Vulnerable Children in Tanzania and where they are

Report to UNICEF Tanzania

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Table of Contents

List of Tables

List of Figures

List of Maps

List of Abbreviations

n.s.	Not Significant
DHS	Demographic and Health Survey
HBS	Household Budget Survey
NBS	National Bureau of Statistics
p. value	Probability value
PEDP	Primary Education Development Plan
PHDR	Poverty and Human Development Report
REPOA	Research on Poverty Alleviation
Std Err	Standard Error
TRCHS	Tanzania Reproductive and Child Health Survey
UNICEF	United Nations Children Fund
WB	World Bank

Summary

This report uses data from the population census 2002 and the household budget survey of 2000/01, as well as the recent report of the 2004/05 Demographic and Health Survey to explore aspects of children's vulnerability in Tanzania. To date, there has been limited quantitative information on vulnerability of children in Tanzania. Recent data from census and national surveys has made it possible to look in greater detail at smaller sub-groups of populations. These data lend further insight into vulnerability of children in general, and especially of some groups of children that according to available literature, are believed to be the most vulnerable.

This report starts by briefly reviewing the general poverty situation in Tanzania. It then addresses the spatial dimensions of variables related to children's vulnerability and relates them to existing geographic disparities in income poverty at the district level. The following specific aspects of vulnerability for which recent data are available are discussed:

- education, both in terms of access to, and quality
- working status of children
- malnutrition
- under-five mortality

The report then focuses on specific groups of children classified to be vulnerable. Using the small area methodology for spatial poverty mapping, an attempt is made to assess their poverty status - essentially, a comparative analysis of household characteristics that are commonly used as proxy indicators for assessing poverty, and of where the vulnerable and non-vulnerable children reside. The following specific groups of vulnerable children are discussed:

- children with disabilities
- orphaned children, both single and double orphans
- children living in a child-headed household
- children living in households where the only adult is over 60 years of age.

Throughout this report, unless otherwise specified, children are defined as those below eighteen years of age.

Because of the specific purpose of this analysis, it is important that its limitations be borne in mind. The analysis reported here is based on on-going spatial poverty mapping work in order to assess the extent to which there are marked geographic areas of Tanzania where there is a congruence of characteristics which would suggest children are more vulnerable there than elsewhere. This is, therefore, not a comprehensive analysis of children's vulnerability, nor does it review all available recent literature pertaining to children's vulnerability in Tanzania. Furthermore, the analysis is limited to selected specific groups of vulnerable children. The following data sources were explored: 2002 census data; 2000/2001 Household Budget Survey; Demographic and Health Survey data from 1996, 1999, and preliminary data from 2004; and routine statistics from the Ministry of Education and Culture. At the time when this study was carried out, the most recent 2004/05 DHS data had not yet been officially released, and the analysis is limited to available preliminary data.

The report is divided into four parts. Part One briefly reviews the general poverty situation in Tanzania. Part Two addresses the spatial dimensions of children's vulnerability – regarding education, working status, nutritional status and under-five mortality - and relates it to existing geographic disparities in income poverty at the district level. Part Three focuses on specific groups of children classified to be vulnerable – children with disabilities, orphaned children, children living in child-headed households and children living in households with only elderly adults. Using the small area methodology for spatial poverty mapping, an attempt is made to assess the poverty status of groups of vulnerable children. A discussion of some of the salient findings is presented in Part Four.

The basic needs poverty line in 2000/01 was estimated to be TShs. 262 per capita per day. Districts with the highest poverty rates, with over 50 per cent of the population below the poverty line, are Bunda, Geita, Musoma, Serengeti, Kisarawe, Singida, Namtumbo, Manyoni, Meatu, Lindi and Babati. Districts with the lowest rates of poverty, with less than 20 per cent of the population below the poverty line, are Mbarali, Arusha, Kinondoni, Lushoto, Ilala, Bukoba rural and Arumeru District. However, some of these better-off districts have the highest number of poor people per km^2, an important factor to bear in mind when considering the costs of interventions to address poverty and the allocation of resources. Overall, districts in Central Tanzania (from Northern to Southern Highlands) are better off; those in North West and in the South East are poorer.

The results from the analysis of poverty and other aspects of children's vulnerability are mixed. But they do draw attention to how different factors of poverty combine to increase children's vulnerability. Some key findings follow. They point to specific actions which need to be taken to tackle aspects of vulnerability, especially of disabled children's education, and specific geographic areas are identified which need more focused attention if children's vulnerability is to be addressed.

Education

PEDP has induced major achievements in primary education. Overall gross and net enrolment has surpassed PRS targets earlier than planned, though there were considerable differences among districts in 2002. In 2002 the study observed a significant correlation between low enrolment ratios and higher levels of income poverty. But this relationship did not hold for 2004, implying that the poorer districts have benefited from PEDP.

Data also suggests that poorer districts had larger proportions of children who were working in 2002 and these districts also had low levels of net enrolment in 2004. Surprisingly, there is hardly any difference in years of primary schooling missed, between children of the same age who are part-time workers and those who do not work.

Primary school attendance of children with disabilities lags far behind those without disabilities, especially in the case of disabled children in urban areas.

Bearing in mind the limitations of cross-sectional data in assessing impacts, this study suggests that there are minimal differences in years of primary schooling of orphaned children and those who are not orphaned, nor among different types of orphanhood. Similarly, there seems to be little difference in education between children in child-headed households and those in households headed by adults, nor

among children living in households with children and the elderly only and those in other types of households.

Disability and orphanhood

The probabilities of being disabled or being orphaned are not equally spread across the country. Higher rates of disability in children are found in Ngara and Songea rural, though these are not necessarily districts having the largest numbers of children with disabilities. Districts with the largest numbers of disabled children are found in the Northwestern part of the country – Kibondo, Geita and Kasulu for example.

Larger proportions of children who have been orphaned are found in districts East and West of Lake Victoria, in and around Dar es Salaam and in the Southern Highlands (Iringa and Mbeya). Female HIV/AIDS prevalence is strongly associated with maternal orphanhood, but a similar relationship is not seen in the case of paternal orphanhood.

Analysis at the individual level indicates that compared to children who have not been orphaned, orphaned children are slightly more likely to be economically active especially at pre- and post primary school ages.

Children in child-headed households are more likely to be working than those in adult-headed households, especially in the urban areas. There are no differences however in comparing children living in households with children and the elderly only with children in other types of households.

Compared to children without disabilities, larger proportions of children with disabilities are living below the poverty line, both in Dar es Salaam as well as in rural areas. Overall orphaned children are only slightly poorer than other children, though these differences are larger among orphaned children compared with others in Dar es Salaam and Pwani.

Nutrition and Mortality

There has been a recent improvement in the nutritional status of children, in particular in reduced rates of stunting (low height for age, commonly used as an indicator of chronic malnutrition) among rural children. This decline was more noticeable in the less poor regions of the country. Analysis suggests that during the 1990s, the prevalence of stunting of children from poorer households actually increased whereas that of children from less poor households decreased. Under-five mortality rates by district calculated from the 2002 population census are highly correlated with regional rates of stunting[1]. These same districts also tend to have higher proportions of children with disabilities and of maternal orphans, and lower proportions of female adults (15 years and above) who are literate.

It is noteworthy that high levels of stunting and under-five mortality do not necessarily occur in the poorer regions and districts. Iringa for example, has relatively high rates of stunting in children and high under-five mortality rates, but also a relatively low proportion of households below the poverty line.

In general, there is some relationship between income poverty and other aspects of poverty. But the relationship is stronger between income poverty and lack of change in malnutrition and under-five mortality. Districts with lower proportions of households below the poverty line seem to have made more

[1] Available data on child nutrition from the demographic and health surveys do not permit disaggregation at district level.

progress towards a reduction in under-five mortality. And similarly, regions with relatively fewer poor households made more progress in reducing the prevalence of stunting.

Mapping aspects of vulnerability

The following map shows the top 20 and bottom 20 districts for a set of indicators starting with the poverty headcount, i.e. the percentage of the population below the poverty line. Districts with the best indicators are shown in shades of green and those with the worst in shades of red. Other indicators mapped are: percentage of children who are working, pupil/classroom ratio, percentage of children with disability, percentage of children who are orphaned, percentage of children in child-headed households.

The maps show an association between higher rates of poverty and a higher proportion of children working, higher pupil/classroom ratio and higher proportion of children with a disability. On the other hand, orphanhood and the proportion of households headed by children are less prevalent in poorer areas.

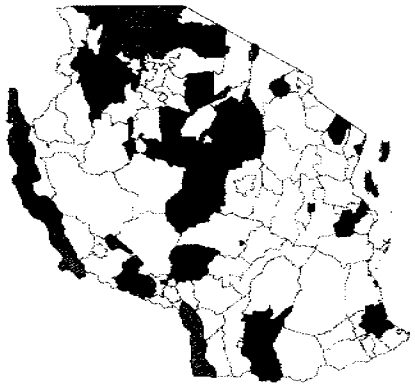
Further analysis

There is clearly need for additional research into aspects of children's vulnerability. This analysis has been limited by its quantitative nature and the data sets available at the time of the analysis. Some of the topics that might be explored include:

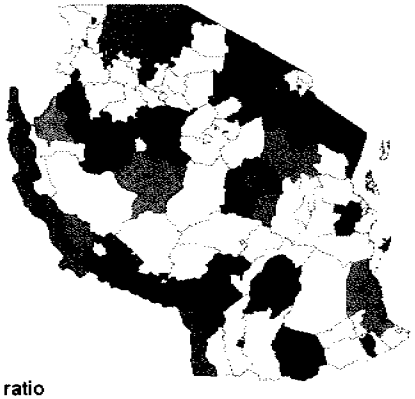
- education: further analysis on aspects of quality, pupil/teacher ratio and impact on enrolment, on completion, further analysis of socio-economic determinants of school performance and the relationship between poverty and education
- further consideration of the finding that rates of poverty in districts are not associated with child mortality rates, further analysis of differential rates of child mortality and malnutrition
- more in-depth trend analysis regarding vulnerability and disparities between less poor and the poorest, urban vs. rural: what has happened between 1999 and 2004?
- exploration of particular vulnerabilities/disparities by socio-economic groups such as for agro-pastoralists.
- the vulnerability of refugee children who are not living in camps

Top and Bottom Districts for Selected Indicators

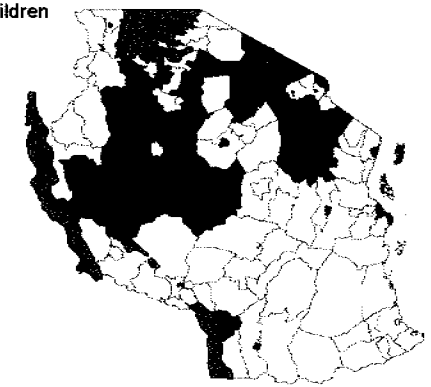
Poverty Headcount



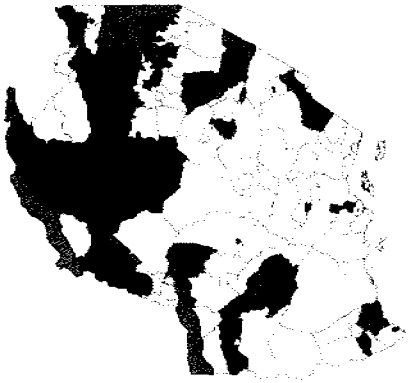
Net Enrolment



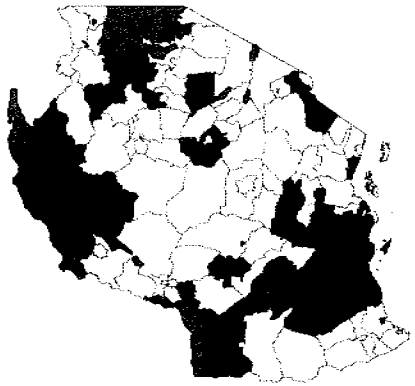
Working children



Pupil Teacher Ratio

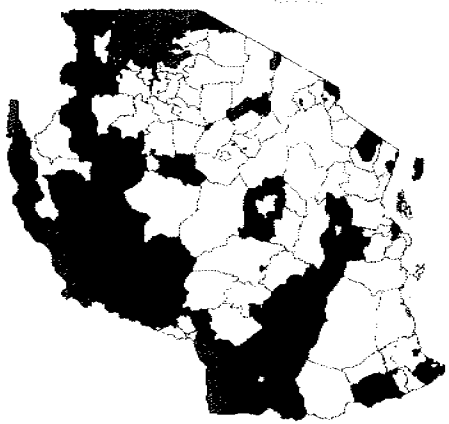


Pupil classroom ratio

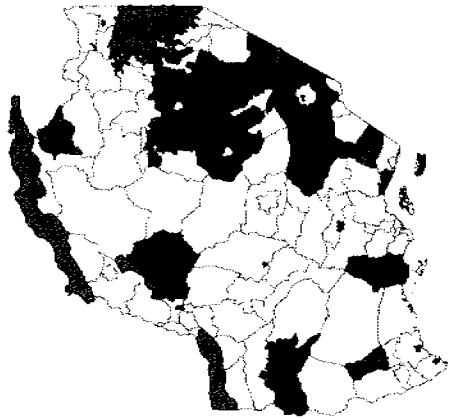


Orphans

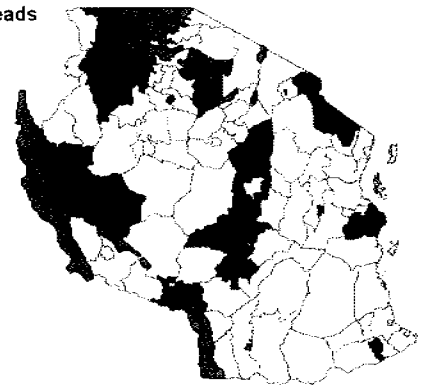
Disabled



Childheads



Elderly Heads



Ranking unranked top ten 11 to 20 top 11 to 20 bottom 10 bottom

1. Introduction

Childhood is a very vulnerable stage of life. Children experience poverty differently compared to adults. They are more vulnerable to the ill effects of poverty. The young ones in particular, are dependent on their parents or guardians for all their needs – mental, physical and emotional. All children are vulnerable to ill health, exploitation and abuse, but some children are more vulnerable than others.

To date, there has been limited quantitative information on vulnerability of children in Tanzania. Recent data from census and national surveys have made it possible to look in greater detail at smaller sub-groups of populations. These data lend further insight into vulnerability of children in general, and especially of some groups of children that according to available literature, are believed to be the most vulnerable.

This report explores some aspects of children's vulnerability in Tanzania. It starts by briefly reviewing the general poverty situation in Tanzania. It then addresses the spatial dimensions of variables related to children's vulnerability and relates them to existing geographic disparities in income poverty at the district level. The following specific aspects of vulnerability for which recent data is available are discussed:

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The report then focuses on specific groups of children classified to be vulnerable. Using the small area methodology for spatial poverty mapping, an attempt is made to assess their poverty status - essentially, a comparative analysis of household characteristics that are commonly used as proxy indicators for assessing poverty, and of where the vulnerable and non-vulnerable children reside. The following specific groups of vulnerable children are discussed:

- children with disabilities
- orphans, both single and double orphans
- children living in a child headed household
- children living in households where the only adult is over 60 years of age.

Throughout this report, unless otherwise specified, children are defined as those below eighteen years of age.

