for 88% of children aged 12-23 months, which is an increase of 2% on the 1992 DHS figure. The retention rate of mothers' tetanus toxoid vaccination cards is 85%. Interestingly, card retention is higher in the rural than the urban areas.

Data on vaccination coverage according to the source of information used to determine coverage -- i.e., the vaccination card or mother's report -- are presented in Table 6.2. These data are for children aged 12-23 months, the age at which they should be fully vaccinated.

According to the vaccination cards, 85% of children have received a BCG vaccination, the same rate as the 1992 DHS result (85.9%). Another 9% of children did not have a card when surveyed in 1995, but were reported by their mothers to have received the BCG vaccine, for which the scar was checked. This, therefore, implies that overall 94% of children aged 12-23 months are vaccinated against tuberculosis, down 3% on the 1992 DHS figure (this difference is significant at the 95% confidence level).

Table 6.2 Vaccination rates of children 12-23 months old, and vaccination rates of same age group before their first birthday, by source of information

	BCG	Polio			DPT			Measles	All*	None	No. in Sample
		1	2	3	1	2	3				
Vaccination card	85	84	81	78	84	80	76	75	71	-	997
Mother's report	9	9	8	6	9	8	6	8	4	-	997
Both sources	94	93	89	84	93	88	82	83	75	3	997
Vaccinated by 12 months of age	91	90	87	80	92	86	76	70	61	6	975

* BCG, measles, three doses of DPT and polio vaccines

Coverage for the first courses of polio stands at 93%, as does coverage for DPT 1. This figure is not significantly different from that for BCG (94%). What is of concern, though, is that coverage of DPT and polio decline with subsequent doses. This could be explained by a number of factors, including unavailability of vaccines and mothers' fatigue.

Another worrying trend is late vaccinations. Only 70% of children were given their measles vaccination before the recommended age of one year, while another 13% received it between their first and second birthdays. Less than two-thirds (61%) of children had all their vaccinations before their first birthday, compared to three-quarters by the time of the survey. Six percent of children had no vaccinations by their first birthday, though half of these had some vaccinations before reaching their second birthday.

Between 1992 and 1995, DPT 3 declined from 82% to 76% and polio 3 from 84% to 80%; other differences were not significant.

There is a slightly higher coverage for boys than girls, though there is a marked difference in measles vaccinations (85% for girls and 79% for boys). All other vaccine types have similar coverage.

There is no significant difference in full immunization by the time of the survey in urban and rural areas. This seems to indicate that both rural and urban mothers are eager to complete the basic vaccinations. However, rural women face more logistical problems than urban mothers, and the latter are more likely to succeed in completing the course of immunization within their children's first 12 months. Full vaccination coverage by 12 months of age is, therefore, shown by this survey to be higher for urban than rural residents.

There is a positive correlation between the education levels of mothers and household heads, on one hand, and the rate of coverage of each antigen as well as full immunization coverage, on the other (Tables 6.3 and 6.5). As the level of education of both the mother and household head increases, immunization coverage is also likely to increase.

Table 6.3 Distribution of children (%) of ages 12-23 months, immunized by their first birthday, by education of mother

Mother's Education	Percent immunized by specific vaccines				
	BCG	DPT3	OPV3	Measles	Fully Immunized
None	92	75	78	67	58
Primary 1-4	91	72	79	67	54
Primary 5-8	94	84	87	79	72
Secondary+	91	86	80	83	76

Specifically, complete timely coverage increases with maternal education, from 58% of children whose mothers have no education to 72% of children whose mothers have an upper primary education. The number rises to 76% for those children of mothers with some secondary education, but this figure should be treated with caution because the number of mothers with secondary education who were surveyed was small (42) and the percent standard error is high (almost 11% SE).

Table 6.4 Distribution of children (%) of ages 12-23 months, immunized before their first birthday, by education of household head

Education of Household Head	Percentage immunized by specific vaccines				
	BCG	DPT3	OPV3	Measles	Fully Immunized
None	91	72	75	68	58
Primary 1-4	94	77	81	66	58
Primary 5-8	95	77	82	72	62
Secondary +	95	86	88	85	76

Interestingly, all of the children 12-23 months old in the urban areas whose mothers have some secondary education had received some vaccines by the time of the survey. This means that those children in urban areas with relatively well educated mothers are more likely to do better in EPI coverage.

Table 6.5 Percentage of children 12-23 months who had received specific vaccines by the time of the survey, by selected background characteristics from all sources

Background Characteristic	BCG	Polio			DPT			Measles	All	None	No. in the sample	% with a card
		1	2	3	1	2	3					
Gender												
Male	95	93	88	84	94	89	82	79	74	3	500	90
Female	93	93	91	83	83	89	80	85	76	2	495	87
Residence												
Urban	89	87	84	81	87	82	78	84	75	0	110	73
Rural	94	93	90	84	94	89	81	82	75	3	887	90
Region												
North	94	95	92	86	95	92	85	83	80	3	191	87
South	94	93	89	82	93	86	76	82	72	2	450	89
Central	93	92	90	85	94	91	86	82	77	3	356	88
Mother's Education												
None	93	92	88	80	92	86	80	79	72	3	410	88
Primary 1-4	95	93	89	84	95	88	80	84	75	4	256	88
Primary 5-8	96	94	93	89	96	94	87	89	82	1	270	90
Secondary +	91	91	91	86	91	91	87	85	78	0	42	88
All Children	94	93	89	84	94	89	81	82	75	3	997	88

Tasks undertaken to date

The coverage to date has been possible as a result of the Expanded Programme of Immunization undertaken by the Ministry of Health with the assistance of UNICEF. This support

has taken the form of supplies, equipment, training, management capacity building and the solicitation of funds from bilateral sources, and has also strengthened monitoring and evaluation activities, human resources development and Social Mobilization. The vaccination programme is now routine and demand-driven and requires a minimum amount of popular persuasion. However, parents and communities need to be reminded periodically of the importance of immunization and their further participation is needed for sustainability.

Constraints

There has been a discernible decline in funding levels for operational costs since 1990. This has led to a severe curtailment of activities during 1995. Also, certain types of vaccines, especially DPT, have not been available in the country at times. Other vaccines, such as for measles, were always available in Malawi, but logistical problems made them periodically unavailable in certain parts of the country.

Financial problems threaten to reverse the benefits achieved in Malawi thus far. The outreach strategy -- which brings health care to the people -- and the supervision of health workers, supplies and deliveries have, in the recent past, been severely affected as a result. A renewed effort by those organizations with resources is needed if the general decline in immunization coverage is to be reversed. During the period 1996 to 2000, support from EPI Donors in the areas of vaccines and cold chain and related equipment are also needed.

District level figures show considerable divergences in immunization coverage (which should be interpreted in light of their standard errors). To counter district differences, more resources generally, and a more precise targeting of funds are needed to support operational costs in weaker districts. To sustain and increase a district's ability to carry out essential tasks and avoid a major decline in coverage, planning for the required support must be the immediate task. The monitoring of outbreaks of disease, especially measles, must be strengthened, too.

If such assistance can be made available, it will go a long way towards alleviating the current problems and reversing the general downward trend.

The MSIS survey collected data about individual vaccination coverage, which are intended to help policy makers pinpoint specific problem areas.

6.2 *BCG*

The MSIS survey found that there has been a drop in BCG coverage (i.e., vaccination against tuberculosis) of children aged 12-23 months by their first birthday. It now stands at 91%, or 4% down on the 1992 DHS survey figures (Figure 6.1). This was found to be statistically significant at the 95% confidence level.

There are no significant differences in coverage between the three regions -- North (93% coverage), South (92%) and Central (91%) regions.

District level coverage rates, however, reveal significant differences, with the lowest (Nsanje) at 83% and the highest (Karonga and Chiradzulu) at 100% (Table 6.1). Chikwawa and Nkhata Bay have significantly higher rates than the average for Malawi, whilst Nsanje has significantly lower.

For the same age group, BCG coverage in the urban areas is 86% whereas coverage in the rural areas is 92%.

BCG coverage for female children of the same age group (93%) is slightly higher than for their male counterparts (90%).

For children aged 12-23 months who had received various vaccines by the time of the survey, BCG coverage was 94%, 3% down from the 1992 DHS figure.

6.3 *Measles*

There has been no change since 1992 in the rate of coverage (70%) of measles vaccinations for children aged 12-23 months who had the vaccine by 12 months of age (Figure 6.1).

There is no significant difference in coverage between the three regions, with the rate only slightly higher for the North and Centre (71%) than in the South (69%).

District level coverage rates, however, reveal significant differences, with the lowest (Machinga) at 48% and the highest (Ntcheu) at 83% (Table 6.1). Ntchisi has a coverage rate significantly lower than the mean rate for Malawi, while Ntcheu's rate is significantly higher.

In the same age group, measles coverage in the urban areas (78%) is not significantly different than in the rural areas (69%).

Measles coverage for female children of the same age group is higher (72%) than their male counterparts (68%).

For children aged 12-23 months who had received vaccines by the time of the survey, measles coverage is 82%. This is 4% down from the level identified by the 1992 DHS survey.

Tasks Undertaken to Date

The epidemiological picture of measles appears to be changing. Specifically, older children (5 years and over) are more likely to get the disease, and there seems to be a longer interval between outbreaks. Although this is a sign of a successful EPI programme, it calls for a reassessment of immunization strategies and measures.

A significant reduction of cases has been recorded over the period 1990-1995. The measles rate among under-5s declined from 248/10,000 population in 1990 to 12/10,000 population in 1994. In-patient cases of all ages fell from 11,988 in 1990 to 531 in 1994, with total deaths of all ages from measles reduced from 1,166 in 1990 to 56 in 1994.

In 1990 there were 1,015 under-5s measles deaths nationally, while this figure fell to 45 deaths by 1994. In 1994, most deaths of under-5s from measles were in the Central region (28), compared to the North (8) and the South (9). At the district level these 45 deaths were located in Blantyre (3), Nsanje (2), Mangochi (1), Chiradzulu (3), Lilongwe (19), Kasungu (8), Dowa (1), Karonga (7) and Mzimba (1).

Localized measles outbreaks were reported in 1995 in Machinga, Mulanje, Zomba and Mangochi in the Southern Region and in Salima, Dedza, Lilongwe, Ntcheu and Nkhotakota districts in the Central Region.

Since the global goal is the reduction of measles cases and deaths, it seems that this is achievable in Malawi in the long term.

Constraints

With the spread of measles to older children, and an unprecedented outbreak of measles in infants below nine months, there is a need to clarify the epidemiological situation if appropriate measures are to be recommended. Additional research is therefore necessary. Any new measures will have to be implemented and closely monitored for impact.

Major Tasks Planned

In the EPI programme, measles outbreaks will be monitored, and 'catch-up' vaccination campaigns and containment activities undertaken. Special attention will be given to low-coverage and hard-to-reach areas in all districts. Case definitions which have been printed in poster form will be widely distributed to health facilities in order to improve diagnosis. A Disease Surveillance course planned for peripheral health staff will emphasize measles case definitions and surveillance, and briefings on measles in the villages will be started.

The challenge in the years to come will be to attract sufficient funding for the programme and to maintain a functioning, decentralized primary health care system.

6.4 *DPT*

The MSIS results reveal that for children aged 12-23 months who had received vaccines by 12 months of age, DPT3 coverage is down 8% from the figure obtained during the 1992 DHS survey, to 76% (Figure 6. 1). This was found to be statistically significant at a 95% confidence level.

There are significant differences in coverage between the three regions. The North again ranks first (83% coverage), compared to the South (80%) and Central (71%) regions.

District level coverage rates also reveal significant differences, with the lowest (Machinga) at 54% and the highest (Chitipa) at 93% (Table 6.1). Machinga, Ntchisi and Lilongwe districts were

all significantly lower than the mean for Malawi, whilst Chitipa and Blantyre districts were significantly higher than the mean.

There is little difference in DTP3 coverage between the urban areas (78%) and the rural (76%).

Nor is there a significant difference in coverage for girl and boy children of the same age group (76% and 75%, respectively).

For the children aged 12-23 months who had received various vaccines by the time of the survey, DPT coverage (at 81%) is 8% lower than the rate reported by the DHS in 1992.

6.5 *Polio*

For children aged 12-23 months who had received various vaccines by 12 months of age, full polio coverage (OPV3) stands at 80%, 4% down from the 1992 DHS (Figure 6.1). This difference was not found to be statistically significant.

There are slight differences in coverage between the North (81% coverage), the South (83%) and Central (78%) regions.

District level coverage rates, however, reveal significant differences, with Mchinji district (62%) significantly lower than Chiradzulu district (93%) (Table 6.1). Mchinji and Ntchisi districts' rates are significantly lower than the mean, while the rate in Chikwawa district is significantly higher.

Polio coverage for the urban areas is not significantly different from the rural areas (i.e., 79% and 80%, respectively).

Polio coverage for female children of this same age group is the same as for males (80%).

For children aged 12-23 months who had received various vaccines by the time of the survey, polio coverage stands at 84%, or 4% down on the 1992 DHS survey figure.

The mid-decade goal is the elimination of poliomyelitis in selected countries and regions, which will contribute to achieving full eradication of poliomyelitis world-wide by the year 2000. This is achievable in Malawi as long as district level coverage is intensified, with an improved surveillance system, and all bottlenecks substantially removed.

Tasks Undertaken to Date

Significant strides have been made in terms of improving polio surveillance. Eradication measures have been put in place and are widely practised. Specifically, the achievement of high rates of vaccination coverage and maintenance of that coverage since 1990 have had an impact. There were only 3 cases of polio in 1990, one each in Nsanje, Thyolo and Zomba districts. The last

confirmed case of polio was reported in 1991. (From 1992 to date no cases have been confirmed though suspects were subjected to rigorous investigations, including stool specimens to isolate the polio virus.) Community briefings for various groups have taken place, during which drama groups sometimes support and enhance the dissemination of messages.

Constraints

The surveillance system is not sensitive enough and it is suspected that some Acute Flaccid Paralysis (AFP) cases are not being reported as they should be. It is not yet clear why this is the case. The tendency seems to be to withhold reporting of AFP cases once polio is ruled out. There is also difficulty in getting information from herbalists, who may be treating Acute Flaccid Paralysis cases.

More effort should be exerted locally in extending surveillance mechanisms beyond the formal health system.

Major Tasks Planned

First, it is necessary to improve the reporting system ofr community organizations and other structures, such as the NGO, Malawi Against Polio. Moreover, to eradicate polio it is also important to check all forms of paralysis to ensure that they are not caused by polio. Because it is difficult to distinguish between the various forms of paralysis and polio, it is necessary to follow-up these cases.

National Immunization Days for polio are planned for implementation in June and July 1996. The aim is to eradicate polio world-wide. This year 26 countries in southern and East Africa agreed to undertake these national campaigns.

6.6 *Tetanus Toxoid for Mothers*

A survey in 1983 established a neonatal tetanus mortality rate of 12/1000 births. A repeat survey in 1990 indicated a reduced rate of 4.6/1000 births. A third survey was planned for 1995, but was cancelled on the advice of WHO because the surveillance system has improved and it was felt that there is little need to do a special survey to monitor trends.

Since then the surveillance system continues to be strengthened with prompt reporting, investigating and mapping of every case in order to identify low coverage, high risk areas. Major activities from 1990 have centred on expanding the coverage of tetanus toxoid vaccine to all women of child-bearing age.

Nationally, about three-quarters (77%) of mothers of 0-11 months old children received at least 2 doses of tetanus toxoid in the 3 years before giving birth. This means that they either received at least two doses of TT during their last pregnancy or had the last dose within the appropriate interval for the total number of doses given in a life time.

Table 6.6 Mothers (%) who have received Tetanus Toxoid, by geographic area

	Percentage	Number of mothers
Malawi	77 (2.1)	1304
Region		
North	64 (6.6)	284
Centre	82 (2.6)	509
South	76 (3.3)	511
District		
Chitipa	50 (9.6)	55
Karonga	95 (3.0)	38
Rumphi	78 (9.7)	39
Mzimba	58 (9.9)	120
Nkhata Bay	48 (19.2)	32
Kasungu	77 (8.6)	35
Mchinji	81 (10.6)	47
Lilongwe	84 (4.4)	162
Dowa	89 (3.8)	35
Nkhotakota	75 (9.1)	42
Salima	75 (8.4)	44
Dedza	92 (3.0)	57
Ntcheu	89 (6.6)	52
Ntchisi	37 (11.9)	57
Mangochi	65 (9.0)	44
Machinga	86 (5.5)	47
Zomba	90 (3.9)	64
Mwanza	65 (6.4)	52
Blantyre	81 (5.2)	89
Mulanje	57 (9.3)	43
Thyolo	75 (14.2)	41
Chiradzulu	77 (6.8)	36
Chikwawa	84 (5.4)	43
Nsanje	76 (6.3)	52
Residence		
Urban	83 (3.9)	149
Rural	76 (2.3)	1155

There are significant differences in coverage between the three regions. In the North coverage is low (64%), higher in the South (76%), and higher still in the Central region (81%).

District level coverage rates also reveal significant differences, with the lowest (Ntchisi) at 37% (standard error of 12%) and the highest (Karonga) at 95% (standard error of 3%). Tetanus Toxoid coverage for new mothers in the urban areas is 83%, whereas the coverage for the rural areas is 76%.

The number of neonatal tetanus cases reported through EPI routine reporting have fallen from 94 in 1990 to 7 in 1995. These seven cases were reported in six districts (Chiradzulu, Ntcheu, Mchinji, Karonga, Chitipa and Nkhata Bay), while the other districts reported none.

These figures demonstrate that the situation in Malawi has improved, but has not yet reached the mid-decade goal of eliminating neonatal tetanus. Additional effort is necessary. This is especially true since the incidence of neonatal tetanus in the villages, about which no data were collected by MSIS, remains significant.

Constraints

Wide coverage of non-pregnant women of child-bearing age is a goal that is still not met. Any attempt to expand coverage necessitates extra vaccine supplies and improved logistics. Long-term (to the year 2000) financial, logistical and to some extent, technical support are required to increase coverage. Additional strategies have to include reaching women outside health facilities.

Major Tasks Planned

Planned activities focus on active surveillance of neonatal tetanus and identification of high risk areas, both of which will lead to 'catch up' campaigns. In addition, it is planned to extend the surveillance system to Traditional Birth Attendants and Herbalists, using a 'Yellow Card System' for follow-up.

The extended surveillance system will investigate each neonatal death. The TBA is supposed to send a yellow card within a few days after a child's death, reporting it to the local health centre or hospital. Health centre staff then follow up these reports, in order to determine if the deaths were related to neonatal tetanus, which has specific signs. Health centre staff have to be trained to recognize these signs, and to encourage pregnant women in the villages to get vaccinated. If health facilities report zero cases, they have to be sure that this figure is accurate and reflects what is happening in the villages.

This will entail training of the peripheral health staff to establish proper and effective linkages with TBAs. A Disease Surveillance Module adapted from WHO has been printed and is to be used for this training. A trial course was conducted in early November 1995 and district-based courses are expected to follow in all three regions during 1996. During 1996-2000 the surveillance system will be made more sensitive by enforcing a zero reporting system by all health facilities.

6.7 *Conclusion and Recommendations*

These results are the first evidence of a downward shift in the last decade in EPI performance and should be taken as a warning sign.

Two-thirds (61%) of children 12-23 months are now fully immunized by the first birthday. That figure rises to three-quarters (75%) for the same age group, who were fully immunized by the time of the survey. If individual antigens are considered, the figure is higher. Specifically, the percentage of those 12-23 month old children who are immunized by their first birthday stands at 91% for BCG, 76% for DPT, 80% for polio, and 70% for measles. By the time of the survey over 80% children 12-23 months old were immunized for each antigen (Table 6.2).

Worrying, then, is the drop in the figures for children immunized before their first birthdays. DPT coverage has fallen from 84% in 1992 to 76%, while polio has dropped by four percent to 80% in the same time period. Measles coverage (at 70%) has not improved, while BCG coverage has fallen slightly.

Furthermore, the percentage of children fully immunized by their first birthday shows a downward trend. In 1992, 67% of children were fully immunized by 12 months, compared to only 61% now. These results are the first evidence of a downward shift in the last decade in EPI performance, and serve as a warning. There has been a discernible decline in the funding levels for operational costs since 1990. This has led to a severe curtailment of activities during 1995. Certain vaccines, especially DPT, have been periodically unavailable due to global shortages in the production of vaccines. Other vaccines, such as for measles, were available in Malawi, but logistical problems made them scarce in certain periods.

In the elimination of neonatal tetanus, the constraint is in providing tetanus vaccinations to non-pregnant women of child-bearing age. Any attempt to expand immunization in this area demands extra vaccine and improved logistics, which increase expenditure. In this time of belt-tightening, it is difficult to expand this necessary programme.

The outreach strategy, the supervision of immunizations, the supply of vaccines and their timely delivery have all been severely affected by insufficient resources, exacerbated by the cash budget. The net effect is reduced service delivery.

If Malawi is to achieve the Summit goal by the year 2000, this trend must be reversed. Moreover, if Malawi is not to go backwards in its rate of coverage -- ending the decade with lower rates than five years ago -- the resource constraints underlying this reversal must be addressed.

In order for Malawi to achieve the immunization goal set at the World Summit for Children, energies and resources must be applied in several areas:

- There is an acute need for funds to support operational costs of the EPI programme at district level;
- From now until 2000, donor support for the EPI programme is necessary in the areas of vaccines, and cold chain and related equipment;
- Government will need to become progressively more responsible for vaccines and other costs;
- Districts must immediately begin to plan for the support required to enable them to carry out immunization programmes. To sustain a district's ability to carry out essential tasks and avoid a major drop in coverage, planning for the required support must be the immediate task;
- The monitoring of disease outbreaks, especially measles, must be strengthened;
- Technical assistance in the form of a team of experts is needed to help assess and make recommendations for the changing epidemiology of measles. Any new measures will have to be implemented and closely monitored for impact;
- Measles outbreaks should be monitored and 'catch-up' campaigns and containment activities supported. Special attention should focus on low coverage and hard-to-reach areas in each district. Case definitions that have been printed in poster form should be widely distributed;
- There is need to pay more attention to providing local briefings on measles to village communities;
- Disease Surveillance courses for peripheral health staff should emphasize measles case definitions and surveillance; Acute Flaccid Paralysis reporting should be enforced;

- The Ministry of Health and Population is committed to primary health care. This, along with recent efforts to strengthen the role of Health Surveillance Assistants and to collaborate with Village Health Committees, should be supported and encouraged;

- Financial, logistical, and to some extent, technical support is required until 2000, to combat neonatal tetanus;

- Raising levels of literacy of mothers and households heads should be an educational priority, as literacy rates have a direct bearing on levels of timely childhood immunization.

CHAPTER SEVEN

DIARRHOEA

Dehydration resulting from severe diarrhoea is a major cause of morbidity and mortality among children. It is estimated that world-wide over 3 million children below five years die every year due to diarrhoea and dehydration. The problem is particularly severe in developing countries, where almost a quarter of the deaths among children under 5 years of age are caused by diarrhoea. Most of these deaths could be prevented through Oral Rehydration Therapy (ORT).

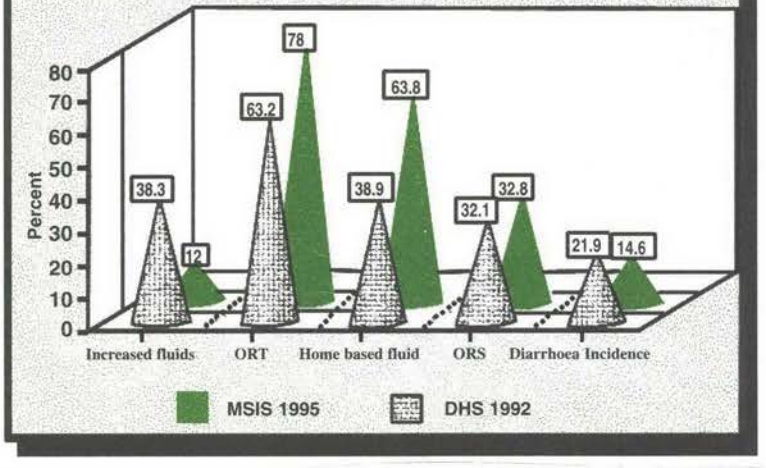
7.1 Situation in Malawi

Diarrhoeal diseases have been, and continue to be a major cause of child morbidity and mortality in Malawi. In 1991 the National Morbidity, Mortality and Treatment Survey showed that the average child suffered six diarrhoeal episodes each year. If this figure is multiplied by the approximately two million children under five years old in Malawi, then the magnitude of the problem is clear.

Fifteen percent of children under the age of 5 had diarrhoea in the two weeks preceding the survey. Four in five of those were treated with some form of Oral Rehydration Therapy.

Among those under-5s hospitalized for diarrhoea in 1992, the case fatality rate was 8.6%, making diarrhoea the fifth most common cause of death among inpatients in this age group. The main cause of death from acute diarrhoea is dehydration, which results from the loss of fluid and electrolytes in diarrhoeal stools. Other important causes of death are malnutrition and infections, such as malaria and pneumonia.

Fig 7.1: Changes in the Prevalence and Treatment of Diarrhoea since 1992



Diarrhoea is also among the top five causes of outpatient attendance of under-5s. As each under-5 child will expect to suffer 5 or 6 diarrhoea episodes each year, by the age of five years they will have spent a total of 4-5 months of life with diarrhoea.

The National Policy for Control of Diarrhoeal Diseases Programme emphasizes effective case management in homes and health facilities as the primary strategy for decreasing diarrhoeal mortality in young children. Effective case management is recommended to include provision of additional fluids, continued feeding (including breast milk), and appropriate use of drugs and referral practices.

7.2 *Prevalence of Diarrhoea*

This Malawi Social Indicators Survey revealed that 14.6% of children under the age of 5 years had diarrhoea in the two weeks preceding the survey. Significant differences are recorded for children of different ages and living in different regions (Table 7.1). Specifically, children in the Central region suffer more from diarrhoea. However, there are no significant differences in the prevalence of diarrhoea with respect to the mother's education or the child's gender.

Table 7.1 Proportion (%) of children with diarrhoea by region, residence, gender and mother's education

	Proportion of Children with Diarrhoea
Malawi	14.6 (0.1)
Region	
North	13.0 (1.7)
Central	16.9 (1.2)
South	12.4 (1.4)
Residence	
Urban	14.4 (2.8)
Rural	14.6 (1.0)
Gender	
Male	15.8 (1.1)
Female	13.3 (1.2)
Mother's Education	
No Education	15.0 (1.4)
Primary 1-4	15.7 (1.8)
Primary 5-8	12.2 (1.3)
Secondary+	17.8 (4.6)
Child's Age(months)	
<6	5.8 (3.9)
6 - 11	26.8 (3.5)
12 - 23	24.2 (1.9)
24 - 35	11.5 (1.3)
36 - 47	8.7 (1.4)
48 - 59	6.8 (1.2)

Standard errors in parentheses

A child's age is correlated with the prevalence of diarrhoea, with low levels recorded when the child is less than six months old. The prevalence rises until the child reaches two years, when it again starts to fall. The likely reason for this is that breast feeding at ages above 6 months tends to be intermittent, and these children are increasingly given prepared foods. In addition, children above 6 months are more mobile and independent, and are likely to put unhygienic items in their mouths.

Diarrhoea is more prevalent in Dowa, Lilongwe and Mulanje districts in particular, though the incidence is high in several others, including Nkhotakota, Mchinji, Nsanje, Salima and Kasungu (Table 7.2).

Diarrhoea is most prevalent where mothers wash hands only after food has been eaten (Table 7.3). However, statistically significant differences exist between washing hands 'before and after meals' and 'other' times.

There exists a direct relationship between the prevalence of diarrhoea and the socio-

economic characteristics of the family. Using correlation and regression analyses reveals that the age of a child is more significant than other factors, such as whether the child is breast fed, the level of the mother's education, family residence, or access to safe water and sanitation. Those most at risk are children aged 6-23 months. This is also the age at which malnutrition levels increase dramatically.

