

Absolute Child Poverty in Haiti in the 21st Century

Report for UNICEF Haiti

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INTRODUCTION

Haiti has long been a beacon of hope for the poor and oppressed peoples of the world. It was the first and only country to have a successful slave-led revolution which resulted in independence from a colonial power. The Haitian Revolution of Independence between 1791 and 1804 has been described by many eloquent authors (for example, James 1963; Dupuy 1989; Frick 1990). At the time of the revolution, Haiti was one of the wealthiest countries on the planet.

Whilst it is beyond the scope of this short report and the abilities of its authors to explain the historical reasons for the persistence of child poverty over Haiti's long and complex history, this brief report shows the extent and nature of child poverty in Haiti in the 21st Century. The results should be directly relevant to policy makers as methods used are based upon internationally agreed standards and definitions of poverty and deprivation.

The results are presented in the first section and those interested in the details of the methodology can find these in the Appendices.

Unicef has a long and distinguished history of humanitarian actions in Haiti which have helped to alleviate the worst effects of severe child poverty. In particular, Unicef has committed funds and other resources to support essential health care, reduce the numbers of children excluded from education, improve sanitation and drinking water facilities and protect vulnerable children – particularly children living on the streets (Unicef, 2008). Unicef also works with national and local policy makers in Haiti to assist them in developing effective and efficient policies to reduce child poverty.

Recent studies of poverty in Haiti

Whilst there has been little work done on studying child poverty in Haiti, there have been a number of recent studies which have included the impact of insecurity and international sanctions on children's health, education and well-being (Gibbons and Garfield 1999; Reid, Psoter et al. 2007). Victora et al (2005) used Demographic and Health Survey (DHS) data from nine countries¹ to compare the receipt of interventions which are important determinants of child survival (Victora, Fenn et al. 2005). Specifically, they looked at the numbers of children receiving vaccinations (BCG, diphtheria-pertussis-tetanus, and measles), tetanus toxoid for the mother, vitamin A supplementation, antenatal care, skilled delivery and safe water access by wealth quintile (Figure 1).

¹ DHS data used: Bangladesh (1999/2000), Benin (2001), Brazil (1996), Cambodia (2000), Eritrea (2002), Haiti (2000), Malawi (2000), Nepal (2001) and Nicaragua (2001).

Figure 1: Percentage of children receiving six or more child-survival interventions, by socioeconomic group and country (Source: Victora et al 2005)

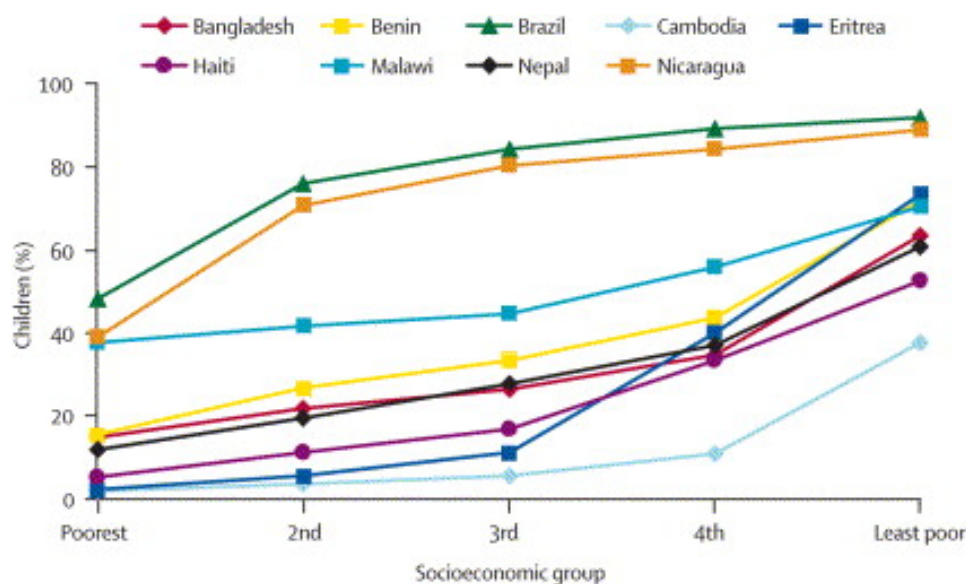


Figure 1 shows that a lower percentage of children in Haiti received six or more interventions important for survival than in any other country except Cambodia. Haiti was characterised as having low coverage of child survival interventions and high levels of inequality between socio-economic groups.

There have also been a number of recent studies on adult poverty however none focus specifically on children. (Pedersen and Lockwood 2001) used household income and expenditure data from 1986/1987 and 1999/2000 to determine a monetary poverty line for Haiti and found poverty to be highest in rural areas (a finding borne out in all other studies of poverty in Haiti). Beauliere (2004) used demographic data from the 1994 Haiti DHS to examine relationships between poverty and fertility and found that high fertility rates were associated with low literacy and high poverty (Beauliere 2004) (Beauliere 2004) (Beauliere 2004).

Using monetary measures of poverty, Sletten and Egset (2004) found more than three-quarters of the Haitian population to be 'poor' or 'extremely poor'² with most of the poor living outside Port-au-Prince, in rural areas. In the main Metropolitan area, 23% were found to be extremely poor. This figure climbed to 57% in other urban areas and to 67% in rural areas. Poverty rates varied considerably by Department. While the Ouest (containing Port-au-Prince) had an extreme poverty rate of 34%, none of the other Departments had a extreme poverty rate below 60% - with the highest rates found in the North East and North West. Households with relatives abroad or who were receiving remittances from abroad had much lower rates of extreme poverty and (unsurprisingly) there was a strong inverse relationship between education level of the main provider and incidence of extreme poverty (70% extreme poverty among households where the main provider had no education, compared to only 7% poverty when the main provider had received a higher education).

² Sletten and Egset defined 'poor' as living on <\$2 a day and 'extremely poor' as living on <\$1 a day.

The most recent study of poverty in Haiti also uses a monetary approach (Jadotte 2006). However, it derives indigence and poverty lines based on the cost of basic needs in Haiti and uses data from the 2001 Haiti Living Conditions Survey (ECVH-2001). The study found 66% of the population living below the indigence line and 74% living below the poverty line³. Jadotte also examined the nature of inequality in income distribution in Haiti (the first such study to do so) and found an extremely high Gini coefficient of 0.65 (higher than that of Brazil). Nearly 70% of national income went to the top 20%, while the bottom 20% received less than 1.5%. Once again, the relationship between education level and poverty was clear cut (sharply inverse), as was the contribution of remittances from abroad in reducing poverty (especially amongst female-headed households). Place of residence was also important, with households living outside the Metropolitan area (or outside the Department de l'Ouest) at much greater risk of poverty and indigence.

³ Using an indigence line of HTG 4,845.51 and a poverty line of HTG 6,438.60.