Because of the specific purpose of this analysis, it is important that its limitations be borne in mind.

Limitations

- The analysis reported here is based on on-going spatial poverty mapping work in order to assess the extent to which there are marked geographic areas of Tanzania where there is a congruence of characteristics which would suggest children are more vulnerable there than elsewhere. This is, therefore, not a comprehensive analysis of children's vulnerability, nor does it review all available

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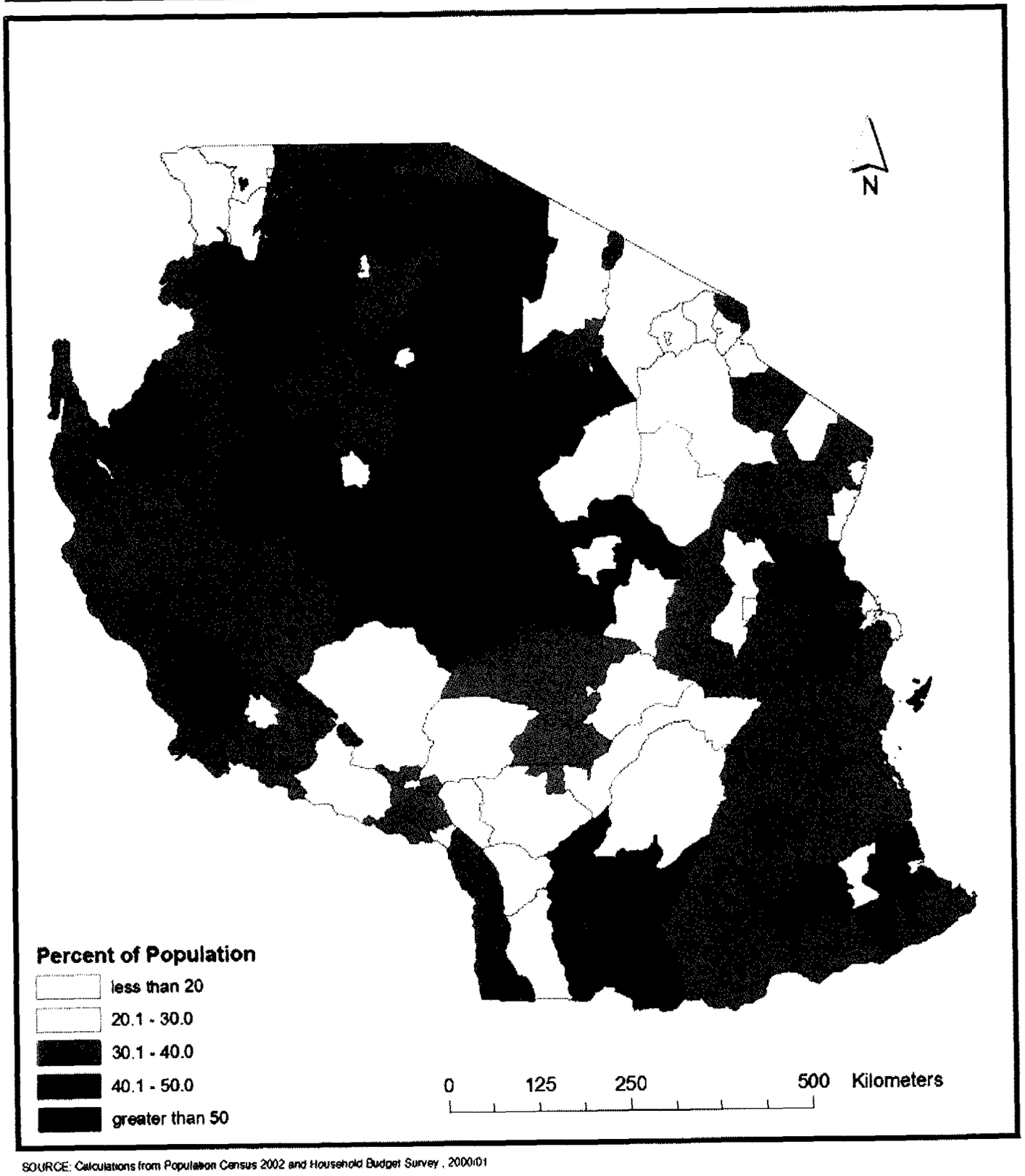
- Because of the link to poverty analysis and the methodology used for poverty mapping, the unit of analysis in most instances is limited to the district level.

- Since the main source of data is the 2002 census so that small-area analysis is possible, the more detailed analysis, usually done using survey information, is not possible. For example, child well being to a great extent depends on mother's characteristics, such as educational attainment. But census data does not allow the linking of a child's information to his/her mother.

- Longitudinal data from Kagera have shown that the age at which a child becomes an orphan, and also if the child was already in school at the time of orphanhood, will have a strong bearing on his/her educational attainment. The analysis reported here of the educational performance of orphans is constrained by the fact that the census provides information only on the current status of the child. The impact of time spent as an orphan cannot be assessed. It is also not known whether the child was already in school when the parent died, or in case of children aged over 13 years, whether the child had already finished primary school. Thus, the census data do not provide information that is vital to assessing the extent of vulnerability–for example, information pertaining to the age and duration of orphanhood or disability, of whether children were already in schools when they became orphans, of how long children have been heading households, or have been without 'productive' adults, of underlying reasons behind children heading households, of their economic circumstances when they became orphans, of degree of disability.

- There are also certain limitations regarding disability data. Though census information is detailed on the type of disability it does not provide details regarding the extent of the disability: so for example, for a child to be classified as visually impaired, s (he) might simply be short-sighted, partially blind, or totally blind. An additional shortcoming is that the classification of disability is based on the reporting of a single respondent, which may have led to misclassification or under reporting.

Map 1 Percentage of Population below the Basic Needs Poverty Line by District, 2001



SOURCE: Calculations from Population Census 2002 and Household Budget Survey , 2000/01

2. Socio-economic and spatial dimensions of vulnerability

2.1. General income/consumption poverty in Tanzania

Income poverty (or consumption poverty) maybe defined as lack of financial resources for expenditure and consumption against a standard, in Tanzania defined by the basic needs poverty line.

Until recently income or consumption poverty estimates were only obtainable through sample surveys, providing quite rough estimates of the population's poverty status at high levels of spatial aggregation. The small area method, refined by Elbers, Lanjouw and Lanjouw (2003) provides a technique that predicts levels of consumption for smaller geographic units based on a combination of data available from the census and from survey estimates, thereby giving a higher resolution of poverty estimates. For Tanzania this has meant, going from regional to district estimates of income/consumption poverty using the 2000/01 Household Budget Survey and the 2002 Housing and Population census. Hoogeveen (2005) applied the small area method to the disabled in Uganda, and successfully obtained poverty estimates for this small group. The later adaptation by Hoogeveen has been applied to disabled children and orphaned children in Tanzania (see sections 3.1 and 3.2)[2].

Map 1 presents the percentage of population below basic needs poverty line at district level. The basic needs poverty line in 2000/01 was estimated to be TShs. 262 per capita per day[3]. The lowest rates of poverty are found in Bukoba Urban (11 per cent), Arusha Urban (12 per cent), Mbeya Urban (12 per cent), Mbarali (13 per cent), Morogoro Urban (14 per cent) and Kinondoni (14 per cent). The highest rates are found in Bunda (68 per cent), Musoma Rural (64 per cent), Misungwi (62 per cent), Serengeti (61 per cent) and Singida rural (56 per cent). As the map shows, there is a clear tendency of the better off districts to be located around urban centers.

Some of the districts with the low prevalence of income poverty – Arusha, Kinondoni, Ilala – also have high population densities and have the highest number of poor people per km^2, an important factor to bear in mind when addressing poverty and allocation of resources.

2.2. Education

Tanzania has registered substantial achievements in the past four years, particularly in terms of access to primary schooling. The implementation of the Primary Education Development Plan (PEDP) at the start of the 2002 school year has lead to major improvements in enrolment rates.

The following section summarises performance and achievements in primary education, with a focus on net enrolment, actual attendance and potential years of primary education missed[4]. Since universal secondary education has not yet been achieved in Tanzania, assessing the deficit in years of primary

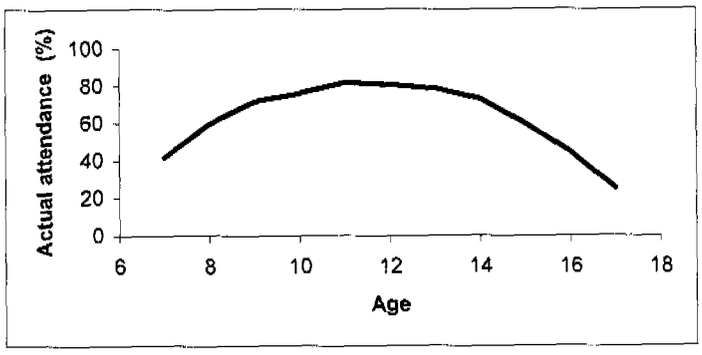
[2] For further details refer to section on spatial analysis in the PHDR 2005 (Research and Analysis Working Group, 2006)
[3] Household Budged Survey, 2000/01, NBS 2002
[4] Primary education deficit indicates the lack of potential years of primary education according to the age of the child. It clearly shows the impact of late and non-enrollment and the gap that needs to be bridged. In addition this indicator facilitates comparison between educational systems with different lengths of primary education.

education is a more appropriate measure than assessing the potential years of life-time education missed i.e. children years of primary and secondary education combined.

All official statistics show a dramatic increase in the net and gross primary school enrolment ratio from 59 and 78 per cent in 2000, to 91 and 106 per cent in 2004. Secondary school enrollment during the same period grew only marginally, mainly due to lack of capacity (infrastructure) to absorb the increasing number of students completing primary education. The Secondary Education Development Plan that has recently been implemented (financial year 2003/04) aims at addressing some of these constraints. The Plan largely marks out similar strategies as adopted in PEDP, one of building more schools and classrooms, and training and recruitment of more teachers.

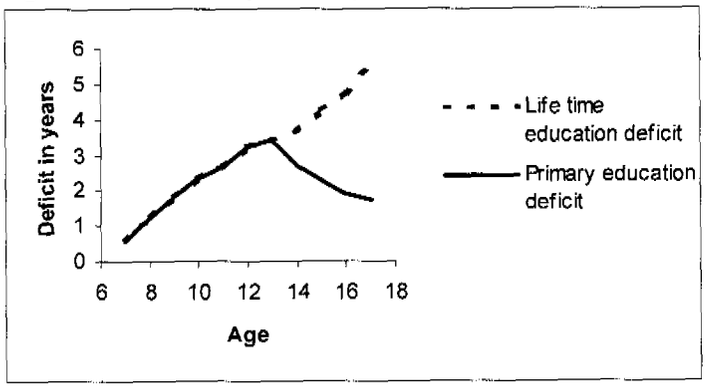
Figures 2.1 and ***Figure 2.2*** above show actual primary school attendance and the potential years of lifetime and primary education missed. Poor attendance of 7 year olds already causes a primary education deficit of a little over half a year at this age. This deficit linearly increases up to the age of 13 years, to almost 3.5 years, and thereafter declines to 1.7 years for those aged 17 years. The observed age pattern suggests high attendance of over aged children in primary education. Primary school attendance peaks at 82 per cent at 11 years of age, with a steady decline from then on.

Figure 2.1. Actual Primary School Attendance by Age



Source: Authors' calculation using 2002 Census, NBS 2003

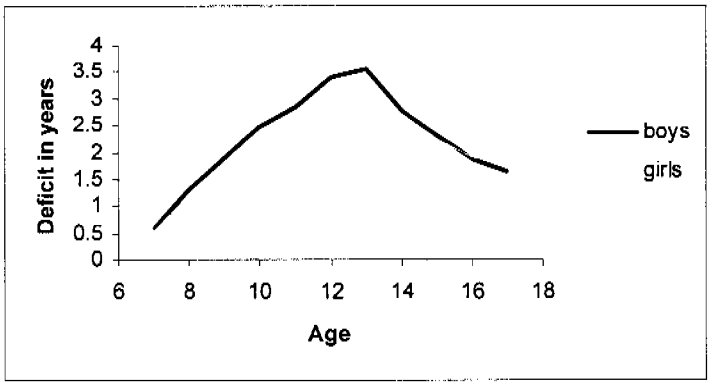
Figure 2.2. Primary and Lifetime Education Deficit by Age



Source: Authors' calculation using 2002 Census, NBS 2003
Note: life time education deficit gives an indication of the potential number of years of primary and secondary education missed at a given age.

According to ***Figure 2.3,*** there is hardly any difference between girls and boys in terms of potential years of primary school missed. Girls seem to be just slightly better off up to 15 years of age, and the situation is somewhat reversed thereafter, though the observed deficit for boys is only marginally less than for girls.

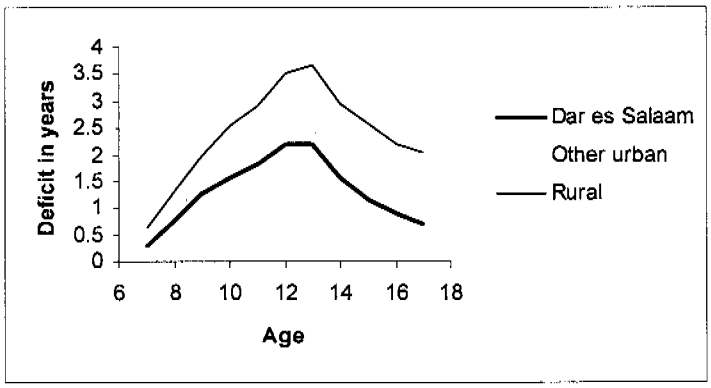
Figure 2.3. Primary Education Deficit for Boys and Girls by Age



Source: Authors' calculation using 2002 Census, NBS 2003

Figure 2.4 above reflects significant urban-rural differences in educational attainment. Overall, children in Dar es Salaam and in other urban areas do not miss as many potential years of primary schooling as do children in the rural areas: there is almost a two-fold difference between the urban and rural areas. However, both urban and rural show similar patterns; potential years of education lost at primary school age are compensated for at later ages.

Figure 2.4. Primary Education Deficit by Residence and Age



Source: Authors' calculation using 2002 Census, NBS 2003

This section looks in more detail at spatial disparities, as well as temporal changes, in primary school enrolment[5].

Between 2002, the first implementation year of the Primary Education Development Plan, and 2004, overall, the net enrolment rate increased from 82 to almost 90 per cent. But this increase was not evenly distributed across the country. There were differences in the rate of increase/decrease between the districts. Thus, in this two-year period, there was a more than 10 per cent **decrease in enrolment rates** in nine out of 103 districts[6]. A drop of over 25 per cent – the largest - was reported for Ngorongoro and Uyui (Tabora Rural) districts. A majority of the districts that experienced a decline of over 10 per cent are in Arusha and Tabora Region. Overall, across the country, more than half the districts (55 per cent) experienced an **increase** of over 10 per cent in their net enrolment rates. The largest rate of increase was observed in Lindi Urban (22 per cent) and in Babati (23 per cent).

Primary school gross and net enrollment rates have increased dramatically, but there are disparities across districts. The enrolment of girls dropped from 2002 to 2004. Continued attendance remains to be a problem, as indicated by a gradual increase with age in the potential years of primary school missed. This is more of a problem in the rural than in the urban areas.