Those infants who are exclusively breast fed (Table 7.3) are less likely to suffer from diarrhoea (8.5%) than those who receive other food and water (14.5%). These findings confirm a previously recognized fact that children who are exclusively breast fed have less diarrhoea.

7.3 Diarrhoea Treatment

Effective case management of diarrhoea consists of the replacement of lost electrolytes and body fluid, continued feeding of the child during and after each diarrhoeal episode, and referral to a health unit if the situation worsens or becomes severe.

Table 7.2 Prevalence (%) of diarrhoea, by district

District	Proportion of Children with Diarrhoea
Chitipa	13.4 (5.1)
Karonga	14.6 (2.6)
Mzimba	13.9 (3.1)
Nkhata Bay	12.1 (4.4)
Rumphi	9.6 (2.9)
Dedza	8.6 (2.5)
Dowa	22.0 (3.7)
Kasungu	15.6 (4.6)
Lilongwe	20.3 (2.2)
Mchinji	16.8 (3.3)
Nkhotakota	17.9 (3.5)
Ntcheu	13.2 (3.1)
Ntchisi	16.4 (3.8)
Salima	15.7 (4.2)
Blantyre	7.6 (2.3)
Chikwawa	12.8 (3.3)
Chiradzulu	11.9 (4.0)
Machinga	9.8 (1.9)
Mangochi	14.8 (5.6)
Mulanje	21.4 (4.1)
Mwanza	13.4 (1.4)
Nsanje	15.9 (1.5)
Thyolo	14.4 (6.4)
Zomba	8.9 (3.2)

Standard errors in parentheses

To assess the effective case management in the home by mothers and caretakers, respondents were asked what fluids and food were given to their children when they were sick with diarrhoea. The MSIS survey found that three-quarters (78%) of under-5s with diarrhoea are given either ORS sachets or gruel. At a regional level, the proportions remain high, with 83% of children in the Central region having some form of ORT treatment, followed by children in the Northern region (74%) and the South (72%).

In the analysis an attempt was made to find explanatory factors for the differences in treatment of diarrhoea. It was found that mother's education and residence have a negligible effect on whether children are provided with ORT (Table 7.4).

The low use of ORS sachets can partly be accounted for by the difficulty in obtaining ORS sachets outside the health system in the last three years. There were also fewer supplied by government and donors due to the change in the policy regarding treatment.

Only one-third (32.8%) of diarrhoea cases are treated with ORS sachets. But the use of ORS sachets differs for girls and boys, and for children of different ages. More than one-third of girls (37.9%), but just over one-quarter of boys (28.6%) will be given ORS sachets when they have diarrhoea. Further research is needed to determine why there is a gender difference. With respect to a child's age, the use of ORS sachets for children less than six months of age is significantly lower than for children aged 6 to 35 months.

After children reach three years of age, they are less likely to receive ORS packets. The use of ORS sachets for the age groups 36-47 and 48-59 months are significantly lower than for age groups under 36 months. This may correspond to the more frequent visits made to health centres or under-five clinics by the younger children, since free ORS sachets are now only provided through the health system.

Table 7.3 Proportion of children (%) with diarrhoea, by water, sanitation, hygiene and breast feeding

Variable	Percentage
Water	
Safe Water	14.3 (1.5)
Unsafe Water	14.8 (1.1)
Sanitation	
Safe Sanitation	14.0
Unsafe Sanitation	16.1
When Hands Were Washed:	
Before Meals	12.8 (2.9)
After Meals	18.8 (10.8)
Before and After	15.0 (0.9)
Other	9.2 (2.2)
Exclusively Breastfed Children	8.5
Children Receiving Food and Water	14.5
Standard errors in parentheses	

Nearly two-thirds (63.8%) of children are treated for diarrhoea with gruel and other home-made remedies, such as rice or maize water. The picture at regional level (60-69%) remains the same. In any event, home-made solutions are the most popular form of diarrhoea treatment everywhere in Malawi. Still, there are significant differences between the treatment of diarrhoea by region, where the use of ORS sachets in the North is much lower than in the Centre, and treatment with ORS and gruel is highest in the Central region.

Data suggest that as a mother's education increases, her children are more likely to be treated with either gruel or ORS during bouts of diarrhoea.

There are no significant differences between the treatment of diarrhoea of those children living in urban and rural areas. Furthermore, no significant differences emerge on the use of gruel in respect of different socio-economic characteristics. There are also no variations in treatment of diarrhoea with either ORS sachets or gruel by socio-economic characteristics, except for a mother's education.

Prior to 1993 mothers were encouraged to give ORS sachets or sugar salt solutions to children suffering from diarrhoea. This policy was changed when it became clear that giving children the wrong mixture of sugar salt solution would aggravate the situation. Since then mothers have been encouraged to undertake the following home treatment of diarrhoea instead:

In order to prevent dehydration, the child should be given more (home available) fluids than normal as soon as the diarrhoea starts. Mothers should continue feeding the child the usual diet

in adequate quantity during and after the bout of diarrhoea, which means at least 5 times a day. In other words, dietary frequency and amount should be increased by an extra 2 or 3 meals each day. If the condition becomes worse or severe, the child should be taken to the health centre.

Table 7.4 Treatment of diarrhoea, by region, residence, gender and mother's education

	Oral Rehydration Therapy (ORT)		Percentage Treated with ORS or Gruel
	ORS Sachet	Gruel	
Malawi	32.8 (2.7)	63.8 (3.2)	78.0 (2.8)
Region			
North	21.2 (4.2)	59.6 (6.6)	73.6 (7.1)
Centre	37.9 (3.8)	68.8 (3.0)	82.9 (2.4)
South	28.4 (4.4)	63.8 (6.8)	72.0 (6.1)
Residence			
Urban	30.0 (8.4)	63.4 (8.2)	75.6 (7.2)
Rural	33.1 (2.9)	63.8 (3.4)	78.3 (3.0)
Gender			
Male	28.6 (3.6)	64.4 (4.3)	76.3 (4.2)
Female	37.9 (3.6)	63.1 (3.3)	80.1 (2.8)
Mother's Education			
No Education	36.6 (5.0)	64.9 (4.9)	75.7 (4.0)
Primary 1 - 4	26.3 (5.3)	60.1 (5.6)	77.1 (6.1)
Primary 5 - 8	34.3 (3.6)	67.1 (3.9)	85.5 (0.3)
Secondary+	36.6 (9.8)	59.8 (8.3)	75.7 (15.6)
Child's Age (months)			
< 6			
6 - 11	14.7 (6.4)	68.0 (9.0)	72.4 (7.5)
12 - 23	37.5 (5.1)	62.5 (6.1)	77.3 (6.2)
24 - 35	37.9 (4.3)	62.5 (3.8)	81.0 (3.1)
36 - 47	32.8 (6.2)	71.6 (5.2)	80.7 (4.4)
48 - 59	19.1 (4.6)	61.0 (7.6)	72.6 (8.7)
	18.2 (7.7)	60.1 (10.5)	68.4 (10.6)

Standard errors in parentheses

In order to assess how effectively the new treatment is being practised, mothers and caretakers were asked if their children with diarrhoea received much more, about the same, less, much less, or no fluids and food. The findings revealed that only 12% of children with diarrhoea receive more fluids and even fewer (5.3%) are also fed. About one-third of the children with diarrhoea (32%) are treated with sugar salt solutions. Overall, the rates of giving food and liquid to children with diarrhoea are low in all regions.

These results are worrying because dehydration is the main cause of death of diarrhoea sufferers. The data indicate that the newly recommended home treatment is not being practised correctly, or has been only partially adopted. Increasingly mothers and caretakers are using home available fluids for the treatment of diarrhoea, which indicates that at least part of the message has

been taken into account. At the same time, though, there is non-compliance with recommendations to increase fluids and to continue feeding these children. This may be caused by the message, which is not clearly understood; by the belief that feeding will worsen the diarrhoea; or by the inability to meet the requirement due to poverty and food shortages.

Table 7.5 Amount of food and fluids taken by children with diarrhoea

	Amount of fluids taken when child is sick with diarrhoea	Amount of food taken when child is sick with diarrhoea
None	10.5 (7.3)	14.4 (4.8)
Much Less	34.9 (2.7)	42.3 (2.2)
Somewhat Less	18.1 (3.3)	19.4 (3.0)
About the same	23.0 (2.6)	19.3 (2.6)
More	12.0 (4.1)	3.0 (8.3)
Don't Know	1.1 (10.3)	0.8 (21.0)

Standard errors in parentheses

Measures Undertaken, 1990-1995

Before 1993 oral rehydration therapy was promoted in Malawi in the form of three interventions: the preparation and use at home of oral rehydration solution (ORS) made from water and commercially produced packets of oral rehydration salts, the provision of mixed ORS by health facilities, and the preparation and use in the home of various grain-based rehydration fluids (such as rice water and maize water).

As noted above, after 1993 the correct case management of diarrhoea has been to increase fluids and continue feeding. This is more cost effective, easier for mothers, and reduces the risk of a mother giving her child too much salt. A new five year Plan of Action has been developed by government to control diarrhoeal disease, and includes in-service training of health workers on appropriate case management of diarrhoeal diseases at home and at health centres. It also includes raising awareness of diarrhoeal diseases in caretakers, promotion of personal hygiene, improvement in water and sanitation facilities, reduction of childhood immunizable diseases, improved nutrition, effective home-based case management, effective health-facility based case management, improvement of logistics and availability of supplies, institutional strengthening and capacity building, and improved monitoring and evaluation and reporting.

Constraints

Problems at the household level are a result, in part, of caretakers' lack of understanding of diarrhoea and personal hygiene. Compounding this are water shortages, inadequate supplies of safe drinking water, and unhygienic methods of drawing, transporting, storing and serving water. Moreover, there is a lack of resources to improve hygiene. Weaning foods are introduced at an early stage, mothers oftentime believe that teething is the cause of diarrhoea, and that feeding will worsen

it. Overall, poverty, which has an impact on the quality of care, is the underlying cause of the problem.

Health workers in the health centres have little knowledge of, and inadequate skills in diarrhoea case management. Furthermore there is no budget allocation for diarrhoeal control activities, no supervision, few storage facilities, and no mechanism to determine the availability and consumption of ORS at national, regional and district levels.

A limited supply of ORS sachets is available to users. The cash budgeting system adopted by the government combined with poor drug procurement procedures have adversely affected the supply of ORS sachets to hospitals. There has also been a reduction in the supply of ORS packets from UNICEF, due to financial limitations and the expressed intention of other donors to provide ORS sachets.

Due to widespread poverty, most households cannot afford ORS packets from shops. The limited supply of ORS sachets has resulted in an increase in the use of home made treatments. However, the message to increase the intake of fluids and to continue feeding has yet to be widely adopted.

7.4 *Conclusion and Recommendations*

The prevalence of diarrhoea has decreased (from 22% to 15%) since the 1992 Demographic and Health Survey. However, it has increased amongst children over 36 months. The use of ORS sachets has remained the same, but the use of home-based solutions has dramatically increased from 39% in 1992 to the current 64%. As a result the number of children receiving either the recommended ORS sachets or home-based solution has increased from 63% to 78%.

One worrying trend, however, is that the proportion of children with diarrhoea who are given increased fluids is less than one-third of what it was in 1992, dropping from 38% to 12%.

As part of a larger programme to control diarrhoeal diseases, the mid-decade goal is to increase the usage of ORT or additional fluids to 80%. In Malawi, this has almost been achieved.

The end-of-decade goal is to cut under-5s' deaths from diarrhoea by one-half, and to reduce the prevalence of diarrhoea by one-quarter, compared to their 1990 levels. In Malawi, the prevalence of diarrhoea has already fallen by 25% since 1992. Now emphasis should be put on maintaining this relatively low figure, and reducing mortality due to diarrhoea. Among under-5s hospitilized for diarrhoea in 1992 the case fatality rate was 0.6%. No data are yet available for 1995.

The use of home made oral rehydration solutions has shown a dramatic increase since the 1992 survey. Still, the number of children receiving increased fluids when they have diarrhoea remains exceptionally low, as does the number of children receiving increased fluids and continued feeding.

The government has also agreed in principle to introduce 'the integrated sick child initiative'. The initiative promotes a shift away from vertical programmes, like the Control of Diarrhoeal Diseases and the Acute Respiratory Infections programme, to an integrated approach in

the treatment of sick children. This will require training and the development of training materials for implementation in Malawi, which will be done by the Ministry of Health and Population in collaboration with WHO and UNICEF among other agencies.

In light of the data collected, the following recommendations are made:

- The message that caretakers should increase the amount of fluids given to, and continue feeding a child with diarrhoea has not been assimilated. It remains unclear whether this is because the information campaign was poorly designed and/or implemented, or whether the caretakers' knowledge of, and experience with diarrhoea makes it difficult for them to accept the message. The information programme and the content of the messages need investigating and possibly, reform. ORT corners should be established in all health facilities.

- Data have shown that low cost treatments of diarrhoea are more frequently used than ORS sachets. However, the recommended low cost treatment -- i.e., giving children additional fluids and continued feeding -- is not always followed correctly, which is of grave concern. This may be caused by confusion about the changed treatment policy, and because the new treatment has not been effectively communicated. ORS sachets that are available in shops are too expensive for most Malawians. To this end, the promotion of home-based fluids for the treatment of diarrhoea should be intensified.

- Programmes should explain to fathers and mothers why children between 6 and 24 months are more likely to have diarrhoea, and how this can be prevented.

- Particular attention should be paid to the districts of Mulanje and Dowa, which have a higher proportion of children with diarrhoea.

- The link between diarrhoea and water sources needs further examination. The quantity and quality of water at these reportedly 'safe' sources should be investigated, as should the quality of sanitation facilities. Training of men and women in collecting, transporting and serving water in clean vessels should be extended.

- Because there is a positive correlation between breast feeding and non-incidence of diarrhoea, breast feeding should be encouraged and general hygiene emphasized.

CHAPTER EIGHT

CHILD NUTRITION

Child malnutrition contributes to stunted mental and physical growth world-wide, and to the death of many children under 5 years old. In fact, over 50% of the 13 million child deaths each year are due to a combination of illness and malnutrition. Children with severe malnutrition are 8 times more likely to die than well nourished children, while moderately malnourished children are 5 times more likely to die. But even if a child survives and nutrition improves, losses in physical and mental development may be irreversible. A child has only one chance to grow.

Although malnutrition is common in children living in low income families, it is not the direct result of low income. Lack of food is one factor, but good health and proper care are also necessary. Some families may not have enough food for everyone, but there is usually enough for a little child. Poor access to health services, an unhygienic environment, and an inability to properly care for young children are often more important causes of malnutrition.

Frequent illness reduces the child's appetite, inhibits food absorption, burns away calories in fever, and drains away nutrients in vomiting and diarrhoea. Therefore, preventing and controlling illnesses, especially through child immunization and oral rehydration therapy, help to reduce malnutrition.

Breast feeding can protect a child against many common illnesses. Although extended breast feeding in Malawi is common practice, exclusive breast feeding should be encouraged for infants, and complementary foods should be introduced at the right age. When weaning begins too early, the risk of disease and malnutrition increases, which explains why child malnutrition typically peaks in the second year of a child's life. When weaning begins too late, growth begins to falter.

Infrequent and inappropriate feeding also contributes to malnutrition. Young children have small stomachs, so they need to eat small meals often, perhaps five or six times a day. They also need protein to develop properly. Their food should be enriched by fats and oils.

Vitamin A deficiency causes blindness in many children every year and leaves many more susceptible to diarrhoeal disease, measles and pneumonia. Even a mild vitamin A deficiency can raise a child's chances of dying from common infections by 20%. It can be easily prevented by adding fruit or green vegetables to the daily diet, or by giving the child Vitamin A capsules twice a year.

The most visible symptom of iodine deficiency is a swollen thyroid gland, or goitre, in the neck. Some demonstrate the most severe symptom, overt cretinism. Thousands of children are stillborn or brain damaged because their mothers lacked small, but essential amounts of iodine during pregnancy. They grow up stunted, listless, mentally retarded, and often incapable of normal speech, hearing or movement.

8.1. Protein-energy Malnutrition

Malawi is in the intermediate group of developing nations, whose malnutrition rate (weight-for-age) for children under five years old ranges between 15% and 30%. Malnutrition in Malawi is caused by a number of factors, including:

- National and household food insecurity, due to low levels of agricultural productivity resulting from rudimentary technology, insufficient cultivatable land, environmental degradation, inadequate crop diversification, insufficient irrigation, and drought; insufficient industrialization and trade; losses of food during storage and processing; lack of employment and business opportunities; insufficient and costly food.

- Frequent infections due to inadequate information, education and communication; limited access to and utilization of social services; improper food handling; unsanitary surroundings; inadequate water supply; and nutrient deficiencies.

- Poor eating habits and traditions, such as early weaning and too few meals each day for small children; the bulkiness of the maize diet; the exclusion of certain healthy foods (e.g., eggs when pregnant); and the dominance of single crop production.

- Insufficient vitamins and minerals, especially vitamins A, B and C, and iron and iodine, due to inadequate information and education; low intake of (especially, dark green leafy) vegetables; reduced protein intake; and low fat intake leading to poor absorption of vitamin A.

- Heavy workloads and poor nutrition of mothers, especially in the 'hungry season' before harvesting, due to the insufficiency of domestic and agricultural labour saving devices; many and frequent pregnancies; and a high dependency ratio (number of children to adults), especially in female headed households.

- HIV infection leading to frequent illness, loss of labour and earnings, and an increased number of orphaned children.

- Population pressure and environmental degradation leading to a shortage of fuelwood, inadequate water supply, and low crop yields.

The rate of stunting of under-fives in Malawi now stands at 48.3%. The rate of wasting has worsened since 1992 and is now at 7%. The rate of underweight children is 29.9%.

Protein-energy malnutrition can be measured using three types of anthropometric indicators. Each of these indicators measures different aspects of malnutrition and gives different information about the growth of children's bodies. This information is used to estimate the nutritional status of individual children and populations. In this survey, estimates for all three indicators have been included for the under-five age group (0-59 months).

Underweight (low weight-for-age) is a measure of a child's weight according to his/her age compared to the median value of a standard reference population. This indicator is used to monitor the growth of an individual child, but is also useful to describe the overall magnitude of malnutrition in a population. However, underweight does not distinguish between chronic malnutrition (stunting) and acute malnutrition (wasting).

Stunting (low height-for-age) is a serious problem in Malawi. It is caused by long-term or chronic malnutrition, which is manifest in children who are too short for their age when measured against an international standard. (Use is normally made of the National Centre for Health Statistics, NCHS, reference population).

Acute malnutrition, or *wasting* (low weight-for-height), refers to a situation where a child weighs too little and is too thin for his/her height. The NCHS reference is again used. Wasting is a very sensitive indicator; levels can change rapidly and show marked seasonal patterns associated with changes in food availability or disease prevalence. The rate is generally higher during drought and other emergencies. It is also a measure of mortality risk, when death is possible because of inadequate food or a high incidence of disease.

Underweight

The weight-for-age measurement is a combination of wasting and stunting. Data collected by the MSIS survey (Table 8.1) show a deterioration in the nutritional status of under-5s since 1992. Significant differences exist between male and female children, between those living in the three regions, and between those whose mothers have different levels of education.

Over 30% of the children in ten districts are underweight. These districts are Lilongwe, Chiradzulu, Mulanje, Nsanje, Salima, Thyolo, Zomba, Mwanza, Mchinji and Ntchisi. The rate in the last three named districts is particularly bad, at 39%, 40% and 40%, respectively. Mchinji also has a high stunting rate, while both Ntchisi and Mwanza perform poorly in other indicators, such as education and access to safe water.

Stunting

In 1981 the National Sample Survey of Agriculture (NSSA) found that the rate of stunting in Malawi was 56%, i.e., the percentage of under-5s falling below -2 standard deviation of the reference mean for height-for-age. There was some improvement by 1992, when the Demographic and Health Survey revealed a stunting rate of 48.7%.

The findings of the MSIS demonstrate that the rate of moderate stunting of under-5s did not change significantly between 1992 and 1995. It is now 48.3%. Likewise, the severe stunting rate, now at 24.2%, has not shown a significant change since 1992.

On the other hand, the incidence of stunting has increased significantly in the urban areas, from 11.1% in 1992 to 19.1% in 1995. This has probably been caused, at least in part, by the migration to the cities of people without an adequate means of subsistence.

Map 3: Underweight

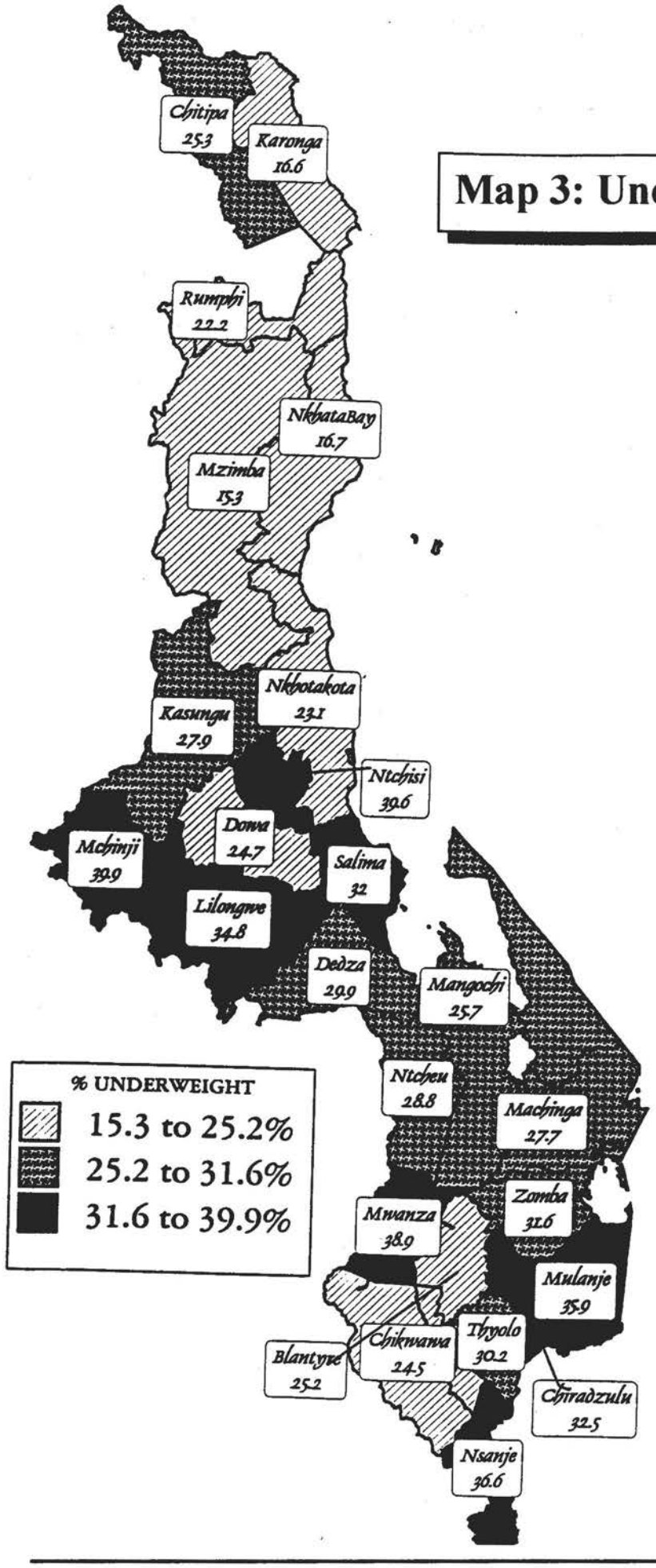


Table 8.1 Underweight rates * (%) of children, by gender, location and socio-economic characteristics. 1992 and 1995

	Weight-for-Age (Underweight)				
	Percent Below -3SD 1992	Percent Below -3SD 1995	Percent Below -2SD 1992	Percent Below -2SD 1995	Number of Children in MSIS Sample
Age in Months					
< 60	7.6	8.7	27.2	29.9	3654
Gender					
Male	8.5	10.4	28.3	32.7	1794
Female	6.7	7.0	26.1	27.1	1860
Residence					
Urban	3.6	10.2	15.4	24.8	463
Rural	8.1	8.5	28.6	30.3	3191
Region					
North	5.0	5.6	20.3	22.1	704
Centre	6.8	8.9	25.0	31.6	1631
South	8.9	9.0	30.8	29.5	1319
Mother's Education					
None	9.0	11.1	30.7	21.1	1432
Standard 1-4	7.9	26.2	27.1	34.5	871
Standard 5 and above	4.5	4.8	19.9	30.8	1151
Occupation of Household Head					
Farming (self)	n/a	9.1	n/a	31.2	2304
Tenant	"	13.7	"	42.9	70
Ganyu Labour (agri)	"	11.8	"	34.2	75
Ganyu Labour (non-agri)	"	13.4	"	36.8	73
Paid Employment	"	11.7	"	26.8	595
Self-employed	"	5.3	"	16.9	281
Other	"	2.6	"	26.1	115
None	"	16.8	"	42.1	26

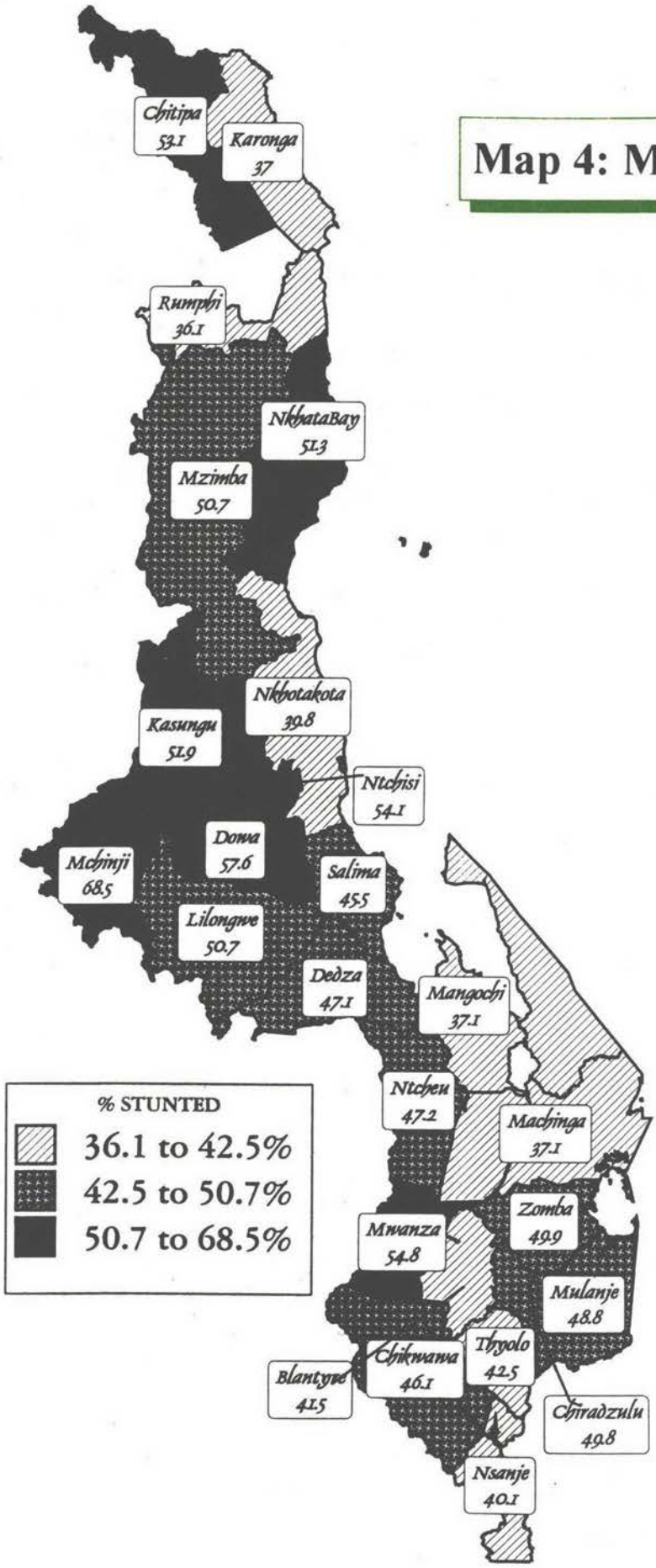
* Proportion of under-5s below -2 and -3 standard deviation of the NCHS/WHO reference population according to weight-for-age anthropometric index of nutritional status.

n/a: no data available

Source: DHS, 1992, MSIS, 1995

Since stunting is a reflection of the cumulative effects of chronic under-nutrition and long term deprivation, the continuing high rates of moderate and severe stunting indicate that over the years nutritional status has not improved. Indeed, there is little reason to think that it would, as real

Map 4: Moderate Stunting



income levels and per capita GNP figures have fallen. Moreover, the recent drought has aggravated normal food insecurity at both the national and household levels. The differences in the stunting rates of boys and girls, and of children resident in the Southern and Northern regions are not statistically significant. Nor does stunting in a child depend on the occupation of the household head alone. The only significant difference exists between *ganyu* (piecework) labourers in agriculture and heads of household who are self-employed. The former are often the poorest in a village, and take poorly paid piece work because they are unable to feed their families in any other way. The poorest are also likely to have the lowest level of education and that, along with inadequate health care, results in higher rates of malnutrition, which is confirmed by the survey results. On the other hand, household heads who are self-employed are apparently better able to feed their families, and therefore, have fewer stunted children.