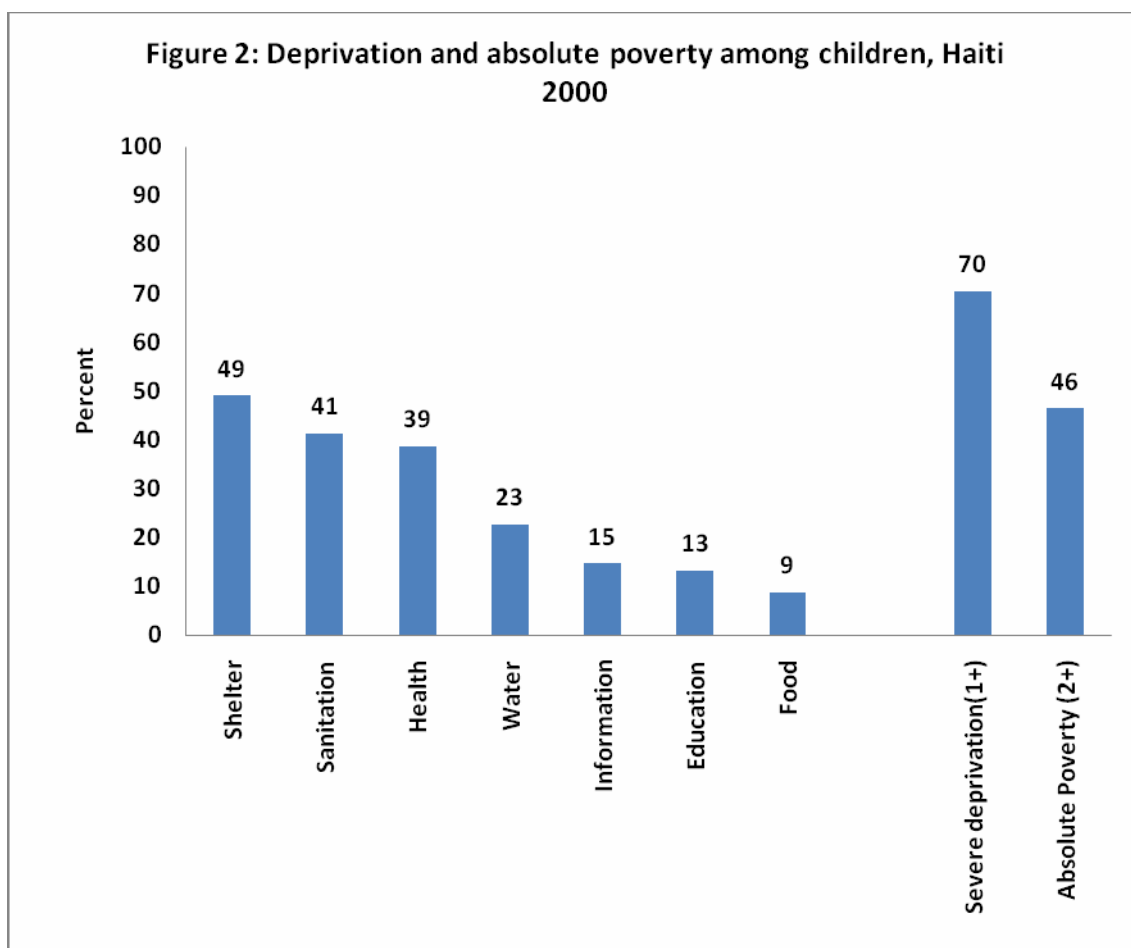
RESULTS

Haiti (2000)

The results from the 2000 Demographic and Health Survey data have been analysed nationally and regionally.

Deprivation and Absolute Poverty (2000)

Figure 2 shows the percent of Haitian children who suffer from different severe deprivations of basic human need. It also shows the proportion of children experiencing one or more deprivations ('severe deprivation') as well as the proportion suffering 'absolute poverty' (two or more deprivations).

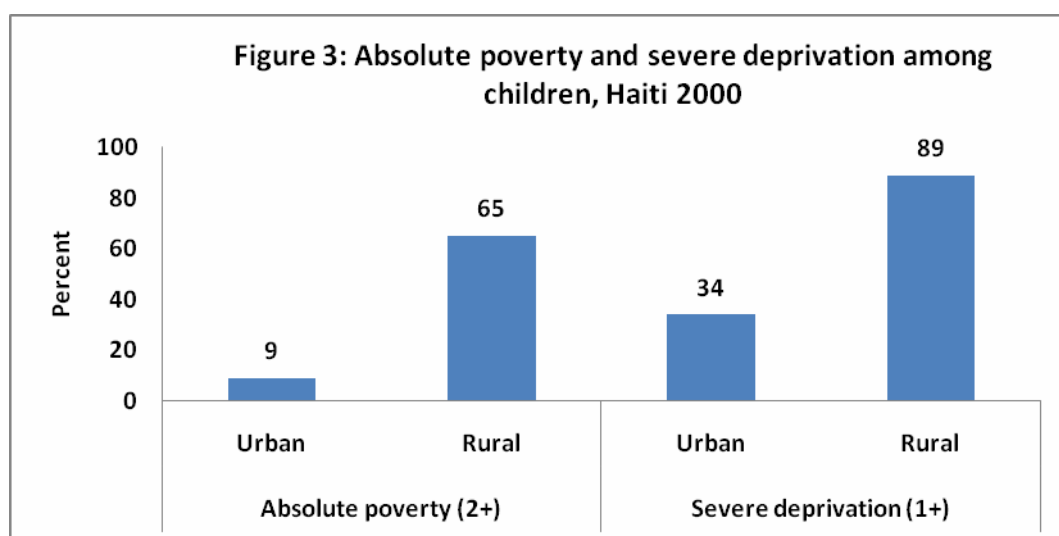


The figure shows that, in 2000, nearly half of all children in Haiti (1.75 million) lived in absolute poverty and seven out of ten children (2.7 million) experienced at least one form of deprivation. In summary, the results for 2000 show that:

- About half of all children (1.85 million) in Haiti are severely shelter deprived. This means they were living in homes with mud floors or in severely overcrowded conditions, with more than five people per room;
- More than four out of ten children (1.56 million) were severely sanitation deprived, living in homes where there were no toilet facilities whatsoever;
- Almost 1.5 million children were severely health deprived. They had not received immunisations against any disease or medical treatment when suffering from serious illnesses;
- More than one in five children (860,000) were severely water deprived, drinking from unsafe open water sources (e.g. ponds, dams) or having such a long walk to water that it is not possible to carry enough to maintain good health (a 30 minute round trip);
- Over half a million children aged 3 to 18 were severely information deprived, with no source of information about the outside world in their homes, i.e. no access to a radio, television, computer, telephone, or newspapers;
- One in eight children (301,000) between the ages of 7 and 18 had never been to school – they are severely education deprived; and
- Just under 10% of children under five years old (78,000) are so severely food deprived and malnourished that, if they survive, their health will be permanently affected for the rest of their lives.