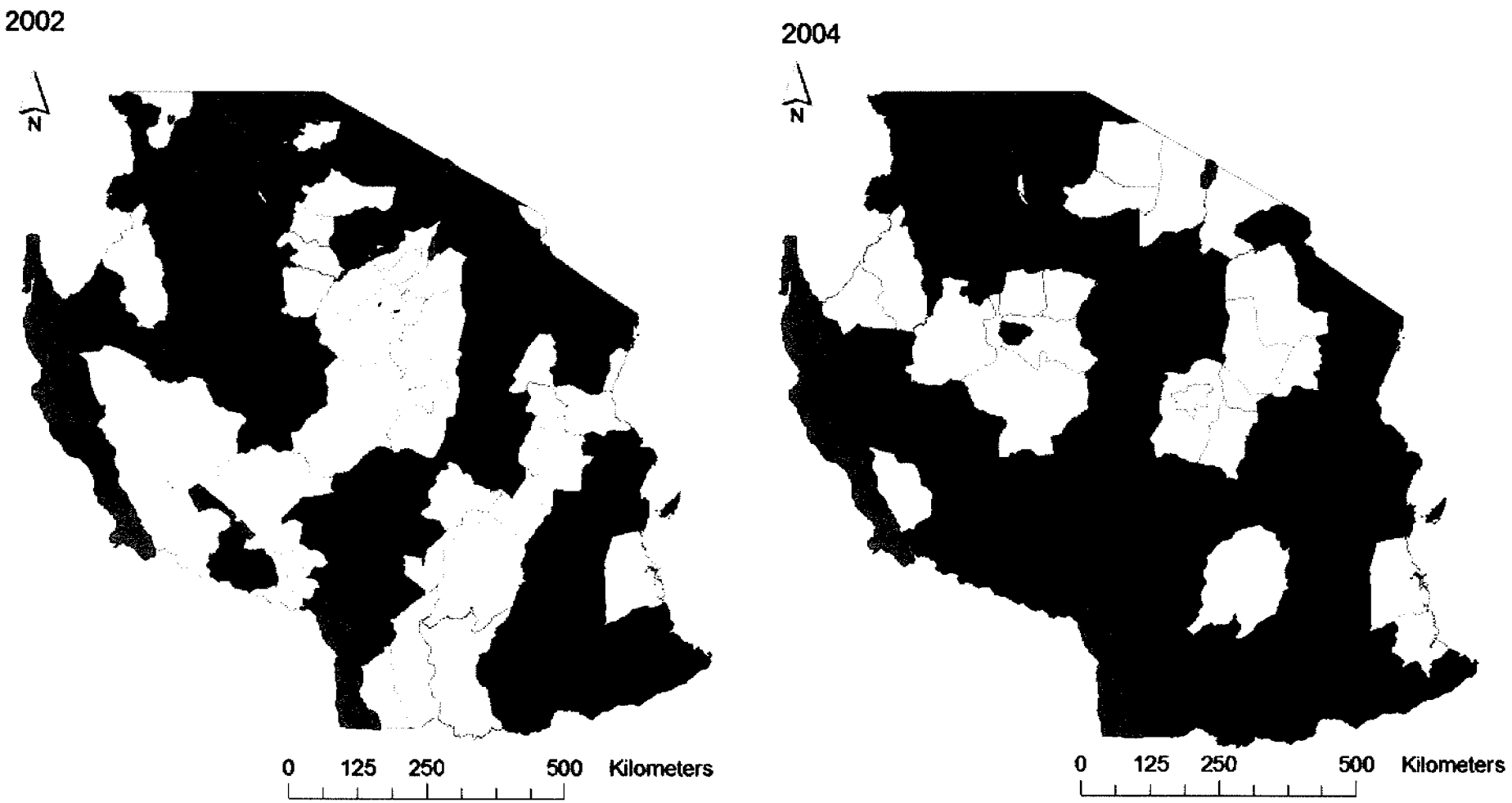
Gender differences in primary enrolment and attendance are on the whole relatively small, though there are the beginnings of a noticeable change. According to Basic Statistics on Education data of 2002, the net enrolment of girls exceeded by 2 percentage points that of boys. In 2004 this difference was also 2 percentage points, but in favour of boys. At district level, data suggest an increase in the observed disparities in net enrolment of girls and boys. In 2002, the difference between male and female net enrolment at district level ranged from –6 to 2 percentage points[7]. In 2004, this range increased, from – 9 per cent in Mbinga district, to 20 percentage points in Ngorongoro district. On the whole, a larger difference in net enrolment in favour of the boys is associated with an overall decline in net enrolment from 2002 to 2004[8] (i.e. there has then been a drop in enrolment of girls over that time period).

Are observed differences in net enrolment rates at the district level related to aspects of economic equity? Are they related to quality and availability of services?

The 2002 district based poverty level estimates do not appear to have influenced the observed change in net enrolment from 2002 to 2004. ***Map 2*** illustrates the spatial pattern of primary net enrolment for 2002 and 2004 assessed against 2003 PRS targets. When compared to the income poverty map (Map 1), data for 2002 suggest that poorer districts had lower levels of net enrolment[9]. For 2004 however, this negative association seems to have disappeared, assuming that poverty levels, or at least differences in poverty levels between districts, did not change from 2002 to 2004. The change in enrolment may partly be a consequence of the implementation of PEDP in 2002, resulting in a more equitable and increased access to primary education.

[5] Using data on net enrolment from the Basic Education Statistics of the Ministry of Education and Culture.
[6] Due to missing data and redefinition of districts, a comparison could only be made for 103 out of the 119 districts.
[7] Negative numbers indicate higher net enrolment for girls, positive numbers indicate higher enrolment for boys
[8] A significant association ($r = -0.53$, $p < 0.001$)
[9] A significant association, ($r = -0.27$, $p = 0.004$).

Map 2. Children Aged 7-13 Years Enrolled in Primary School, by District, 2002 and 2004



SOURCE: Ministry of Education 2002 and 2004

The availability of schools on the other hand, measured by school density at district level (number of schools per km^2) shows a significant positive correlation with net enrolment rate. More schools per square kilometre are associated with higher net enrolment rates in 2002 and in 2004, though the relationship seems to be weakening[10] and also with increases in net enrolment between 2002 and 2004[11]. Availability of schools is an important factor influencing levels of enrolment. Implicitly it is assumed that accessibility increases with increased availability of schools, in particular in the rural areas (i.e. not only an increase in number of schools, but also an increase in their spread, and thereby reducing the physical distance to the nearest school.)

The level of income poverty in 2002 does not appear to be associated with observed changes in net enrolment at the district level from 2002 to 2004. The availability of schools in a district on the other hand, measured by the number of schools shows a significant positive correlation with net enrolment rate.

Regarding quality of education, the available parameters of pupil/teacher and pupil/classroom ratio do not seem to have had much of an impact on primary enrolment. However, it is possible that these parameters did not change much over the two-year period, and may be more likely to influence continued attendance at primary school rather than enrolment rates.

Children's enrolment (and continued attendance) in primary schools is partly determined by opportunities provided by the government under PEDP, for example, the abolition of school fees on enrolment. Other determining factors such as distance to schools, girls' safety, quality of education, other educational expenses (such as for books and uniforms) and household economic status, will also influence the extent to which children and parents are able or willing to take advantage of what is made available.

Analysis reported in the following section suggests that a fairly large proportion of children between the ages of 5 and 18 years are engaged in paid or unpaid work, and have failed to enroll in primary education.

2.3. Working Children

The 2002 census provides information on economic activities of all household members aged 5 years and above. Working children are defined as those who are

- engaged in paid work
- engaged in unpaid work
- working for their own benefit (i.e. self employed).

This definition does not include domestic work, and also does not include children who are unemployed but who are actively looking for work. Census data do not provide information on actual time spent working, whether it is a full-time or a part-time activity. To be considered a working child, work is reported by the respondent to be his/her main occupation during the 12 months preceding the census. The

[10] Significant associations both in 2002 ($r = 0.24$, $p = 0.011$) and in 2004 ($r = 0.20$, $p = 0.034$).
[11] Significant association ($r = 0.19$, $p = 0.045$)

definition of working children used here may not necessarily coincide with the official ILO definition of child labour[12].

The following analysis focuses on children between 5 and 18 years of age who have been working during the 12 months preceding the census.

An estimated 1.8 million children, accounting for 16 per cent of the relevant age group, were working for most of the year prior to the 2002 census. For rural and urban areas the proportions of working children are 18 and 8 percent respectively.

Figure 2.5a suggests that when excluding domestic work, there is hardly any difference in the working status of girls and boys. Overall, the proportion of working children increases with age. There is a gradual increase to begin with, from around 7 per cent of 5 year olds, to roughly 9 per cent of 11 year olds, and a rapid increase thereafter, with close to 60 per cent of children working by the time they are 18 years of age.

Figure 2.5a. Proportion of Children Working by Sex and Age (excluding domestic work)

Source: Authors' calculation using 2002 census, NBS 2003

According to ***Figure 2.5b***, rural children are more likely to be working than their urban peers. When compared to five-to-twelve year olds living in Dar es Salaam or other urban areas, those in the rural areas are almost five times more likely to be working.

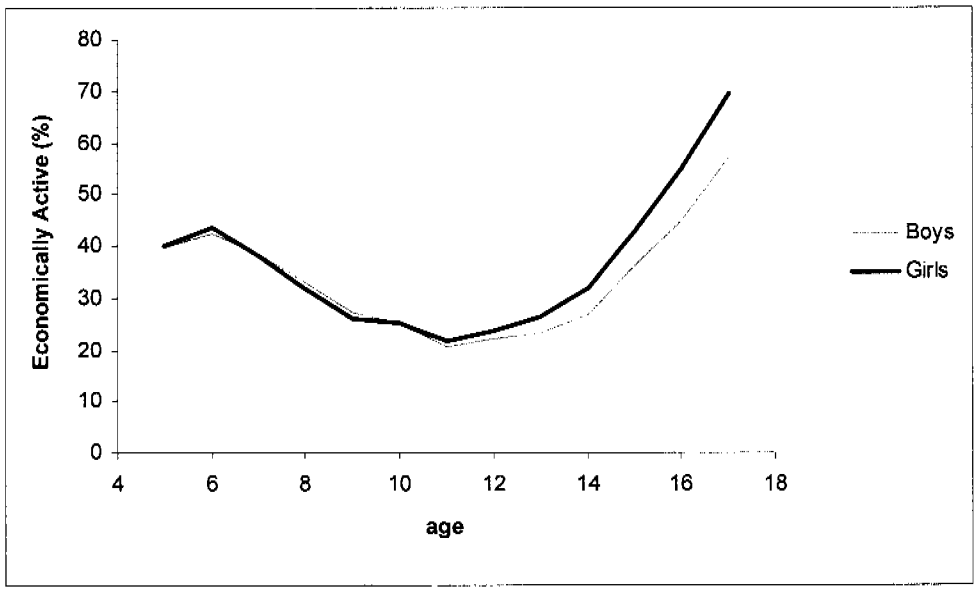
12 Child labour is work performed by children under 18 years of age, which is exploitative, hazardous or inappropriate for their age, and which is detrimental to their schooling, or social, mental, spiritual and moral development (ILO, Child Labour in Tanzania)

Figure 2.5b. Proportion of Children working by Area of Residence and Age (excluding domestic work)

Source: Authors' calculation using 2002 census, NBS 2003

Including domestic work to the definition of working children changes the pattern (***see Figure 2.6a***). With this inclusion, there is a gradual decrease in the proportion of children aged 6 to 11 years who are working, and an increase thereafter. This pattern is applies for both boys and girls, though the increase in the proportion of girls who are working is sharper than that of boys.

Figure 2.6a. Proportion of Children working by Sex and Age (including domestic work)

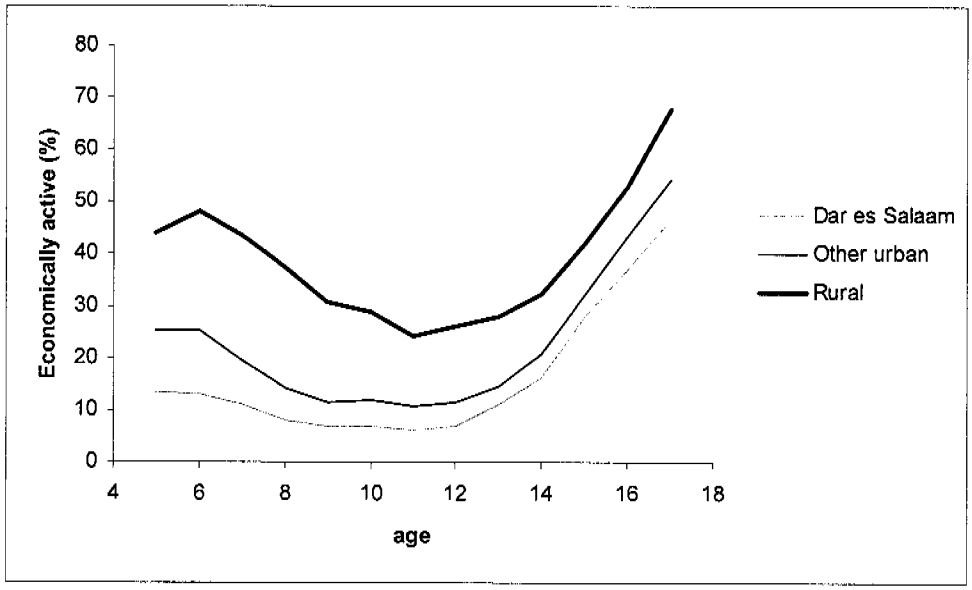


Source: Authors' calculation using 2002 census, NBS 2003

After the age of 12 years, the difference between rural and urban children who are working becomes less pronounced (***see Figure 2.6b***). Census data do not provide information about how much time is spent in

domestic work. It is however, very possible that this activity impacts negatively on children's school attendance, especially in the case of older children and girls.

Figure 2.6b. Proportion of Children working by Area of Residence and Age (including domestic work)

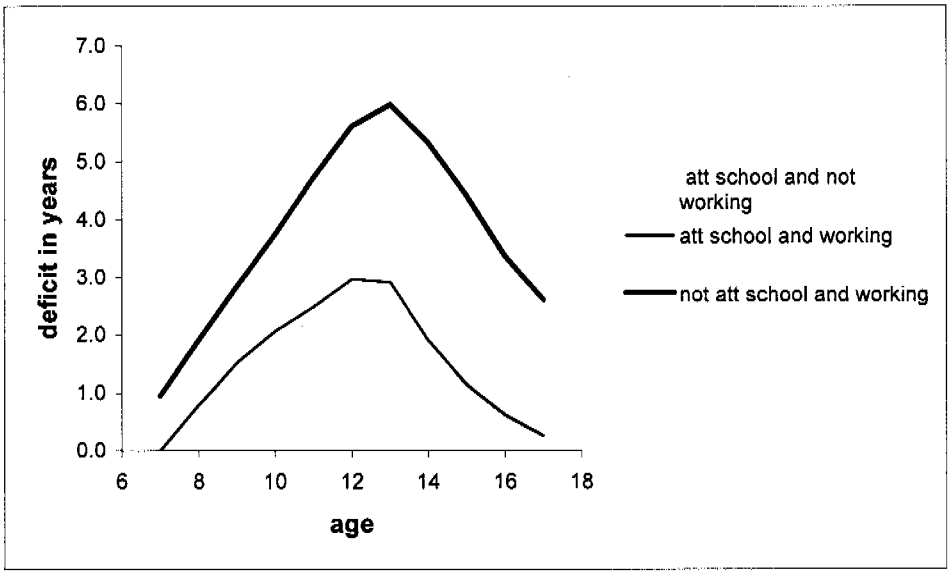


Source: Authors' calculation using 2002 census, NBS 2003

Figure 2.7 illustrates the primary education deficit accumulated by children who are currently attending school and not working[13], those who are currently attending school and working, and those working and not currently attending school. The potential years of primary school missed by working children who are currently not attending school is not at all surprising. But one would have expected part-time workers to have missed more time of primary schooling. Rather, the observed pattern from them is very similar to that of children going to school and not working.