Table 8.2 Stunting rates * (%) of children, by gender, location and socio-economic characteristics, 1992 and 1995

	Height-for-Age (Stunting)				
	Percent Below -3SD 1992	-3SD 1995	Percent Below -2SD 1992	-2SD 1995	Number of Children in MSIS Sample
Age in Months					
< 60	22.9	24.2	48.7	48.3	3548
Gender					
Male	24.5	26.9	48.7	49.7	1741
Female	21.4	21.5	46.5	47.0	1807
Residence					
Urban	11.1	19.1	35.0	33.5	447
Rural	24.3	24.6	50.3	49.7	3101
Region					
North	17.5	17.8	44.7	46.1	679
Centre	25.0	26.7	50.5	51.5	1587
South	22.5	22.8	48.1	45.4	1282
Mother's Education					
None	26.4	28.2	51.7	51.3	1429
Standard 1-4	23.1	25.5	51.7	46.6	868
Standard 5 +	15.3	15.6	39.4	41.6	1144
Occupation of Head of Household					
Farming (self)	n/a.	25.5	n/a.	50.9	2868
Tenant	"	37.1	"	51.4	88
Ganyu Labour (agri)	"	36.4	"	59.7	97
Ganyu Labour (non-agri)	"	24.0	"	50.3	97
Paid Employment	"	20.3	"	42.2	334
Self-employed	"	13.0	"	29.9	361
Other	"	17.4	"	39.4	140
None	"	21.6	"	48.7	34

* Proportion of under-5s below -2 and -3 standard deviation of the NCHS/WHO reference population according to height-for-age anthropometric index of nutritional status.

n/a: no data available.

Source: DHS, 1992, MSIS, 1995

However, there are significantly higher rates of stunting in the Central region. Also, stunting is worse in the rural areas than in the cities, and amongst families where the mother has no education. Those children in families where the mothers have a Standard 5 or above education are less likely to be stunted.

Ten districts recorded a stunting rate over 50%: Chitipa, Mzimba and Nkhata Bay in the Northern region; Kasungu, Lilongwe, Mchinji, Ntchisi, and Dowa in the Central region; and Machinga and Mwanza in the South. Particularly bad is Mchinji, with a massive 69% (Table A2.a in appendix).

Table 8.3 Wasting rates * (%) of children, by gender, location and socio-economic characteristics, 1992 and 1995

	Weight-for-Height (Wasting)				
	Percent Below -3SD 1992	-3SD 1995	Percent Below -2SD 1992	-2SD 1995	Number of Children in MSIS Sample
Age in Months					
< 60	1.4	2.0	5.4	7.0	3532
Gender					
Male	2.0	1.9	6.0	8.5	1729
Female	0.9	2.0	4.9	5.6	1803
Residence					
Urban	1.0	2.1	2.6	8.7	440
Rural	1.5	2.0	5.8	6.8	3092
Region					
North	0.4	2.4	3.5	6.3	677
Centre	1.0	1.6	4.5	7.0	1576
South	2.1	2.3	6.7	7.1	1279
Mother's Education					
None	1.9	0.6	6.2	6.9	1426
Standard 1-4	1.2	2.7	4.9	9.6	860
Standard 5 and above	0.7	2.0	4.4	5.1	1138
Occupation of Head of Household					
Farming (self)	n/a	1.9	n/a	7.1	2868
Tenant	"	3.4	"	10.9	88
Ganyu Labour (agri)	"	4.0	"	6.0	97
Ganyu Labour (non-agri)	"	10.1	"	18.2	97
Paid Employment	"	2.1	"	7.5	334
Self-employed	"	3.1	"	6.3	361
Other	"	2.9	"	5.4	140
None	"	0.0	"	0.0	34

* Proportion of under-5s below -3 and -2 standard deviation of the NCHS/WHO reference population according to weight-for-height anthropometric index of nutritional status.

n/a: no data available

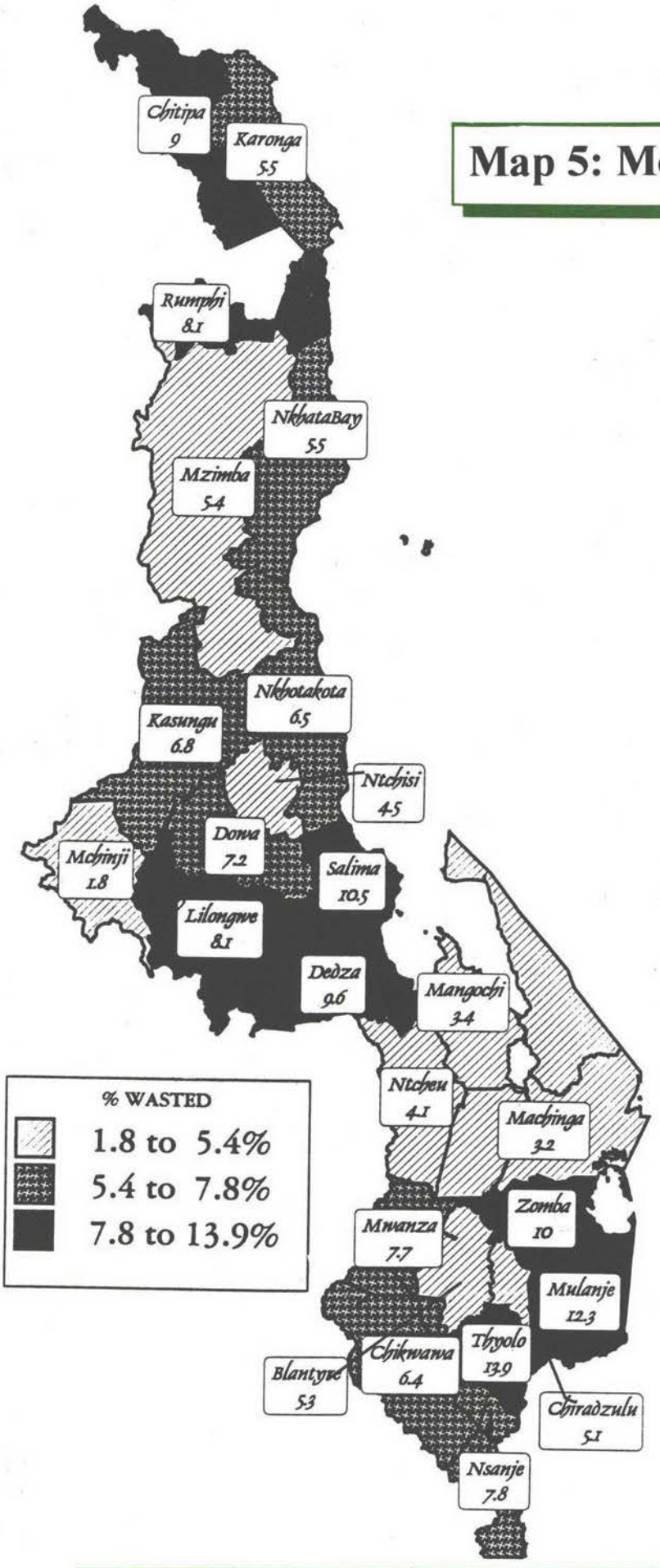
Source: DHS, 1992 MSIS, 1995.

These areas where the rates are especially high need additional research to determine the cause, and to analyse the relationship between the rates and such factors as income levels, household labour dependency ratio, landholding size, the gender of heads of households, educational levels, and access to health facilities and supplementary feeding centres. This is needed to generate appropriate action by communities, government, NGOs and donors.

Wasting

There is evidence that the rate of wasting (acute malnutrition) is rising, for in 1992 it stood at 5.4% and it now is 7.0%. The increase undoubtedly reflects the decline in household food security caused by the drought and the generally worsening economic climate. It is likely, too, that the rate of wasting will have climbed after October 1995, when the survey was done, for according to the Ministry of Agriculture, over

Map 5: Moderate Wasting



a third of smallholders run out of food by September in a normal year, and 80% by December. Not surprisingly, farmers with the smallest landholdings run out of food the earliest.

Ironically, there seems to be a decrease in the short-term nutritional status of children whose mothers went to school beyond Standard 4.There are hardly any statistically significant differences in wasting rates at the regional level or between families whose household heads have different occupations. It seems that those whose parents do *ganyu* or work on estates are more seriously wasted, but when applying the significance tests these differences appear not to be sufficiently explained by occupation alone. However, there is a significant difference in moderate wasting rates between boys and girls. This gender difference may reflect the general weakness of boys due to genetic differences.

Table 8.4 Wasting rates * (%) of children in urban districts

District	Weight-for-Height (Wasting)		
	Percent Below		Number of Children
	-3SD	-2SD	in Sample
Blantyre			
Urban	1.3 (0.9)	4.8 (2.1)	84
Rural	1.8 (1.2)	5.8 (2.6)	116
Lilongwe			
Urban	3.0 (1.4)	13.2 (1.6)	137
Rural	1.9 (0.9)	7.0 (1.8)	341
Mzimba			
Urban	0.0 (0.0)	3.4 (2.3)	124
Rural	0.4 (0.4)	5.7 (2.5)	139
Zomba			
Urban	4.4 (2.6)	16.5 (6.5)	95
Rural	4.1 (3.5)	9.6 (6.8)	120
Total (all 4 districts)			
Urban	2.1 (0.7)	8.7 (1.5)	440
Rural	2.0 (0.8)	7.1 (1.6)	716

* Proportion of under-5s in urban and rural areas falling below -3 and -2 standard deviation of the NCHS/WHO reference population according to weight-for-height anthropometric index of nutritional status.

Standard errors in parentheses

Source: DHS, 1992, MSIS, 1995

Four districts have wasting rates of over 9% -- Chitipa, Dedza, Salima and Zomba -- while the rates in both Mulanje (12.3%) and Thyolo (13.9%) are higher, but should be interpreted by taking into account the standard error.

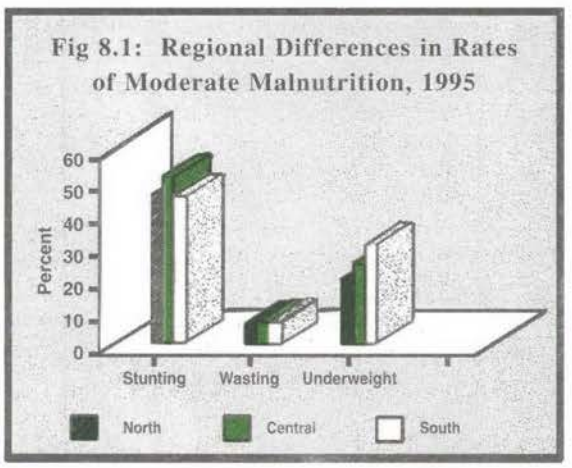
A separate analysis of wasting for those districts with urban areas was carried out (Table 8.4). Wasting in the urban areas is rising, with a rate of 2.1% in 1992 increasing to 8.7% in 1995.

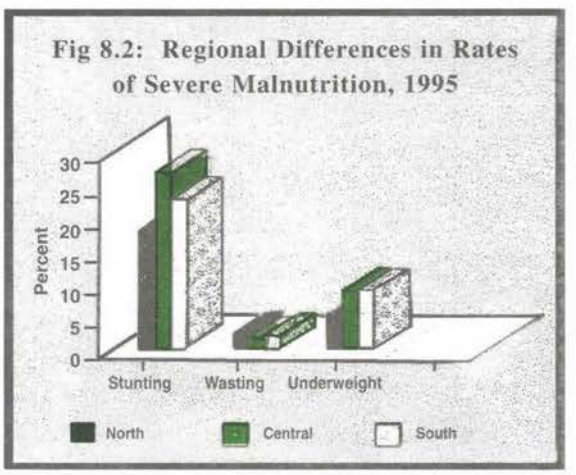
The significantly higher rate of wasting in Lilongwe is a reflection of the extent of poverty in the capital, which results, in part, from the immigration of poor people from rural areas. Water shortages during the drought have raised the rate of diarrhoea in Lilongwe, which also probably contributed to an increase in wasting.

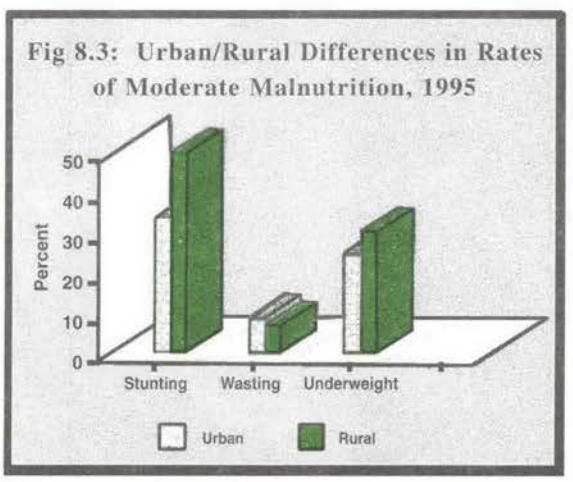
The difference in the rates of wasting between the urban and rural areas of Zomba, Blantyre and Mzimba districts is not significant.

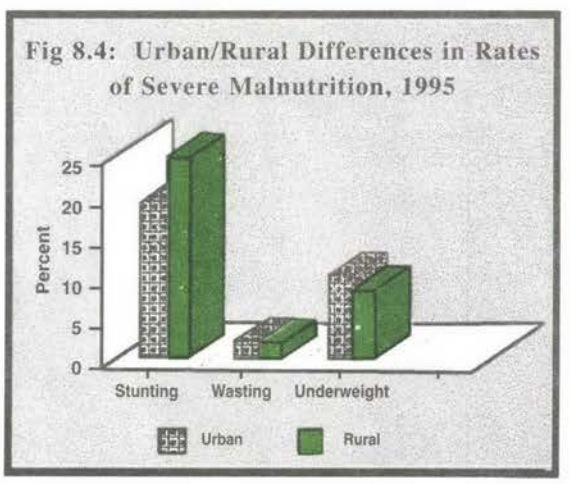
Regional and residential variations

Disparities in regional (Figures 8.1 and 8.2) and residential (Figures 8.3 and 8.4) rates of moderate and severe malnutrition are depicted below. The various measures of malnutrition generally indicate lower rates for children in the North and in the urban areas.









Gender and age variation

Malnutrition rates also differ according to the gender and age of the child (Table 8.5). Significant differences are found in the rate of severe and moderate stunting in the age group 6-11 months. High rates of moderate wasting were recorded for boys aged 12-23 months. Also statistically significant are the rates of severe and moderate underweight children in the age group 24-35 months. Finally, male children aged 48-59 months have significantly higher rates of moderate

underweight measurement. The differences between the other variables are not statistically significant.

Table 8.5 Age-specific nutritional status (%), by gender

Age in Months	Gender	Severe	Moderate	Number of Children
STUNTING				
6-11	male	16.7 (2.9)	35.2 (3.5)	242
	female	7.6 (2.0)	22.6 (3.8)	220
12-23	male	23.1 (2.7)	42.5 (3.2)	459
	female	16.7 (2.5)	46.6 (3.2)	470
24-35	male	25.0 (3.0)	46.1 (3.3)	379
	female	21.3 (2.3)	46.6 (2.6)	433
36-47	male	35.9 (3.4)	62.1 (3.2)	357
	female	30.2 (3.0)	54.8 (3.4)	395
48-59	male	32.9 (3.5)	62.6 (3.3)	303
	female	34.5 (5.1)	55.0 (4.8)	282
WASTING				
6-11	male	1.2 (0.6)	7.9 (1.9)	245
	female	4.1 (1.6)	9.9 (2.7)	221
12-23	male	4.2 (1.3)	16.1 (2.6)	453
	female	4.0 (1.3)	8.1 (1.7)	464
24-35	male	2.1 (0.9)	6.6 (1.5)	378
	female	0.7 (0.5)	4.3 (1.0)	433
36-47	male	1.4 (0.7)	4.6 (1.2)	356
	female	1.1 (0.5)	5.1 (2.2)	395
48-59	male	0.8 (0.5)	5.8 (1.7)	303
	female	0.6 (0.6)	0.8 (0.6)	284
UNDERWEIGHT				
6-11	male	6.1 (1.8)	24.0 (3.2)	245
	female	2.6 (1.1)	16.9 (3.0)	220
12-23	male	12.4 (2.0)	37.4 (3.4)	461
	female	6.1 (1.3)	34.2 (2.9)	471
24-35	male	15.5 (2.4)	38.0 (3.2)	380
	female	9.2 (1.5)	28.6 (2.6)	434
36-47	male	8.5 (2.0)	30.1 (2.9)	358
	female	8.5 (1.8)	27.8 (3.7)	397
48-59	male	8.6 (2.3)	34.6 (3.3)	304
	female	7.7 (2.8)	23.2 (3.3)	284

Proportion of children below standards set by the NCHS/WHO reference population according to anthropometric indices of nutritional status.

Standard errors in parentheses

Fig 8.5: Age-specific Moderate Stunting Levels (Height-for-Age) 1992 and 1995

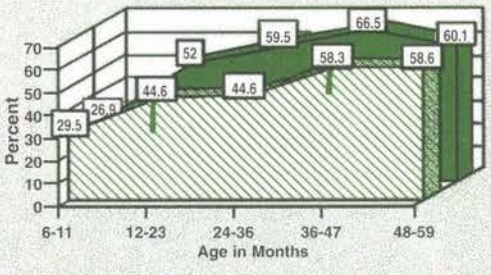


Fig 8.6: Age-specific Severe Stunting Levels (Height-for-Age) 1992 and 1995

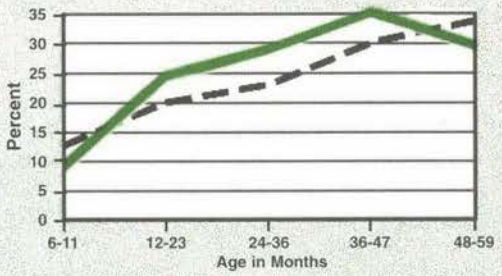


Fig 8.7: Age-specific Moderate Wasting Levels (Weight-for-Height) 1992 and 1995

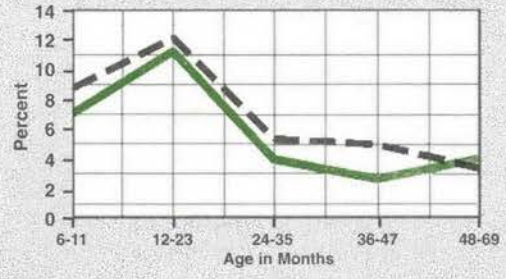


Fig 8.8: Age-specific Severe Wasting Levels (Weight-for-Height) 1992 and 1995

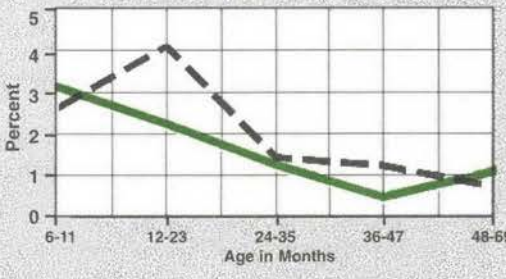


Fig 8.9: Age-specific Moderate Underweight Levels (Weight-for-Age) 1992 and 1995

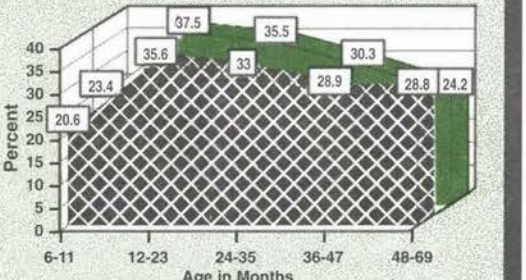
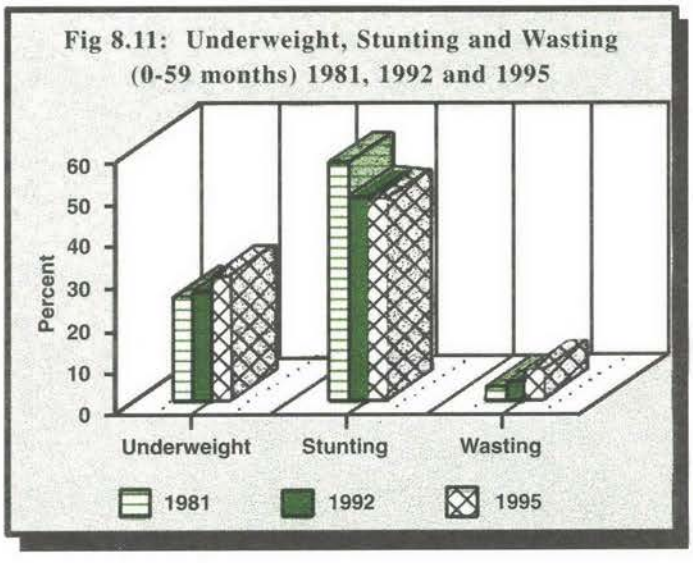


Fig 8.10: Age-specific Severe Underweight Levels (Weight-for-Age) 1992 and 1995



Changes in Malnutrition, 1992-1995

Combined rates of malnutrition for boys and girls are also presented: Figures 8.5 and 8.6 show levels of cumulative stunting, while wasting, which is worse between the ages of 6-23 months, is indicated in Figures 8.7 and 8.8. These are the months when children are weaned, when they begin eating adult foods, and when they become more mobile and put unhygienic objects in their mouths.



These increase the incidence of diarrhoea, which may suppress appetite at the same time as nutrient needs during illness increase. As noted before, diarrhoea is particularly prevalent in Malawian children aged 6-23 months . Finally, Figures 8.9 and 8.10 combine stunting and wasting and indicates underweight levels.

To elucidate trends, changes in the rates of malnutrition as measured by stunting, wasting and underweight data from the 1981 (NSSA), 1992 (DHS) and 1995 (MSIS) surveys is produced in Figure 8.11.

Although it appears that malnutrition levels have worsened since 1992 (DHS), it must be borne in mind that these differences are not statistically significant.

Major Tasks Undertaken

In the face of declining food security, the government has undertaken several activities to raise nutrition levels in Malawi. In 1990 the government produced a National Food Security and Nutrition Policy Statement. In 1993 the National Plan of Action for the Protection, Survival and Development of Children was produced, and by December 1995 the National Plan of Action for Nutrition was in draft form. Nutrition has been included in the government's Poverty Alleviation Framework and in the Agricultural and Livestock Development Strategy.

Malnutrition is a manifestation of a social process and cannot remain the exclusive concern of any one discipline, be it agriculture, health, education, or economics. The multi-faceted nature of the immediate and underlying causes of malnutrition can, therefore, only be tackled by multi-sectoral efforts.

The National Plan of Action for Nutrition is meant to be a framework for medium-term food and nutrition policy, based on consensus about the nature of the nutrition problem. Immediate causes are inadequate dietary intake and disease. Underlying causes are insufficient household

causes are inadequate dietary intake and disease. Underlying causes are insufficient household food security, education, care, and health services, as well as an unhealthy environment. The underlying causes are linked to the availability of resources (human, economic and organizational), which is determined by who controls resources at different levels of society. This in turn is influenced by a number of historical processes, including socio-political, ecological and ideological factors specific to Malawi.

Certain problems have hampered progress in this area, including previous government policies, and past and current resource constraints. The implementation of nutrition interventions by government is still very top-down, though the situation is improving. Moreover, the commitment from government and donors to tackle malnutrition is improving, but this still needs strengthening. Finally, the drought of the last 3 years has worsened national and household food insecurity, as traditional coping strategies failed and hunger deepened.

Conclusion and Recommendations

The mid-decade goal is to reduce moderate and severe rates of malnutrition by twenty percent or more. But in Malawi there has been no significant change in malnutrition levels since the DHS survey in 1992. The widespread poverty faced by many Malawians, caused by factors such as drought, population growth, pressure on the land as well as inflation, can account for the lack of improvement. The continuing high rates of AIDS, leading to frequent infections and the insufficient intake of micronutrients, is a contributing factor.

The goal to be reached by the year 2000 is to cut severe and moderate malnutrition in half. Considering the mid-decade results, this goal will be difficult to achieve unless poverty in Malawi is drastically reduced. This entails nothing less than effectively tackling Malawi's underdevelopment. As the eradication of malnutrition within Malawi depends on the improvement of the general economic and social conditions within the country, the following general recommendations are made.

- The National Plan of Action for Nutrition, which provides a framework for addressing nutrition problems, needs to be finalized and implemented as soon as possible. The Plan of Action will tackle malnutrition by improving household food security, protecting consumers through improved food quality and safety, preventing and managing infectious diseases, promoting breast feeding, preventing and controlling micronutrient deficiencies, caring for the socio-economically deprived and nutritionally vulnerable populations, promoting appropriate diets and healthy lifestyles, and by assessing, analysing and monitoring nutritional status.

- Now that the profile of nutrition has been included in the Poverty Alleviation Framework and the Agriculture and Livestock Development Strategy, both the government and donors should recommit themselves to tackling malnutrition by allocating more resources to those sectors known to help eradicate malnutrition. Raising the educational level of mothers and the diversification of crops should be of special concern.

- The nutrition situation in Lilongwe especially, is worsening, which means that efforts to raise nutrition levels should not focus solely on the rural areas.

- Particular attention should be paid to districts that have a higher than average malnutrition rate. These include Mulanje, Mchinji, Dowa, Lilongwe, Mwanza, Ntchisi, Thyolo, Salima, Zomba and Chitipa. Further research is needed to determine why these districts are so badly hit, and to disaggregate the data for each district to determine if there are particular groups or areas where people are more malnourished.

- Higher rates of malnutrition have been recorded in children 6-23 months. Weaning problems and diarrhoea are undoubtedly a factor. Future nutrition programmes should focus on this age group, while breast feeding and safe weaning practices should be reemphasized.

- Boys seem to be more vulnerable than girls to malnutrition, and further research is needed to determine the underlying causes for this (e.g., in the area of intra-household food distribution, disease incidence by gender, etc.) and in order to develop strategies for appropriate action.

8.2 *Vitamin A*

Vitamin A deficiency has long been associated with blindness. But its link with reduced resistance to disease and with the death of children was only recognized in the mid-1980s. According to UNICEF's *State of the World's Children 1995*, each year more than one-half million children are blinded as a result of vitamin A deficiency. Moreover, it is now estimated that globally two children die every minute for the same reason. These dramatic statistics have led to measures designed to counteract vitamin A deficiency, measures that range from encouraging people to eat foods rich in vitamin A, to the fortification of foods and the distribution of vitamin A capsules.

Situation in Malawi

It is estimated that two million children in Malawi are suffering from severe vitamin A deficiency. Vitamin A is crucial for normal growth and development, and for building a child's resistance to disease. Where Vitamin A deficiency is worse, levels of stunting, blindness and child mortality are also significantly above average. The Government of Malawi recognizes the problem of Vitamin A deficiency, and efforts are being intensified to ensure that the population has access to adequate vitamin A resources through a combination of breast feeding promotion, supplementation and measures to improve diet. Government commitment is also demonstrated through incorporating nutrition objectives in a number of development programmes, including health, agriculture and poverty alleviation.