Geographic differences in severe deprivation and absolute poverty (2000)

As would be expected, there are considerable differences in the extent of deprivation between urban and rural Haiti, with significantly larger proportions of children in rural areas suffering both absolute poverty and severe deprivation. Whilst lower proportions of urban children live in absolute poverty, one in three still experience severe deprivation (Figure 3).



However, urban/rural disparities are complex. Figure 4 (below) shows the gradient in the extent of poverty between rural areas, towns and cities in Haiti. The difference in the rate of absolute poverty between rural children and children in all urban areas is statistically significant, as is the difference between children in towns and the capital city. While one in

25 children in the capital city lives in absolute poverty, in small cities it is one child in eight. In towns, it is around one child in four whereas, in the countryside, nearly seven out of 10 children live in absolute poverty.

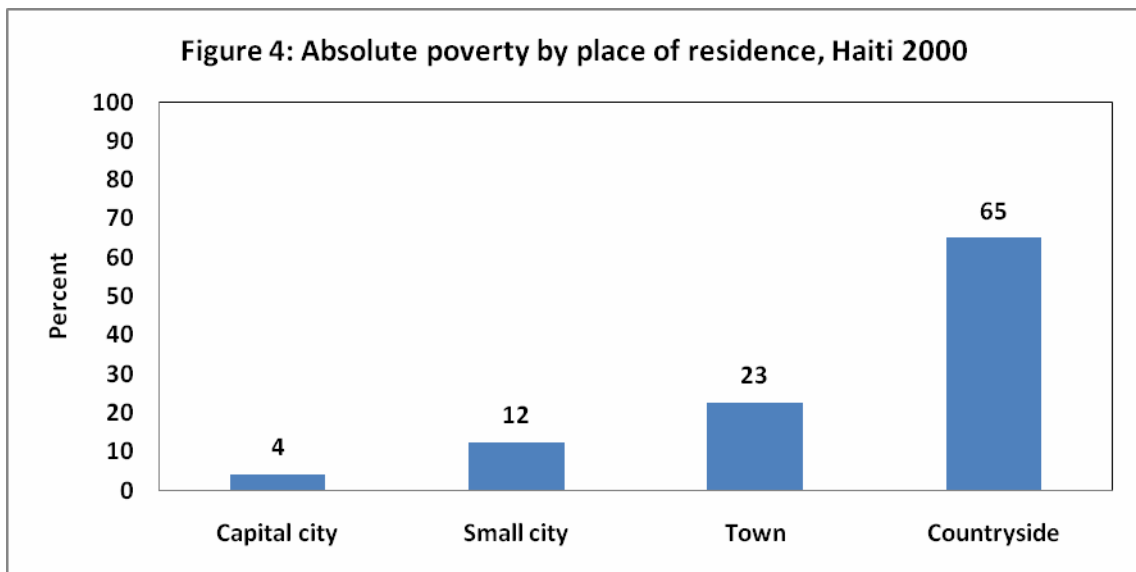


Figure 5 presents the extent of absolute poverty in each Department. What is most apparent is that all but one of the Departments has rates of absolute poverty above the national average (46%). The Department which includes the capital city (Port-au-Prince) has the lowest rate of absolute poverty (25%). However, although it is clear that the ‘West’ region has on average less than half the absolute child poverty rate of the rest of Haiti, regions are too large and diverse to provide a clear picture of the distribution of absolute poverty.

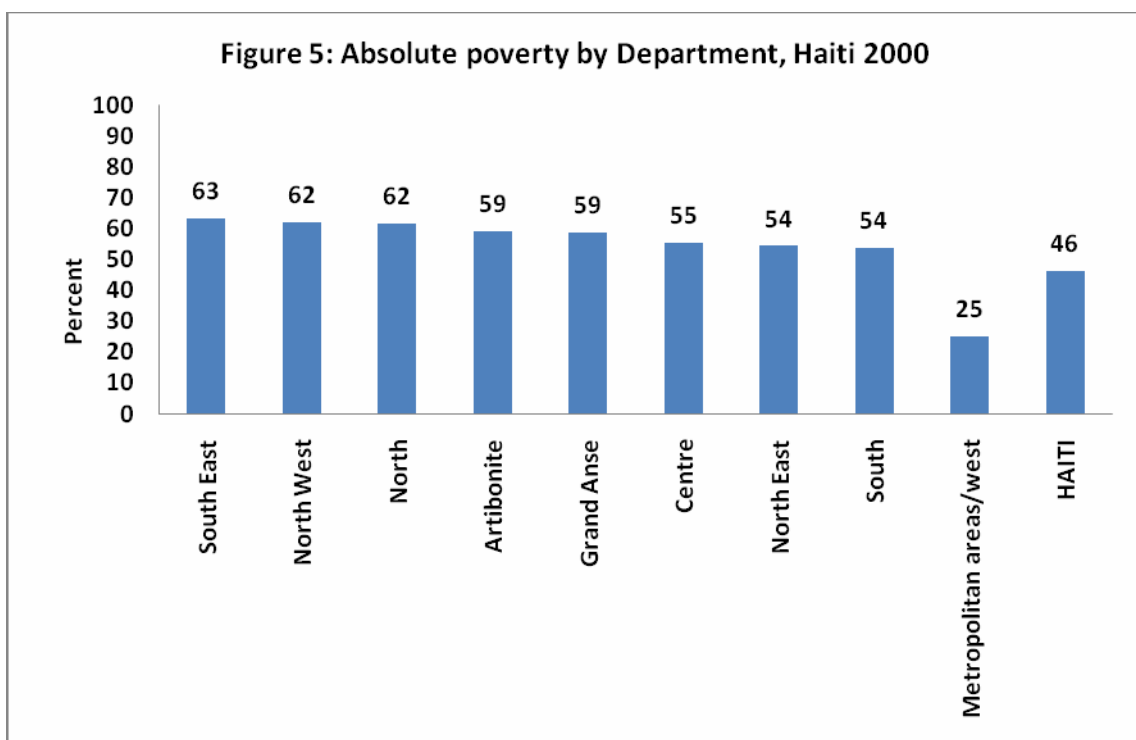
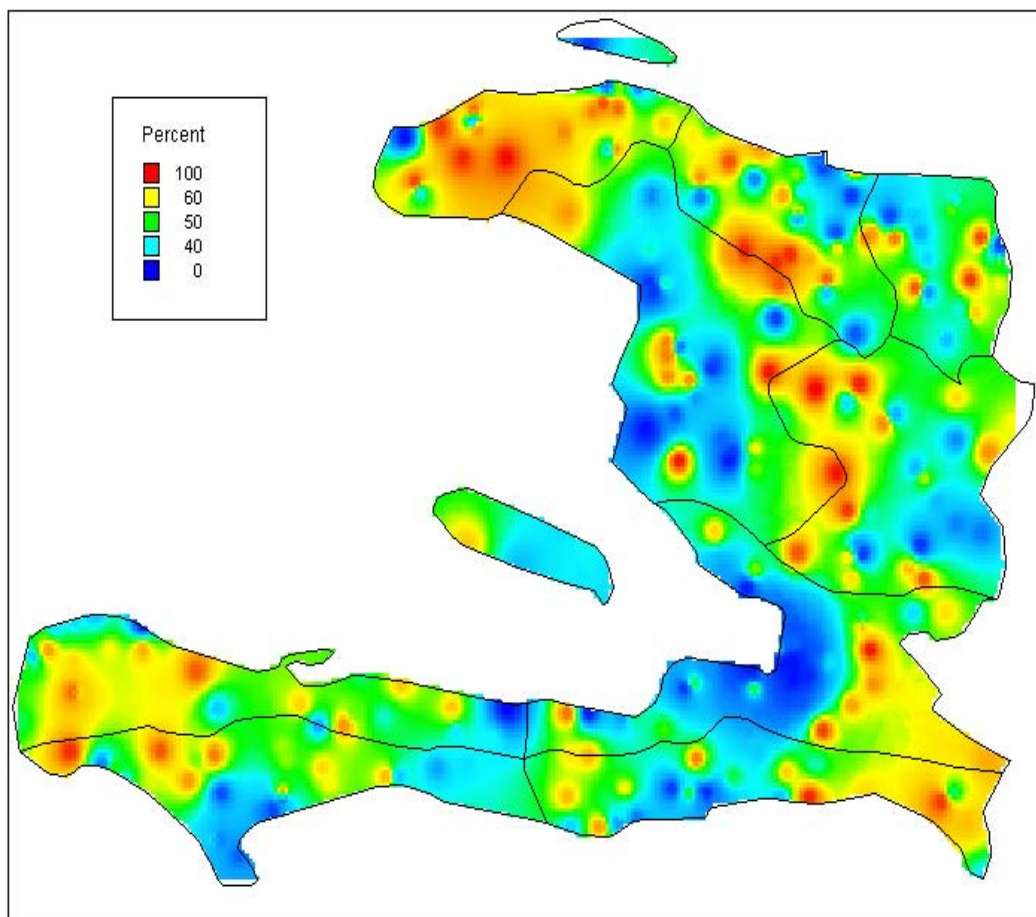