[13] Excludes domestic work

Figure 2.7. Primary Education Deficit assessed for Actual School Attendance and Working Status, by Age



Source: Authors' calculation using 2002 census, NBS 2003

In 2002, the first year of PEDP, there was no significant correlation at the district level between the proportion of 7 to 13 year old children who were working, full-time or part-time, and net enrolment ratios.

Available data suggest a strong correlation between the high levels of children working in 2002, and relatively low levels of net enrolment in 2004 across districts.

But the impacts are felt with time. Districts with relatively large proportions of working children in 2002 showed on average lower net enrolment rates for the year 2004[14]. ***Map 3*** shows the spatial distribution of proportion of children working (aged 7 to 13 years) and not attending school in the year 2001/02. Relatively large proportions of working and out of school children are observed in the rural districts of Tabora region, ranging from 14 per cent in Urambo district, to 33 per cent in Uyui. Net enrolment in these districts dropped substantially between 2002 and 2004. Overlaying Map 2 with net enrolment in 2004 (second panel) with Map 3 confirms once more a strong correlation between the high levels of child labour observed in 2002, and the relatively low levels of net enrolment for 2004.

Estimated levels of poverty at the district level show a positive correlation with the proportion of children working, and also with children working and not going to school[15]. Districts located in Tabora and Shinyanga regions show high rates of working children and also a relatively large proportion of the population below the poverty line.

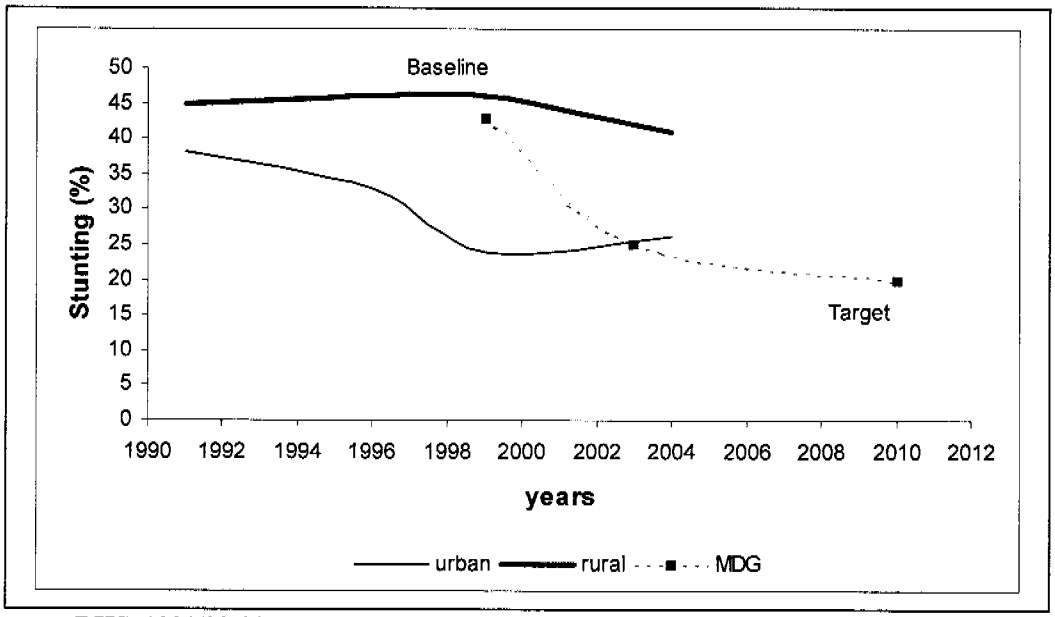
[14] According to routine data for 2004, and a significant association ($r = -0.50$, $p < 0.001$).
[15] $r = 0.31$, $p = 0.006$ and $r = 0.28$, $p = 0.002$ respectively

2.4. Childhood malnutrition

Malnutrition rates continue to be high in Tanzania.

Overall, the 1990's showed little progress in the nutritional status of rural children under five years. With regard to prevalence of stunting among the under fives, the urban-rural gap increased, especially between 1996 and 1999 (see ***Figure 2.8a and 2.8b***). Malnutrition rates are worst amongst the poor. According to the 1999 Demographic and Health Survey[16], 50 per cent of children aged 0 to 59 months in the poorest forty per cent of households chronically undernourished or stunted[17] (i.e. low height for age) as opposed to 23 per cent of children from the least poor twenty per cent of households. The respective figures for prevalence of underweight (low weight for age), a composite measure of short and longer term undernutrition, were 34 and 22 per cent. More recent preliminary results from the 2004 Demographic and Health Survey however, suggest some improvements. There has been a modest decline in the prevalence of stunting, from 44 per cent in 1999 to 38 per cent in 2004. The observed improvement is largely the result of a decline in rates of stunting among rural children from 1999 to 2004 (from 48 to 41 per cent), and a parallel small increase in urban prevalence during the same time period (from 24 to 26 per cent). This has also led to a considerable lessening of the urban-rural differences. But as ***Figure 2.8a*** indicates, the prevalence of stunting in Tanzania is still high. Radical measures are needed if Tanzania is to reach the Millennium Development Goals set for 2015 - aiming at a 50 per cent reduction in stunting from a 1999/2000 baseline. The situation with regard to under weight seems to be more promising, with current urban and also rural prevalence already below the MDG trend line (see ***Figure 2.8b)***. Overall prevalence of underweight declined from 29.5 in 1999, to 21.9 in 2004.

Figure 2.8a. Trends in the Prevalence of Stunting in under Five Year Olds in Urban and Rural Areas, 1991-2004.

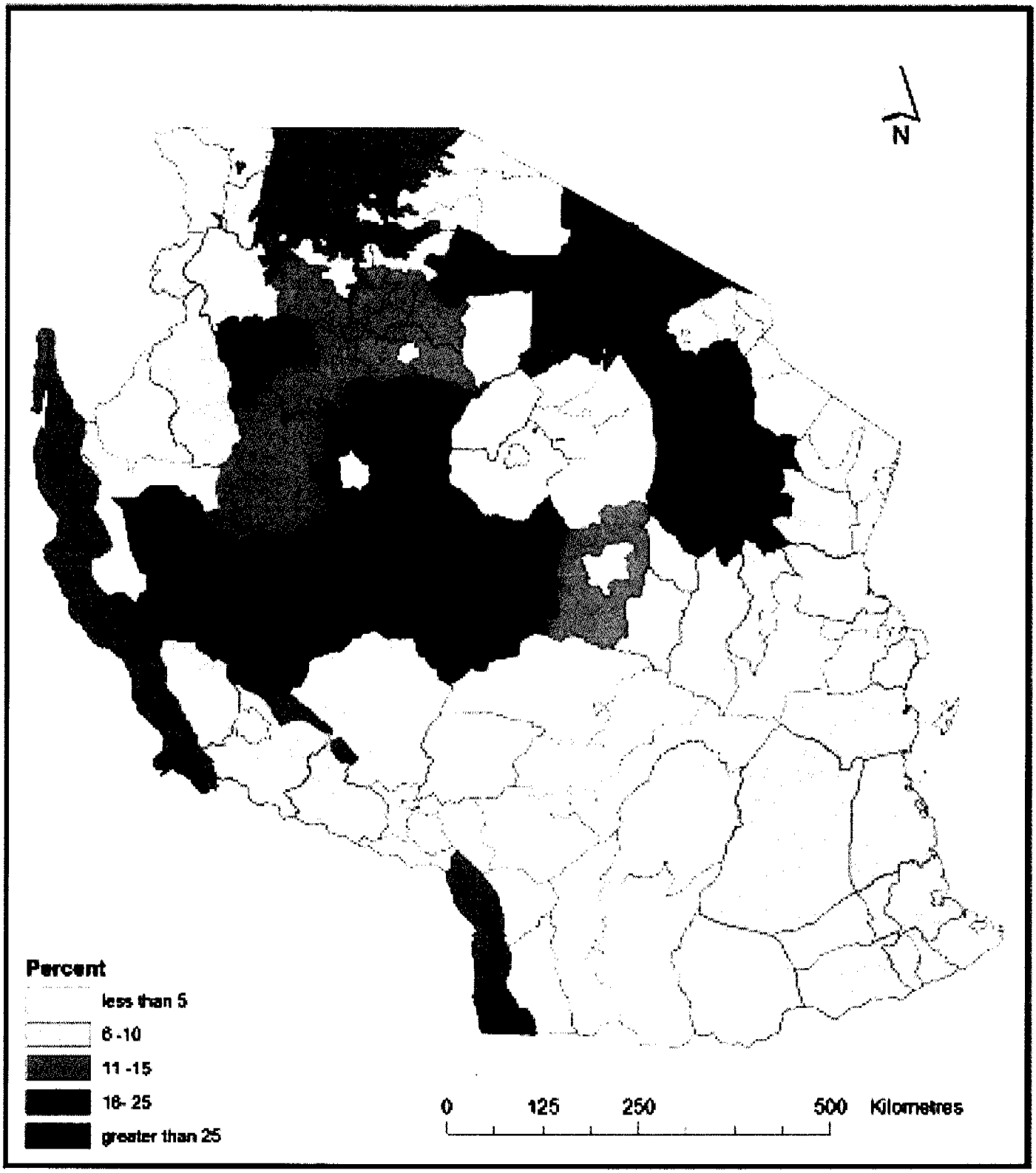


Source: DHS, 1991/92-2004

[16] Tanzania Reproductive and Child Health Survey (TRCHS)

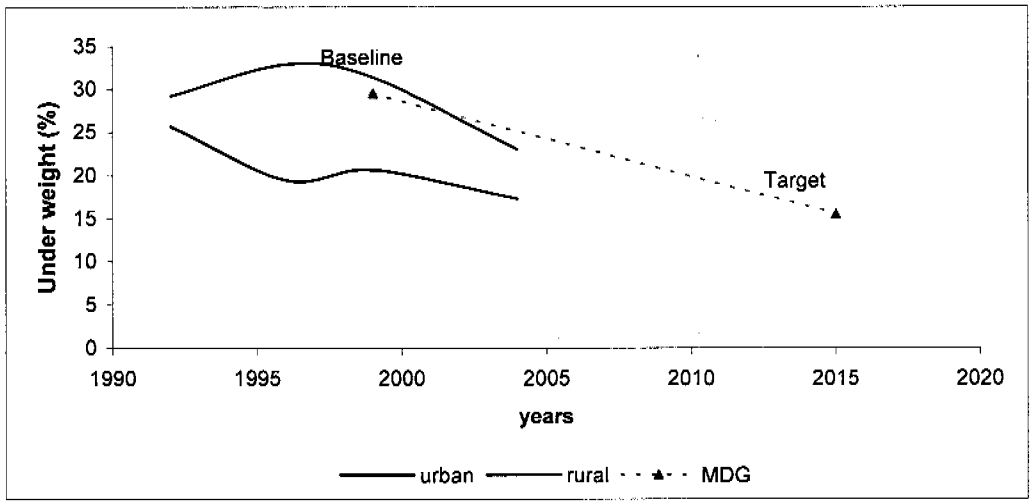
[17] Stunting is the outcome of failure to receive adequate nutrition over an extended period and is also affected by recurrent or chronic illness.

Map 3. Children Aged 7-13 Years working and not in School, by District, 2002



SOURCE: Population Census 2002

Figure 2.8b. Trends in the Prevalence of Underweight in under Five Year Olds in Urban and Rural Areas, 1991-2004.



Source: DHS, 1991/92-2004

The 2004 Demographic and Health Survey suggests some improvements in rural levels of stunting in underfives – those who are chronically undernourished. Compared to 1996, data for 2004 suggest less of variation between regions.

The two panels of ***Map 4*** illustrate regional stunting levels that existed in 1996 and 2004. The insert shows the pattern of change. Between 1996 and 2004, average stunting rates at the regional level decreased from 45 to 39 per cent. But the pattern of change is somewhat mixed. Some regions that were already doing relatively well in 1996 showed considerable improvements. For example, for both Dar es Salaam and Kilimanjaro, the prevalence of stunting declined from 31 and 34 per cent in 1996, to 17 and 23 per cent in 2004. Substantial improvements were also noted in some of the worst performing regions of 1996. Iringa for example, showed a 20 percentage point improvement, from 71 per cent in 1996 to 51 per cent in 2004, though this still exceeds the national regional average of 39 per cent. Pwani and Morogoro, with stunting levels of over 50 per cent in 1996, succeeded in achieving rates below the average figure of 39 per cent in 2004. Then there are regions – all found in the North Western part of the country - that performed better than average in 1996, and continue to do so in 2004, though stunting rates appear to have somewhat deteriorated over the time period, albeit slightly: Tabora (from 26 to 34 per cent), Shinyanga (from 31 to 37 per cent) and Mara (from 33 to 39 per cent).

Map 4 suggests the following changes and regional variations in stunting levels between 1996 and 2004:

- continued stagnation in the South (Lindi, Mtwara and Ruvuma)
- worsening in the South-West (Rukwa), in the Centre (Tabora and Shinyanga) and in the North (Mara)
- improvements in the Coastal Region (excluding Tanga)
- continued relatively better situation or even improved nutritional status in other Central and in the North Western part of Tanzania.

Overall, the range (or extremes) in the prevalence of stunting also narrowed between 1996 and 2004: ranging from 26 to 71 per cent in 1996, to 17 to 54 per cent in 2004. In other words, compared to 1996, data for 2004 suggest less of a difference in stunting levels between regions.

There appears to be a very strong correlation between 2002 regional poverty estimates and the change in regional stunting rates from 1996 to 2004. Poorer regions do not show the same degree of change – either positive or negative - the better-off regions during this time period. Children from poorer households, tend to have a higher probability of being stunted.