41% of Malawian children between 6-24 months received a vitamin A capsule in the 6 months preceding the survey.

39% of mothers who gave birth in the same time period received a vitamin A capsule.

Many areas in Malawi experience high levels of subclinical vitamin A deficiency. In some places the situation is severe. WHO recognizes vitamin A deficiency as a problem of public health significance where 1% of children suffer from this condition. A survey of 5436 children in the Lower Shire Valley in 1983 found that 3.9% were severely vitamin A deficient. Varying degrees of eye damage were recorded, and levels of night blindness were five times higher than the WHO criteria.

In 1988 surveys were conducted in Kasungu, Mchinji, Salima and Dedza in the Central region and in Mzimba in the North. Prevalence of vitamin A deficiency was recorded at 1.4%. In Salima and Dedza eye cytology tests were done and the results showed 22% of children suffering from the deficiency, and another 20% on the border line. These levels are extremely high.

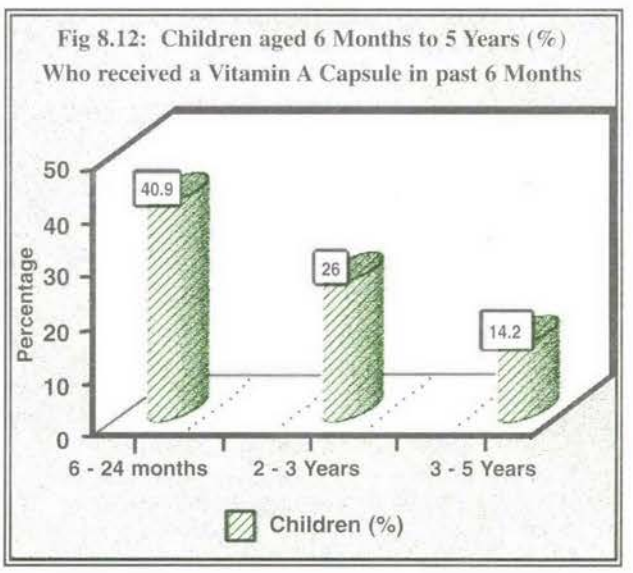
Vitamin A deficiency is caused by both inadequate dietary intake and frequent infections. Production of crops rich in Vitamin A is very low in Malawi and they are only available seasonally.

The average Malawian diet contains inadequate fat, which is necessary for vitamin A absorption. Frequent diarrhoeal and acute respiratory infections, particularly among children, are known to deplete vitamin A reserves as surely as a poor diet.

Efforts to increase dietary intake are underway. Mothers are given vitamin A capsules after giving birth. Through promotion of exclusive breast feeding for the first 4-6 months of age, infants are ensured of sufficient vitamin A intake through breast milk. Children over 6 months are given vitamin A capsules regularly until they reach the age of six years. Extension workers promote the growing and consumption of foods rich in vitamin A and fat.

Vitamin A Supplementation

Until 1990 the government's policy was to give vitamin A supplements to children who already had symptoms of vitamin A deficiency, or a severe illness such as measles. After 1990 preventative measures came to the fore.



In 1992 vitamin A supplementation for all children under six years was approved. Since then 15 million capsules have been distributed, largely through under-five clinics.

The current policy combines preventive and treatment regimes. Children with signs of deficiency, and those with measles, pneumonia, chronic diarrhoea or severe malnutrition are given a dose of vitamin A. Babies up to six months are not treated. Instead mothers are given one dose up to 8 weeks postpartum, ensuring adequate vitamin A for the exclusively breast fed infant during the first six months of life. Children between 6 months and five years of age should receive a preventive dose of vitamin A twice a year. Each dose is recorded on the child's health card.

But in fact less than one-half of the children aged between 6 and 24 months received a capsule in the six months preceding the survey. This figure drops as the age of children increases, with only one-quarter of two year olds having received a capsule and 14% of those aged 3-5 years.

These results are not surprising because supplementation has been through the under-five clinics, where the EPI programme targets children under 2. There is no alternative channel for supplying capsules to older children.

Breast feeding and Supplementation

Under normal circumstances, infants receive vitamin A primarily through breast feeding. In Malawi this process is bolstered by giving mothers a vitamin A capsule soon after giving birth. Ninety-seven percent of children under 6 months are breast feeding and 9.4% are exclusively breast feeding, which means they are not taking any other foods or fluids. The positive results from the change in breast feeding habits (see section 8.4 below) have particularly positive implications for vitamin A coverage, especially for children under 6 months.

However, in order to ensure that mothers have an adequate amount of vitamin A, they need to receive vitamin A capsules. The survey asked mothers if they had received a vitamin A capsule within six weeks of giving birth, for the last three times they gave birth. Nationally, just over one-third (38.6%) of mothers of children under six months receive a vitamin A capsule within six weeks of their child's birth. This figure varies considerable by region, with more than one-half (51.9%) of new mothers in the Northern region taking the capsule. This figure falls for mothers in the Southern (42.7%) and Central regions (31.8%).

Table 8.6 Children (%) aged 6 months-5 years who received a vitamin A capsule in the previous 6 months

	6-24 months	2-3 years	3-5 years
Malawi	40.9 (2.2)	26.0 (2.6)	14.2 (1.7)
Gender			
Male	41.8 (2.7)	25.8 (3.6)	13.3 (2.0)
Female	40.2 (2.9)	26.1 (2.9)	15.0 (2.1)
Region			
North	40.9 (4.1)	17.5 (4.5)	10.0 (2.8)
Central	38.2 (3.3)	24.8 (3.3)	14.4 (2.4)
South	43.6 (3.5)	29.7 (4.9)	14.8 (2.7)
Residence			
Urban	33.8 (4.0)	18.0 (5.9)	10.5 (3.3)
Rural	41.4 (2.4)	26.7 (2.8)	14.5 (1.8)
Mother's education			
None	39.9 (2.8)	25.1 (4.4)	12.7 (2.1)
Primary 1-4	40.2 (3.6)	29.0 (4.1)	15.7 (3.0)
Primary 5-8	46.1 (4.2)	26.4 (3.9)	16.4 (3.3)
Sample Size	1369	725	1160

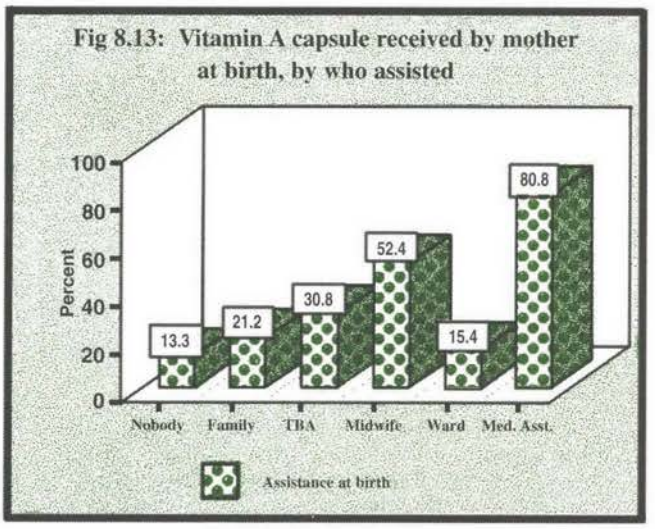
Standard errors in parentheses

New mothers with up to eight years of education are more likely (51.4%) to take the capsule. This figure drops to 43.8% for those with up to four years of schooling, and to 27.0% for those with no education.

Importantly, only 18% of mothers who have home deliveries receive a vitamin A capsule, compared to 50% of those women who give birth at a hospital, and 60% of those delivering at a health centre. A third (33%) of those giving birth at a TBA house receive the capsule. This has important implications for vitamin A deficiencies, for a large portion of births take place at home (41%) rather than in a hospital (29%). Not unexpectedly, vitamin A capsules are more often given to mothers who are assisted by trained individuals.

Interestingly, though, there is a decline in the proportion of mothers receiving a capsule when their deliveries are assisted by a ward attendant, indicating that the person assisting has a greater influence on dissemination of capsules than does the institution (Figure 8.13). This points, then, to the need for hospitals to train all of their staff. Considering the high proportion of home births, mothers should also be made aware of the importance of receiving a vitamin A capsule.

Fig 8.13: Vitamin A capsule received by mother at birth, by who assisted



Diet diversification

Information about vitamin A, supplementation, and the need to eat green vegetables has been disseminated by the media in Malawi. In order to ensure that the vitamin is absorbed, groundnuts, oil and other foods rich in fat should be consumed simultaneously with fruits and vegetables rich in vitamin A.

The survey found that 86% of children under 24 months of age had eaten one food rich in vitamin A in the week previous to the survey, and 72% had eaten three. Tables 8.7 and 8.8 represent children who consumed at least one vitamin A product and either oil or groundnuts in the week preceding the survey, though it is not known whether the vitamin A was consumed at the same time as oil or groundnuts.

Table 8.7 Children (%) who consumed at least one vitamin-A rich food and oil in the week preceding the survey, by region, residence, and mother's education.

	Under 2 Years	2-3 years	4-5 years
Malawi	25.0 (1.4)	31.2 (1.8)	29.0 (1.7)
Region			
North	27.4 (3.1)	29.9 (4.8)	38.2 (5.2)
Centre	20.8 (1.5)	26.3 (2.6)	25.7 (2.4)
South	29.0 (2.5)	37.4 (3.2)	30.5 (2.7)
Residence			
Urban	67.7 (5.0)	84.5 (5.2)	75.8 (6.7)
Rural	21.0 (1.4)	25.5 (1.9)	24.5 (1.8)
Mother's Education			
None	17.2 (2.1)	19.9 (2.5)	22.6 (2.4)
Primary1-4	20.6 (2.5)	31.4 (3.5)	21.0 (2.7)
Primary5-8	37.3 (2.7)	39.9 (4.3)	43.2 (3.7)
Sample Size	1933	828	1320

Standard errors in parentheses

There is a significant difference in the consumption of oil by people in the urban and rural areas. This may be because cooking oil is more readily available in cities, and because urban families have higher incomes.

Eating food rich in vitamin A and oil is more frequent among those children whose mothers have a better education. No significant differences occur from one region to another.

More groundnuts are consumed by urban children over 2 years old than by those in the rural areas. The level of a mother's education is not especially significant in this case. Nor are other social indicators.

Table 8.8 Children (%) who have consumed at least one vitamin A-rich food and groundnuts in the week preceding the survey, by region, residence, and mother's education

	Under 2 years	2-3 years	3-5 years
Malawi	20.6 (1.7)	24.5 (2.6)	24.9 (2.3)
Region			
North	28.3 (4.2)	27.9 (4.9)	25.0 (4.6)
Centre	18.0 (2.0)	22.0 (3.2)	21.7 (2.8)
South	21.9 (3.1)	26.7 (4.8)	28.1 (3.9)
Residence			
Urban	21.3 (5.2)	40.4 (9.6)	33.1 (8.3)
Rural	20.6 (1.8)	22.8 (2.7)	24.1 (2.5)
Mother's Education			
None	18.4 (2.6)	22.5 (4.6)	22.3 (3.3)
Primary 1-4	19.8 (2.6)	24.2 (3.9)	21.0 (3.2)
Primary 5-8	25.1 (2.5)	25.1 (3.3)	30.3 (3.8)
Sample Size	1969	846	1377

Standard errors in parentheses

Table 8.9 Under-5s (%) who consumed vitamin A-rich fruits and vegetables in the week preceding the survey, by the fruits and vegetables they consumed

Dark Leafy Vegetables	Total	Fruits/Veg	Tot
Amaranthus	7.7	Pumpkins	3.2
Cassava	27.0	Carrots	5.6
Pumpkin Leaves	63.9	Groundnuts	23.3
Pulses Leaves	24.4	Mangoes	41.6
Potato Leaves	17.9	Pawpaws	36.6
Rape	23.8	Sweet Potatoes	17.5
Mustard	44.1		
Chinese Cabbage	37.9		

In the week before the survey, the most frequently eaten vitamin A-rich foods (Table 8.9) included pumpkin leaves, mustard, and mangoes, whereas the least frequently consumed were pumpkins, carrots and *bonongwe* (amaranthus spinach). These findings generally reflect food availability and seasonality in Malawi, and a survey at another time of year would produce different results.

As expected, the consumption of vitamin A-rich foods increases as the child gets older. But children in different districts eat varying amounts of these. Specifically, children under 2 years old in Karonga and Mwanza districts eat significantly less than the national average. (Many other districts could not be tested due to the small sample size. The results are presented in Appendix 3.)

Table 8.10 Children (%) who had eaten at least 3 vitamin A rich foods in the week preceding the survey

	Under 2 Years	2-3 Years	3-5 Years
Malawi	62.8 (1.8)	77.8 (2.0)	78.0 (1.9)
Region			
North	60.5 (4.1)	75.0 (5.0)	76.1 (4.4)
Central	61.1 (2.5)	75.7 (3.0)	74.4 (2.6)
South	65.0 (2.8)	81.1 (3.1)	81.9 (2.8)
Residence			
Urban	64.5 (7.4)	79.5 (5.4)	87.6 (5.3)
Rural	62.6 (1.8)	77.6 (2.2)	77.1 (2.0)
Gender			
Male	61.9 (2.4)	78.9 (2.6)	75.1 (2.6)
Female	63.9 (2.3)	76.9 (2.7)	80.6 (2.2)
Mother's Education			
None	59.6 (2.5)	77.3 (3.0)	74.3 (2.9)
Primary 1-4	66.6 (2.7)	75.7 (3.5)	79.9 (2.9)
Primary 5-8	64.0 (2.8)	78.8 (3.1)	81.1 (2.8)

Standard errors in parentheses

Children in Malawi eat fruits and vegetables rich in vitamin A. Unfortunately, they do not consume the oil or groundnuts necessary to absorb the vitamin A. Not surprisingly, people tend to eat certain fruits and vegetables because they are readily available in season, and because they are less expensive.

Change in coverage

A survey conducted in 1989-1991 assessed the percentage of 12-71 month olds attending under-5 clinics who had received a vitamin A capsule in the previous 6 months. Coverage of these children was found then to be only 14%, while 18% of one year olds had received a capsule.

According to the EPI coverage survey, in 1993 over two-thirds (70%) of children under 24 months of age received adequate vitamin A, defined as receiving a capsule in the previous 12 months.

Now, using the same criteria as the EPI survey, less than one-half (43.6%) of children receive adequate vitamin A. Further investigation is needed to confirm this significant decline and to assess its cause.

Constraints

A major challenge is to reach children over 24 months of age with vitamin A supplementation. Most mothers regularly take their babies to the clinics for vaccination, providing an effective access point for distributing capsules. After receiving the measles vaccine, attendance drops dramatically, from approximately 80% to 10%. In communities distant from the health centres, there is, therefore, a need to develop and use alternative channels for vitamin A distribution, such as community health workers. They need additional training, especially in participatory approaches. Training within this area would enable them to exert greater influence on local communities. Health staff are training volunteers to establish community-based growth monitoring centres. Children's development is being monitored within their own communities, saving the time and energy mothers spend getting to and from health facilities. Vitamin A supplementation is gradually being incorporated into the scheme, as volunteers are trained to dispense capsules and to record them on a child's card. Children living in communities closer to health centres rarely attend clinics unless they are sick. There are no growth monitoring centres there, and older children have no access to vitamin A supplements.

Continued assistance is needed to increase the spread of supplementation and to diversify the normal diet. In the area of supplementation, a low dose vitamin A supplement will be marketed in 1996. This is directed at children in the target group, who do not receive a high dose Vitamin A capsule through the health system. This will enable families to give low dose capsules to their children on a weekly basis.

The possibility of fortifying sugar and maize flour with vitamin A is being investigated jointly by the Malawi Bureau of Standards, the Ministry of Health and Population, producers of sugar and maize, and UNICEF.

To encourage dietary diversification, the growth and consumption of vitamin A-rich foods will be promoted by NGOs and Initiative for the Mobilization of Private Action, IMPACT, in collaboration with the Ministry of Agriculture and Livestock Development. A large scale nutrition education campaign by the mass media will be organized to promote consumption of crops rich in Vitamin A.

Recommendations

Children in Malawi are not receiving adequate vitamin A. Supplementation rates are low both for mothers giving birth and for under-5s. Children receive most of their vitamin A through their diet. However, there is a low intake of oil and groundnuts, especially in the rural areas, which is necessary to aid absorption of vitamin A. Therefore, the following recommendations are made:

Because the proportion of under-2s receiving vitamin A capsules is low, there is a need to increase promotion of vitamin A capsules and to strengthen the distribution network to ensure that these children receive capsules.

- Dispensing of vitamin A capsules to children over two years old should be encouraged.
- Messages should be disseminated clarifying the link between vitamin A absorption and consumption of oil or fat-rich foods, such as groundnuts.
- Affordable cooking oil is not readily available in rural areas. Research aimed at solving this problem should be undertaken, and a greater emphasis should be given by extension workers to growing and eating groundnuts, groundnut powder, and other foods rich in fat.
- A small proportion of mothers are receiving vitamin A capsules when giving birth. Additional training in this field for midwives, hospital staff, TBAs, and clinic personnel is needed. Considering the large number of home births, it is also necessary for mothers to become aware of the need to take vitamin A capsules.
- Additional research is needed to analyse the extent of, and the reasons for the drop in vitamin A supplementation, to ensure that the decline cannot be solely attributed to different research methods.
- Greater emphasis should be placed by health and agricultural extension workers, and through campaigns, on the consumption of affordable and available vitamin A foodstuffs, such as pumpkin leaves. Account should be taken of the seasonality of fruits and vegetables when encouraging local farmers to diversify their crops.

The goal is the virtual elimination of vitamin A deficiency by the year 2000. This is considered to be achievable in Malawi with effort.

8.3 *Salt Iodization*

Iodine is an essential micronutrient for the normal growth and development of children and for the normal physical and mental activity of adults. Iodine deficiency disorders (IDD) are manifest in poor hand-eye co-ordination, partial paralysis, deaf-mutism, dwarfism, facial and physical deformity, cretinism, neurological damage, and goitre. Researchers have estimated that children that are mildly iodine deficient may forfeit as many as 10 to 15 IQ points. This has important implications for childhood educational attainment and for the productivity of adults. Babies born to iodine deficient mothers have irreversible impairment, while an iodine deficient pregnant woman has a higher chance of miscarriage, premature delivery, and stillbirth.

In Malawi iodine deficiency is caused by the inadequate dietary intake of iodine and low levels of iodine in food. In many parts of Malawi there are low levels of iodine in the soils due to leaching and erosion. Moreover, salt is not fortified with iodine in the country. Finally, there are insufficient trained personnel to combat iodine deficiency effectively.

In order to prevent, control and eventually eliminate IDD, a long-term, sustainable programme is needed, in which all salt for human and animal consumption is fortified with iodine. As a party to the international agreement to achieve this goal, Malawi has adopted a policy of eliminating IDD through salt iodization.

Situation in Malawi

No data on prevalence of Iodine Deficiency Disorders were collected in this 1995 survey. But it is known that iodine deficiency disorders are prevalent in several highland districts of Malawi. In 1983, when Malawi's population was much smaller, a national survey found that 1-2.5 million people were at risk of developing IDD.

Only 58% of salt in Malawi is sufficiently iodized.

Table 8.11 Prevalence (%) of Iodine Deficiency Disorders in the seven most affected districts, 1983

Sign	Prevalence
Cretinism	0.3 - 1.5
Visible goitre	8.7 - 30.0
All goitre	36.0 - 66.0

Source: *Situation of Iodine Deficiency in Malawi*, Government of Malawi, Ministry of Health, 1989.

The seven most affected districts are Dedza, Ntcheu, Mchinji, Mulanje, Mzimba, Lilongwe and Chitipa. Nine other districts are moderately affected. The groups considered most at risk are children below 15 years of age, and women of reproductive age. Table 8.11 shows the IDDs in the most effected districts in 1983. This survey looked at clinical deficiency. Since then, more emphasis has been put on subclinical deficiency, which still affects mental development.

Major Tasks Undertaken

Today iodine supplementation is provided to all children from birth to 14 years, and to females from 15 to 45 years of age in areas where severe iodine deficiency disorders are endemic. Moreover, individuals with treatable cases of goitre are attended in most health facilities.

In 1987 it was gazetted that all imported salt should contain the required amounts of iodine, and three years later the government decided to have all locally produced salt iodized in-country. In 1993 the UNICEF Regional Director held discussions with the President, which revitalized plans for salt iodization. In 1995 the government commissioned a study on the salt trade and the feasibility of in-country salt iodization. The results of the study were incorporated in the Salt Iodization Act, which was passed in 1995. Also in 1995, a meeting was held to inform the media about iodine deficiency and the disorders it can cause.

Subsidiary regulations and a monitoring scheme have since been prepared. The regulations require that all salt distributed and sold in Malawi for human and animal consumption is iodized. Salt iodization plants were ordered by UNICEF and were handed to the government in 1996.

The Use of Iodized Salt in 1995

During the 1995 MSIS study, an average of three salt samples were collected by the National Statistical Office from each cluster. These were sent to the Community Health Sciences Unit (CHSU) of the Ministry of Health and Population for analysis. A total of 949 salt samples were analysed and the results were sent to the Centre for Social Research to determine the situation of iodine levels in salt consumed in households in various parts of the country.

Table 8.12 Households (%) using salt with an iodine content of at least 20 ppm, by geographic divisions

	Percentage	Number of Salt Samples
Malawi	58.1 (2.8)	845
Region		
North	85.4 (4.1)	164
Central	62.0 (2.8)	377
South	48.7 (5.2)	304
Residence		
Urban	74.7 (6.4)	125
Rural	56.2 (3.0)	720

Standard errors in parentheses

Only 845 salt samples analysed at CHSU were included in the analysis at the CSR because their cluster numbers were provided and could be linked to their districts and regions of origin.

At the household level consumption of salt with an iodine level of at least 20 parts per million (ppm) is considered adequate to prevent iodine deficiency disorders. If at least 90 percent of households are consuming salt with at least 20 ppm iodine content, Universal Salt Iodization is considered to have been achieved in a country.

It is clear from the results (Table 8.12) that Malawi has not achieved Universal Salt Iodization at all levels. Disparities exist in the proportions of people using iodized salt in various areas, with significantly more iodized salt being consumed in the North and in the cities. Most percentages are not significantly different from the national figure, except in the Northern districts as well as in Dowa, Nkhotakota, Ntchisi, Chikwawa, Machinga and Nsanje. District level data are presented in Table A4 in Appendix 4.

Special Constraints

The trade in, and the consumption of iodized salt are inadequate. This is in part because most of the activities to raise awareness of the problem -- including the orientation of salt traders and the training of officials in monitoring salt -- were postponed until the Salt Iodization Act took effect. The salt iodization plants also took a long time to arrive in Malawi.

Support Required and Recommendations for the Future

Increasingly Malawi imports its salt from Mozambique. However, most of this salt is neither properly packaged nor iodized. Therefore, support is needed to help Mozambican salt producers and traders purify, iodize and package the salt better. Although less numerous, the small scale producers of salt in Malawi need similar technical support.

Efforts to monitor compliance will be hindered by dwindling resources. Therefore, Malawi needs both technical and financial support in 1997-2001, particularly to build capacity for monitoring the amount of iodine in salt and the impact of iodization on the population.

Malawi is still a long way from Universal Salt Iodization. To raise levels the following recommendations are made:

- The Northern region has substantially more iodized salt than the Central or Southern regions, and urban areas have more than rural areas. Research should focus on the reason -- e.g., are different brands of salt being used? Where is salt being acquired?
- A sustainable salt monitoring system should be established to ensure that all regulations under the Act are adhered to.
- Emphasis should be placed on sustainable advocacy campaigns that create awareness in all groups of people.
- The impact of the salt iodization intervention on iodine deficiency disorders should be monitored.
- All import licences should specify the required level of salt iodization, and traders should be informed that they have the right to query their suppliers, should the salt be of sub-standard quality.

8.4 *Breast Feeding and the 'Baby Friendly' Hospital Initiative*

Breast feeding is the best way to feed infants and young children. Breast milk is uncontaminated, and it contains all the nutrients needed by a child in the first few months of life. It also carries the mother's antibodies, thereby strengthening a baby's immunity to disease. Also, a breast feeding mother is less likely to return to fertility, thus reducing the chance of an early new pregnancy, and thereby improving her health. The duration and intensity of breast feeding, as well as the manner and age of weaning, affect a mother's fertility and her child's health.

It is very important that children are not given any additional foods and fluids before they reach the age of four months in order not to expose them to contamination and disease. Formula feeding, for the same reason, is associated with higher rates of acute illness as well as with immune system disorders, and allergic reactions.

10 STEPS TO SUCCESSFUL BREAST FEEDING

1. Have a written breast feeding policy that is routinely communicated to all health care staff.

2. Train all health care staff in skills necessary to implement this policy.

3. Inform all pregnant women about breast feeding.

4. Help mothers initiate breast feeding within a half-hour of birth.

5. Show mothers how to breast feed and how to maintain lactation, even if they should be separated from their infants.

6. Give newborn babies no food or drink other than breast milk, unless medically indicated.

7. Practice rooming-in to allow mothers and infants to remain together 24 hours a day.

8. Encourage breast feeding on demand.

9. Give no artificial teats or pacifiers.

10. Foster the establishment of breast feeding support groups and refer mothers to them on discharge from the hospital or clinic.

According to WHO estimates, the death of more than 1 million infants annually could be prevented if all babies were **exclusively** breast fed for the first few months of life.

In 1990, 31 governments met with UNICEF and WHO at the Innocenti Centre in Florence to draft the *Innocenti Declaration on the Promotion, Protection and Support of Breast Feeding*. The Declaration set out operational targets for all countries to achieve by 1995. Four operational targets were established: the formation of a national breast feeding committee, the establishment of 'baby-friendly' hospitals, the establishment of regulations in the marketing of breast milk substitutes, and the guaranteed rights of paid maternity leave and breast feeding breaks at work.

The 'baby friendly' hospital initiative was launched in June 1991 in an attempt to enlist the support of hospitals everywhere, to encourage breast feeding. Hospitals declared 'baby friendly' follow the 'ten steps to successful breast feeding' being promoted by WHO and UNICEF.

Situation in Malawi

Most mothers in Malawi breast feed their children until after their second birthday (Table 8.13), regardless of the family's characteristics.

Table 8.13 Under-5s (%) who were ever breast fed, by selected background characteristics

Background Characteristic	Percentage ever Breast Fed	Number of Children
Gender		
Male	96.0	2055
Female	96.8	2125
Residence		
Urban	97.3	519
Rural	96.3	3661
Region		
North	97.4	817
Central	95.9	1845
South	96.8	1518
Mother's Education		
None	96.4	1749
Primary 1-4	96.0	1014
Primary 5 +	96.8	1321
All Children	96.4	4180

8.4.1 *Exclusive breast feeding*

Traditionally, infants are given complementary food and drinks before they are four months old, which is strongly discouraged by health specialists.

11% of Malawian children under 4 months are exclusively breast feeding, up from 3% in 1992.

The Ministry of Health and Population even recommends that babies in Malawi should be exclusively breast fed for the first six months of age. Thereafter, breast feeding should be continued

with complementary foods for two years and beyond. Hospitals are being encouraged to promote exclusive breast feeding through the 'baby friendly' hospital initiative.

Breast feeding infants maximizes their intake of the nutritional and immunological benefits of breast milk. The survey results reveal that although exclusive breast feeding of small babies under 4 months is becoming more common, there is still a long way to go.