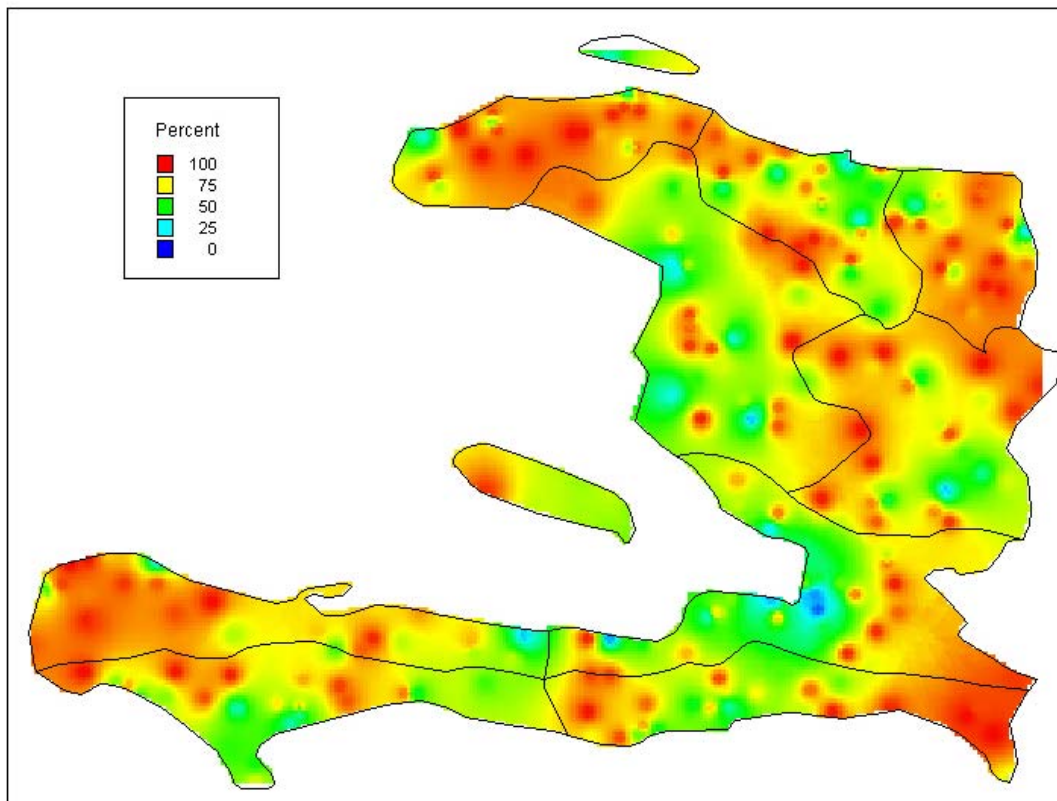
Figure 6 shows a map of the distribution of absolute child poverty in Haiti in 2000. The map is an estimate of the percent of poor children at sub-regional level, produced using Global Positioning System (GPS) latitude and longitude data on the location of the 317 primary sample units (clusters) used in the Haiti 2000 DHS survey. The percent of poor children between sample points has been estimated using the Inverse Distance Weighting technique (see Appendix for details). The red and yellow areas on the map show that these are very high rates of absolute child poverty in rural areas on all regions. Conversely, the dark blue areas on the map show relatively low rates of absolute child poverty in the cities of all regions.

Absolute Child Poverty in Haiti in 2000



Similarly, Figure 7 shows a map of the estimated distribution of severe child deprivation in Haiti in 2000. The distribution is similar to the map of absolute poverty but the percent of children suffering from severe distribution is higher than the percent suffering from absolute poverty. The highest rates of severe deprivation are found in the rural areas with significantly lower rates in the cities.