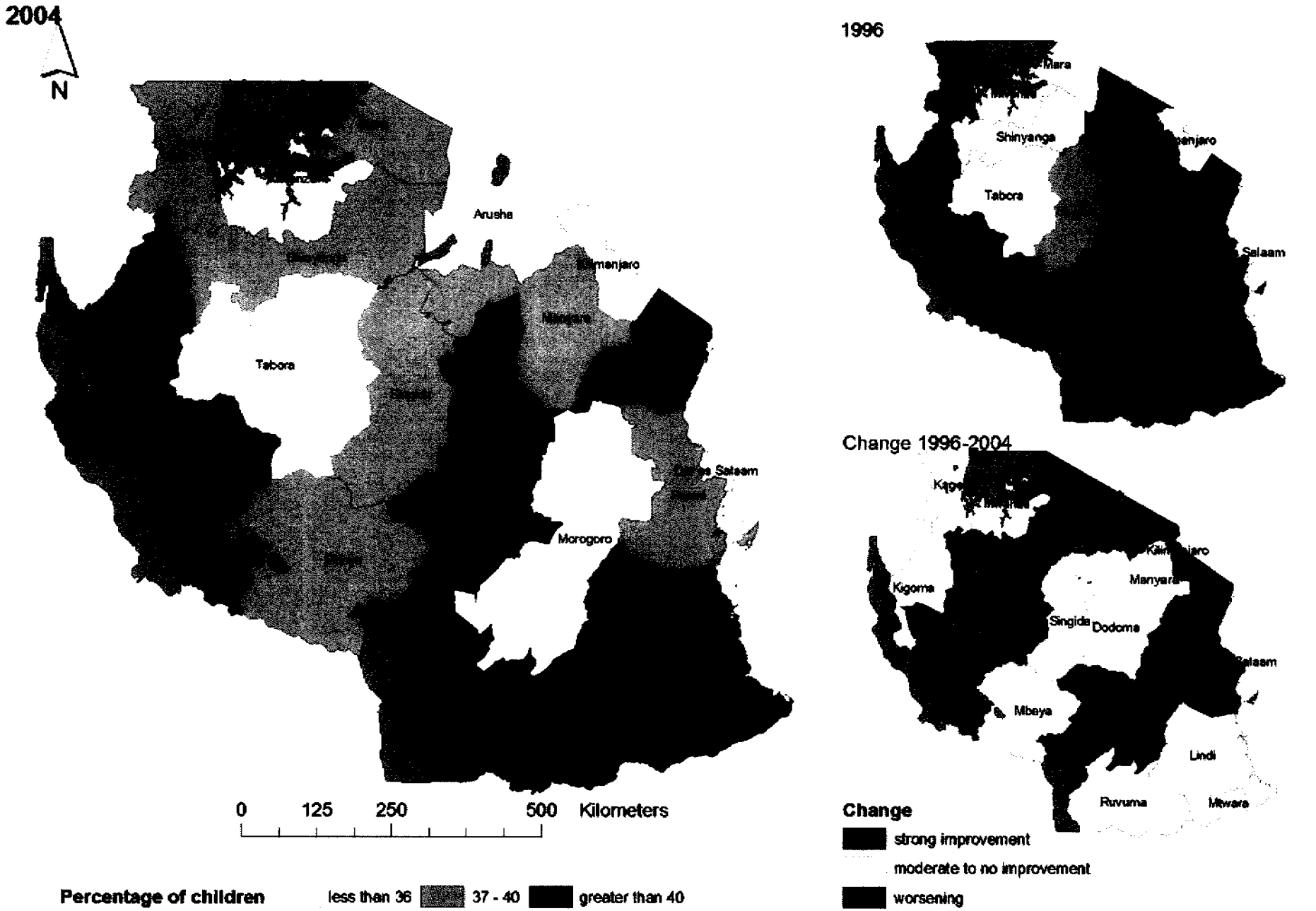
Further analysis suggests that there is no correlation between regional poverty levels estimated for 2002 and stunting levels observed in 2004. However, there appears to be a very strong correlation between 2002 regional poverty estimates and the change in regional stunting rates from 1996 to 2004[18] (see also ***Map 1***). Poorer regions do not show the same degree of change – positive or negative - as the better-off regions over the eight-year time period (***see inset Map 4***).

Findings of a study undertaken by REPOA[19] indicated a widening rich/poor gap between 1991/92 and 1999: an increase of roughly eight percentage points in prevalence of stunting in children from the poorest households, and a large decrease of about 20 percentage points in those from the richest households (***see Figure 2.9***) (Lindeboom and Kilama, 2005). Overall, children from roughly 30 per cent of the poorest households did not show any improvement in their nutritional status. Rather, the prevalence of stunting worsened in this group. The new data for 2004 may change this picture, since improvements were noted then especially among rural children and the majority of the poor are living in rural areas.

Equity analysis[20] at the micro level – based on a study undertaken in Kagera Region - suggests a clear relationship between household poverty/wealth status and the nutritional status of children residing in the household. Compared to children from the better-off households, those from the poorer households tend to have a higher probability of being stunted. Further analysis suggests an association between household consumption of milk on stunting levels[21], though this link may well be related to other underlying factors, such as feeding patterns.

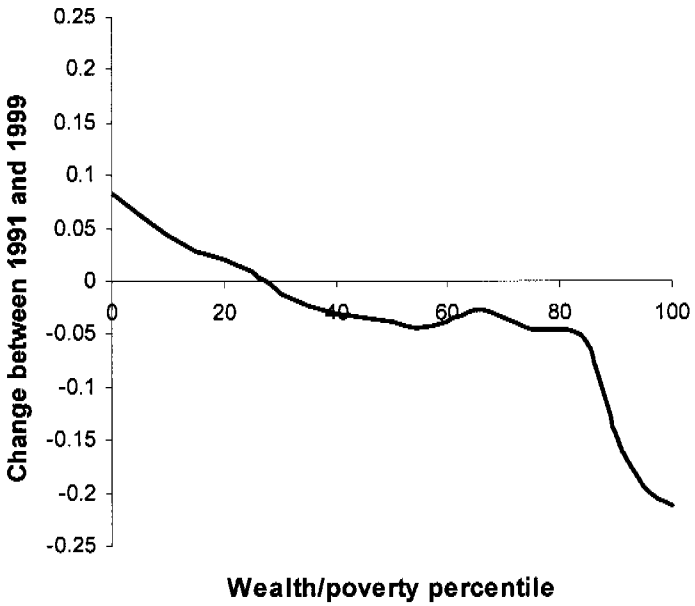
[18] $r = 0.76$, $p < 0.001$, assuming that poverty levels and differences remained constant over the time period (1996-2004).
[19] The REPOA study analyses the DHS data-sets independently and pooled together
[20] Kagera nutrition study (WB 2005)
[21] Using household consumption data from the Kagera nutrition study (WB 2005, unpublished)

Map 4 Prevalence of Children Stunted by Region, 1996 and 2004



SOURCE: Tanzania Demographic and Health Survey 1996 and Tanzania Demographic and Health Survey 2004-05 Preliminary report

Figure 2.9. Proportion Change in the Prevalence of Stunting by Wealth/Poverty Percentile (Concentration Index Growth Curve), 1991-1999



Source: Lindeboom & Kilama, 2005

2.5. Child mortality

Infant and child mortality are among the most important indicators to monitor progress towards achieving national targets and Millennium Development Goals. In Tanzania, as noted in the case of malnutrition, there was minimal progress in reducing infant and child mortality in the late 1980s, and during the 1990s. The situation deteriorated towards the end of the 1990s.

Overall indirect estimates of infant and child mortality derived from the 2002 census data are comparable to direct estimates from the 1999 Demographic and Health Survey. These earlier estimates were not conclusive on the direction of change of infant and under-five mortality. But the recent preliminary 2004 demographic and health survey data have generated a declining trend, which is particularly promising. There was a substantial decline in infant mortality: from 99 per 1,000 live births during 1996-1999, to 68 in 2004 and a corresponding decline in under-five mortality rates from 147 in 1996 to 112 per 1,000 live births in 2004.

The following section details spatial-temporal changes, analysed by comparing under-five mortality rates derived from the 1988 and the 2002 census data.

The left panel of ***Map 5*** shows district based under-five mortality rates derived from 2002 census data. The right upper panel provides the same information using 1988 census data. The lower right panel shows the relative change of under-five mortality by district between 1988 and 2002. An assessment of change at the district level is slightly complicated due to restructuring and formation of new districts during the time period under consideration. Nonetheless, the general comparison from 1988 to 2002 is of little

improvement in under-five mortality in the South and parts of Central Tanzania, and of considerable improvement in areas constituting part of a North-to-Central band of low infant and under-five mortality rates.

Preliminary 2004 Demographic and Health Survey results point to a declining trend in infant and under-five mortality. A comparison of 1988 and 2002 census data suggests geographically differential levels of improvement - little improvement in under-five mortality in the South and considerable improvement in areas constituting part of a North-to-Central band of low infant and under-five mortality rates.

At the district level, there appears to be some relationship between the observed prevalence of under-five mortality in 2002 and levels of poverty [22] (see again ***Map 1*** for comparison).

A multi-variate analysis to predict rates of under-five mortality proved to be difficult since most of the independent variables included were highly correlated with each other. Elimination of the larger part of the mutually highly correlated variables resulted in a model with the following five independent explanatory variables:

- proportion of population below poverty line
- access to/ use of piped or protected water
- proportion of literate women age 15 years and above
- proportion of children with disabilities
- proportion of maternal orphans.

Multivariate analysis: district poverty level is not an independent predictor of under-five mortality. But the proportion of children with disabilities (a possible proxy indicator for physical condition/well-being of children), the proportion of maternal orphans and rates of adult female literacy are important independent predictors of district under-five mortality.

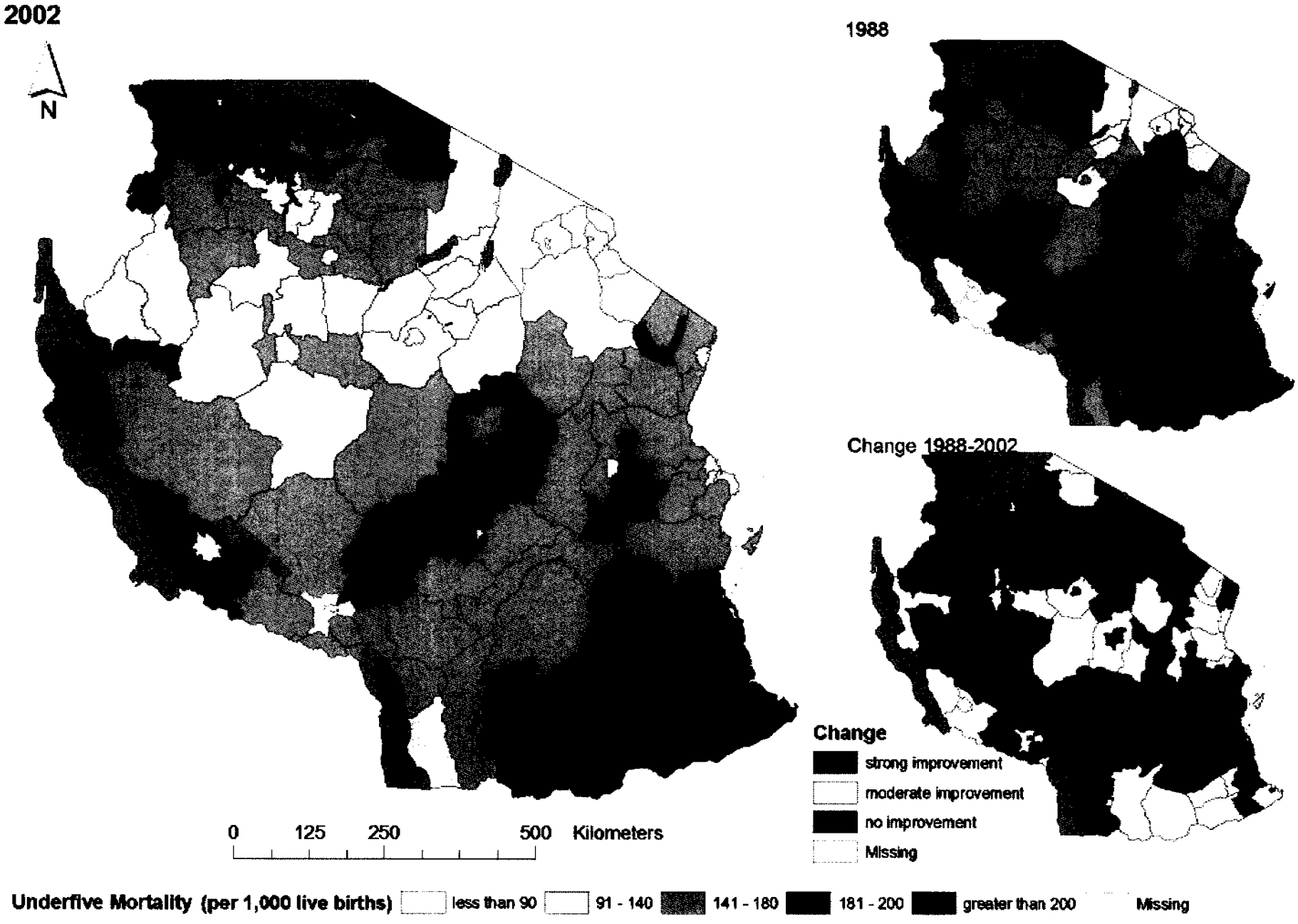
Results of the multivariate analysis indicate that contrary to expectations, district poverty level is not an independent predictor of under-five mortality in the district (see ***Table 2.1***). These findings clearly demonstrate the importance of mother's education and well being to the survival of under-fives. Low rates of adult female literacy and high rates of maternal orphanhood result in higher rates of under-five mortality. Patterns of maternal orphanhood coincide highly with patterns of HIV/AIDS prevalence. Mother to child transmission is likely to increase mortality rates further[23] increasing the probability that a child will die once his/her mother has died.

The multivariate analysis also points to the increased vulnerability of children with disabilities.

[22] $r = 0.25$, $p = 0.006$

[23] Combining fertility rates with female HIV/AIDS prevalence and the approximately 27% probability of mother to child transmission of HIV/AIDS by unprotected pregnant and lactating women, it is estimated that about 2% of the recently born infants will be HIV/AIDS infected, which most likely will form a significant proportion of all under-five deaths.

Map 5. Under five Mortality, by District 1988 and 2002



SOURCE: Population Census 1988 and 2002

Table 2.1. Model explaining district rates of under-five mortality, 2002

Variable	Type of relationship	significance level[24]
Proportion of population below poverty line	increasing	n.s.
Access to/use of piped or protected water	decreasing	n.s.
Proportion of literate women age 15 and above	decreasing	v.s.
Proportion of disabled children	increasing	v.s.
Proportion of maternal orphans	increasing	v.s.
$R^2 = 0.43$		

2.6 Summary of socio-economic and spatial dimensions of vulnerability

In summary, districts with high rates of income poverty in 2002:

- did not have the highest rates of under-five mortality, but had little change in under-five mortality between 1988 and 2002
- are located in regions that did not have the highest rates of child malnutrition, and they showed substantial change in under-five malnutrition
- had lower enrolment rates in 2002, but not necessarily in 2004
- show higher proportions of children working and children working and not attending school.

Overall, there appears to be little relationship between income poverty and poor indicators such as under-five mortality and net enrolment. But the relationship is stronger between income poverty and lack of change in malnutrition and under-five mortality. Districts with economically better off households seems to make more progress towards a reduction in stunting and a reduction in under-five mortality. In other words, there seems to be more dynamics for change in better off districts compared to worse off districts.

Equally important is the relationship between specific indicators. Districts with high rates of under-five mortality are located in regions that show high prevalence of stunting[25]. These districts also have high proportions of children with disabilities and of maternal orphans, and lower proportions of literate female adults (15 years and above). Districts with high proportions of working children showed lower net enrolment rates.