Table 8.14 Proportion (%) of infants less than 4 months of age who are exclusively breast fed, 1992 and 1995

Age in Months	Children Exclusively Breastfed		Number of Children in Sample	
	1992	1995	1992	1995
0 - 1	4.8	16.7	162	160
2 - 3	1.7	4.9	168	143
0 - 4	3.2	10.9	330	303
4 - 5	0.0	6.9	178	161
0 - 5	2.1	9.4	508	564

Source: DHS 1992 and MSIS, 1995

Table 8.15 Under-3s (%) who are still breast feeding

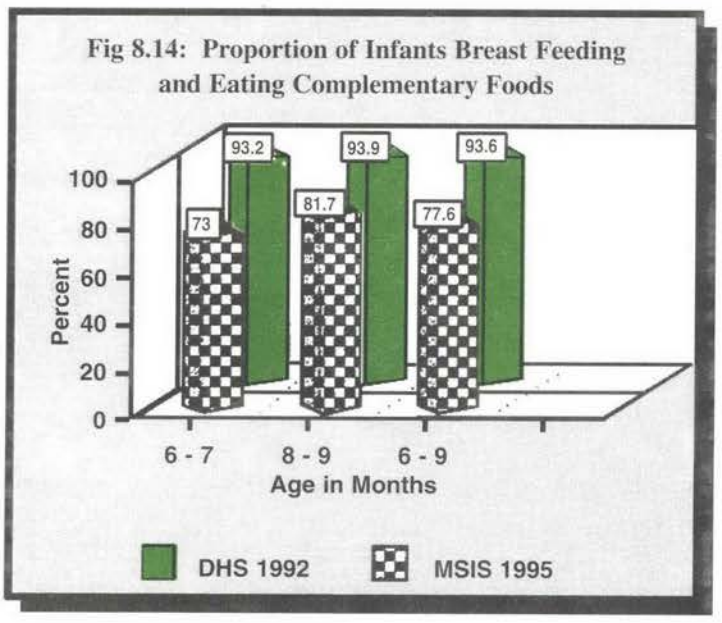
Age in Months	Children still Breastfeeding	Number of Children
0 - 1	97.3	155
2 - 3	98.0	140
4 - 5	96.0	157
6 - 7	97.3	151
8 - 9	96.2	175
10-11	93.4	187
12-13	96.5	170
14-15	92.1	181
16-17	90.7	155
18-19	85.7	151
20-21	80.0	172
22-23	56.6	141
24-25	37.8	160
26-27	24.4	132
28-29	13.6	137
30-31	9.7	119
32-33	8.1	126
34-35	6.1	158

Data indicate that breast feeding decreases with age, with only 6.1% of children breast feeding at the end of their third year (Table 8.15). The proportion who continue breast feeding at one year (12-15 months) is 94.2%, nearly identical to the rate found in the 1992 DHS survey. Continued breast feeding at 2 years (or 20 to 23 months) stands at 69.5%.

Female and urban babies under 3 years, and those whose mothers have a Standard 5 and above education were much less likely to have been breast fed at least once in the 24 hours preceding the survey (Table 8.16).

Table 8.16 Under-3s (%) who were breast fed at least once in the previous 24 hours, by selected background characteristics.

Background Characteristic	Percentage of Children	Number of Children
Gender		
Male	66.0 (1.7)	1377
Female	59.7 (1.6)	1406
Residence		
Urban	53.5 (5.0)	343
Rural	63.8 (1.4)	2440
Region		
North	58.1 (2.7)	545
Central	62.3 (1.8)	1225
South	64.5 (2.3)	1013
Mother's Education		
None	64.8 (1.4)	1137
Primary 1-4	65.0 (2.2)	678
Primary 5 +	57.8 (2.3)	906
All Children	62.9 (1.4)	2783



Fewer babies of 6 months and older now receive complementary foods in addition to breast milk (Figure 8.14) than in 1992. This is a discouraging trend as it indicates a reduction in the timely introduction of complementary foods.

Table 8.17 Breast feeding children (%) who receive supplements, by age

Age in Months	Infant Formula	Other Liquids	Solid/ Mushy food	SSS	ORS	Vitamins, Minerals or Medicine	Number of Children
0 - 1	4.6	89.4	8.1	1.2	4.4	12.9	160
2 - 3	4.9	85.5	25.8	0.8	1.0	14.2	143
4 - 5	5.4	82.2	40.2	6.0	0.1	10.2	161
6 - 7	7.8	65.3	55.7	7.6	2.9	10.1	153
8 - 9	9.6	65.4	56.7	5.9	5.0	22.8	179
10-11	6.7	73.7	69.6	5.9	1.1	12.3	194
12-13	8.3	63.9	57.7	8.6	2.4	19.0	176
14-15	6.2	63.9	68.3	7.6	6.3	18.2	90
16-17	7.3	65.7	60.4	4.7	3.2	11.0	160
18-19	5.5	71.6	61.5	3.4	3.5	15.7	153
20-21	5.6	69.3	60.7	3.2	2.8	10.2	174
22-23	5.4	64.3	66.1	2.5	0.6	17.8	141
24-25	2.3	70.9	58.6	4.5	0.0	8.1	163
26-27	6.5	72.0	65.5	3.0	0.0	0.0	135
28-29	2.1	91.1	73.6	0.0	0.0	0.0	139
30-31	0.0	73.7	33.6	0.0	0.0	0.0	122
32-33	0.0	77.1	72.6	0.0	0.0	0.0	133
34-35	0.0	85.3	29.2	0.0	0.0	0.0	160
0 -35	**4.5**	**73.6**	**53.9**	**3.9**	**1.9**	**10.7**	**2836**

*Other fluids include sweetened or flavoured water, fruit juice, sweet tea, or other liquids.

Food is introduced to infants as early as one month after birth, when 8.1% of infants are given solid or mushy food (Table 8.17), generally made from *nsima* (maize meal). However, in general, children below the age of 36 months receive proportionally more fluids than solid or mushy foods.

Table 8.18 Under-2s (%) who used a bottle with a nipple at least once in previous 24 hours, by background characteristics

Background Characterstics	Percentage of Children	Number of Children
Gender		
Male	66.0 (1.7)	1377
Female	59.7 (1.6)	1406
Residence		
Urban	53.5 (5.0)	343
Rural	63.8 (1.4)	2440
Region		
North	58.1 (2.7)	545
Central	62.3 (1.8)	1225
South	64.5 (2.3)	1013
Mother's Education		
None	64.8 (1.4)	1137
Primary 1-4	65.0 (2.2)	678
Primary 5 +	57.8 (2.3)	906
All Children	62.9 (1.4)	2783

Standard errors in parentheses

Bottle feeding of babies is still relatively uncommon (Table 8.18), which is beneficial for the prevention of infections.

8.4.2 *Baby Friendly Hospital Initiative*

The Malawi government embraced, and began implementing the Baby Friendly Hospital Initiative in 1993. A core team of national trainers in lactation management and breast feeding promotion was developed and several orientation training courses have been conducted.

Out of nine hospitals assessed in 1995, only one -- St. Montfort hospital in Chikwawa district -- was found to be 'baby friendly' in accordance with this global standard. Six hospitals received a certificate of commitment to become 'baby friendly' by meeting more than five of the ten steps. These include Malamulo (Thyolo), Dedza, Rumphi, Ekwendeni, Chikwawa, and Nsanje hospitals. These should be ready for re-assessment in 1996.

Measures Undertaken 1990-1995

Most measures to improve the rate of breast feeding by mothers were carried out from 1993. In that year, nurses, midwives and nursing school tutors were trained in the 18 hour Lactation Management Course by the IBFAN Regional Co-ordinator. This training was followed by an intensive 80 hour course for three trainers in Swaziland.

In 1994 five Malawians participated in an international course in formulating and monitoring a national code for marketing breast milk substitutes. A draft national code was also produced. During the same year Information Education Communication materials were produced.

In 1995 the national co-ordinator was trained and guidelines were formulated on baby friendly hospital policies. Subsequently these were introduced to district health staff, who are, in turn, orienting health centre staff. A special course for physicians was held so that they can influence hospital maternity practices.

Constraints and Recommendations

The increase in the breast feeding rate in Malawi is one of the most positive aspects of this report. Significant improvements were made in all aspects of breast feeding, especially in the exclusive breast feeding of children under 6 months old. This is particularly significant as it has happened within three years.

The implementation of the 'baby friendly hospital' policy was hindered by the late training of hospital policy-makers, which meant there was little support for the changing of hospital practices. In addition, early training sessions did not adequately cover global criteria for creating a 'baby friendly' hospital. Moreover, hospitals lacked important training materials.

In light of these mixed findings, the following recommendations are made:

- A need exists to continue to promote breast feeding through mother and 'baby friendly' initiatives and nutrition education.

- Both technical and financial support is needed to carry out tasks already planned for fostering breast feeding, including the provision of training materials; further training of health staff, production of IEC materials; promotion of breast feeding through traditional arts and culture, and the media; and the development of breast feeding support groups.

- Because there has been a reduction in the timely introduction of complementary foods, there is a need to continue with efforts to promote breast feeding and improved young child feeding practices through mother and 'baby friendly' initiatives and nutrition education.

- Most improvements have been made since 1992 and the DHS survey. A thorough study of the breast feeding campaign is needed in order to ascertain which policies have been most successful.

- Mothers' breast feeding practices are often influenced by grandmothers and other important relatives and elders in the community. If mothers are to continue with practices learned at 'baby friendly' hospitals, these influential leaders should also be sensitized.

- Only one Malawian hospital has been declared a 'baby friendly' hospital. Renewed emphasis on training for hospital staff is needed to increase the number.

The end-of-decade goal is to have all women breast feed their children exclusively for 4-6 months, and to continue breast feeding well into a baby's second year while offering complementary food. This is not considered achievable in Malawi by 2000. Instead, the goal is to achieve a rate of 30% nationally.

CHAPTER NINE

WATER AND SANITATION

A sufficient supply of clean water for drinking and hygiene, and an adequate means of waste disposal are fundamental rights and necessary for public health and personal well-being. However, vast numbers of people in developing countries, mostly in rural areas, have neither. In 1990, only 52% of the population in Africa had access to safe water and 40% had proper sanitation facilities.

9.1 Situation in Malawi

Water development in Malawi began in the colonial period, with more than four hundred wells dug and equipped in the 1930s. A major effort followed independence, with up to five hundred boreholes completed and equipped annually between 1969 and 1972, when large scale agricultural projects began. In the mid-1970s, a low cost water development programme was initiated to increase coverage in the rural areas. Shallow ground water was exploited and pipe systems were installed in springs and streams.

More than one-third of Malawians have convenient access to safe drinking water. Only 6% have access to proper sanitation facilities.

By the mid-1990s, though, an estimated 30% of water facilities were out of order at any time due to breakdowns and water sources drying out from drought. Meanwhile, little attention had been given to developing a systematic or wide-ranging sanitation system.

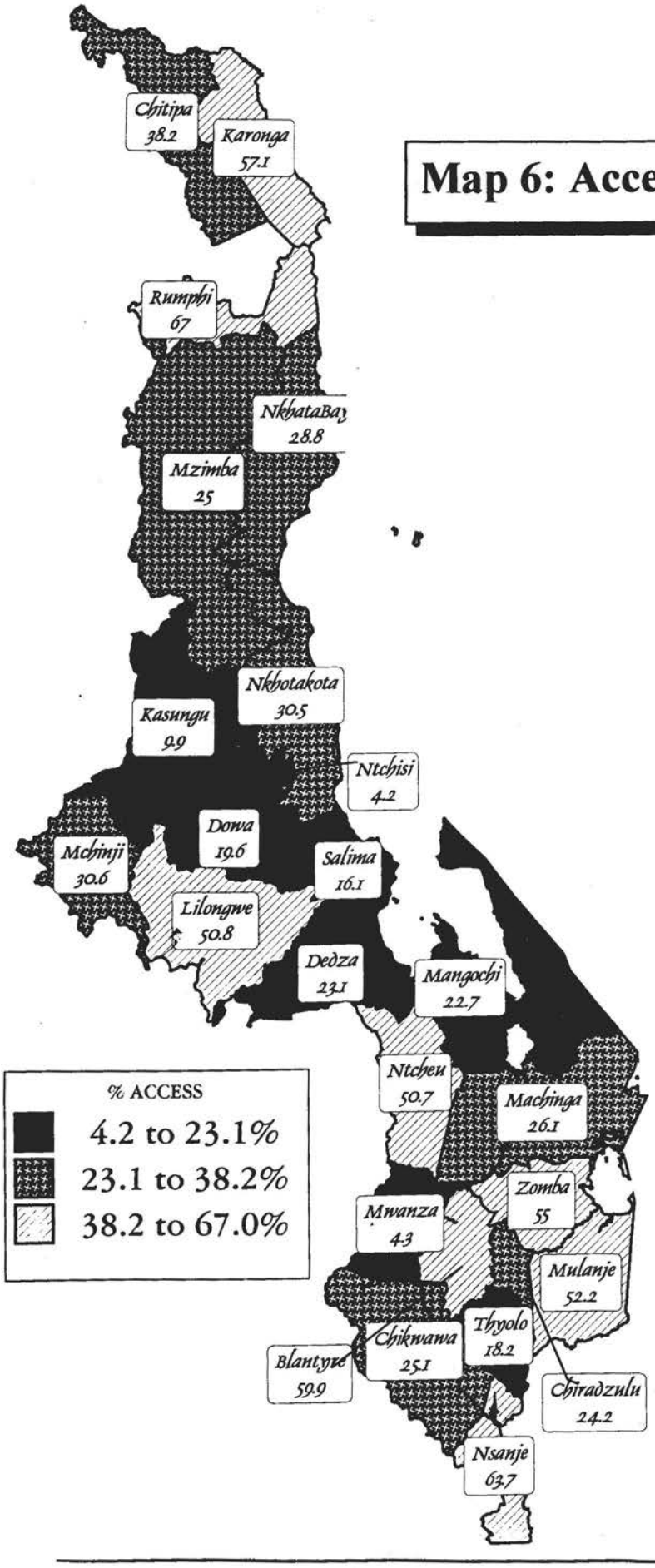
9.2 *Water*

The findings of the Malawi Social Indicators Survey reveal that only one-third (37%) of the Malawian population has access to safe water for drinking that is located within a distance of less than one-half kilometre. This figure increases to 48% when the distance is increased to one kilometre (Table 9.1).

Safe drinking water is defined as water piped into the dwelling, a public tap, a borehole, or a protected well or spring located either on the premises or less than one-half kilometre away.

People in the Northern region are best served when considering distances of less than one-half kilometre, while those in the South are best served when extending the distance to one

Map 6: Access to Safe water



kilometre. (There are significant differences in accessibility to safe water at less than 1 km. distance between the Central and Southern regions only, as none of the other differences are statistically significant.)

Table 9.1 Use and accessibility (%) of safe water, by region and residence

	Access to Safe Water (<0.5km)	Access to Safe Water (<1km)	Number of Children in Sample
Malawi	36.8 (2.3)	48.4 (2.6)	6204
Region			
North	41.0 (4.8)	50.7 (5.0)	1238
Centre	33.0 (2.6)	42.1 (3.0)	2418
South	39.3 (4.2)	53.2 (4.6)	2548
Residence			
Urban	80.3 (6.4)	92.2 (3.3)	839
Rural	32.2 (2.5)	43.7 (2.8)	5365

Standard errors in parentheses

Not surprisingly, there are significant variations between urban and rural areas, and city dwellers have more than twice the level of access to safe water as rural people.

The greatest variations in accessibility to a safe water source occur at district level (Table 5a in Appendix 5). Two-thirds (67%) of the population in Rumphi district have convenient access to safe water, for instance, while less than 5% of people in Ntchisi and Mwanza do. This figure increases to 14% for Ntchisi when the distance is increased to one kilometre.

The most common type of water facility used in Malawi is an unprotected well or spring, while the most popular safe source of water is a borehole (Table 9.2). In urban areas the most common form of water supply is a public tap.

There are some variations from the norm at district level (Table 5b in Appendix 5). Mwanza district's low figure with respect to safe water can be accounted for by the frequent use of unprotected wells and springs, rivers and streams. Kasungu has the highest dependence (72%) on unprotected wells and springs, while 82% of Nsanje's population uses boreholes, and over one-half of Blantyre district's residents use public taps.

Table 9.2 Type of water facility used (%), by region

	Piped in Dwelling	Public Tap	Bore hole	Well/ Spring (Protected)	Well/ Spring (Unprotected)	River/ Stream	Lake Dam	Other
Malawi	2.1	16.4	27.8	5.1	35.7	11.1	1.7	0.2
Region								
North	1.9	22.3	26.5	3.2	35.1	9.7	0.5	0.8
Centre	2.6	9.8	27.4	5.3	43.6	10.7	0.2	0.4
South	1.7	20.9	28.3	5.3	29.0	11.7	3.1	0.0
Residence								
Urban	16.5	65.9	8.2	1.7	5.6	1.3	--	0.8
Rural	0.5	11.2	29.9	5.4	38.9	12.1	1.8	0.2

9.3 *Sanitation*

Only 5.5% of the Malawian population has access to adequate sanitary facilities located within a convenient distance of dwellings. The principal reason for the extremely low figure is the high use of traditional pit latrines. A pit latrine consists of a hole in the ground, with a wooden and mud platform and a mud or straw structure for privacy constructed on top. Nearly 30% of the population is without any sanitary facility.

A safe sanitation facility includes a toilet that flushes to a sewage system or a septic tank, a ventilated improved pit (VIP) latrine, or a latrine with a concrete sanitation platform (a sanplat) located less than 50 metres from the user's dwelling.

Districts where the population has particularly poor access (less than 1%) to adequate and nearby sanitation facilities include Chitipa, Mwanza and Chiradzulu. Ntchisi has the highest proportion of safe sanitation facilities, but that figure (at 17%) is still extraordinarily low.

People in the Northern region have the poorest access to adequate sanitation facilities, even when extending the definition to include pit latrines. The regional differences are statistically significant for access to sanitation with a pit latrine, but not for access to adequate sanitation.

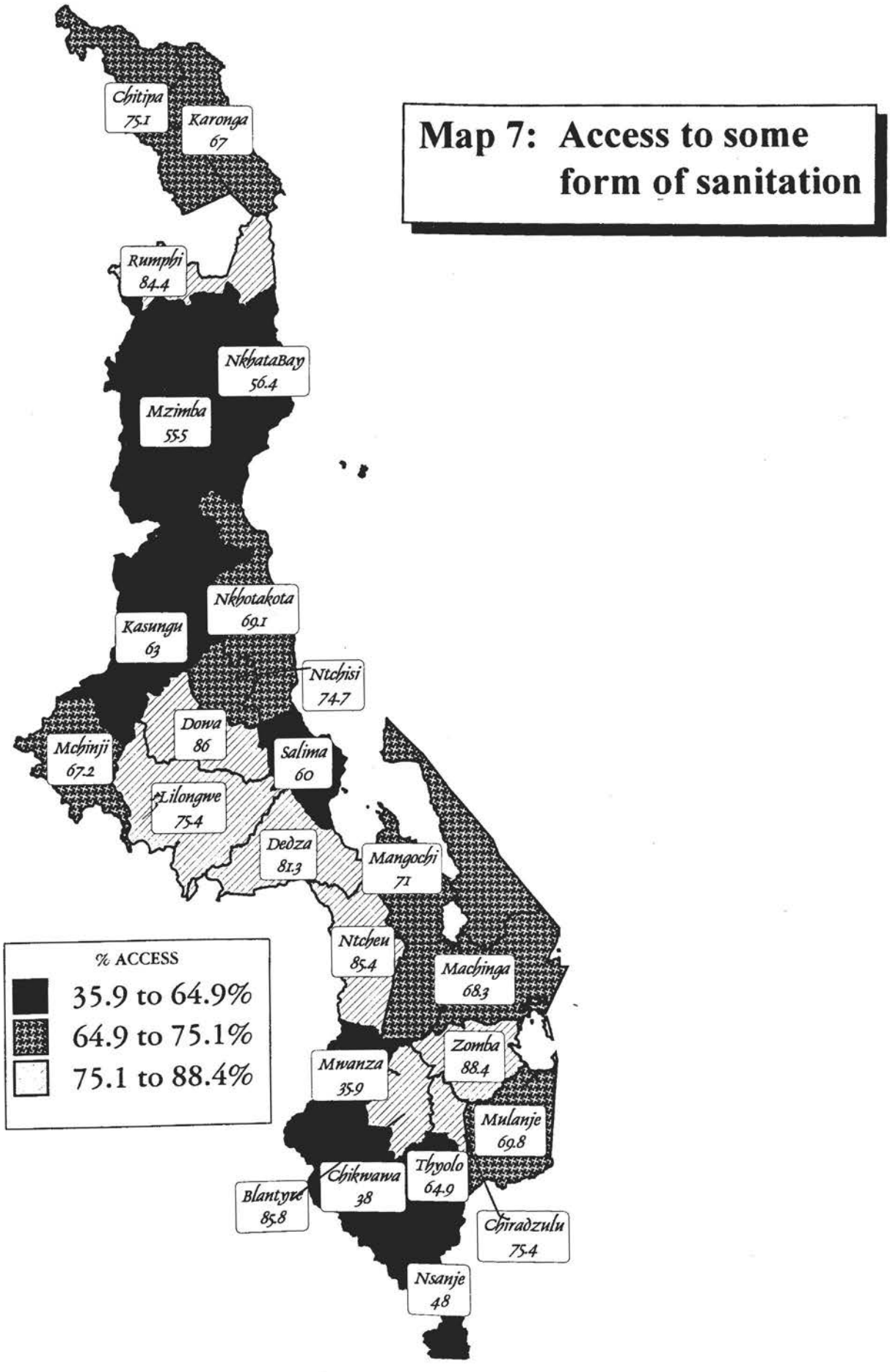

Map 7: Access to some form of sanitation
Chitipa 75.1
Karonga 67
Rumphi 84.4
NkhataBay 56.4
Mzimba 55.5
Nkhotakota 69.1
Kasungu 63
Ntchisi 74.7
Dowa 86
Mchinji 67.2
Salima 60
Lilongwe 75.4
Dedza 81.3
Mangochi 71
Ntcheu 85.4
Machinga 68.3
Zomba 88.4
Mwanza 35.9
Mulanje 69.8
Thyolo 64.9
Chikwawa 38
Blantyre 85.8
Chiradzulu 75.4
Nsanje 48
% ACCESS
35.9 to 64.9%
64.9 to 75.1%
75.1 to 88.4%

Table 9.3 Access to adequate sanitation (%), by region and residence

	Access to Adequate Sanitation	Access to Sanitation (with Pit Latrine)	Number of Sample Observations
Malawi	5.5 (7.9)	71.8 (1.5)	6,204
Region			
North	3.8 (1.0)	65.7 (4.0)	1,238
Centre	5.4 (1.1)	75.2 (2.0)	2,418
South	5.9 (1.3)	70.1 (2.4)	2,548
Residence			
Urban	22.4 (4.8)	88.5 (3.3)	839
Rural	3.7 (0.7)	70.0 (1.6)	5,365
Standard errors in parentheses			

There is a substantial and significant difference in the coverage of sanitation facilities in urban and rural areas. Nearly one-quarter (23%) of the urban population has access to adequate sanitation facilities located within a convenient distance, compared to only 4% of rural people.

Table 9.4 Type of toilet facility (%), by region and residence

	Facility	Flush to Sewage System	Flush to Sceptic Tank	VIP Latrine	Latrine with Sanplat	Traditional Pit Latrine
Malawi	22.2	0.5	0.9	0.6	3.9	71.9
Region						
North	28.6	1.1	0.6	0.1	2.4	67.4
Centre	18.9	0.3	1.2	0.8	3.4	75.3
South	23.6	0.6	0.8	0.5	4.6	69.9
Residence						
Urban	3.6	2.7	7.2	2.9	10.2	73.4
Rural	24.1	0.3	0.3	0.3	3.2	71.7

Over one-half of the population in Chikwawa district, and over one-third of the population in Salima, Mwanza, Mzimba and Nsanje districts have no sanitary facilities. Where facilities exist, they tend to be pit latrines.

9.4 *Conclusion and Recommendations*

In order to reach the mid-decade goals in Malawi, various measures have been taken to improve water and sanitation facilities. Since 1990, over 2000 water points have been installed in the rural areas in a joint effort by government, donors and NGOs. In addition, water points were equipped with hand pumps, about 2300 improved pit latrines were installed with sanplats, and hygiene education was intensified, with emphasis placed on hand washing and the two-cup system of serving water. About 400 village health and water committees have been formed, and about one-half of these have been trained in community procedures, hand pump maintenance, and sanplat making.

Constraints

The major constraints to achieving universal access to water and sanitation have been limited funding and a lack of government capacity to maintain the existing facilities.

Sanitation development is plagued by poor policy formulation and work plans, and complex institutional arrangements. There is no sanitation policy, and activities in the field of sanitation are undertaken by three different ministries: Local Government, Health, and Water and Irrigation.

The Water Policy is implemented by the Ministry of Water and Irrigation through five regional Water Boards. The Water Department has developed clear policies and strategies for the improvement of water resources under the National Water Development Project.

The objectives of the Development Project are to achieve by the year 2010 almost 100% coverage in public water supply to the urban areas and 74% coverage to the population in the rural areas. Further goals include twenty-four percent sanitation coverage through waterborne sewerage and septic tanks in urban areas, implementation of the water resource management, environmental protection policies and comprehensive institutional reforms.

The Project will rehabilitate or construct more than 20 gravity piped, community-managed water schemes; rehabilitate more than five thousand hand pump-equipped boreholes and shallow wells; and construct another 16,400 boreholes with hand pumps.

Until recently communities were not empowered to take control of water and sanitation projects. Nor were they involved in the planning, operation or maintenance of these facilities. Persistent drought in Malawi, especially in the 1990s, has meant that most safe sources of water within convenient distances have dried up.

Finally, because infrastructural development was for so long determined by political factors rather than need, some districts were better provided for than others. Taken together, these problems

have ensured that people in many districts have less than average accessibility to nearby water and sanitation facilities, and that most development has been top-down and with little community input. The new National Water Development Project will tackle this through the promotion of community participation, village level operations and maintenance, and personal hygiene through health campaigns.

To achieve universal access to safe drinking water and adequate sanitation by 2000 will require tremendous effort. First and foremost, both government and donors will have to allocate additional financial resources in order to increase accessibility to water and sanitation facilities in the country. But other support is also required to foster hygiene and sanitation education, rehabilitation of existing water points and hand auguring techniques, development of community based management and sector monitoring, and provision of appropriate technologies and provision of emergency water supply in areas where there are disasters or civil strife.

To achieve universal access to safe drinking water and sanitary means of waste disposal by the year 2000 is considered very challenging.

Recommendations

Universal access to safe water and sanitation facilities remains a major challenge for this country. Less than one-half of the population consumes safe water, and most use inadequate sanitation facilities. Therefore, the following recommendations are made:

- Districts identified in this survey as being poorly served should receive special assistance. Interventions should be governed by needs assessment rather than by political expediency
- There is a need to create a National Sanitation Policy, aimed at improving the sanitation conditions in Malawi.
- The quality and quantity of water sources need further investigation, as should the quality of sanitation facilities.
- There is need to harmonize the development of water and sanitation facilities in the rural and urban areas and to eliminate the bias against sanitation development.
- Government capacity at district level should be strengthened in order to facilitate the management of water and sanitation facilities by communities.
- Training of men and women in collecting, transporting and serving water in clean vessels is needed to ensure that they understand the importance of safe water.Community-based management of water and sanitation facilities should be extended.

CHAPTER TEN

EDUCATION

Education for all is the most important basic building block of development. Though the importance of female education has finally been acknowledged in Malawi, education for all has not yet been achieved. The underlying constraints include the limited access marginalized communities have to education as well as the problems children encounter when entering school. These include the poor quality of education, and consequently, high repetition, drop out and failure rates. Hence, progress in education can no longer be seen simply as raising the rate of enrolment, but must include improving the quality and relevance of education.

10.1 *Situation in Malawi*

Before the introduction of free primary education in Malawi, just over one-half of eligible Malawian children were enrolled in primary school. Drop out rates were high, and the school system lost about half of its students before they reached a state of permanent literacy. This had important negative consequences for national development as well as personal growth.

Eighty-three percent of primary school-age children are enrolled in primary school. Only one-half of children age six, the primary school entry age, start Standard 1 at that age.