Percent of Severely Deprived Children in Haiti

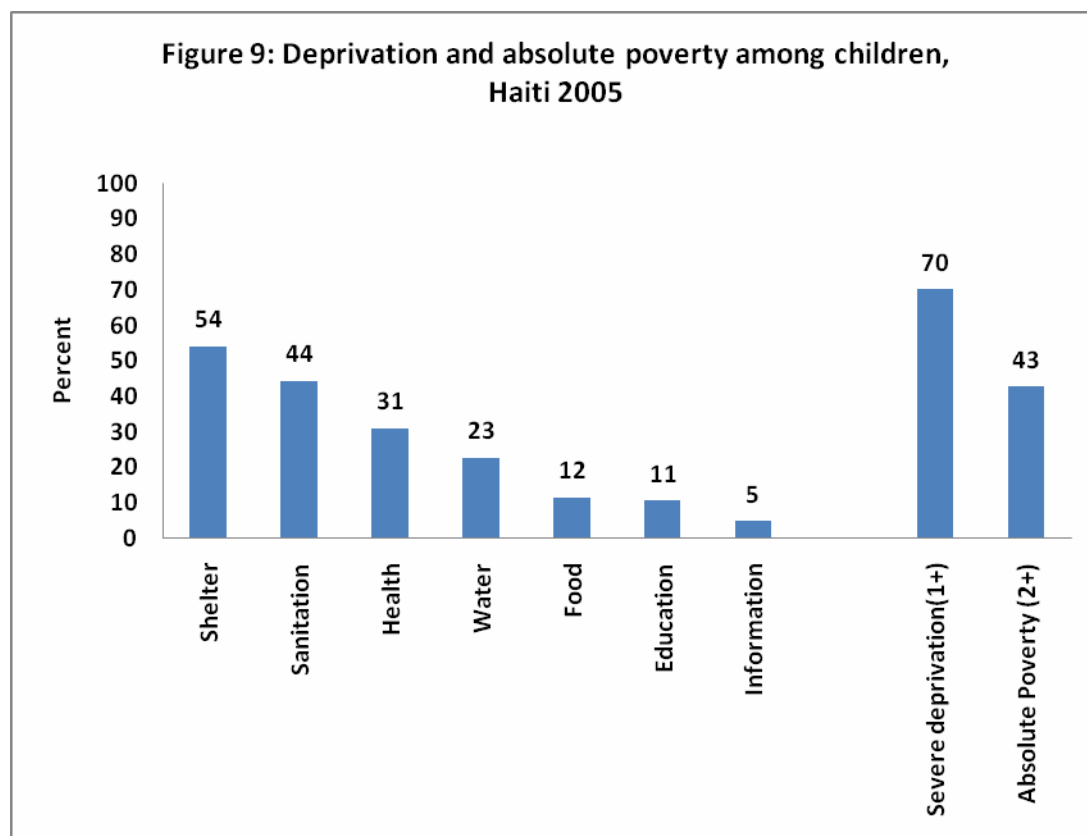


Haiti (2005)

This section presents results using the 2005 DHS survey data for Haiti. It uses the same methods, thresholds and outcome measures as the analyses of the 2000 DHS data, so the results are directly comparable.

Deprivation and Absolute Poverty (2005)

Figure 9 shows estimates of severe deprivation and absolute poverty among children in Haiti in 2005.



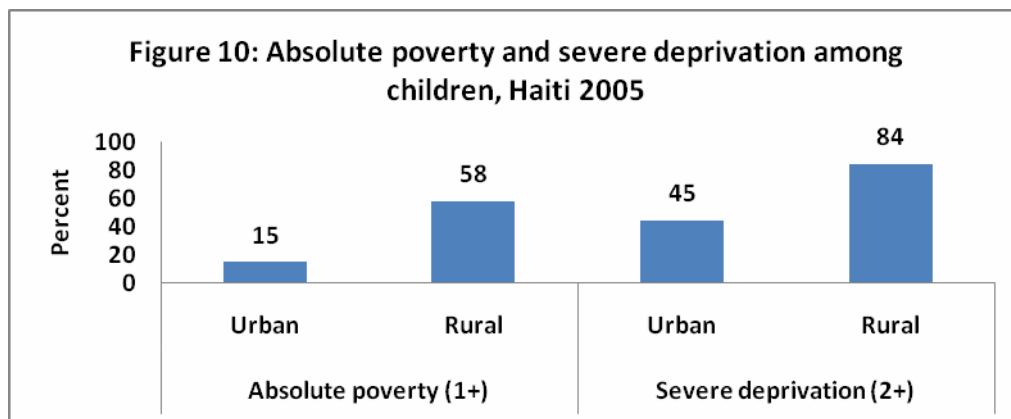
In 2005, more than 4 in 10 children in Haiti (1.62 million) lived in absolute poverty, with seven out of ten children (2.66 million) experiencing at least one form of deprivation. In summary, the results for 2005 show that:

- More than half of all children (2.1 million) in Haiti are severely shelter deprived. This means they were living in homes with mud floors, or in severely overcrowded conditions, with more than five people per room;
- More than four out of ten children (1.7 million) were severely sanitation deprived, living in homes where there were no toilet facilities whatsoever;
- A third of all children (1.2 million) were severely health deprived. They had not received immunisations against any disease or medical treatment when suffering from a serious illnesses;

- About one in five children (861,000) were severely water deprived, drinking from unsafe open water sources (e.g. ponds, dams) or having to walk such a long way to water that it is not possible to carry enough to maintain good health (a 30 minute round trip);
- Over 100,000 young children under five years old were so severely food deprived and malnourished that, if they survive, their health will be permanently affected for the rest of their lives;
- A quarter of a million children between the ages of 7 and 18 had never been to school – they are severely education deprived;
- Five percent of children aged 3 to 18 were severely information deprived and had no source of information about the outside world in their homes i.e. no access to a radio, television, computer, telephone, or newspapers;

Geographic differences in severe deprivation and absolute poverty (2005)

Figure 10 shows that urban/rural disparities were still marked in 2005. While 15% of urban children lived in absolute poverty, in rural areas the rate was much higher at 58%. Whilst nearly half of all urban children suffered severe deprivation, in rural areas the rate was 84%. In the year 2005, a clear majority of children in Haiti were experiencing considerable hardship and their basic needs were unmet.



As discussed above, the differences between the urban and rural areas are complex. Figure 11 shows rates of absolute poverty in urban and rural areas, with rates significantly lower in the capital city at 8% and highest in the countryside (61%).