3. Specific Vulnerable Groups of Children

This part of the report provides information on the following specific vulnerable groups of children: children living with disabilities, children whose mother or father or both have died, children living in child headed households or with only elderly adults (defined as 60 years and above). Attention is paid to living conditions (household characteristics), educational attainment and employment status of these children. As a reference, comparisons are made with households with children who are not in these vulnerable groups. Spatial analysis focuses on relative and absolute concentrations of vulnerable children

[24] v.s. denotes very significant and all at <0.001, and n.s. denotes not significant.
[25] A very significant association, $r = 0.59$, $p < 0.001$

at district level. The poverty status of orphans and children living with disabilities was assessed applying the small area poverty mapping technique to these sub-populations.

3.1. Children living with disabilities

Children with disabilities constitute a particularly vulnerable group, for whom extreme poverty is frequently compounded by exclusion and discrimination. They lack the necessary social and economic support that is necessary to ensure that their potentials are developed to the maximum and few opportunities for better livelihoods are open to them.

The 2002 census provides quite detailed information on the status of physical and mental ability of each individual. But, as mentioned at the beginning of the report, there are certain constraints regarding these data.

Table 3.1 gives the distribution of children with disabilities by type of handicap. The largest category of disability is physically handicapped/leprosy, with almost 40 per cent, followed by mentally handicapped that account for close to 20 per cent of the population of children living with a disability. Altogether, one per cent of children from birth to 17 years of age are living with a disability, a total of around 175,000 children. The actual number of children with disabilities may well exceed reported numbers as data suggest a certain amount of under-reporting, especially at younger ages.

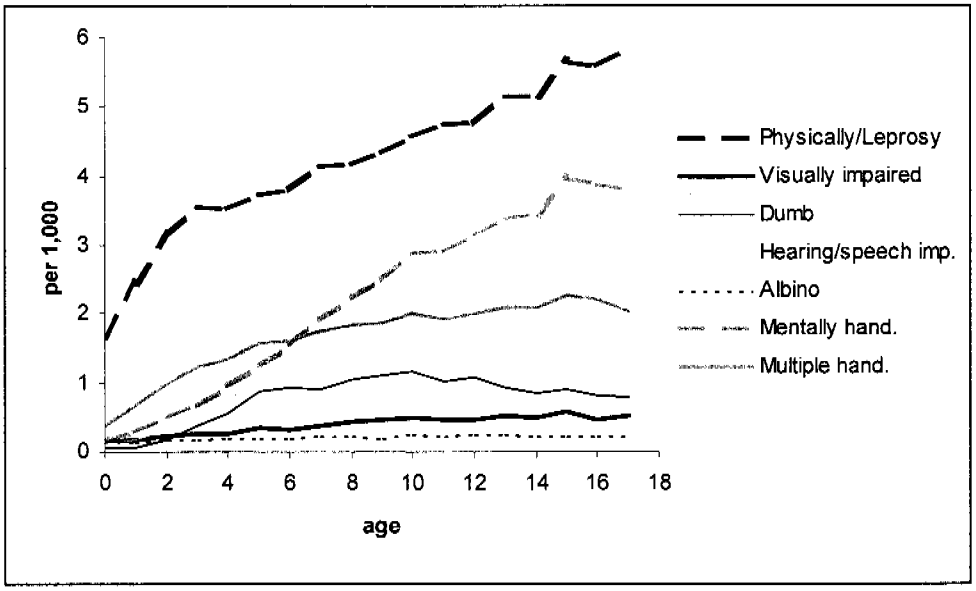
Table 3.1 Distribution of children living with disabilities, by type of handicap

Type of handicap	%
Physically handicapped/Leprosy	39.3
Visually impaired	3.6
Dumb	7.1
Hearing/speech impaired	13.1
Albino	2.1
Mentally handicapped	19.4
Multiple handicapped	15.5

Source: NBS census, 2002

Except for albinos and those who are visually impaired, an analysis of type of disability by age suggests a progressive increase in proportion of children experiencing physical and mental handicaps, by age. (***see Figure 3.1***). The increase in prevalence of mental handicaps may partly be explained by prevalent illnesses and accident-induced handicaps that may increase with age. But for the greater part, it is probably due to under-reporting of the presence of a mental disability at an earlier age – either parents choose not to report, or because the disability is not yet detected.

Figure 3.1. Disability by Type and Age



Source: Author's calculation using 2002 Census, NBS 2003

Map 6 shows the proportion of children living with a disability by district. The numbers are small, but there is a definite pattern in prevalence of childhood disability. In the Southwest and in the Northeast are pockets of areas with relatively low numbers of children with disabilities. The highest disability rates are found in Ngara district and Songea Rural (19 per 1,000 children). The lowest rates can be observed in Sumbawanga Urban and Arusha district (4 per 1,000 children). Districts with a high prevalence of childhood disability do not necessarily have the largest absolute numbers of disabled children. Districts with large numbers of children living with a disability can be found in the northwestern part of the country, for example in Kibondo district, with almost 4,400 children with a disability and in Geita and Kasulu both with around 4,100 disabled children.

There is an association between estimated district poverty levels and prevalence of childhood disability, but this does not hold for all types of disabilities. The prevalence of albinos, of a mental handicap or of multiple handicaps do not seem to be associated with district based poverty levels. Physical disability/leprosy, visual impairment, a hearing/speech impairment or being dumb, all show a positive correlation with district based poverty estimates – higher rates of poverty are associated with higher prevalence of these disabilities.

Table A.1 in the appendix provides information on household characteristics and those of the head of the household in which children with and without disabilities live, separately for Dar es Salaam, other urban areas and rural Tanzania. In the two urban strata, when compared to households without children with disabilities, those with disabilities are worse off in terms of assets, energy use, access to improved water and sanitation and residential building characteristics. These differences seem to be absent in the rural areas. The differences related to household size are quite striking. Both in urban and rural areas, children

living with a disability are living in larger households compared to children without disabilities. In the urban areas the difference in the size of the households is around 2, and in rural areas it is 3.5.

A comparison of heads of households suggests that in the urban areas, heads of households with children with disabilities are generally older, and more often a woman with lower literacy levels. In rural areas, the household heads are also slightly older, and though differences in sex and literacy levels are there, they are less pronounced.

Children with a disability are less educated than those without a disability, and urban children with a disability are particularly disadvantaged compared to their peers without a disability.

Table 3.2 compares primary education deficit[26] of children with and without a disability at age 14 and 17 years. It is evident that children with a disability are less educated than those without a disability, in particular in urban areas. The absolute difference in potential years of primary education missed is 1.9 for 14 year olds, increasing to 2.3 by the end of childhood.

Compared to national level estimates, in Dar es Salaam the absolute differences at a given age between the two groups of children are relatively small.

Table 3.2 Primary Education Deficits in Children with and without Disability

	Children with disability		Children without Disability	
Age	mean	Std Err	mean	Std Err
Mainland Tanzania				
Deficit at age 14	4.6	0.1	2.7	0.0
Deficit at age 17	4.0	0.1	1.7	0.0
Dar es Salaam				
Deficit at age 14	2.8	0.6	1.6	0.1
Deficit at age 17	2.6	0.7	0.7	0.1
Other urban areas				
Deficit at age 14	3.9	0.2	1.8	0.0
Deficit at age 17	3.3	0.2	0.9	0.0
Rural				
Deficit at age 14	4.9	0.1	2.9	0.0
Deficit at age 17	4.2	0.1	2.0	0.0

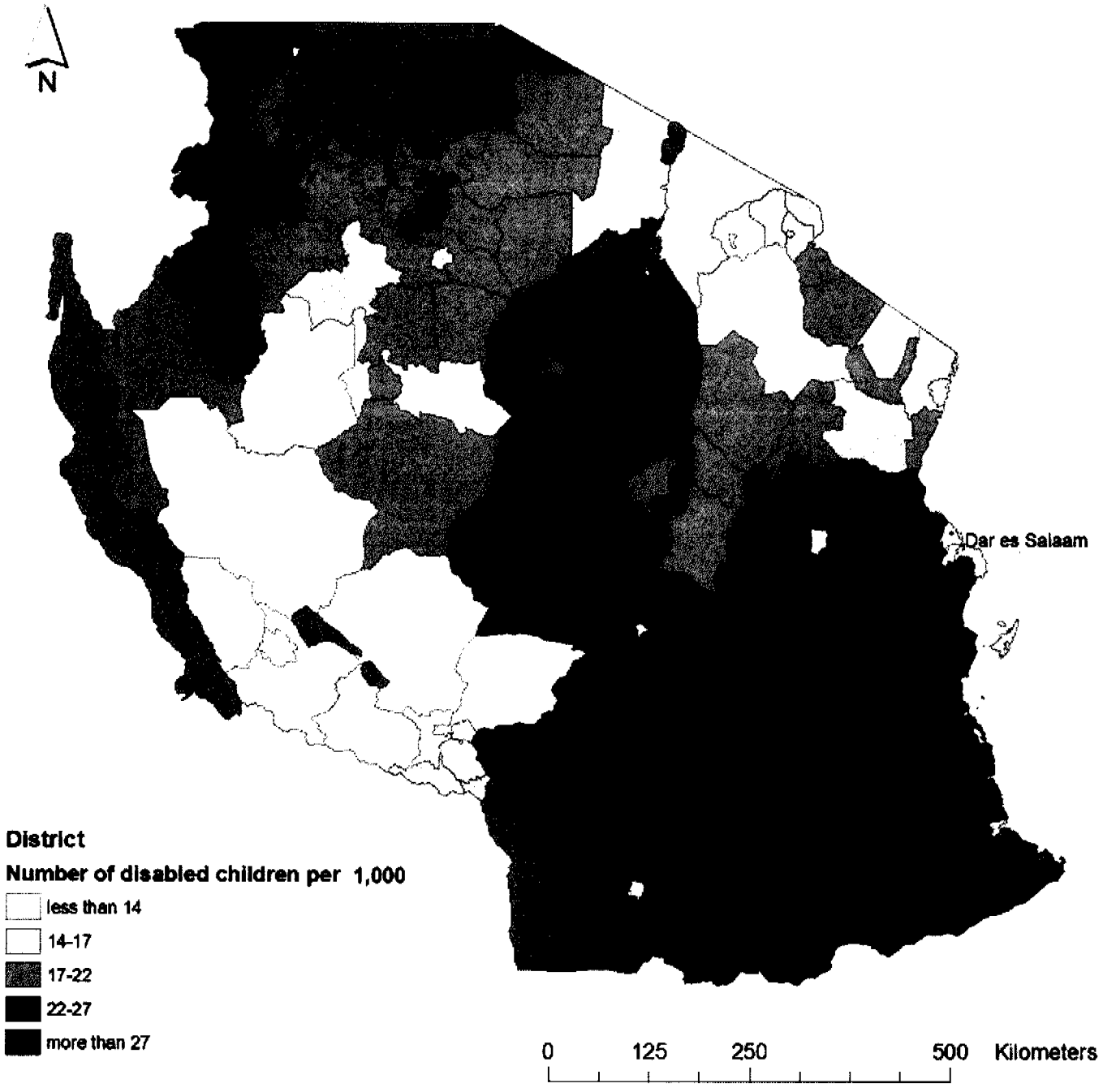
Source: Authors' calculation using 2002 Census, NBS, 2003

An assessment of the poverty status[27] of children with disabilities revealed that for rural Tanzania and Dar es Salaam combined, excluding other urban areas; about 46 per cent of the children living with a disability are estimated to be living below the basic needs poverty line. Among children without disabilities, this

[26] as noted earlier on, primary education deficit indicates the lack of years of primary education according to the age of the child.

[27] Applying the poverty mapping methodology to children with and without disabilities.

Map 6 Children with Disability per 1,000 Children, by District 2002



SOURCE: Calculations from the census 2002

figure is around 38 per cent. For Dar es Salaam, the estimated poverty head counts are 31 per cent for children with a disability, and 21 per cent for those without disabilities. For rural areas the respective figures are 47 and 39 per cent. As is to be expected, poverty levels for disabled and non-disabled children located in the urban areas are far below those observed among their rural counter parts. But differences in poverty levels between the disabled and non-disabled children seem to be more pronounced in Dar es Salaam.

Table A.2 in the appendix provides an overview of regional differences in poverty levels between children with and without disabilities. Within all regions poverty levels of children from households with at least one disabled child are higher than poverty levels of children from household with no disabled children, though the differences are only significant in 11 out of 21 regions. The largest differences are observed in the coastal regions of Tanga and Pwani. In the Southern and also in Western parts of the country, poverty differences between disabled and non-disabled children are less pronounced.

Compared to children from households without disabled children, a higher proportion of children from households with disabled children are living below the poverty line.

3.2. Orphaned Children

Orphaned children are defined as children whose mother or father or both have died. Since the probability of becoming an orphan increases with age, orphaned children are on average older than non-orphaned children, complicating direct comparisons of the orphaned with non-orphaned children.

According to the 2002 census, almost 1.1 per cent of children under 18 years of age had reportedly lost both parents, 7.4 per cent had no father and 3.4 per cent had no mother. (***see Table 3.3***). The probability that a father has died is more than twice the probability of a mothers' death. This can be explained by age differences between spouses (men tend to be married to younger women) and a generally higher level of age specific mortality among men. For every 1,000 children, around 6 of them lost their mother during infancy compared to 17 who lost their father at the same age. By the age of 17 years, 170 out of every 1,000 children had lost their father, and 88 had lost their mother. Altogether, there are 1.6 million orphans and they make up almost 10 per cent of all children in the country.

Table 3.3: Distribution of Orphaned Children by Type of Orphanhood

	%	Std Err
Father died (paternal)	7.4	0.1
Mother died (maternal)	3.4	0.0
One surviving parent (single)	8.5	0.1
No surviving parents (double)	1.1	0.0
Single or Double	9.6	0.1

Source: Authors' calculation using 2002 Census, NBS 2003

Map 7 shows the distribution by district of children who had lost at least one parent. Relatively large proportions of orphans can be found in the districts East and West of Lake Victoria, in and around Dar es Salaam and in the Southern Highlands (Iringa and Mbeya). Seven out of the 10 districts with a high prevalence of orphanhood can be found in Iringa and Mbeya region. Makete district in Iringa region

shows the largest proportion of orphans – 24 per cent (242 per 1,000) - among its child population, with an estimated absolute number of 12,400 orphans. Superimposing the orphanhood prevalence map on the regional HIV/AIDS prevalence map clearly demonstrates the correlation between levels of orphanhood and the prevalence of HIV/AIDS (***see insert Map 7***) in some of the districts (Mbeya and Iringa). Thus, previously high HIV/AIDS prevalence rates in Kagera region has resulted in relatively large numbers of children without a surviving parent, for example in Bukoba urban and Bukoba rural districts with respective orphanhood rates of 16 and 18 per cent. According to Tanzania HIV/AIDS Survey of 2003/04 (NBS, 2005), one out of every nine children under the age of eighteen years is orphaned in Kagera.

The probability of being orphaned is highly correlated with adult mortality rates in the 15-49 year age interval, as is to be expected. This relationship is especially strong for maternal orphanhood. And as noted earlier on, there is a strong association between proportion of maternal orphans and under-five mortality and, as is to be expected, also with infant mortality. HIV/AIDS is a major cause of maternal death. The transmission of the HI virus from the infected mother to the infant is also a significant cause of mortality in under fives (see also note 24). Further, maternal death due to childbirth considerably reduces the survival probability of the recently born; the chances of an infant's survival are of course closely linked to the mother's survival.