The new government targeted education as one of the main areas for development. In 1994 it introduced a policy of universal access to basic education for all children. The budget allocation for education, which had never reached more than 13% before, rose to 23%, of which 65% was allocated to primary education. The most important policy changes included the abolition of school fees and uniforms for primary school, and the possibility of providing government assistance and teachers to previously unassisted community-based schools. Some 4000 retired teachers were called back to service, and another eighteen thousand para-professional teachers were recruited and given three weeks of training before being sent to classrooms.

Improvements were also made in the area of educational infrastructure to enable the system to cope with the additional influx of pupils and to ensure that communities in marginalized areas would also have access to education. Still, the government has a long way to go, for it estimated that some 38,000 additional classrooms and 25,000 more teachers must be added to the service to bring the teacher-pupil ratio to at least 1:50, which is the current goal.

It was recognized that access to education had to be made easier for people in marginalized areas. Therefore, the establishment of community schools in rural and urban areas was promoted.

The importance of female education was also acknowledged, and changes were made to the curriculum to make it more gender sensitive. The policy that previously excluded girls because they became pregnant was reviewed to make it possible for such girls to re-enter the system.

Eighty-six percent of children who enter Standard 1 reach Standard 5.

Studies have shown that a number of factors, including poverty, easy access to schools, poor learning conditions, demand for domestic and agricultural labour in peak seasons, and the low social value attached to being educated have an impact on enrolments and the retention of pupils in Malawian schools.

Table 10.1 Distance to primary schools by district

District	In village	< 1 km	1-3 km	3-5 km	>5 km
Malawi	19.5	17.1	39.9	19.8	3.8
Chitipa	43.4	-	44.2	12.4	-
Karonga	33.6	4.8	35.0	26.6	-
Mzimba	15.2	28.1	38.1	18.6	-
Nkhata Bay	-	82.2	-	17.8	-
Rumphi	-	88.8	9.5	1.6	-
Dedza	25.9	26.4	32.1	5.8	9.8
Dowa	24.5	9.1	26.2	40.2	-
Kasungu	15.7	9.0	41.6	13.9	19.8
Lilongwe	11.8	13.7	51.7	18.6	4.1
Mchinji	1.6	-	47.2	32.6	18.6
Nkhotakota	39.2	12.0	40.7	8.1	-
Ntcheu	-	18.5	72.5	8.3	0.7
Ntchisi	18.5	2.2	16.0	55.8	7.5
Salima	-	-	76.0	24.0	-
Blantyre	18.4	23.4	27.7	21.0	9.4
Chikwawa	40.0	30.0	15.0	15.0	-
Chiradzulu	15.5	6.0	51.9	26.5	-
Machinga	10.5	18.1	37.9	33.5	-
Mangochi	28.8	22.3	27.0	14.6	7.2
Mulanje	58.6	2.2	17.4	21.8	2.2
Mwanza	29.3	3.1	47.7	19.8	-
Nsanje	-	14.5	85.5	-	-
Thyolo	-	19.4	71.6	9.1	-
Zomba	-	19.4	54.1	19.1	7.4

Access to Primary Schools

The MSIS survey found that less than one-half of Malawians live between 1-3 km from a primary school. A fifth (20%) live 3-5 km, while 4% live further than 5 km from a school. Seventeen percent live less than one kilometre from a school, while another one-fifth (20%) have a school within their village (Table 10.1). Populations living in Nkhata Bay, Rumphi and Chitipa districts have shorter than average distances to travel to school, while those in Mchinji, Ntchisi and Dowa districts must go further.

10. 2 *Primary School Enrollment*

On a national level 83% of primary school-age children (6 through 13 years old) were enrolled in primary school at the time of the survey in October 1995. (Net enrolment is defined as the number of primary school-age children enrolled in primary school, expressed as a percentage of the total number of children that age.)

District figures (Table 10.2) reveal substantial differences in enrolments. For instance, enrolments in Dedza, Mwanza, Ntchisi and Salima districts were all significantly lower than average -- with Dedza showing the largest difference. By contrast figures for Blantyre, Mzimba, Nkhata Bay and Rumphi districts were all significantly higher.

There are significant regional differences (Table 10.3) in enrolment figures as well, with children in the North more likely to enter school than those in the Central or Southern regions.

Table 10.2 Net enrollment of 6-13 year olds (%), by district, 1992/93 and 1995.

DISTRICT	1992/93	1995
Chitipa	79.3	89.8 (4.1)
Karonga	85.5	89.3 (2.8)
Mzimba	90.7	90.9 (2.5)
Nkhata Bay	76.4	94.3 (2.0)
Rumphi	91.8	91.9 (3.3)
Dedza	38.1	66.1 (5.0)
Dowa	48.7	87.6 (3.2)
Kasungu	80.6	77.1 (3.0)
Lilongwe	53.8	85.1 (2.2)
Mchinji	54.8	86.1 (4.0)
Nkhotakota	86.6	82.9 (5.1)
Ntcheu	54.5	80.3 (5.9)
Ntchisi	58.8	73.8 (3.1)
Salima	54.3	72.8 (2.6)
Blantyre	48.5	90.7 (2.3)
Chikwawa	45.3	74.5 (5.1)
Chiradzulu	54.4	89.3 (3.3)
Machinga	47.8	83.4 (3.7)
Mangochi	49.0	86.5 (3.5)
Mulanje	41.9	80.9 (3.1)
Mwanza	57.9	64.6 (6.7)
Nsanje	57.1	83.3 (3.3)
Thyolo	48.5	75.0 (9.2)
Zomba	51.5	90.5 (2.8)

Source: Ministry of Education, 1992/93 and MSIS, 1995.

There are a number of reasons for this. First, the North has a tradition of educating children. There are also more primary schools located within a convenient distance of villages in the North -- 36% of children are less than 1 km. from a primary school, compared to 13% in the Central region, and 16% in the South.

Table 10.3 Net enrollment (%), by region, gender and residence

	Net Enrolment
Malawi	**83.0** (1.0)
Region	
North	90.9 (1.4)
Central	80.3 (1.5)
South	83.8 (1.6)
Gender	
Male	83.3 (1.3)
Female	82.9 (1.2)
Residence	
Urban	90.6 (2.2)
Rural	82.3 (1.1)

Standard errors in parentheses

Not surprisingly, there is a significantly higher net enrolment in the urban areas than in the rural areas.

As expected, mothers' educational levels have a significant influence on whether children are enrolled at school. For instance, net enrolment for children of mothers with a secondary education is 93.5%, compared to 78.8% for children whose mothers have no education.

Analysing gender and district figures (Table 10.4) reveals little variation in net enrolment rates. Only three districts show statistically significant differences between male and female enrolment -- Karonga and Mulanje districts have more males than females enrolled, while Salima district has more girls than boys. Salima district's figures may reflect the strength of the matrilineal system there. On the other hand, Salima is on the lake shore, where many boys engage in fishing and may forego schooling.

Map 8: Net Primary Enrolment

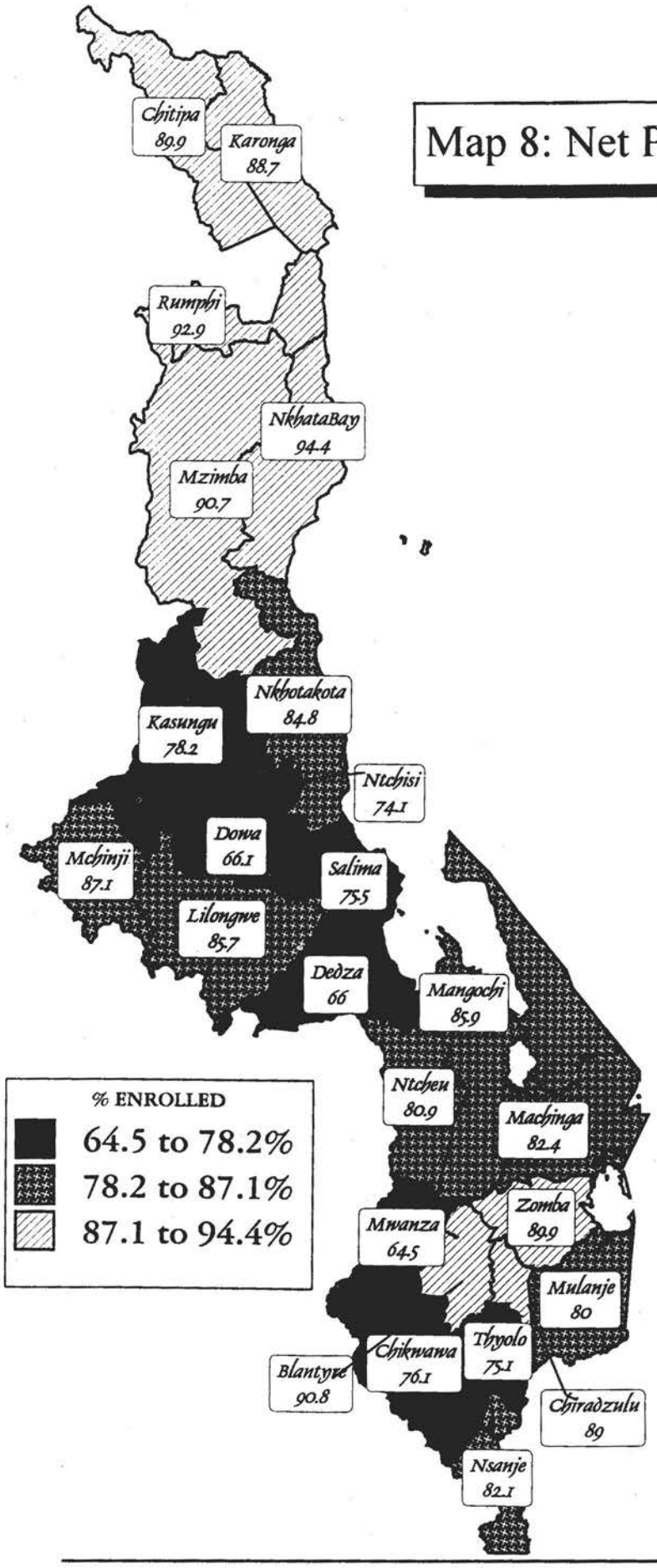


Table 10.4 Net enrolment (%), by district and gender

DISTRICT	MALE	FEMALE
Chitipa	94.9 (1.3)	86.4 (7.0)
Karonga	93.5 (2.0)	83.1 (3.4)
Mzimba	86.9 (4.9)	93.6 (2.0)
Urban	94.1 (1.7)	90.2 (2.5)
Nkhata Bay	94.2 (1.8)	94.6 (4.3)
Rumphi	91.8 (3.7)	93.7 (2.8)
Dedza	69.2 (6.8)	63.7 (5.4)
Dowa	88.2 (3.7)	88.4 (5.5)
Kasungu	74.9 (2.7)	81.2 (4.9)
Lilongwe	83.9 (3.4)	87.3 (2.4)
Lilongwe urban	89.3 (3.0)	84.7 (2.8)
Mchinji	83.6 (7.6)	90.6 (2.8)
Nkhotakota	87.5 (5.4)	82.2 (9.0)
Ntcheu	84.6 (6.1)	78.7 (5.5)
Ntchisi	72.2 (3.9)	75.7 (3.6)
Salima	68.8 (4.6)	82.8 (4.8)
Blantyre	90.0 (3.1)	91.8 (2.3)
Blantyre urban	91.2 (3.0)	90.2 (3.1)
Chikwawa	81.7 (2.9)	71.5 (8.0)
Chiradzulu	87.9 (2.7)	89.8 (5.3)
Machinga	84.4 (6.3)	81.8 (5.1)
Mangochi	85.4 (5.7)	85.7 (3.1)
Mulanje	88.1 (1.8)	74.2 (3.8)
Mwanza	61.8 (6.5)	66.6 (9.0)
Nsanje	84.1 (4.2)	80.8 (4.3)
Thyolo	80.9 (10.2)	70.5 (10.5)
Zomba	90.4 (4.8)	91.3 (2.0)
Zomba urban	88.0 (4.7)	90.1 (4.4)

Standard errors in parentheses

The high enrolment rates obscure the fact that a considerable number of students repeat classes (Table 10.5). Repetition rates are particularly high in Standard 1, and there are significant differences in repeat rates in urban and rural areas for Standard 1. However, no other significant differences emerge. At the same time continuation rates are quite high. In other words, students seem to choose to repeat classes instead of dropping out of school completely.

Table 10.5 Students (%) repeating the school year, by standard

	Std 1	Std 2	Std 3	Std 4
Malawi	47.3 (2.1)	22.4 (2.0)	23.3 (2.5)	17.6 (2.4)
Region				
North	47.1 (2.9)	18.0 (4.1)	19.4 (3.5)	18.6 (3.9)
Central	48.3 (2.1)	21.4 (2.8)	21.6 (3.4)	21.6 (4.2)
South	46.4 (3.7)	24.1 (3.2)	25.3 (4.2)	14.2 (3.7)
Gender				
Male	44.0 (2.8)	19.6 (2.2)	24.9 (3.5)	18.0 (3.5)
Female	49.8 (2.4)	25.0 (2.7)	21.5 (2.9)	17.2 (2.9)
Residence				
Urban	34.8 (6.0)	33.8 (7.3)	20.8 (7.4)	12.6 (7.4)
Rural	48.1 (2.1)	21.2 (2.0)	23.6 (2.7)	18.4 (2.5)

Standard errors in parentheses

High rates of repetition in the primary grades could be an indication that students are not receiving an education of a sufficient standard to enable them to pass from one standard to the next. While students may not be prepared to start primary school due to a lack of pre-school education, repetition rates of such magnitude indicate that the cause is not solely due to the calibre of students, but could also be a fault of the system. The repetition rate has serious implications for classroom sizes and facilities, particularly in Standard 1 where the rate is particularly high.

Continuation Rates

In 1995, it was estimated that 86% of children continued their education up to Standard 5. This figure was reached by calculating the dropout rate per standard for Standards 1 through 5, and aggregating them to assess their cumulative impact. This national figure obscures considerable differences at district level (Table 10.7), for some districts have over 95% of their students reaching Standard 5, while others have much less.

There is a considerable difference between the regions as well (Table 10.6), with the Northern region performing better than either the Central or Southern regions in this and other indicators. Urban areas are more likely than rural

Table 10.6 Children reaching Standard 5, by region, gender and residence

	Proportion who reach Standard 5
Malawi	86
Region	
North	94
Central	83
South	86
Gender	
Male	89
Female	83
Residence	
Urban	96
Rural	85

areas to keep their children in school -- 96% reach Standard 5 in towns, compared to 85% in the countryside. This can be attributed in part to the accessibility of schools in urban areas as well as the age children start school, which seems to be higher in cities.

A substantially greater number of children whose mothers have achieved Standard 5 or higher stay in school. This is also the case for those children in households headed by educated persons. A higher proportion of males (89%) than females (83%) remain at school, as was the case before free primary education started.

Table 10.7 Children (%) who reach standard 5, by district

DISTRICT	Proportion who reach Standard 5
Chitipa	90
Karonga	92
Mzimba	93
Nkhata Bay	97
Rumphi	100
Dedza	75
Dowa	95
Kasungu	91
Lilongwe	84
Mchinji	75
Nkhotakota	73
Ntcheu	86
Ntchisi	81
Salima	90
Blantyre	99
Chikwawa	96
Chiradzulu	88
Machinga	100
Mangochi	79
Mulanje	89
Mwanza	41
Nsanje	94
Thyolo	58
Zomba	90

Figures from the Ministry of Education reveal that historically, the continuation rate for girls for Standards 5 through 8 tended to be much lower than for boys. The value put on education for girls in the rural areas is generally low, while girls tend to marry and have children early.

The proportion of children remaining in school increases in the higher standards (Table 10.8). There are statistically significant differences between continuation rates in the Northern and Southern regions at Standard 1; and between the Central and Northern regions, urban and rural areas, and between male and female students at Standard 2. No significant differences at the higher standards were revealed.

Table 10.8 Students (%) dropping out of school, by standard

	Std 1	Std 2	Std 3	Std 4
Malawi	5.5 (1.3)	4.5 (0.9)	3.0 (0.9)	1.8 (0.7)
Region				
North	0.6 (0.6)	1.8 (1.4)	3.2 (2.0)	0.0 (0.0)
Central	3.9 (1.1)	6.4 (1.4)	3.5 (2.2)	3.5 (1.4)
South	7.5 (2.5)	3.6 (1.3)	2.5 (1.0)	1.0 (1.0)
Gender				
Male	5.4 (1.5)	2.3 (0.8)	1.6 (0.8)	2.5 (1.3)
Female	5.6 (1.6)	6.6 (1.4)	4.3 (1.5)	1.0 (1.1)
Residence				
Urban	2.0 (1.4)	1.1 (1.1)	0.0 (0.0)	1.3 (1.3)
Rural	5.8 (1.4)	4.8 (0.9)	3.3 (1.0)	1.8 (0.8)

Standard errors in parentheses

Starting School

Fifty-one percent of all 6 year olds (primary school entry age) enter Standard 1 at that age. This means a substantial proportion of children do not enter school at the recommended age.

Table 10.9 Children (%) entering School at the correct age, by region, gender and residence

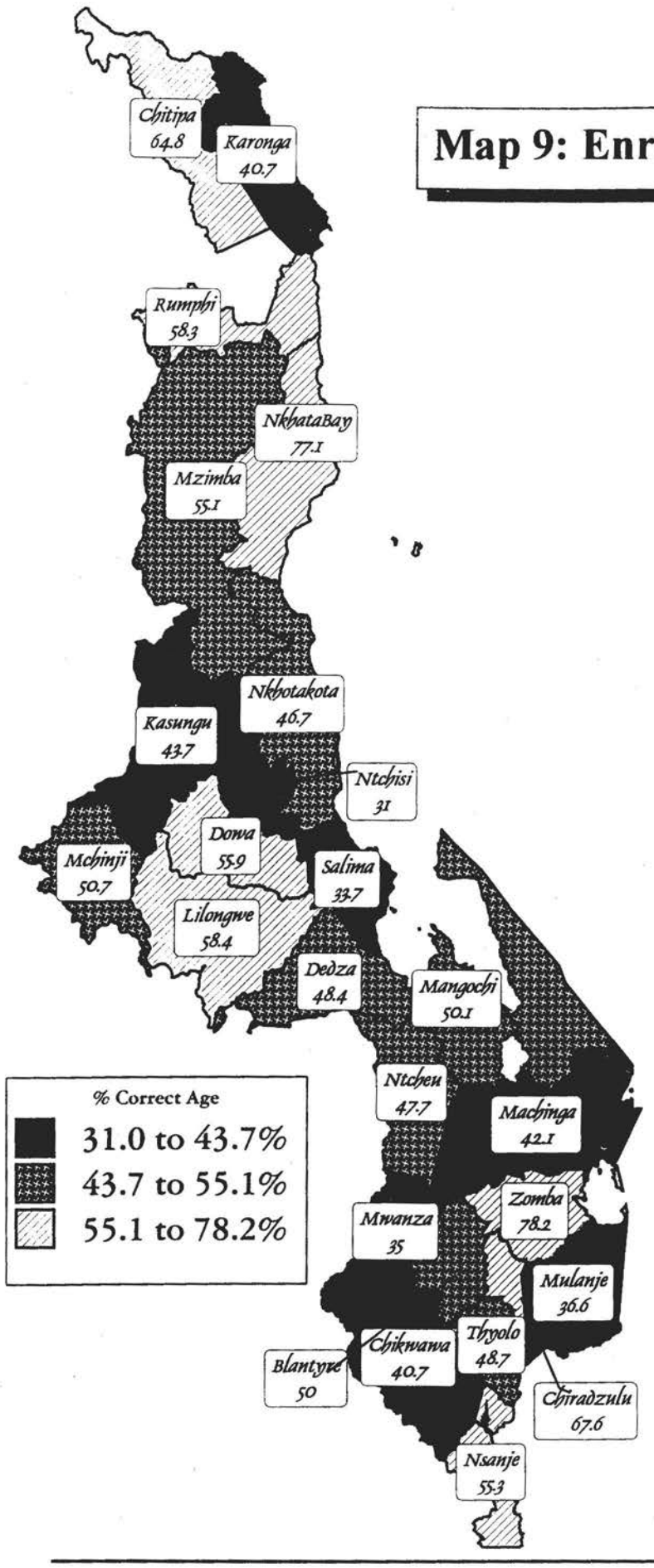
	Proportion who enter School at the correct age
Malawi	**51.0 (2.4)**
Region	
North	57.0 (6.0)
Central	50.6 (3.1)
South	50.4 (4.0)
Gender	
Male	48.4 (3.3)
Female	52.9 (2.9)
Residence	
Urban	41.4 (5.2)
Rural	52.2 (2.6)

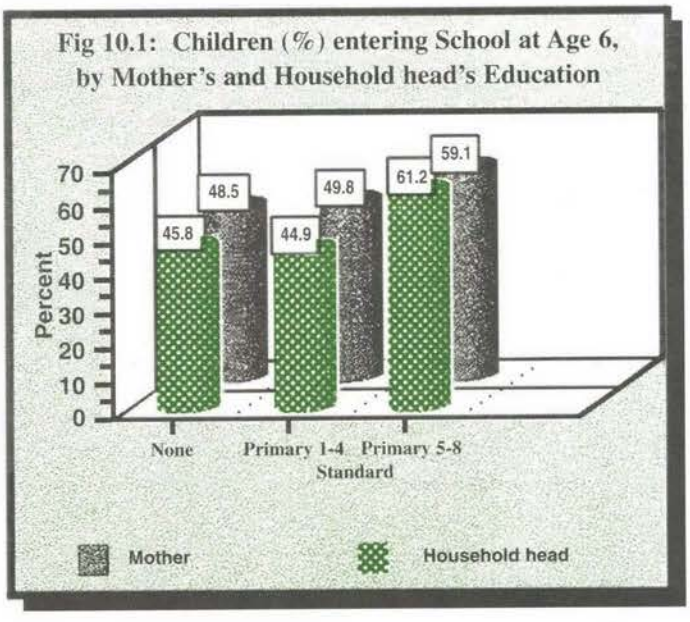
Standard errors in parentheses

Given the high standard errors and wide confidence intervals, only two districts proved statistically different from the mean: Zomba has a significantly higher proportion of children entering school at age six than the mean and Ntchisi has a significantly lower percentage. Ntchisi also has a low net enrolment figure, indicating that there are serious educational problems in this district. Not surprisingly, Ntchisi district also performed poorly in other sectors -- such as malnutrition and immunization -- which indicates that developmental weaknesses are interrelated, and are not confined to one sector alone.

No residential or gender variables are statistically significant for explaining why children start school at the recommended age. On the other hand, a mother's education does influence starting ages (Figure 10.1).

Map 9: Enrol at correct age





Not surprisingly, children of educated mothers are more likely to start school on time than are those of un- or under-educated mothers.

Over one-third (35%) of children enter primary school at age 5. To capture this effect, the proportion of six year olds enrolled in any standard was determined. It was found that 62.5% of 6 year olds are in school.

Table 10.10 Children (%) entering school at the correct age, by district

District	Proportion who enter School at the correct age	District	Proportion who enter School at the correct age
Chitipa	64.8 (10.8)	Blantyre	50.0 (6.3)
Karonga	40.7 (12.8)	Chikwawa	40.7 (12.9)
Mzimba	55.1 (10.0)	Chiradzulu	67.6 (6.3)
Nkhata Bay	77.1 (12.2)	Machinga	42.1 (12.0)
Rumphi	58.3 (17.9)	Mangochi	50.1 (5.8)
		Mulanje	36.6 (13.6)
Dedza	48.4 (7.2)	Mwanza	35.0 (9.3)
Dowa	55.9 (7.8)	Nsanje	55.3 (8.5)
Kasungu	43.7 (9.9)	Thyolo	48.7 (14.1)
Lilongwe	58.4 (6.1)	Zomba	78.2 (6.6)
Mchinji	50.7 (10.6)		
Nkhotakota	46.7 (7.6)		
Ntcheu	47.7 (10.7)		
Ntchisi	31.0 (8.4)		
Salima	33.7 (6.2)		

Standard errors in parentheses

10.3 *Conclusions and Recommendations*

Before 1994 progress towards universal education was slow. Net enrolment increased from 53% to only 58% between 1990 and 1994. However, with the introduction of free primary education in 1994, the net enrolment rate rose dramatically (Figure 10.2). District figures (Table 10.2) also reveal the rise in net enrolment.

Since 1992/93 significant increases can be seen in net enrolment in a number of districts. Dowa, Mangochi, Machinga, Chikwawa and Mulanje districts, in particular, show large increases in net enrolment. Most of those districts with low net enrolment figures in 1992/93 increased substantially. For instance, Dedza, despite remaining significantly lower than the mean, showed a large increase from its 1992/93 level. Most of the northern districts, along with Kasungu and Nkhotakota, changed little from their 1992/93 levels, which were already high. Mwanza district figures have increased only slightly since 1992/93, indicating that the removal of education fees had little effect on its net enrolment. It appears there are other factors in Mwanza district which limit school attendance. Other districts that performed significantly below the mean in the 1995 survey all managed to show a marked increase from their 1992/93 levels.

The proportion of children reaching Standard 5 has largely remained the same -- from approximately 83% in 1990 to 86% in 1995. However, this obscures the rise in the absolute number of drop-outs, as total enrolment has increased from 1.4 million in 1990/91 to 3.2 million in 1994/95. Approximately fourteen percent of 3.2 million children (or some 450,000 children) dropped out in 1994/95. The Northern region is estimated to have performed well, with a substantial increase (from 82% in 1990 to 94% in 1995) in the number of children retained.

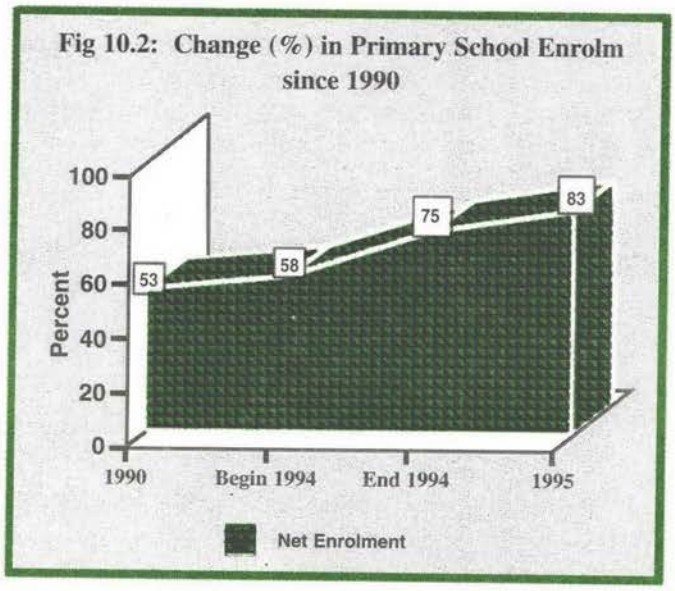
The proportion of children who enter Standard 1 at the correct age of 6 has also shown a marked increase nationally, from 33% to 51% between 1988/89 and 1995.

Constraints and Recommendations

With the introduction of free primary education it became apparent that the country lacked the basic resources to run the expanded programme. As a result of resource constraints, the quality of primary education is now compromised. Class sizes are large, supplies are scarce, and many teachers have received only limited training. The Ministry of Education has recognized the need for strengthening capacity at the national, district and community levels. Moreover, the community-based educational programme needs support.

With the assistance of donors, the Ministry of Education has developed a ten year Education Investment Plan, with high priority for primary education. The plan aims to improve the quality of the learning environment by providing critical inputs such as classrooms, trained teachers, learning materials and teacher support services.

Fig 10.2: Change (%) in Primary School Enrolm since 1990



Teacher training and supervision are most in need of assistance. The training of para-professional teachers is necessary to address the shortage of primary school teachers country-wide.

There is also a recognized need to enhance the quality of the training at the teacher training colleges, which will improve the quality of schooling in due course.

Continuing support will also be needed for the provision of classrooms and learning materials, and the procurement of vehicles for teacher support. Outside the mainstream education system there is a need to provide extra educational opportunities through the development of a non-formal education system for out-of-school youth.