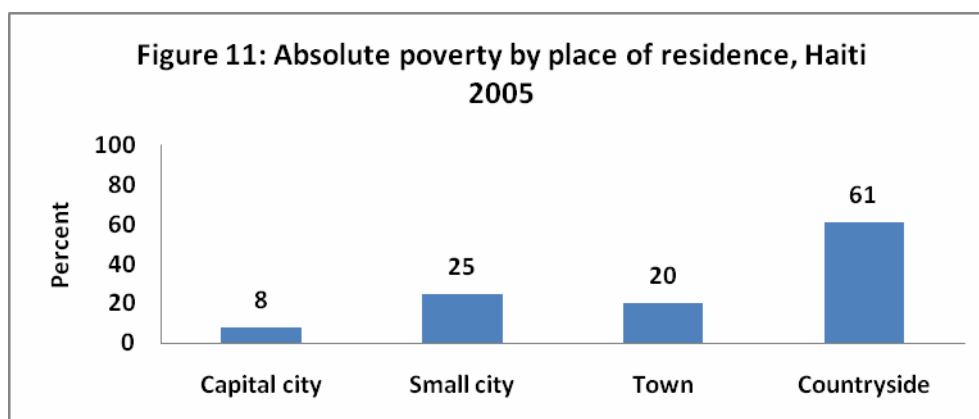
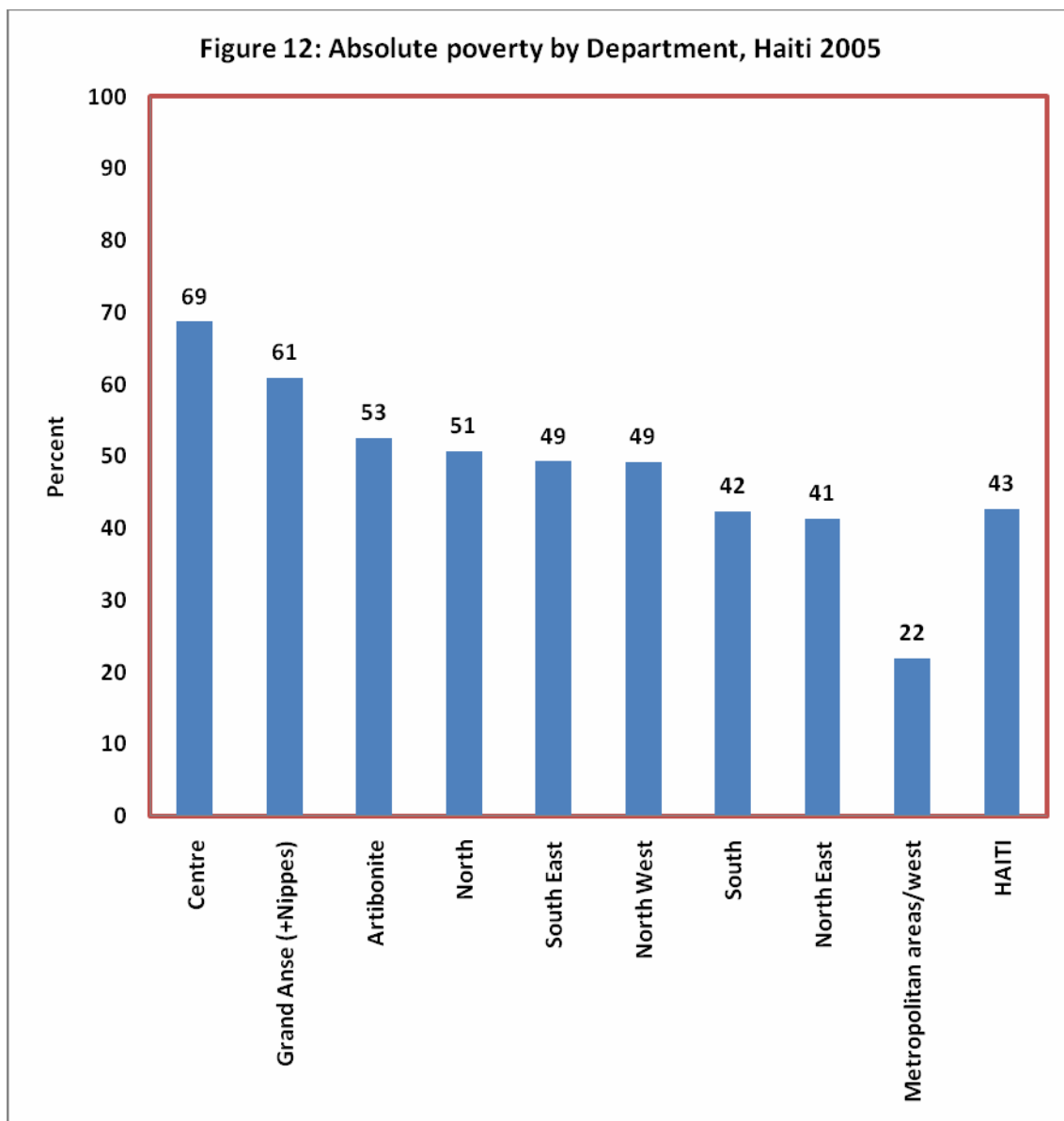


Figure 12 presents rates of absolute poverty by Department. As in 2000, the Department containing Port au Prince has the lowest rate (22%). Rates are highest in Centre (69%) and Grand' Anse (61%). Three Departments have rates of poverty below the national average (43%).



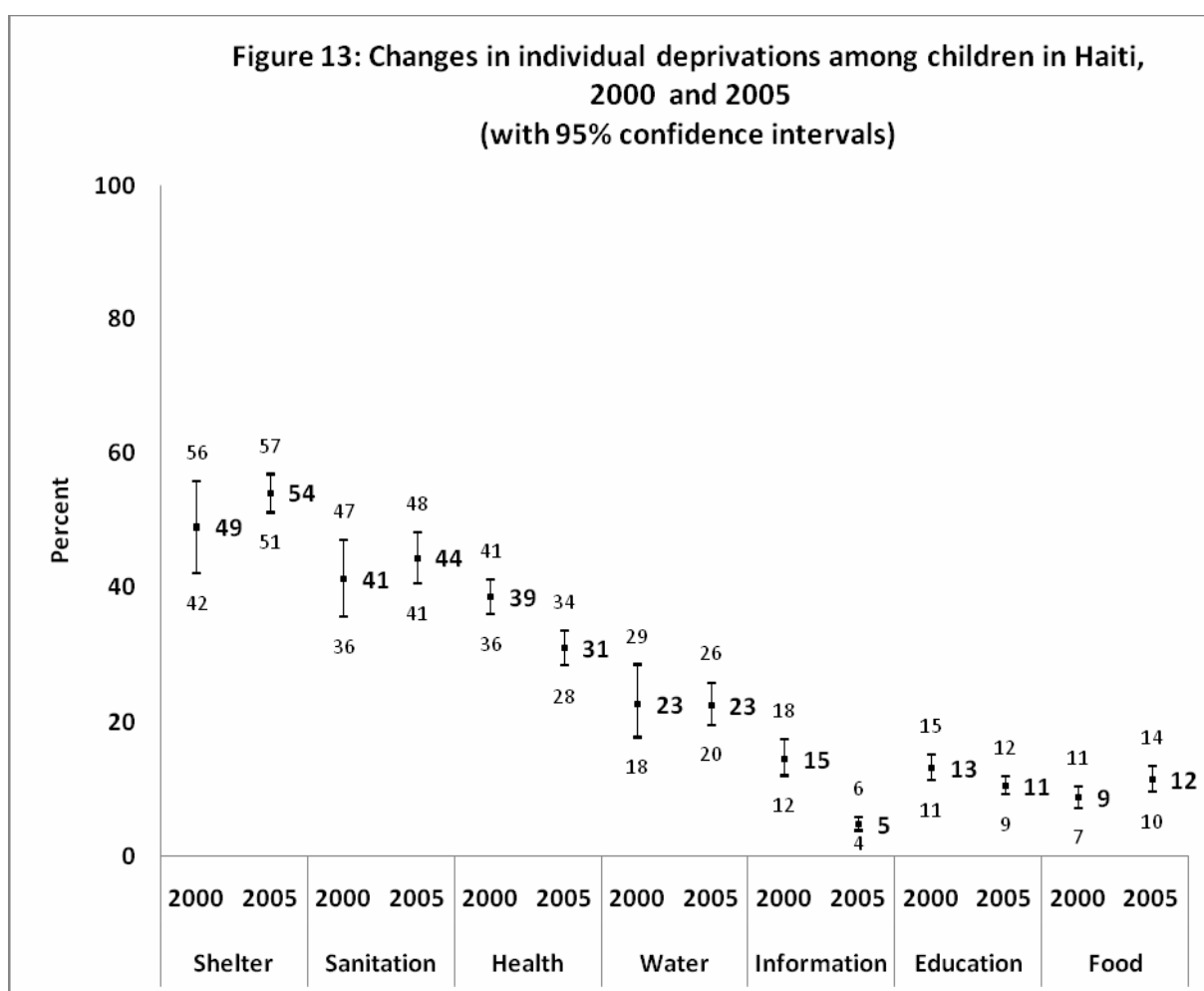
Unfortunately, GPS latitude and longitude data for the 2005 Haiti DHS survey primary sample locations are not currently available (although they will be available in the near future) so it is not possible at the moment to produce maps of poverty and severe deprivation at sub-regional level. However, it seems likely that a similar distribution of poverty and deprivation existed in 2005 as in 2000, so it may be expected that 2005 maps will look similar to the 2000 maps (Figures 6 and 7).