These three variables explain more of the variation in maternal than in paternal orphanhood and this may be for several reasons, including:

- a large part of the mortality amongst women is pregnancy and childbirth related
- single men may have a higher mortality risk than men who are not single
- children more frequently live with their mothers than with their fathers

Data also suggest an inverse relationship between district based poverty levels and proportion of orphans in a district (Compare *Map 1* and *Map 7*). Higher poverty levels are associated with a lower prevalence of orphanhood[28]. Moreover, the prevalence of maternal orphanhood appears to be higher in more densely populated areas, whereas there is no such relation between population density and paternal orphanhood.

Table A.3 in the appendix presents some insight in living conditions of orphaned and non-orphaned children located in Dar es Salaam, other urban and rural areas. For all three strata, differences between households with and without orphans are small when looking at variables related to household assets, use of energy, housing quality and access to water and sanitation. Compared to households without any orphans, those with orphans tend to be larger in the urban areas, and living in houses with more rooms. Differences in household size and housing are less pronounced in the rural areas. Heads of households with orphaned children are on average a few years older, more often female and are less well educated, compared to heads of households with no orphaned children.

Households with and without orphaned children show little difference in household assets, source of energy used, quality of housing materials and their access to water and sanitation.

The educational performance of orphaned children is a matter of concern. ***Table 3.4*** provides information on the impact of parent survival on educational attainment of children, once again expressed in terms of

[28] $r = 0.21$, $p = 0.0211$

deficit in years of primary education. Nationally, differences in years of primary education deficit between orphaned and non-orphaned children are small at 14 and 17 years of age. Differences in favour of the non-orphaned children tend to increase slightly with decreasing levels of urbanization, with Dar es Salaam exhibiting the smallest gap and the rural areas the largest. Within each stratum, there are minimal differences in educational attainment between orphaned children and those who are not orphaned, and between the different types of orphanhood. However, as noted earlier on in the report, this analysis is constrained by the cross-sectional nature of census data.

Table 3.4 Primary Education Deficit for non-Orphaned and Orphaned Children

	Mainland Tanzania		Dar es Salaam		Other urban		Rural	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Non Orphans								
Deficit at age 14	2.7	0.0	1.6	0.1	1.8	0.0	2.9	0.0
Deficit at age 17	1.7	0.0	0.7	0.1	0.8	0.0	2.0	0.0
Orphans								
Deficit at age 14	2.8	0.0	1.7	0.1	2.0	0.0	3.1	0.0
Deficit at age 17	2.0	0.0	0.9	0.1	1.1	0.0	2.4	0.0
Paternal orphans								
Deficit at age 14	2.8	0.0	1.6	0.1	2.0	0.0	3.7	0.0
Deficit at age 17	2.0	0.0	1.0	0.1	1.1	0.0	2.4	0.0
Maternal orphans								
Deficit at age 14	2.8	0.0	1.8	0.2	2.0	0.0	3.1	0.0
Deficit at age 17	2.0	0.0	1.1	0.2	1.2	0.0	2.5	0.1
Single orphans								
Deficit at age 14	2.8	0.0	1.7	0.1	2.0	0.0	3.1	0.0
Deficit at age 17	2.0	0.0	0.9	0.1	1.1	0.0	2.4	0.0
Double orphans								
Deficit at age 14	2.7	0.1	1.6	0.3	2.1	0.1	3.0	0.1
Deficit at age 17	2.1	0.1	1.3	0.3	1.3	0.1	2.6	0.1

Source: Authors' calculation using 2002 Census, NBS 2003

A recent analysis of a sample of children in Kagera Region in Northwestern Tanzania identified in 1991-94, and traced and re-interviewed 13 years later in 2004, suggest that compared to children who had not been orphaned during this time, orphaned children were severely affected in their education and nutrition outcomes (Beegle, de Weerdt & Dercon, 2005). Maternal orphans, on average, lost 2cms of accumulated height and 1 year of schooling. But the analysis also suggests the following: age at orphanhood matters – those who became orphans after they had turned 12 years showed no difference in these indicators compared with children who were not orphaned; orphaned children from least poor households did not suffer as much as those from poorer households; children living with a parent who subsequently dies suffers most; and orphaned children who are already in school before they are orphaned do not suffer as much as orphaned children who were not in school.

In both urban and rural areas, there are minimal differences in educational attainment at 14 and 17 years of age between orphaned children and those who are not orphaned, and between paternal, maternal and double orphans.

At district level, contrary to general expectations, there seems to be a strong negative association between prevalence of orphanhood and prevalence of working children[29]. ***Figures 3.2 to 3.5*** examine whether this also holds true at the level of the individual child, showing proportion of orphaned and non-orphaned children working by age. Nationally, and in all three strata - Dar es Salaam, other urban areas and rural areas - orphaned children seem slightly more economically active than non-orphaned children, more so at pre- and post-primary school ages. Differences in both urban strata are larger than in rural areas, but just slightly. Due to the small number of orphans sampled in Dar es Salaam, the line representing the economically active orphans there shows substantial random fluctuations.

Figure 3.2: Children Working by Age, Mainland Tanzania

Figure 3.3: Children Working by Age, Dar es Salaam

Source: Authors' calculation using 2002 census, NBS 2003

[29] $r = -0.43$, $p < 0.001$

Figure 3.4: Children Working by Age for Other Urban Areas

Source: Authors' calculation using 2002 census, NBS 2003

Figure 3.5: Children Working by Age for Rural Areas

Source: Authors' calculation using 2002 census, NBS 2003

To assess whether there is a difference in poverty status between orphaned and non-orphaned children, poverty head counts were estimated for both groups. Results show that an estimated 43 per cent of orphaned children in rural areas are living below the poverty line, compared to 39 per cent of the non-orphaned children. In Dar es Salaam differences are substantially larger, 29 per cent of orphans versus 19 per cent of non-orphans are living below the poverty line. For rural Tanzania and Dar es Salaam combined, the poverty head counts for orphans and non-orphans were 42 and 37 per cent.

Table A.4 in the appendix provides poverty differences between children from households with and without orphans by region. Available data suggest that on average, in economic terms, orphaned children are worse off than non-orphaned children, however differences vary by region. Significant differences were noted in 7 out of 21 regions, with most striking differences in poverty levels of close to 10 percentage points in Pwani and Dar es Salaam. For most regions, differences in poverty head counts between orphaned and non-orphaned children are too small and standard errors around the estimates too large to show statistically significant differences.

In summary – individually, orphaned children are poorer, but household living conditions are no different from those with children who are not orphaned. Orphaned children tend to live in districts, which are less poor

The following two sections focus on children who are generally believed to be living under unfavourable conditions: households that are headed by a child and households occupied by children and elderly adults only (i.e. adults aged 60 years and above). The same format as for orphaned children and those with disabilities is followed - looking into prevalence, spatial distributions, household characteristics and child's characteristics in terms of primary education deficit and economic activity.

3.3. Child headed households

According to the 2002 census about 1.2 per cent of the households were headed by a child. The children heading a household are on average between 14 and 15 years of age and are more frequently female when compared to adult headed households.

As suggested in ***Table 3.5*** households headed by children are more of an urban than a rural phenomenon, with the highest prevalence not in Dar es Salaam, but in other urban areas.

Table 3.5: Prevalence of Child Headed Households

	%
Mainland Tanzania	1.2
Dar es Salaam	1.5
Other urban areas	2.2
Rural areas	1.0

Source: Authors' calculation using 2002 census, NBS 2003

The largest proportions of child headed households are in Simanjiro (2.8%), Lindi urban (2.5%) and Iringa urban (2.4%). The lowest prevalence of child headed households is observed in Igunga, Maswa, Kishapu and Singida rural (all around 0.6%). District correlates show higher probabilities of child-headed households in the least poor districts[30]. And as is to be expected, higher proportions of households headed by children are found in districts with a higher prevalence of orphanhood. This association applies for maternal orphanhood and it is even stronger with for orphanhood[31]. Districts with a high prevalence of child headed households are not necessarily the same districts with large proportions of working children[32].

Table A.5 in the appendix shows that there are some differences between child and adult headed households in terms of the size of the household, energy source used for cooking, and some household assets. On the whole, adult headed households appear to be better off in both urban and rural areas,

[30] $r = -0.48$, $p < 0.001$

[31] $r = 0.35$ and 0.40 respectively, with a $p < 0.001$

[32] $r = -0.21$, $p = 0.020$

especially in terms of ownership of radio and bicycle. In Dar es Salaam, the most striking differences can be observed in the energy source used for cooking. Child headed households make infrequent use of firewood and charcoal, and are more likely to use paraffin for cooking than are other households.

Educational performance does not seem to suffer from the fact that a household is lead by a child. Only in rural areas is there a small difference of 0.3 in years of primary education deficit (both at the age of 14 and17 years) in favour of children from adult headed households (***see Table A.6*** in the appendix).

More important than differences in educational attainment are the observed differences in economic activity. At the age of 10 and 15 years, children in child headed households tend to be economically more active than children in adult headed households, the differences being larger in urban than in rural areas. In urban areas just over 30 per cent of 15 year olds living in child headed households are working. In adult headed household the corresponding figure is 11 per cent for Dar es Salaam and 18 per cent for other urban areas. In rural areas 44 and 34 per cent of the 15 year olds in child and adult headed households are working.

Educational performance does not seem to suffer from the fact that a household is lead by a child, even though children in child headed households tend to be economically more active than those in adult headed households.

3.3. Households with elderly and children

This section is devoted to a category of households occupied by children and the elderly, age 60 years and above only i.e. households without any adult household member in the age group between 18 and 60 years of age. Close to 3 per cent of all households fall in this category. This, as suggested by ***Table 3.6***, is more common in rural areas - 3.4 per cent of the households fall in this category than in urban areas.

Table 3.6. Households with children and elderly only

	Per cent
Mainland Tanzania	2.9
Dar es Salaam	0.7
Other urban areas	1.7
Rural areas	3.4

Source: Authors' calculation using 2002 census, NBS 2003

The most affected districts, those with a high prevalence of households with only children and the elderly, are Bukoba Rural and Mufindi (6.3%), Moshi rural (6.4%) and Rungwe (7%). The least affected ones are: Kinondoni (0.5%), Nyamagana and Ilala (0.7%) and Temeke (0.8%). This aspect of vulnerability does not show any correlation with district based poverty estimates. It does, however, show a positive correlation with the prevalence of orphanhood[33]. But on the other hand, there is a negative correlation with child labour i.e. such households seem to be less prevalent in districts with higher rates of working children[34].

[33] $r = 0.35, p < 0.001$

[34] $r = -0.20, p < 0.032$

Table A.7 in the appendix provides further information on ownership of specific household assets and access to some services by the two subgroups of households in both urban and rural areas. Caution should be drawn in interpreting data for Dar es Salaam given that there were very few households with only children and elderly adults. However, it can be concluded that compared to the rural areas, households with only children and the elderly in urban areas are worse off in almost all aspects under discussion: ownership of household assets, type of energy used for cooking and for lighting, access to piped water and flush toilets, and quality of construction materials used – for roof, wall and floor. In the rural areas, differences in ownership of some of the household assets are substantial (possession of radio and bicycles), but there is not much difference when looking at access to improved water sources, or types of sanitation facilities, or even in terms of use of various construction materials. Other indicators are comparable for both groups of rural households.

Table 3.7. Characteristics of Children from Households with only children and the elderly and in other households

	household with children and elderly only		other households	
	Mean	Std Err	Mean	Std Err
Mainland Tanzania				
Orphaned (%)	25.4	0.4	9.3	0.1
Primary education deficit at age 14	2.8	0.0	2.7	0.0
Primary education deficit at age 17	1.9	0.1	1.7	0.0
Children economically active at age 10 (%)	9.2	0.6	10.3	0.3
Children economically active at age 15 (%)	31.8	1.0	30.3	0.4
Dar es Salaam				
Orphaned (%)	22.8	3.1	11.4	0.3
Primary education deficit at age 14	2.3	0.5	1.6	0.1
Primary education deficit at age 17	2.6	0.8	0.7	0.1
Children economically active at age 10 (%)	1.5	1.0	1.5	0.3
Children economically active at age 15 (%)	14.0	8.4	11.9	1.0
Other urban				
Orphaned (%)	28.8	0.7	11.3	0.1
Primary education deficit at age 14	2.2	0.1	1.8	0.0
Primary education deficit at age 17	1.4	0.1	0.9	0.0
Children economically active at age 10 (%)	5.1	1.0	3.5	0.2
Children economically active at age 15 (%)	22.0	1.6	18.4	0.3
Rural				
Orphaned (%)	25.1	0.4	8.8	0.1
Primary education deficit at age 14	2.8	0.1	3.0	0.0
Primary education deficit at age 17	2.0	0.1	2.1	0.0
Children economically active at age 10 (%)	9.7	0.6	12.2	0.4
Children economically active at age 15 (%)	33.3	1.1	34.6	0.4

Source: Authors' calculation using 2002 census, NBS 2003

Table 3.7 compares some characteristics of children residing in households with children and the elderly only and those in other types of households for each of the three strata, Dar es Salaam, other urban and rural areas. Except for the increasing proportion of orphans in households with only children and the elderly, there are no significant differences in two other characteristics - neither in years of primary education deficit at age 14 and 17 years, nor in the proportion of children working at age 10 and 15 years.

This is despite the differences observed in household characteristics in both the urban strata of Dar es Salaam, and other urban areas.

3.4. Summary of vulnerable groups of children

Disability
The highest disability rates are found in Ngara and Songea rural districts. Some of the disabilities, such as physical disability/leprosy, visual, hearing or speech impairment, are more prevalent in the poorest districts. As poverty estimates show, disabled children are more likely to be poor, but also poorer districts are more likely to have disabled children. Children with a disability, especially those in the urban areas, have fewer years of education than those without a disability.

Orphanhood
The prevalence of orphanhood is higher in districts East and West of Lake Victoria, in and around Dar es Salaam and in the Southern Highlands. Makete district has the largest proportion of orphans amongst its child population. Regional HIV/AIDS prevalence rates are strongly associated with the prevalence of maternal orphanhood. Census data show that there are minimal differences in primary education deficit between orphaned children and those who are not orphaned and between the different types of orphanhood. In terms of income poverty, orphaned children are worse off, but to a lesser extent than disabled children are compared to children who are not disabled.

Child-headed households and households with only children and elderly
Child-headed households are more common in urban and least poor districts, whereas households with children and the elderly only are more common in rural and poorer districts. There are no substantial differences in educational performance between children from a child- and from an adult-headed household; or amongst children living in households with children and the elderly only.

Children from a child-headed household are more likely to work compared those from adult-headed household, but such differences is not observed when comparing children from households with children and the elderly only with other households.

Table A.2 Poverty levels for children with and without disabilities for Rural Tanzania and Dar es Salaam, by Region

Region	Children with Disability p(0)	Children without Disability p(0)	p-value[1]
Tanga	39.9	29.3	**
Morogoro	40.3	31.7	**
Pwani	55.5	44.3	**
Dar es Salaam	30.9	21.2	**
Arusha	35.7	25.7	**
Kilimanjaro	39.1	30.2	**
Manyara	55.7	45.7	*.
Tabora	49.3	43.8	n.s.
Kigoma	44.3	40.5	n.s.
Shinyanga	52.4	46.3	n.s.
Kagera	38.6	31.4	*
Mwanza	53.9	48.9	n.s.
Mara	59.5	52.5	n.s.
Dodoma	44.0	35.0	*
Singida	57.7	50.9	n.s.
Iringa	36.9	30.3	*
Mbeya	29.9	27.1	n.s.
Rukwa	45.5	38.9	n.s.
Lindi	50.9	45.1	n.s.
Mtwara	48.3	42.9	n.s.
Ruvuma	47.7	42.2	n.s.