Overall, the rates of enrolment and continuation are impressive and the goal of universal access to basic education within Malawi is on track and achievable.

Beyond that, a commitment has been made by government to reach a national enrolment figure of 90% by 2005, and to reduce the drop out and repetition rates to 5% for Standards 1-7 and to 15% for Standard 8. Moreover, emphasis during the next decade will include strengthening partnerships between the education sector and others, promoting community-oriented approaches in education, and using affirmative action to ensure equal access for all children.

While progress is being made in the field of education, the MSIS survey revealed some areas in need of special attention:

- Repetition rates are very high, particularly in Standard 1. This has serious repercussions for class size, distribution of classroom equipment, and the quality of education. It makes forward planning of class size particularly difficult.

- Free education means that students can choose to stay in school rather than drop out. However, because of the paucity of informal and formal preschool education, students may not be prepared for school and will do poorly. High rates of repetition result, though these may also be a result of students not receiving an education of a standard sufficient to enable them to pass from one grade to another. Repetition of such magnitude may indicate that the students are ill prepared to enter primary school and that the schools have inadequate resources. Further research is needed to determine exactly why the repetition rate is so high.

- District figures reveal substantial problems. Mwanza, Dedza, Ntchisi, Thyolo and Salima districts have especially low net enrolment figures. Further research is needed to determine why this is the case. Mwanza, in particular, recorded no significant increase in its net enrolment rate once free education was introduced. The survey revealed that people in districts such as Mwanza, Ntchisi and Salima have other problems, such as malnutrition and low levels of immunization, which probably contribute to low educational levels and vice versa. The relationship between these problems should be investigated before tackling problems in one sector alone.

- Further research is needed to determine the impact that distance from school has on educational indicators. Preliminary research especially in Ntchisi, Nkhata Bay and Rumphi suggests that there is a link, though findings in Mwanza and Dedza indicate otherwise.

- Further research is needed to determine why a large proportion of children are not starting school at the correct age, even though the introduction of primary education makes this financially feasible and the distances to schools are not prohibitive.

- Additional research should determine the reasons why some districts have a higher rate of enrolment for one gender or the other. One possible explanation -- the impact of matrilineal and patrilineal social systems -- deserves special attention.

- Quality of education should not suffer as a result of higher enrolments. This relationship should be monitored and assessed further.

- The gender differences need further investigation. In the education sector, enrolment figures historically have shown a gender bias. In this survey, the national net enrolment didn't show a difference between boys and girls. Only two districts recorded significantly more males than females between 6 and 13 years of age, enrolled at school, while one district, Salima, recorded the reverse. The survey assessed the attainment rate until Standard 5 and found that 89% of boys reach Standard 5 against 83% of the girls. Gender differences are even more likely to occur after Standard 5, when girls and boys are maturing and girls marry early. Furthermore, it has to be noted that the survey was undertaken in October, just after the start of the school year, and outside the planting and harvesting seasons. Usually these seasons have more of a negative impact on the attendance of girls than boys. Figures at the national level tend to obscure the existing gender differences at district level.

CHAPTER ELEVEN

CONCLUSIONS AND RECOMMENDATIONS

The aim of the Malawi Social Indicators Survey is to provide an overview of social indicators in the areas of health, nutrition, education, and water and sanitation. These sectors are considered key for the development of children, and progress is needed in each in order to reach the end-of-decade goals outlined at the World Summit for Children in 1990.

When comparing the MSIS findings with those of the Demographic and Health Survey of 1992, it is clear that in most regards, the state of children has not changed much in the past few years. For instance, infant and child mortality rates and malnutrition rates, two important indicators, are little different. On the other hand, immunization levels have shown their first significant drop since 1992.

Malawians continue to have poor access to health facilities, both health centres and under-five clinics. This has implications for the quantity and quality of health care given to a child, for long distances will often prevent a child receiving timely treatment.

Progress is being made in other areas, though. The rates of exclusive breast feeding have shown significant improvement since 1992 and more people are using home-made ORT solutions for the treatment of diarrhoea. The introduction of free primary education has increased the enrolment of both girls and boys at school and more children are estimated to reach Standard 5.

Infant and child mortality are key indicators of the state of children in a country. Malawi's child mortality rate currently ranks the eighth worst in the world, and that ranking seems unlikely to change as a result of these findings. Indeed, mortality rates have shown little change since the national census of 1987. This is hardly surprising, given the level of population growth and underdevelopment; the extent of the drought, the AIDS epidemic, and environmental degradation; and the depth of the current economic crisis.

Although the recommendations enumerated below are made separately for each sector, an overall improvement can only be achieved by adopting an integrated approach. This becomes most evident in assessing the districts.

11.1 *Districts*

A major objective of this study was to identify districts where problems are especially bad. The survey found that a number of districts face difficulties in several sectors, highlighting the inter-relatedness of the various problems.

- Ntchisi, Salima and Mwanza districts have performed significantly below the mean in a number of sectors. Some districts are evidently falling behind due to a lack of investment and poor infrastructural development, but further research is needed to determine the exact causes of poor performance in each of these districts. Addressing problems in each sector individually may not offer a solution, and an integrated approach is undoubtedly necessary to tackle these problems. Failing to attend to these districts will further their underdevelopment.

- Districts that are performing badly in terms of nutrition are Zomba, Dowa, Chitipa, Thyolo and Mulanje, while Lilongwe, Machinga and Mchinji districts are falling behind in immunization. Individual programmes to address these specific problems should be started.

There have been differing rates of progress in the various sectors.

11.2 *Health*

Immunization rates have dropped for the first time in a number of years. Particularly hard hit were polio and DPT rates, but the proportion of children fully immunized has also decreased. While the recent shortage of certain vaccines helps explain the fall in coverage, the situation should be watched and seen as a warning sign. Data should be regularly collected and analyzed in the future.

In order to achieve the Summit goal on immunization in Malawi the following recommendations are made :

- Many of the problems encountered in the EPI programme are logistical. In order to sustain the districts' ability to carry out essential tasks and avoid a further reduction in coverage, planning for improved outreach services must be the immediate task. Also, the monitoring of disease outbreaks, especially measles, must be strengthened. There is an acute need for funds to support EPI programme operations, particularly at district level.

- From 1996-2000 the EPI programme needs donor support for vaccines, cold chain and related equipment. The government, on the other hand, should plan to take progressively greater responsibility for vaccines and other costs.

- Measles vaccinations have the lowest coverage of all the antigens in Malawi. Also, cases have been recorded in children under 9 months of age. As a result, technical assistance in the form of a team of experts is needed to assess the situation and make recommendations, and any new measures will have to be implemented and closely monitored for impact.

- Measles outbreaks should be monitored and 'catch-up' campaigns and containment activities supported. Special attention should focus on low-coverage and hard-to-reach areas in each district. There is a need to strengthen local briefings of village committees,

to raise awareness about the need for measles vaccinations. Disease surveillance courses for peripheral health staff should emphasize measles case definitions and surveillance.

- Districts needing special attention at the moment include Nsanje for BCG; Machinga, Ntchisi and Lilongwe for DPT; Mchinji and Ntchisi for polio; and Ntchisi for measles.

- The ideal of inoculating all women of child-bearing age against tetanus is logistically and financially difficult in the current economic climate. As regards neonatal tetanus, financial, logistical and to some extent technical support are required to expand coverage.

The prevalence of diarrhoea in Malawi has declined while the use of ORT solutions, including home-based solutions, to treat diarrhoea has increased. This is a significant achievement, especially as it has occurred over only three years. Given these results, the following recommendations are made:

- A correlation between diarrhoea and breast feeding is found in the survey. Breast feeding should be encouraged to lower the incidence of diarrhoea, though it is not the only determining factor. General hygiene should be equally emphasized.

- The quality of water from so-called 'safe sources' should be verified. The survey showed a high incidence of diarrhoea occurring when 'safe' water sources are used, which might be caused either by the handling of water, or by the quality of the source. Similarly, the quality of sanitation facilities should be emphasized.

- The marketing of low cost ORT solutions for the treatment of diarrhoea should be intensified, as the survey shows a preference for low cost home-made diarrhoea cures.

- The message of increasing the amount of fluids given to a child with diarrhoea has not been absorbed. This indicates that the message campaigns have failed, and that mothers need a better general understanding of diarrhoea treatment. The content of the message needs to be altered, and the campaign extended.

11.3 *Nutrition*

The increase in the breast feeding rate in Malawi is one of the more positive aspects of the survey. Significant improvements were made in all aspects of breast feeding, exclusive breast feeding of those under 6 months in particular. These improvements are significant, as they have occurred over a three year period. Yet much more remains to be done, including more training and message campaigns.

- There is a need to continue with efforts to promote breast feeding and better young child feeding practices through mother and 'baby friendly' initiatives and nutrition education. Both technical and financial support is needed to carry out the tasks planned, including the provision of training materials, further training of health staff, the production of IEC

materials, promotion of breast feeding through traditional folk arts and the media, and the development of breast feeding support groups.

* Research is needed to determine which aspects of the breast feeding campaign have been most successful. These can be built on, and used to develop other aspects of the campaign.

* Only one hospital to date has been declared a 'baby-friendly' hospital. Further training of hospital staff is needed, including administrators and health personnel.

Particularly distressing is the failure to reduce malnutrition levels since 1992. The widespread poverty faced by many Malawians, in addition to the drought, accounts for the lack of improvement. The high rate of HIV, which leads to frequent infections, and the insufficient intake of micronutrients, are also contributing factors. Salt iodization is presently low, and although vegetables high in vitamin A are being consumed, they are not consumed in large quantities. Nor are they eaten with the fat necessary for the absorption of vitamin A. Because the eradication of malnutrition depends on the general improvement of socio-economic conditions in the country, the following general recommendations are made:

- The National Plan of Action for Nutrition needs to be finalized and implemented as soon as possible.

- Now that the profile of nutrition has been included in the Poverty Alleviation Framework and the Agriculture and Livestock Strategy, more commitment should be evidenced by government and donors in tackling malnutrition, especially in the form of allocating resources to sectors that foster its eradication.

- Malnutrition rates in urban areas have worsened considerably, and Lilongwe has a higher rate than other cities. This may be caused by the immigration of poor people from the rural areas, though the drought as well as price rises have undoubtedly been contributing factors. The malnutrition rate in rural areas has not changed significantly, but remains high. Emphasis in tackling malnutrition should be placed on the urban areas as well as the rural.

Legislation was passed in 1995, making the iodization of salt compulsory, which should increase the amount of iodized salt consumed in the country. The current rate, while reaching over one-half of the population, is far from the goal of Universal Salt Iodization sought. However, because most activities were planned to take affect after the Salt Iodization Act was passed, improvements should be evident soon. In order to encourage consumption of iodized salt, the following recommendations are made:

- A sustainable salt monitoring system should be established to ensure that all regulations under the Act are adhered to.

- Emphasis should be placed on sustainable advocacy campaigns to raise the awareness of people -- including politicians, urban and rural people, rich and poor, and traders -- to use iodized salt.

- The impact of the salt iodization intervention on iodine deficiency disorders should be monitored.

The lack of vitamin A is a contributing factor of malnutrition. Although about three-quarters of the population is consuming at least three vitamin A- rich foods per week, the intake of oil, groundnuts or other foods containing fat, which is necessary to aid absorption of vitamin A, is low. This is the result of poverty, which makes certain vegetables, fruits and oil unaffordable, as well as a lack of knowledge. The following conclusions and recommendations are made:

- The continued distribution of vitamin A capsules to all children is needed, particularly to those over two years old. However, because the proportion of under-2s who have received a vitamin A capsule is quite low, additional effort is needed to reach these children too.

- Overall, a person's food choices are influenced by messages on vitamin A. However, only a small proportion of people eats foods rich in vitamin A with oil or groundnuts, either of which is necessary for vitamin A absorption. The messages disseminated should make it clearer that in order to absorb vitamin A, fats must be consumed simultaneously with a vitamin A food.

- Affordable oil does not seem to be readily available in rural areas. Research should discover the reasons for this, while people should also be taught that groundnuts can substitute for oil.

- A small percentage of mothers receives a vitamin A capsules when giving birth. Additional training should be given to midwives, traditional birth attendants, and hospital personnel involved with births.

11.4 *Water and Sanitation*

Thirty-seven percent of Malawians have access to safe water, while the prevalence of traditional pit latrines has resulted in less than 10% of the population having access to safe sanitation. In light of these findings, the following recommendations are made:

- Districts specially affected -- Ntchisi, Mwanza and Dedza in particular -- should be targeted for assistance. Interventions in this sector should be governed by needs assessment rather than political expediency.

- A National Sanitation Policy should be developed that aims to improve sanitation in Malawi.

- Considering the fact that diarrhoea is prevalent in areas where people use a so-called 'safe water source', an evaluation of water quality in such sources should be undertaken. Also needed is an assessment about the way water is treated after it is drawn.

- There is need to harmonize the development of water and sanitation facilities throughout the country to eliminate the bias against sanitation development.

- There is a need to strengthen government capacity at district level to facilitate the management of water and sanitation facilities by communities. The communities have to be empowered through training in the management and maintenance of these facilities.

- Continued education, particularly of women who are the main water carriers, is needed to ensure that they understand the importance of safe water.

11.5 *Education*

The sector showing the greatest achievements and changes over the past few years has been education. The proportion of children in primary school has dramatically increased, as has the proportion starting at the correct age. However, there remain a few critical areas to address:

- Repetition rates are very high, particularly in Standard 1. This has serious repercussions for class size, distribution of classroom equipment, and the quality of education. It makes forward planning of class size particularly difficult.

- Free education means that students can now choose to stay in school rather than drop out. However, students who have not had pre-school training may not be prepared for school, and may have to repeat classes. Alternatively, high rates of repetition within the primary schools are also an indication that students are not receiving an education of a sufficient standard to enable them to pass. Repetition of such magnitude may indicate that the students are ill prepared to enter primary school and that the schools have inadequate resources. Further research is needed to determine the reasons why this rate is so high.

- Analysis by district reveals substantial problems. Mwanza, Dedza, Ntchisi, Thyolo and Salima have significantly lower indicators. Additional research is needed to determine why these districts are performing badly. Mwanza, in particular, recorded no significant increase in its net enrolment rate once free education was introduced.

- Research is needed to determine why a large proportion of children are not starting school at the correct age, for the introduction of free primary education should make this at least financially feasible.

- Research is needed to determine why some districts record a higher rate of enrolment for boys or girls.

- The increase in the number of children in primary education should not affect the quality of education. This should be monitored and assessed regularly.

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APPENDICES

APPENDIX 1

Sampling and Estimation Procedure of the Malawi Social Indicators Survey

INTRODUCTION

Sampling and data collection for the Malawi Social Indicators Survey was carried out by the National Statistical Office, while data entry and analysis was undertaken by the Centre for Social Research, with funding from UNICEF. The MSIS is intended to enable Malawi to establish an appropriate mechanism for the timely collection, analysis and publication of data required to monitor social indicators related to the well-being of children.

The mid-decade goals have narrowed the information needs to specific areas critical to the survival and development of children: the right to be protected against the immunizable diseases, to be treated when sick with diarrhoea, to be breast fed, to be well nourished, to be protected against the disorders of iodine and vitamin A deficiencies, to go to school and to have access to clean water as well as sanitation facilities. Each of the goals is framed within the availability of resources of each country and the international community.

The MSIS survey was a sample survey. This sample was a sub-sample of the master sample of the National Sample Survey of Agriculture, carried out from October 1992 to September 1993. The following sampling and estimation procedures were adopted in the National Sample Survey of Agriculture. The methodology of sampling adopted in the MSIS survey is also presented below, as are the estimation procedures for different types of estimates.

SAMPLING PROCEDURE: NATIONAL SAMPLE SURVEY OF AGRICULTURE 1992/93

For the NSSA, the country was divided into 107 strata, which covered only the rural smallholder population and excluded people in the urban areas. The strata were demarcated according to ecological features such as rainfall, cropping pattern, soil types, etc. The strata contained a complete set of Enumeration Areas or clusters, which were demarcated to enable enumeration in the 1987 Population Census. Each of the 30 Rural Development Projects in the country contained a complete set of strata, while each of the 8 Agriculture Development Divisions contained a complete set of Rural Development Projects. Data users wanted the results to be presentable at Rural Development Project level with acceptable levels of precision. To enable this, the number of clusters to be selected nation-wide was statistically set at 600. Each of the 107 strata had to be represented, therefore the 600 clusters were shared among the strata based on the population size of the stratum. Hence, larger strata had more clusters than smaller strata. Selection of clusters was done independently within each stratum.

A two-stage sampling procedure was adopted where Enumeration Areas/clusters (the first stage units) were selected with Probability Proportional to Size (PPS), where size was given by the population of the Enumeration Area/cluster as found in the 1987 Census. The second stage units, households, were selected within the selected clusters through Simple Random Sampling (SRS). Twenty Households were selected within each selected Enumeration Area/cluster, giving a total sample of 1200 households. An Enumeration Area/cluster had on average, a population of 250 to 300 households.

MALAWI SOCIAL INDICATORS SURVEY

DETERMINATION OF SAMPLE SIZE

The users of the results of the MSIS survey required that the results be presentable at district, regional and national levels. The lower the level of aggregation, the higher the sample size has to be in order to obtain results at specified levels of precision or margin of error. Once a sample size satisfies the precision requirement at the lowest level, it would automatically satisfy the precision requirement at all higher levels. The higher level estimates would even be presentable at better levels of precision.

The various indicators required for this survey to be reported at district level, given a margin of error 0.1, determined the calculation of the sample size per district. The sample size was set in terms of the required sample population, which was later converted into the population of households that would be required to cover the sample population. In doing so, it was assumed that the variability of the respective indicators was uniform across all 28 districts. Four of these district comprised the urban areas of Blantyre, Mzuzu, and Lilongwe, and the municipality of Zomba.

In this exercise it was discovered that if all indicators were to give estimates with a margin of error of 0.1, the sample size per district, hence national, would be too large for the available financial resources. As a result, it was decided to set the number of sample households per district at 200. Such a sample size will give estimates of all the indicators with a margin of error of 0.1 except for TT2 coverage, use of ORT in diarrhoea, and vitamin A coverage. These indicators would be estimated with a larger district margin of error mainly because, according to UNICEF, use of these remedies is rare and would require a larger number of households to capture the target population.

SAMPLING PROCEDURES (Rural)

It was decided that the sample used for this survey should be a sub-sample of the 600 Enumeration Areas selected in the National Sample Survey of Agriculture 1992/93. Since variability of indicators was assumed constant across districts, it was set that a sub-sample of 10 Enumeration Areas/clusters be selected from each district with PPS and 20 'fresh households' (not a sub-sample of the NSSA households) be selected from each sub-sample of Enumeration Areas/clusters by SRS procedures. This would give a total sub-sample of 240 Enumeration Areas/clusters, with 4800 households.

For the sampling exercise, the 600 NSSA Enumeration Areas were listed by district in order of the NSSA strata to which they belonged. Note that since the sub-sample was being selected, the Enumeration Areas/clusters had to be selected from each of the strata in the district. This was dictated by the way the original sample had been selected in order to make a statistically acceptable estimation of values of the indicators.

Users required that determination of variance be possible at the analysis stage and to enable this, at least 2 Enumeration Areas/ clusters had to be selected from each stratum in the district. The number of strata in a district ranged from 3 to 17. This being the case, it was not possible to maintain a minimum of 10 Enumeration Areas/clusters per district without increasing the sub-sample to beyond 280 clusters. It was therefore decided to select the sub-sample of Enumeration Areas/clusters in proportion to the number of strata in the district. Hence, the number of clusters selected ranged from 6 to 34 per district, where the districts with fewer clusters had more households selected within their clusters than districts with a larger number of clusters. This maintained a minimum of 200 households per district.

The sub-sample of Enumeration Areas/clusters and the households within them were selected through the Simple Random Sampling procedure.

SAMPLING PROCEDURE (Urban)

As mentioned earlier, among the 28 districts, 4 of them are the urban areas of Blantyre City, Lilongwe City, Mzuzu City and the Municipality of Zomba. The National Sample Survey of Agriculture did not cover these areas, and so a fresh sample was drawn for these areas.

The 4 urban areas were considered as 4 independent strata. In each stratum, a list of Enumeration Areas enclosed in it comprised the frame for the selection of sample Enumeration Areas/clusters. Ten clusters were selected from each of these 4 strata independently, with probability proportional to size. A listing of households from each of the selected clusters comprised the frame of households, from which a sample of 20 households was drawn through simple random sampling. Thus, the total sample of urban areas consisted of 40 clusters -- hence 800 households.

Sampling Social Facilities

The second questionnaire on social facilities and distances to various services was administered at village level(rural)/ward(urban) in the cluster selected. The questionnaire was filled out for each village in the Enumeration Area/cluster where households had been selected. The questions were addressed to either the village head or a prominent person in the village/ward.

APPENDIX 2

Nutritional Status

Table A.2a Stunting rates of under-5s (%) using the NCHS/WHO reference, by location and gender

	Percent below -3 SD	Percent below -2 SD	Number of Children
Malawi	24.2 (1.2)	48.3 (1.4)	3548
Gender			
Male	26.9 (1.4)	49.7 (1.6)	1741
Female	21.5 (1.5)	47.0 (1.9)	1807
Region			
North	17.8 (1.8)	46.1 (2.8)	679
Central	26.7 (1.6)	51.5 (1.8)	1587
South	22.8 (2.0)	45.4 (2.4)	1282
Residence			
Urban	19.1 (3.7)	33.5 (3.7)	447
Rural	24.6 (1.2)	49.7 (1.5)	3101
District			
Blantyre	23.8 (6.3)	41.5 (5.8)	201
Chikwawa	16.5 (3.1)	46.1 (7.1)	115
Chiradzulu	24.3 (4.3)	49.8 (10.0)	88
Chitipa	19.2 (3.2)	53.1 (4.5)	113
Dedza	25.7 (1.7)	47.1 (5.5)	169
Dowa	26.5 (8.4)	57.6 (7.2)	149
Karonga	12.1 (4.8)	37.0 (4.8)	107
Kasungu	24.8 (4.0)	51.9 (3.0)	105
Lilongwe	29.7 (2.6)	50.7 (2.9)	481
Machinga	19.4 (2.6)	50.0 (5.2)	142
Mangochi	15.9 (4.9)	37.1 (6.5)	131
Mchinji	33.4 (5.3)	68.5 (3.6)	142
Mulanje	24.8 (6.3)	48.8 (6.2)	76
Mwanza	28.0 (8.4)	54.8 (4.1)	125
Mzimba	21.4 (2.4)	50.7 (5.1)	267
Nkhata Bay	17.0 (5.2)	51.3 (5.8)	86
Nkhotakota	13.8 (5.9)	39.8 (7.3)	26
Nsanje	14.1 (5.5)	40.1 (2.5)	113
Ntcheu	21.2 (4.7)	47.2 (5.8)	133
Ntchisi	32.6 (3.6)	54.1 (4.4)	149
Rumphi	15.2 (4.9)	36.1 (2.6)	106
Salima	24.3 (4.5)	45.5 (4.1)	133
Thyolo	27.8 (8.1)	42.5 (9.3)	77
Zomba	31.2 (3.4)	49.9 (7.1)	214

Standard errors in parentheses

Table A.2 b Wasting rates of under-5s (%) using NCHS/WHO reference, by location and gender

	Percent below -3 SD	Percent below -2 SD	Number of Children
Malawi	2.0 (0.4)	7.0 (0.7)	3532
Gender			
Male	1.9 (0.5)	8.5 (0.9)	1729
Female	2.0 (0.4)	5.6 (1.0)	1803
Regional			
North	2.4 (0.7)	6.3 (1.2)	677
Central	1.6 (0.3)	7.0 (0.9)	1576
South	2.1 (0.8)	7.1 (1.3)	1279
Residence			
Urban	2.1 (1.0)	8.7 (1.5)	440
Rural	2.0 (0.4)	6.8 (0.8)	3092
District			
Blantyre	1.5 (0.7)	5.3 (1.7)	200
Chikwawa	2.7 (2.0)	6.4 (1.9)	116
Chiradzulu	0.0 (0.0)	5.1 (1.4)	87
Chitipa	5.0 (2.2)	9.0 (3.2)	114
Dedza	1.9 (1.2)	9.6 (3.9)	166
Dowa	1.6 (1.3)	7.2 (2.2)	149
Karonga	1.8 (1.2)	5.5 (2.6)	107
Kasungu	0.6 (0.6)	6.8 (1.7)	104
Lilongwe	1.9 (0.7)	8. 1(1.4)	477
Machinga	0.0 (0.0)	3.2 (2.0)	142
Mangochi	0.0 (0.0)	3.4 (1.3)	130
Mchinji	0.0 (0.0)	1.8 (1.1)	141
Mulanje	5.4 (4.1)	12.3 (6.8)	76
Mwanza	2.1 (1.1)	7.7 (2.4)	125
Mzimba	0.3 (0.3)	5.4 (1.9)	263
Nkhata Bay	5.5 (3.3)	5.5 (3 3)	86
Nkhotakota	2.3 (1.6)	6.5 (3.2)	126
Nsanje	3.3 (2.5)	7.8 (2.5)	113
Ntcheu	1.0 (0.9)	4.1 (2.3)	132
Ntchisi	1.8 (0.8)	4.5 (1.3)	149
Rumphi	4.4 (2.4)	8.1 (3.2)	107
Salima	2.9 (2.6)	10.5 (4.5)	132
Thyolo	5.4 (3.0)	13.9 (6.1)	76
Zomba	3.9 (2.5)	10.0 (5.8)	214

Standard errors in parentheses

Table A.2c Underweight rates of under-5s (%) using NCHS/WHO reference, by location and gender

	Percent below -3 SD	Percent below -2 SD	Number of Children
Malawi	8.7 (0.7)	29.9 (1.1)	3654
Gender			
Male	10.4 (1.1)	32.7 (1.5)	1794
Female	7.0 (0.7)	27.1 (1.4)	1860
Regional			
Northern	5.6 (1.1)	20.3 (1.8)	704
Central	8.9 (0.9)	25.0 (1.7)	1631
Southern	9.0 (1.3)	30.8 (1.6)	1319
Residence			
Urban	10.2 (3.4)	24.8 (4.4)	463
Rural	8.5 (0.7)	30.3 (1.1)	3191
District			
Blantyre	11.8 (3.5)	25.2 (4.5)	205
Chikwawa	10.0 (3.8)	24.5 (4.6)	122
Chiradzulu	9.3 (2.1)	32.5 (6.6)	96
Chitipa	5.5 (2.5)	25.3 (3.0)	119
Dedza	7.6 (2.8)	29.9 (4.4)	174
Dowa	9.5 (3.0)	24.7 (7.9)	152
Karonga	3.3 (1.8)	16.6 (3.7)	112
Kasungu	7.9 (2.3)	27.9 (5.6)	105
Lilongwe	10.1 (1.8)	34.8 (2.8)	505
Machinga	2.6 (1.2)	27.7 (3.9)	143
Mangochi	5.9 (2.5)	25.7 (5.4)	131
Mchinji	8.4 (2.5)	39.9 (4.5)	144
Mulanje	13.4 (7.3)	35.9 (6.0)	77
Mwanza	13.9 (5.1)	38.9 (3.6)	128
Mzimba	7.4 (1.8)	25.3 (2.9)	276
Nkhata Bay	7.1 (3.1)	16.7 (3.9)	88
Nkhotakota	4.6 (3.2)	23.1 (6.5)	127
Nsanje	9.7 (3.6)	36.6 (2.3)	114
Ntcheu	7.1 (1.9)	28.8 (3.6)	135
Ntchisi	14.0 (2.2)	39.6 (3.9)	151
Rumphi	2.7 (1.4)	22.2 (4.4)	109
Salima	9.5 (3.3)	32.0 (3.9)	138
Thyolo	3.7 (2.0)	30.2 (4.7)	81
Zomba	11.6 (2.3)	31.6 (2.0)	222

Standard errors in parentheses

APPENDIX 3

Vitamin A

Proportion of children who have eaten groundnuts and oil with one vitamin A-rich food and the proportion who have eaten at least three foods with vitamin A in the week preceding the survey.