Comparison of the 2000 DHS and 2005 DHS

This section looks at changes in deprivation and poverty in Haiti between 2000 and 2005. As the data and methods used are consistent, results can be compared directly⁵.

Comparison of Deprivation and Absolute Poverty

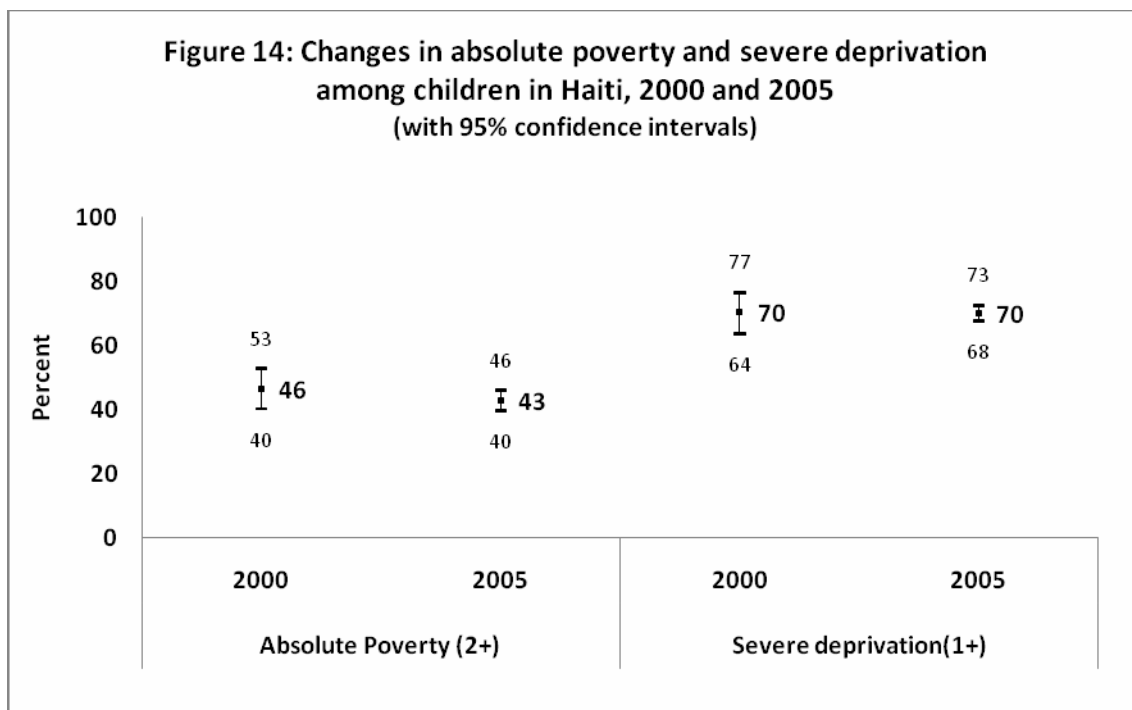
Figure 13 shows the changes which took place for each of the seven main deprivations. There were apparent increases in shelter, sanitation and food deprivation and falls in health, information and education deprivation although many of these changes are unlikely to be statistically significant⁶. However, there does appear to have been a small improvement in the percent of children suffering from health and information deprivation during the 21st Century in Haiti.



⁵ 95% confidence intervals are included in the charts in this section to help identify if any of these changes over time are statistically significant. As discussed in the Methods section, neither the 2000 or 2005 Haiti DHS surveys were simple random samples - both had a stratified cluster design. Therefore the 95% confidence intervals have been calculated using complex sample statistics which allows for the sample design when making these calculations.

⁶ The 95% confidence intervals for each estimate overlap for shelter, sanitation, water, education and food deprivation and these changes may simply be a result of random sampling variation between the two surveys.

Figure 14 shows the changes in absolute poverty and severe deprivation. While it appears that absolute poverty fell slightly, this fall is not statistically significant. Similarly, there was no change in the extent of severe deprivation between 2000 and 2005.



Comparison of geographic differences

It has been possible to compare geographic differences over the five years. While rates of absolute poverty are generally lower in urban areas, it is interesting to note that it is urban areas which see the greatest increases in child poverty between 2000 and 2005. Figure 15 (below) shows that the rate of poverty in urban areas increased from 9% to 15% but appeared to fall in rural areas. One reason for this may be that rural to urban migration may initially reduce child poverty in rural areas and increase poverty in urban areas. However, none of these changes appear to be statistically significant.