Note n.s. = not significant; *) significant at 0.05; **) significant at 0.01

[1] T-test is used to test if children from a household with a disabled child are poorer than children from households without a disabled child

Table A.3 Characteristics of Households with Orphaned and without Orphaned Children

	Dar es Salaam				Other Urban				Rural			
	households with orphans		households without orphans		households with orphans		households without orphans		households with orphans		households without orphans	
	mean	Std Err	Mean	Std Err	mean	Std Err	mean	Std Err	mean	Std Err	mean	Std Err
Household assets (%)												
Electricity	48.8	2.2	43.6	1.9	28.2	0.6	24.8	0.6	1.3	0.1	1.1	0.1
Radio	79.1	1.0	77.8	0.7	67.7	0.4	69.3	0.3	42.9	0.3	45.7	0.3
Phone	27.1	1.6	22.4	1.2	10.7	0.3	8.3	0.3	0.6	0.0	0.6	0.0
Bicycle	17.4	0.9	17.2	0.8	35.5	0.4	36.6	0.4	35.0	0.4	38.9	0.3
Energy for cooking (%)												
Electricity	4.3	0.6	4.3	0.5	2.3	0.2	2.5	0.2	0.1	0.0	0.1	0.0
Paraffin	15.9	1.3	19.3	1.4	3.7	0.3	6.7	0.5	0.2	0.0	0.2	0.0
Fire wood	13.5	1.6	12.6	1.3	40.0	0.7	36.6	0.7	96.7	0.2	96.7	0.2
Charcoal	65.7	1.7	62.8	1.6	53.5	0.7	53.9	0.7	2.9	0.2	2.9	0.2
Energy for lightning (%)												
Electricity	51.5	2.2	46.1	1.9	30.3	0.6	26.8	0.6	1.4	0.1	1.2	0.1
Hurricane lamp	25.8	1.4	31.5	1.4	34.4	0.5	36.9	0.5	15.5	0.3	14.5	0.3
Pressure lamp	2.8	0.5	3.1	0.5	1.7	0.1	1.9	0.1	0.6	0.0	0.6	0.0
Fire wood	0.5	0.1	0.5	0.1	1.1	0.1	1.0	0.1	6.0	0.2	6.2	0.2
Source of drinking water (%)												
Piped	73.4	2.6	71.9	2.5	67.3	0.8	66.3	0.8	20.5	0.7	20.1	0.6
Protected	14.6	1.8	16.3	1.9	16.2	0.6	15.8	0.5	23.0	0.6	21.9	0.6
Unprotected	7.6	1.2	8.0	1.2	10.2	0.4	11.0	0.4	37.9	0.7	39.0	0.7
Surface water	0.2	0.1	0.2	0.1	3.7	0.2	3.9	0.3	18.0	0.6	18.3	0.5
Toilet facilities (%)												
Flush toilet	17.6	2.1	14.9	1.7	12.0	0.5	10.1	0.4	0.4	0.0	0.3	0.0
Pit latrine	79.5	2.0	82.6	1.7	81.1	0.6	83.6	0.5	88.5	0.3	88.2	0.3
Ventilated impr. pit latrine	1.5	0.3	1.5	0.2	5.4	0.2	4.7	0.2	0.6	0.1	0.5	0.0
No toilet facility	1.3	0.3	0.9	0.1	1.5	0.1	1.6	0.2	10.4	0.3	10.8	0.3
Roof material (%)												
Poor quality	3.8	0.7	3.5	0.5	14.2	0.4	15.7	0.4	63.4	0.5	67.3	0.5
Wall material (%)												
Poor quality	8.6	1.0	7.4	0.7	16.7	0.5	17.9	0.6	41.5	0.7	42.0	0.6
Floor material (%)												
Earth	13.6	1.2	12.4	0.9	37.2	0.6	39.4	0.5	87.9	0.3	89.9	0.2
Household size	6.5	0.1	5.0	0.0	6.0	0.0	4.9	0.0	6.1	0.0	5.9	0.0
# of rooms	2.8	0.0	2.3	0.0	2.7	0.0	2.3	0.0	2.5	0.0	2.3	0.0
# of rooms per adult equiv.	0.6	0.0	0.6	0.0	0.6	0.0	0.6	0.0	0.6	0.0	0.6	0.0

Source: Authors' calculation using 2002 Census, NBS 2003

Table A.4 Poverty levels for orphaned and non-orphaned children for Rural Tanzania and Dar es Salaam, by Region

	Orphaned Children	Non-orphaned Children	
Region	**p(0)**	**p(0)**	**p-value**
Tanga	35.2	29.5	*
Morogoro	38.1	31.4	*
Pwani	52.1	42.6	**
Dar es Salaam	28.6	19.2	***
Arusha	29.8	25.7	n.s.
Kilimanjaro	32.2	30.1	n.s.
Manyara	50.8	45.0	n.s.
Tabora	48.2	42.9	n.s.
Kigoma	43.9	39.5	n.s.
Shinyanga	51.1	45.0	n.s.
Kagera	31.7	31.3	n.s.
Mwanza	53.0	47.8	n.s.
Mara	56.1	51.7	n.s.
Dodoma	42.0	33.9	*
Singida	52.6	51.4	n.s.
Iringa	33.7	29.9	n.s.
Mbeya	30.7	26.4	*
Rukwa	40.6	38.8	n.s.
Lindi	48.5	43.8	n.s.
Mtwara	47.3	41.4	n.s.
Ruvuma	46.4	41.6	n.s.

Note: n.s. = not significant; *) significant at 0.05; **) significant at 0.01; ***) significant at 0.001

Table A.5 Characteristics of Child and Adult Headed Households

	Dar es Salaam				Other Urban				Rural			
	child headed household		adult headed household		child headed household		adult headed household		child headed household		adult headed household	
	mean	Std Err	mean	Std Err	mean	Std Err	mean	Std Err	mean	Std Err	mean	Std Err
Household assets (%)												
Electricity	44.0	3.8	44.7	1.9	25.1	1.0	25.5	0.6	1.5	0.2	1.1	0.1
Radio	70.0	3.1	78.2	0.7	58.8	0.9	69.2	0.3	39.6	0.8	45.7	0.3
Phone	16.4	2.8	23.5	1.2	5.9	0.5	8.9	0.3	0.4	0.1	0.6	0.0
Bicycle	16.6	2.3	17.2	0.7	25.6	0.7	36.6	0.4	29.3	0.7	38.9	0.3
Energy for cooking (%)												
Electricity	3.8	1.4	4.3	0.5	2.3	0.3	2.5	0.2	0.1	0.0	0.1	0.0
Paraffin	34.0	3.6	18.3	1.3	12.6	0.9	5.9	0.4	1.0	0.1	0.2	0.0
Gas	0.3	0.3	0.6	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0
Fire wood	8.8	1.7	12.9	1.3	25.9	0.9	37.5	0.7	91.3	0.6	96.7	0.2
Charcoal	47.3	3.6	63.7	1.5	55.5	1.1	53.8	0.7	6.7	0.5	2.9	0.2
Energy for lightning (%)												
Electricity	48.0	4.2	47.2	1.9	28.9	1.0	27.4	0.6	1.8	0.2	1.2	0.1
Hurricane lamp	25.2	3.0	30.4	1.3	33.5	0.8	36.5	0.4	14.7	0.6	14.5	0.3
Pressure lamp	2.7	1.1	3.0	0.5	1.8	0.2	1.8	0.1	0.7	0.1	0.6	0.0
Fire wood	0.2	0.1	0.5	0.1	0.7	0.1	1.0	0.1	7.5	0.5	6.2	0.2
Source of drinking water (%)												
Piped	73.9	3.6	72.2	2.5	67.8	1.1	66.5	0.8	21.8	0.9	20.1	0.6
Protected	15.7	3.2	15.9	1.9	15.6	0.7	15.9	0.5	20.2	0.9	21.9	0.6
Unprotected	5.8	1.2	8.0	1.2	9.8	0.6	10.9	0.4	38.8	1.1	39.0	0.7
Surface water	0.4	0.3	0.2	0.1	3.4	0.3	3.9	0.2	18.4	0.8	18.3	0.5
Toilet facilities (%)												
Flush toilet	16.4	3.1	15.4	1.7	8.7	0.7	10.5	0.5	0.6	0.1	0.3	0.0
Pit latrine	81.2	3.1	82.0	1.7	84.7	0.8	83.0	0.5	84.8	0.7	88.2	0.3
Ventilated impr. pit latrine	0.5	0.5	1.5	0.2	4.6	0.4	4.8	0.2	0.5	0.1	0.5	0.0
No toilet facility	1.9	0.8	0.9	0.1	1.9	0.2	1.6	0.1	13.8	0.7	10.8	0.3
Roof material (%)												
Poor quality	3.9	1.0	3.6	0.5	10.8	0.6	15.5	0.4	64.2	0.9	67.3	0.5
Wall material (%)												
Poor quality	7.9	1.6	7.6	0.7	18.3	0.9	17.7	0.5	44.7	1.0	42.0	0.6
Floor material (%)												
Earth	10.6	1.8	12.7	0.9	33.7	0.9	39.0	0.5	86.2	0.6	89.9	0.2
Household size	2.4		5.5		2.4		5.3		3.1		5.9	
# of rooms	2.2	0.2	2.4	0.0	1.9	0.0	2.4	0.0	2.1	0.0	2.3	0.0
# of rooms per adult equiv.	1.4	0.2	0.6	0.0	1.1	0.0	0.6	0.0	1.1	0.0	0.6	0.0

Source: Authors' calculation using 2002 census, NBS 2003

Table A.6 Characteristics of Children from Child and Adult Headed Households

	child headed household		adult headed household	
	Mean	Std Err	Mean	Std Err
Mainland Tanzania				
Orphaned (%)	22.7	0.4	9.5	0.1
Primary education deficit at age 14	2.7	0.1	2.7	0.0
Primary education deficit at age 17	1.8	0.1	1.7	0.0
Children economically active at age 10 (%)	16.1	1.4	10.2	0.3
Children economically active at age 15 (%)	40.7	1.4	30.2	0.4
Dar es Salaam				
Orphaned (%)	21.3	2.6	11.3	0.3
Primary education deficit at age 14	1.4	0.4	1.6	0.1
Primary education deficit at age 17	0.8	0.2	0.7	0.1
Children economically active at age 10 (%)	0.4	0.4	1.6	0.3
Children economically active at age 15 (%)	33.9	9.4	11.4	1.0
Other urban				
Orphaned (%)	24.5	0.6	11.3	0.1
Primary education deficit at age 14	1.8	0.1	1.8	0.0
Primary education deficit at age 17	1.0	0.1	0.9	0.0
Children economically active at age 10 (%)	9.7	1.6	3.4	0.2
Children economically active at age 15 (%)	33.3	1.8	18.0	0.3
Rural				
Orphaned (%)	22.3	0.5	9.0	0.1
Primary education deficit at age 14	3.2	0.1	2.9	0.0
Primary education deficit at age 17	2.3	0.1	2.0	0.0
Children economically active at age 10 (%)	18.8	1.7	12.0	0.4
Children economically active at age 15 (%)	44.0	1.6	34.3	0.4

Source: Authors' calculation using 2002 census, NBS 2003

Table A.7 Characteristics of Households with Children with Elderly Adults only

	Dar es Salaam				Other Urban				Rural			
	household with children and elderly only		other households		household with children and elderly only		other households		household with children and elderly only		other households	
	mean	Std Err	mean	Std Err	mean	Std Err	mean	Std Err	mean	Std Err	mean	Std Err
Household assets (%)												
Electricity	19.0	4.1	44.8	1.9	10.1	0.7	25.8	0.6	1.0	0.1	1.1	0.1
Radio	50.6	4.5	78.2	0.7	34.9	0.8	69.6	0.3	22.6	0.5	46.5	0.3
Phone	3.5	1.9	23.5	1.2	2.8	0.4	8.9	0.3	0.3	0.0	0.6	0.0
Bicycle	12.3	3.0	17.2	0.7	16.2	0.6	36.7	0.4	14.8	0.4	39.6	0.3
Energy for cooking (%)												
Electricity	1.4	1.4	4.3	0.5	0.6	0.1	2.5	0.2	0.0	0.0	0.1	0.0
Paraffin	10.9	3.4	18.6	1.3	1.8	0.3	6.2	0.4	0.2	0.0	0.2	0.0
Fire wood	53.3	5.5	12.5	1.3	73.2	1.0	36.6	0.6	98.9	0.1	96.6	0.2
Charcoal	33.5	5.4	63.6	1.5	24.2	0.9	54.3	0.7	0.7	0.1	3.0	0.2
Energy for lightning (%)												
Electricity	18.0	4.1	47.4	1.9	10.8	0.6	27.8	0.6	1.2	0.1	1.2	0.1
Hurricane lamp	21.2	4.0	30.4	1.3	22.4	0.7	36.6	0.4	9.2	0.4	14.7	0.3
Pressure lamp	4.0	2.2	3.0	0.5	1.3	0.2	1.8	0.1	0.5	0.1	0.6	0.0
Fire wood	3.3	1.6	0.5	0.1	2.5	0.3	1.0	0.1	8.6	0.3	6.1	0.2
Source of drinking water (%)												
Piped	57.2	5.1	72.3	2.5	57.9	1.2	66.6	0.8	23.6	0.9	20.0	0.6
Protected	14.8	3.8	15.9	1.9	17.5	0.8	15.8	0.5	21.6	0.8	21.9	0.6
Unprotected	26.2	3.9	7.8	1.1	16.8	0.8	10.7	0.4	37.4	0.9	39.1	0.7
Surface water	0.3	0.2	0.2	0.1	5.8	0.5	3.8	0.2	16.7	0.6	18.3	0.5
Toilet facilities (%)												
Flush toilet	5.0	2.2	15.5	1.7	3.1	0.4	10.6	0.5	0.2	0.0	0.3	0.0
Pit latrine	90.3	2.7	82.0	1.7	91.7	0.5	82.9	0.5	89.7	0.4	88.1	0.3
Ventilated impr. pit latrine	0.0	0.0	1.5	0.2	2.0	0.3	4.9	0.2	0.3	0.1	0.5	0.1
No toilet facility	4.5	1.6	0.9	0.1	3.2	0.3	1.6	0.1	9.7	0.4	10.9	0.3
Roof material (%)												
Poor quality	21.4	3.7	3.5	0.5	32.3	0.9	15.1	0.4	63.6	0.8	67.4	0.5
Wall material (%)												
Poor quality	33.7	4.6	7.5	0.7	30.3	1.0	17.5	0.5	45.9	0.8	41.9	0.6
Floor material (%)												
Earth	48.5	5.3	12.4	0.9	67.3	0.9	38.4	0.5	91.2	0.3	89.8	0.0
Household size	3.2		5.4		3.3		5.3		3.4		5.8	
# of rooms	2.2	0.1	2.4	0.0	2.2	0.0	2.4	0.0	2.1	0.0	2.3	0.0
# of rooms per adult equiv.	1.0	0.1	0.6	0.0	1.0	0.0	0.6	0.0	0.9	0.0	0.6	0.0

Source: Authors' calculation using 2002 Census, NBS 2003