Table A3 Consumption of vitamin, A by district

	Eaten at least one food with vitamin A and Groudnuts	Eaten at least one food with vitamin A and oil	Eaten at least three foods with vitamin A
District			
Chitipa	33.0 (8.7)	33.0 (8.7)	68.9 (7.6)
Karonga	15.9 (6.3)	15.9 (6.3)	35.6 (5.7)
Mzimba	30.6 (7.2)	30.6 (7.2)	64.6 (4.8)
Nkhata Bay	31.7 (8.1)	31.7 (8.0)	77.9 (9.2)
Rumphi	31.0 (10.5)	31.0 (10.5)	62.0 (12.7)
Dedza	10.1 (3.4)	23.1 (4.3)	54.4 (6.8)
Dowa	27.8 (9.3)	27.8 (3.2)	71.0 (9.3)
Kasungu	20.6 (4.1)	15.2 (2.8)	59.7 (6.7)
Lilongwe	20.7 (2.8)	27.8 (3.0)	61.1 (4.2)
Mchinji	23.5 (8.7)	13.2 (5.9)	47.7 (7.8)
Nkhotakota	17.7 (8.7)	11.5 (6.1)	69.1 (6.0)
Ntcheu	14.6 (6.1)	16.5 (6.1)	68.7 (7.5)
Ntchisi	10.6 (2.3)	15.8 (2.9)	55.8 (6.9)
Salima	3.2 (1.9)	11.3 (6.5)	58.8 (10.7)
Blantyre	13.8 (4.4)	51.1 (5.8)	62.3 (8.3)
Chikwawa	23.2 (7.1)	19.3 (5.4)	62.3 (9.7)
Chiradzulu	29.0 (10.9)	30.8 (7.3)	70.4 (8.7)
Machinga	16.7 (7.4)	28.5 (10.2)	51.0 (6.4)
Mangochi	12.4 (6.4)	18.9 (6.3)	72.0 (4.9)
Mulanje	18.2 (5.3)	13.3 (5.9)	60.1 (7.9)
Mwanza	4.6 (2.0)	5.9 (3.0)	34.6 (9.7)
Nsanje	12.6 (6.7)	31.7 (5.8)	59.9 (5.8)
Thyolo	39.8 (12.2)	32.8 (11.8)	89.9 (3.8)
Zomba	49.3 (7.3)	36.2 (3.8)	79.3 (2.4)

Standard errors in parentheses

APPENDIX 4

Salt Iodization

Table A.4 Households (%) with salt of an iodine content at least 20 ppm, by district

District	Percentage	Number of salt samples
Chitipa	84.4 (7.8)	31
Karonga	84.9 (8.4)	32
Mzimba	79.2 (7.8)	62
Nkhata Bay	100.0 (0.0)	21
Rumphi	96.5 (2.9)	18
Dedza	54.7 (7.4)	51
Dowa	77.2 (9.8)	23
Kasungu	69.0 (13.3)	24
Lilongwe	61.7 (4.4)	140
Mchinji	74.6 (10.0)	20
Nkhotakota	76.9 (6.9)	25
Ntcheu	55.9 (6.9)	44
Ntchisi	22.0 (5.4)	24
Salima	66.0 (10.7)	26
Blantyre	69.0 (7.9)	48
Chikwawa	25.8 (4.8)	19
Chiradzulu	54.1 (11.4)	18
Machinga	17.6 (7.0)	55
Mangochi	59.0 (9.6)	34
Mulanje	59.4 (18.2)	25
Mwanza	48.1 (15.1)	16
Nsanje	22.4 (8.9)	18
Thyolo	65.3 (17.2)	18
Zomba	44.5 (14.2)	53

Standard errors in parentheses

These figures need to be treated with caution because of very high standard errors. Those with high standard errors also have wide ranges of confidence limits and therefore, the percentages can be anywhere between those wide confidence limits. For example, Mulanje district has a standard error of 18.2%. This implies that the lowest confidence level is 4.9% and the highest is 76.3%, and the real value (of households consuming iodized salt of 20 ppm) can be anywhere within this range. Therefore, most of these results at district level have to be read with care.

APPENDIX 5

Water and Sanitation

A.5a Accessibility to safe water (%), by district

District	Access to Safe Water (<0.5km)	Access to Safe Water (<1km)	Number of Observations
Chitipa	38.2	47.1	204
Karonga	57.1	67.5	195
Mzimba	25.0	35.6	432
Nkhata Bay	28.8	29.0	199
Rumphi	67.0	80.0	208
Dedza	23.1	32.1	270
Dowa	19.6	29.7	200
Kasungu	9.9	16.6	196
Lilongwe	50.8	58.9	709
Mchinji	30.6	35.0	207
Nkhotakota	30.5	47.2	202
Ntcheu	50.7	60.9	210
Ntchisi	4.2	13.7	224
Salima	16.1	30.0	200
Blantyre	59.9	68.9	390
Chikwawa	25.1	39.5	200
Chiradzulu	24.2	44.3	210
Machinga	26.1	43.5	254
Mangochi	22.7	34.8	237
Mulanje	52.2	73.9	200
Mwanza	4.3	4.9	210
Nsanje	63.7	87.7	210
Thyolo	18.2	25.1	230
Zomba	55.0	67.4	407

A.5b Type of water facility by district

	Piped in Dwelling	Public Tap	Bore hole	Protected Well/ Spring	Unprotected Well/ Spring	River/ Stream	Lake/ Dam	Other
Malawi	**2.1**	**16.4**	**27.8**	**5.1**	**35.7**	**11.1**	**1.7**	**0.2**
District								
Chitipa	-	22.0	17.5	9.1	22.0	29.3	-	-
Karonga	-	34.2	31.9	2.5	20.6	9.3	1.4	-
Mzimba	4.0	6.6	28.8	2.1	53.2	3.6	-	1.8
Nkhata Bay	2.3	15.9	10.4	0.3	66.2	2.4	2.4	-
Rumphi	0.5	46.7	31.5	3.9	2.7	14.0	-	0.6
Dedza	0.4	0.6	31.1	6.5	33.8	27.7	-	-
Dowa	1.9	0.8	21.8	5.2	61.4	8.9	-	-
Kasungu	1.6	9.4	4.2	5.0	71.8	7.9	-	-
Lilongwe	5.6	12.2	36.7	7.1	32.8	5.3	0.3	-
Mchinji	1.2	0.4	33.5	1.1	59.6	4.3	-	-
Nkhotakota	4.1	29.0	11.0	3.1	43.9	8.4	0.5	-
Ntcheu	-	27.1	31.9	3.9	29.4	7.6	-	-
Ntchisi	-	1.5	16.3	0.7	68.0	13.5	-	-
Salima	1.3	0.9	26.7	8.4	30.6	24.4	1.8	6.0
Blantyre	5.7	54.6	1.9	6.9	19.5	11.3	-	-
Chikwawa	-	9.8	38.3	-	38.1	13.7	-	-
Chiradzulu	0.4	9.5	36.6	1.6	45.3	6.5	-	-
Machinga	0.8	16.7	29.3	4.4	37.8	11.1	-	-
Mangochi	-	5.3	24.5	7.4	30.7	8.7	23.4	-
Mulanje	-	23.3	49.9	3.4	10.2	13.3	-	-
Mwanza	-	-	4.7	0.2	47.6	47.5	-	-
Nsanje	1.6	5.1	82.1	2.2	-	8.9	-	-
Thyolo	0.2	10.8	5.2	13.0	56.6	13.4	0.7	-
Zomba		19.6	38.8	5.4	26.5	5.8	-	0.1

A.5c Access to adequate sanitation (%), by district

District	Access to Adequate Sanitation	Access to Sanitation (with Pit Latrine)	Number of Observations
Chitipa	0.7	75.1	204
Karonga	2.6	67.0	195
Mzimba	5.6	55.5	432
Nkhata Bay	2.9	56.4	199
Rumphi	3.8	84.4	208
Dedza	1.4	81.3	270
Dowa	1.0	86.0	200
Kasungu	4.2	63.0	196
Lilongwe	7.0	75.4	709
Mchinji	1.6	67.2	207
Nkhotakota	6.9	69.1	202
Ntcheu	7.9	85.4	210
Ntchisi	17.6	74.7	224
Salima	4.5	60.0	200
Blantyre	13.5	85.8	390
Chikwawa	2.2	38.0	200
Chiradzulu	0.9	75.4	210
Machinga	11.2	68.3	254
Mangochi	4.0	71.0	237
Mulanje	1.0	69.8	200
Mwanza	0.9	35.9	210
Nsanje	6.1	48.0	210
Thyolo	4.2	64.9	230
Zomba	5.5	88.4	407

APPENDIX 6

Description of the sample

A.6 Single-Year Age Distribution of the Household Population by Sex (Weighted)

	Males		Females			Males		Females	
Age	Number	%	Number	%	Age	Number	%	Number	%
<1	456	4.9	434	2.9	36	136	1.3	115	0.7
1	529	5.0	508	3.5	37	117	1.2	123	0.9
2	449	4.3	522	3.4	38	101	1.1	112	0.8
3	384	3.9	446	3.2	39	85	0.8	110	0.8
4	365	3.3	359	2.4	40	119	1.3	168	1.2
5	362	3.3	389	2.6	41	65	0.6	79	0.5
6	421	4.3	428	3.2	42	100	0.9	117	0.8
7	342	3.3	389	2.7	43	93	1.0	100	0.8
8	353	3.4	388	2.7	44	63	0.7	80	0.6
9	329	3.4	362	2.5	45	99	1.0	113	0.9
10	329	3.2	553	3.9	46	75	0.7	94	0.7
11	287	2.9	550	4.0	47	76	0.8	80	0.5
12	300	3.0	564	3.7	48	86	0.9	97	0.7
13	269	2.6	499	3.6	49	72	0.6	79	0.6
14	251	2.6	515	3.7	50	80	0.7	102	0.7
15	210	2.0	477	3.6	51	44	0.4	50	0.3
16	2	0.0	178	1.2	52	68	0.7	64	0.4
17	2	0.0	187	1.3	53	66	0.6	57	0.4
18	9	0.0	268	1.9	54	46	0.5	48	0.3
19	17	0.2	252	1.8	55	74	0.8	78	0.5
20	41	0.3	278	1.9	56	40	0.4	51	0.4
21	76	0.8	263	1.9	57	42	0.5	51	0.3
22	92	1.1	263	1.9	58	41	0.4	59	0.5
23	133	1.4	251	1.8	59	35	0.3	52	0.5
24	103	1.0	209	1.5	60	67	0.6	113	1.0
25	168	1.7	226	1.7	61	29	0.3	41	0.3
26	109	1.0	166	1.0	62	36	0.4	45	0.3
27	161	1.5	155	1.0	63	47	0.6	48	0.4
28	150	1.7	176	1.2	64	32	0.4	38	0.3
29	89	0.8	129	0.8	65	60	0.5	88	0.7
30	143	1.4	218	1.7	66	19	0.2	23	0.1
31	153	1.3	176	1.3	67	24	0.2	23	0.2
32	153	1.6	149	0.9	68	38	0.4	47	0.2
33	136	1.2	147	1.0	69	38	0.3	35	0.2
34	86	0.9	86	0.6	70+	246	2.3	219	1.4
35	164	1.6	188	1.4					
					Total	**10083**	**100.0**	**14142**	**100**

APPENDIX 7

Household Questionnaire

Form MDG/95/2
MALAWI GOVERNMENT
National Statistical Office

CONFIDENTIAL

MID - DECADE GOALS SURVEY, 1995

PART A: IDENTIFICATION

Survey Number		*1*	*(1)*
Region/District			*(2)*
Urban/Rural			*(1)*
Stratum			*(1)*
Cluster Number			*(3)*
Township/Village			
Household Number			*(2)*
Name and sex of Head of Household			*(1)*
Age of head of household			
Number of Rooms (in main dwelling)			*(1)*
Floor Material			*(1)*
Date of interview			*(6)*

Urban/Rural
Urban=1
Rural=2

Floor Materials
(i) Wood/tile =1
(ii) Planks/Concrete =2
(iii) Dirt/Straw =3
(iv) Other =6

Sex of Household Head

Male = 1
Female = 2

CLUSTER NO_____ HOUSEHOLD NO._____

PART B:: PARTICULARS OF HEAD OF HOUSEHOLD; WATER AND SANITATION,

1. What is the main occupation of the head of household?

(i)	farming (owner-operated)	1
(ii)	tenant	2
(iii)	Ganyu labour (Agric)	3
(iv)	Ganyu labour (Non agric)	4
(v)	Paid employment (other)	5
(vi)	Self employed (not farming)	6
(vii)	Other (specify)	7
(viii)	None	8

☐ (1)

2. What level of education did he/she reach?

Standard 1 = S1 Form 1 = F1 Univ = U1
Standard 2 = S2 etc Form 2 = F2 etc None 99

☐☐ (2)

3. How many people usually live in this household? ☐☐ (2)

4. What is the main source of drinking water for members of your household at this time?

(a) Piped-in dwelling	=1
(b) Public Tap	=2
(c) Borehole	=3
(d) Well/spring (protected)	=4
(e) Well/spring (unprotected)	=5
(f) River/stream	=6
(g) Lake/Dam	=7
(h) Other (specify)	=9 .....

☐ (1)

5. How far is this source from your dwelling?

(a) On Premises	=1
(b) Less than 100 metres	=2
(c) 100-<500 metres	=3
(d) 500 metres to 1 kilometre	=4
(e) More than 1 kilometre	=5
(f) Don't know	=9

☐ (1)

6. What kind of toilet facility does your household use?

(a) Flush to Sewage system	= 1
(b) Flush to Sceptic Tank	= 2
(c) VIP Latrine	= 3
(d) Latrine with sanplat	= 4
(e) Traditional pit latrine	= 5
(f) No facility	= 0 Go to 8

☐ (1)

7. How far is the facility from your dwelling?

(a) In dwelling	=1
(b) <50m away	=2
(c) 50m or more away	=3
(d) Don't Know	=9

☐ (1)

8. When do you usually wash your hands?

(a) before meals	= 1
(b) after meals	= 2
(c) before and after	= 3
(d) other	= 4

☐ (1)

CLUSTER NO_____ HOUSEHOLD NO_____

PART C:

1. Applicable to women aged 10 years or more who BELONG TO the household.

a	b	c	d						
Line No.	List names of women	Age in yrs	Children ever-born to woman						
			Total children	Living in the household		Living Elsewhere		Dead	
				Male	Female	Male	Female	Male	Female
(3)		(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
1.0									
2.0									
3.0									
4.0									
5.0									
6.0									
7.0									
8.0									
9.0									
10.0									
11.0									

CLUSTER NO _____ HOUSEHOLD NO _____

PART C: Cont'd 2. Woman's Pregnancy History

a	b	c		d								e
Wom. Line No.	List names of women	Pregnancy outcome Live birth =1 Stillbirth =2 Miscarriage/ abortion =3		Live births only								
				Sex of Child M=1 F=2	Date of birth dd	mm	yy	Where Delivered?	Who assisted?	Received Vit. A Capsule Yes = 1 No = 2 DK = 9 N/A= 8	Still alive Yes=1 No=2	Age at Death (Months)
(3)			(1)	(1)	(2)	(2)	(2)	(1)	(1)	(1)	(1)	(3)
		Last										
		Next last										
		Sec. last										
		Last										
		Next last										
		Sec. last										
		Last										
		Next last										
		Sec. last										

Home	=1
TBA House	=2
Health Centre	=3
Hospital	=4
Other (specify)	=9
.....	

Nobody	=1
Family member	=2
TBA	=3
Nurse/Midwife	=4
Ward Attendant	=5
Med. Assistant/Clinical Officer/Physician	=6
Other (Specify)	=9
.....	

HOUSEHOLD NO _____CLUSTER NO

PART D: PARTICULARS OF CHILDREN 0 - 15 YEARS OF AGE

Respondent is Mother = 1, Caretaker = 2		(1)
MOTHER/CARETAKERS NAME	LINE NO ... ... HIGHEST LEVEL OF EDUCATION ATTAINED	(2)

	CHILDREN 0-15 YEARS OF AGE					PERSONS AGED 5 - 15 YEARS				
a	b	c	d	e	f	g				
Line NO.	List names of children aged 15 yrs or below for whom woman is responsible Start with the youngest child	Rel. to H/Hold Head	Sex M=1 F=2	Date of Birth	Age in Yrs	Education				
						Ever Attended School? Yes=1 No=2 DK=9	Now in School? Yes=1 No=2 DK=9	Highest level and class attended	Attended Sch. last Year? Yes=1 No=2 DK=9	Highest level and class attended last year
(3)		(1)	(1)	(6)	(2)	(1)	(1)	(2)	(1)	(2)

Son/daughter = 3.0
(Orphan = -.1)
Grandchild = 4.0 or 4.1
Other relative = 5.0 or 5.1
No relative 6.0 or 6.0

Std 1 = S
Std 2 = S2
Std 3 = S3
etc.

Form 1 = F1
Form 2 = F2
Form 3 = F3
etc.

Univ = U1
N/A = 88
None = 99

CLUSTER NO. _____ HOUSEHOLD NO_____

PART E: MOTHERS DETAILS

(a) Applicable only to mothers with children under 5 years of age and NOT caretakers

1. Name of mother .....

2. Mother line NO. ☐☐ (3)

3. Do you have a card or any document with your own immunisation listed? (1)

Yes (seen)	1	
Yes (not seen)	2	
No	3	
Don't Know	9	

4. When you were pregnant with your last child, did you receive any injection (e.g. to prevent him /her from getting convulsions after birth, an anti-Tetanus shot, an injection at the top of the shoulder)? (1)

Yes	1	
No	2	
Don't Know	9	

5. If yes, how many doses of TT did you receive during your last pregnancy? ☐ (1)

Note:

If the mother reports two or more TT injections during the last pregnancy, STOP here and continue with question 10.

CLUSTER NO_____HOUSEHOLD NO_____
PART E: Cont'd

6. Did you receive any TT injection (at the top of your shoulder) at any time before your last pregnancy or between pregnancies?

Yes	1		
No	2		(1)
Don't Know	9		

7. If yes, how many doses? ☐ (1)

8. When was the last dose received?
Record month and year the last dose was received OR if not known the number of years ago.

Month			(2)
Year			(2)
Years ago			(2)
Can't Remember	99		

9. Total doses given in lifetime (add up responses to Q.5 and Q.7) ☐ (1)

10. When your child is ill with a cold and/or cough, what signs or symptoms would lead you to take him/her to a health centre/clinic/hospital? Do not prompt.

When he/she:		Yes	NO
(a)	Has a blocked nose	1	2
(b)	Has trouble sleeping/eating	1	2
(c)	Has a fever	1	2
(d)	Is breathing fast	1	2
(e)	Has difficulty breathing	1	2
(f)	Is ill for a long time	1	2
(g)	Other (Specify).....	1	2
(h)	Don't Know	1	

CLUSTER NO____ HOUSEHOLD NO_____

PART F: DETAILS OF CHILDREN UNDER 5 YEARS OF AGE

a	b	c	d	e							f	
Child's Line No.	Names of children under 60 months of age	Sickness (past two weeks?) Yes=1 No=2 Dk=9 If no, go to g	If Yes What Type?	Did the Child drink any of the following during last episode of sickness? Yes=1, No=2, N/A=6, DK=9							During Child's Sickness	
				Breast Milk	Gruel	SSS	ORS sachet	Infant formula or milk	Water	Other	Amount of fluids taken	Amount of food taken
(3)		(1)	(1)	(1)	(1)	(1)	(1)		(1)	(1)	(1)	(1)

Fever =1
Diarrhoea =2
Vomiting =3
Fever and Diarrhoea=4
Fever and Vomiting =5
Fever, Diarrhoea and Vomiting =6
Diarrhoea and Vomiting =7
Not applicable =8
Other (Specify) =9
.....

phala
thobwa
rice water

s s s = sugar salt solution

other= sweetened fluids
fizzies,
sweet tea
bought fruit juice

None =1
Much less =2
Somewhat less =3
About the same =4
More =5
Don't Know =9

CLUSTER NO_____ HOUSEHOLD NO_____

PART F: Cont'd : DETAILS OF CHILDREN UNDER FIVE YEARS OF AGE

	For Children aged below 60 months				
g	h	i	j	k	l
Child's line No.	Names of Children aged below 60 months	Did the child ever receive a Vitamin A Capsule like this one? Yes=1, No=2, DK=9	If yes, How many months ago did (name) take the last capsule N/A = 88 DK = 99	Do you have cooking oil in your house? Yes (seen) =1 Yes (not seen)=2 No =3 N/A =8	Did the child eat food prepared with oil during the last 7 days Yes=1 No=2 N/A=8 DK=9
(3)		(1)	(2)	(1)	(1)

CLUSTER NO_____ HOUSEHOLD NO _____

PART F: Cont,d DETAILS OF CHILDREN UNDER FIVE YEARS OF AGE

2. Name of child .....

3. Child line No. | | | (3)

4. Have you (mother or caretaker) heard messages which promote food rich in Vitamin A which is good for child survival? (1)

Yes	1	
No	2	
N/A	8	
DK	9	

If No or DK to Q4, please go to Q6

5. If yes, can you mention some of them? (a) Dark leafy vegetables

Do not prompt

Food Codes

Amaranthas (Bononge)	01	(2)
Cassava leaves	02	(2)
Pumpkin leaves	03	(2)
Pulses leaves	04	(2)
Potato leaves	05	(2)
Rape	06	(2)
Chinese cabbage	07	(2)
Mustard (Mpiru)	08	(2)
Other (Specify).....	09	(2)
Not applicable	88	(2)

PART F: Cont'd DETAILS OF CHILDREN UNDER FIVE YEARS OF AGE

5. (b) Yellow,Orange, green Fruits and Vegetables

	Food Codes	
Pumpkins	1	(1)
Carrots	2	(1)
Bananas	3	(1)
Sweet Potatoes	4	(1)
Mangoes	5	(1)
Pawpaws	6	(1)
Other (Specify).....	9	(1)
Not applicable	8	(1)

6. During the last 7 days did (name of child) eat any of the following food? (a) Dark leafy Vegetables

Do prompt

	Yes	No	DK	Produced	Bought	Gift
Amaranthas (Bonongwe)	1	2	9	1	2	3
Cassava leaves	1	2	9	1	2	3
Pumpkin leaves	1	2	9	1	2	3
Pulses leaves	1	2	9	1	2	3
Potato leaves	1	2	9	1	2	3
Rape	1	2	9	1	2	3
Chinese cabbage	1	2	9	1	2	3
Mustard (Mpiru)	1	2	9	1	2	3
Groundnuts	1	2	9	1	2	3
Other (Specify).....	1	(1)				

CLUSTER NO_____ HOUSEHOLD NO_____

PART F: Cont'd DETAILS OF CHILDREN UNDER FIVE YEARS OF AGE

6. (b) Yellow, Orange, green fruits and Vegetables

	Yes	No	DK	Produced	Bought	Gift
Pumpkins	1	2	9	1	2	3
Carrots	1	2	9	1	2	3
Bananas	1	2	9	1	2	3
Sweet Potatoes	1	2	9	1	2	3
Mangoes	1	2	9	1	2	3
Pawpaws	1	2	9	1	2	3
Other (Specify).....	1					

(1)

7. Has (Name of the child) ever been breast-fed?

Yes	1	
No	2	
DK	9	

(1)

8. If yes, Is he/she still being breast-fed?

Yes	1	
No	2	
NA	6	

(1)

CLUSTER No _____ HOUSEHOLD No _____

9. Since this time yesterday, did (Name of the child) receive the following?

Please prompt:

		Yes	No	DK	
a	Received breast milk	1	2	9	(1)
b	Vitamins, Mineral Supplement or medicine	1	2	9	(1)
c	Plain water	1	2	9	(1)
d	Sweetened, flavoured water, fruit juice, sweet tea	1	2	9	(1)
e	ORS-sachet	1	2	9	(1)
f	Tinned, Powdered or fresh milk or infant formula	1	2	9	(1)
g	Any other liquids (specify).....	1	2	9	(1)
h	Solid or semi-solid (mushy) food	1	2	9	(1)
i	Sugar salt solution	1	2	9	(1)
j	Received only breast milk	1	2	9	(1)

10. Since this time yesterday, has (name of the child) been given anything to drink from a bottle with a nipple or a teat?

Yes	1		
No	2		(1)
DK	9		

CLUSTER NO_____ HOUSEHOLD NO_____

PART F: Cont'd DETAILS OF CHILDREN UNDER FIVE YEARS OF AGE

11. (a) Was (name) immunised?

If no to (a) go to next child or part G

Yes	1		(1)
No	2		
DK	9		

(b) If yes, is there a vaccination record card?

If YES, go to (c)
If NO, go to (d)

Yes	1		(1)
No	2		
DK	9		

(c) Please complete for each of the following

		Yes=1 No=2 N/A=6 DK=9	Date of Immunisation			
			Day	Month	Year	
i	BCG					(7)
ii	DPT 1					(7)
iii	DPT 2					(7)
iV	DPT 3					(7)
V	OPV 1					(7)
Vi	OPV 2					(7)
Vii	OPV 3					(7)
Viii	Measles					(7)
(ix) BCG Scar? Yes=1, No=2, Not examin=9			(1)			

Go to part G

CLUSTER NO _____ HOUSEHOLD NO_____

Part F: Cont'd DETAILS OF CHILDREN UNDER FIVE YEARS OF AGE

11 (d) If no to QN (b) ask mother/caretaker the following questions:

(1) Has (mention name of the child) ever been given BCG Vaccination aganist Tuberculosis - that is, an injection in the left shoulder that caused a scar?

Yes	1		(1)
No	2		
DK	9		

(2) Has (mention name of the child)ever been given "Vaccination injections; that is an injection in the thigh or buttocks to prevent him/her from getting Tetanus, Whooping cough, Diphtheria?

Yes	1		(1)
No	2		
DK	9		

If yes, how many times [ ] (1)

(3) Has (mention name of the child) ever been given any "Vaccination drops" to protect him/her from getting diseases - that is, polio?

Yes	1		(1)
No	2		
DK	9		

If yes, how many times [ ] (1)

(4) Has (mention name of the child) ever been given "Vaccination injections, that is, a shot in the arm, at the age of 9 months or older - to prevent him/her from getting measles?

Yes	1		(1)
No	2		
DK	9		

APPENDIX 8

Questionnaire Social Facilities

Form MDG/95/3
MALAWI GOVERNMENT
National Statistical Office

CONFIDENTIAL

MID - DECADE GOALS SURVEY, 1995
(Social Facilities)

PART A: IDENTIFICATION

Survey Number		2	*(1)*
Region/District			*(2)*
Urban/Rural			*(1)*
Stratum Number			*(2)*
Cluster Number			*(3)*
Township/Village			*(1)*

PART B: AVAILABILITY OF SOCIAL FACILITIES

1. How far are the following social facilities from this Urban EA/village?

	In this Urban EA/Village	≤ 1 km	1-3 km	3-5 km	>5 km
Health Centre					
	0	1	2	3	4
Under 5 Clinic					
	0	1	2	3	4
Nursery School					
	0	1	2	3	4
Primary School					
	0	1	2	3	4
Secondary School					
	0	1	2	3	4
Grocery Store					
	0	1	2	3	4
Homecraft Centre					
	0	1	2	3	4
Market					
	0	1	2	3	4
Bus stage/station					
	0	1	2	3	4

2. Do you have a community Health Volunteer in this village?

Yes	1	
No	2	
Don't Know	9	

(1)

3. Is there a Health Surveillance Assistant in this village?

Yes	1	
No	2	
Don't know	9	

If yes, how often does he visit the village?

Living in the village	1	
At least once a month	2	
Every two months	3	
Less Frequently	4	

(1)

4. Do you have a Community based Growth Monitoring Centre in this village?

Yes		
No		
Don't Know		

PART C: DECLARATION

I declare that the information contained herein is correct			
Function	Name	Signature	Date
Enumerator			
Supervisor			
Office checker			
Office verifier			
Data entry Clerk			

unicef

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