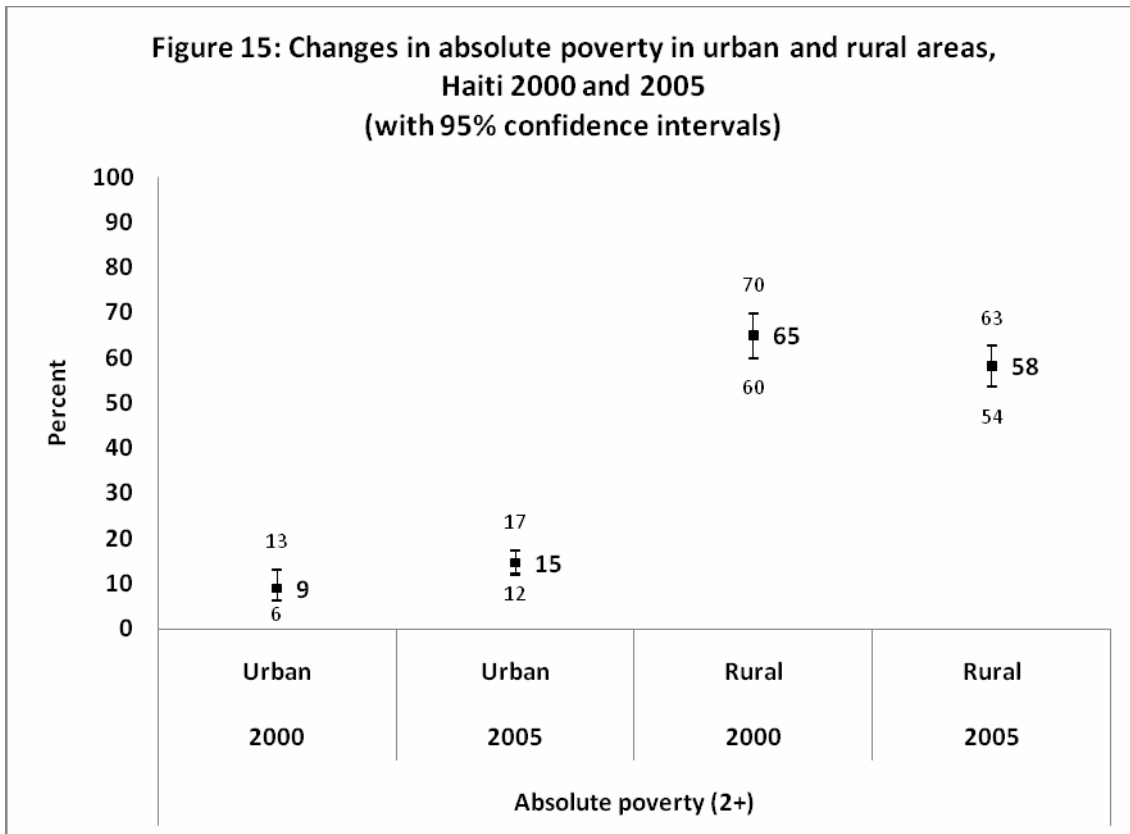
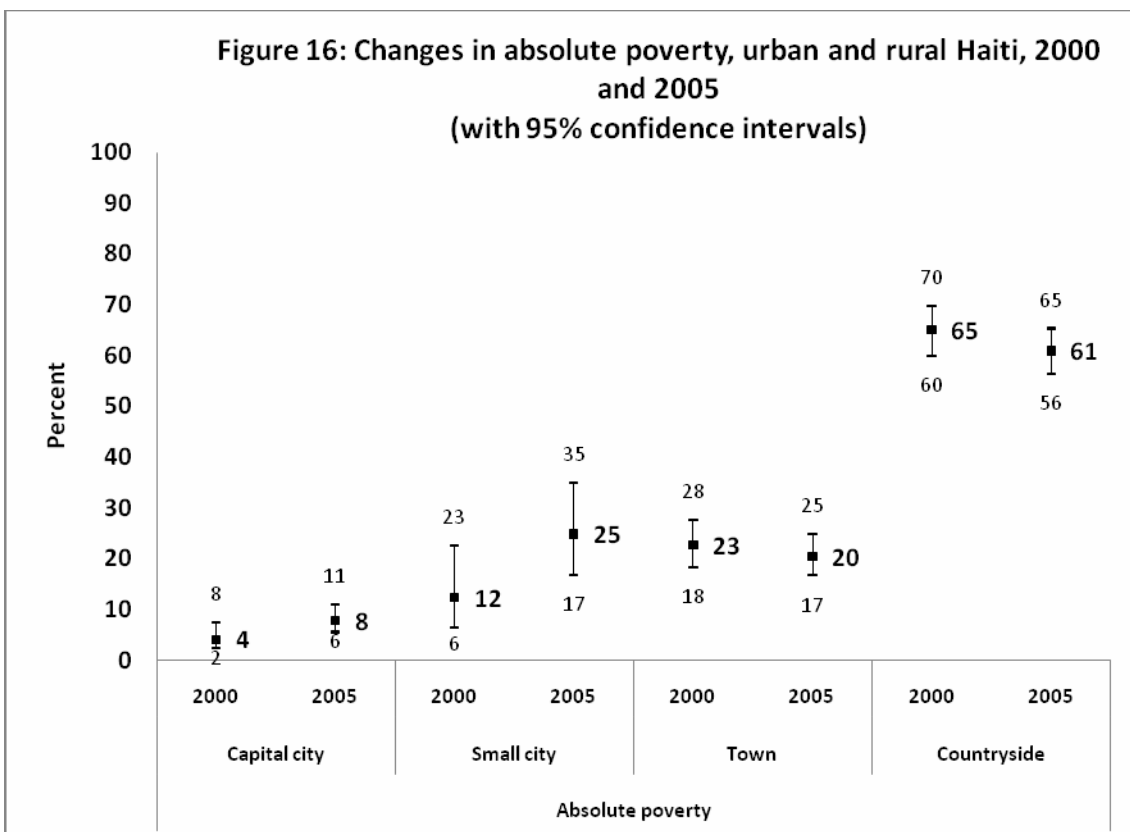
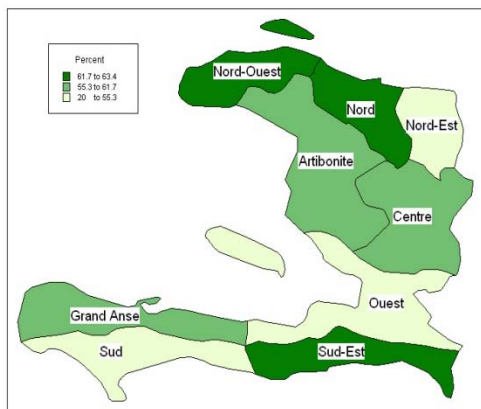


Figure 16 confirms these patterns of change over time, showing large increases in child poverty in both the capital and other small cities, which both see a doubling of poverty rates. By contrast, there are small declines in poverty in smaller towns and the countryside.



There were also changes in the distribution of child poverty in the different Departments, as these two maps show.

Absolute Child Poverty by Region, Haiti 2000



Absolute Child Poverty by Region, Haiti 2005

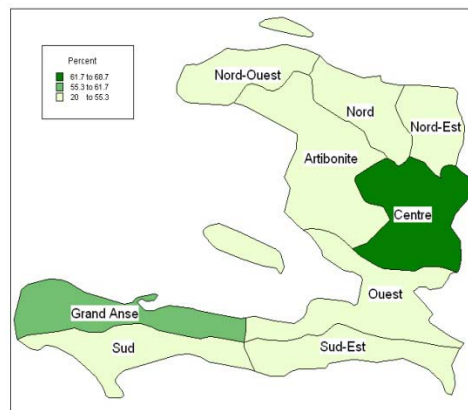
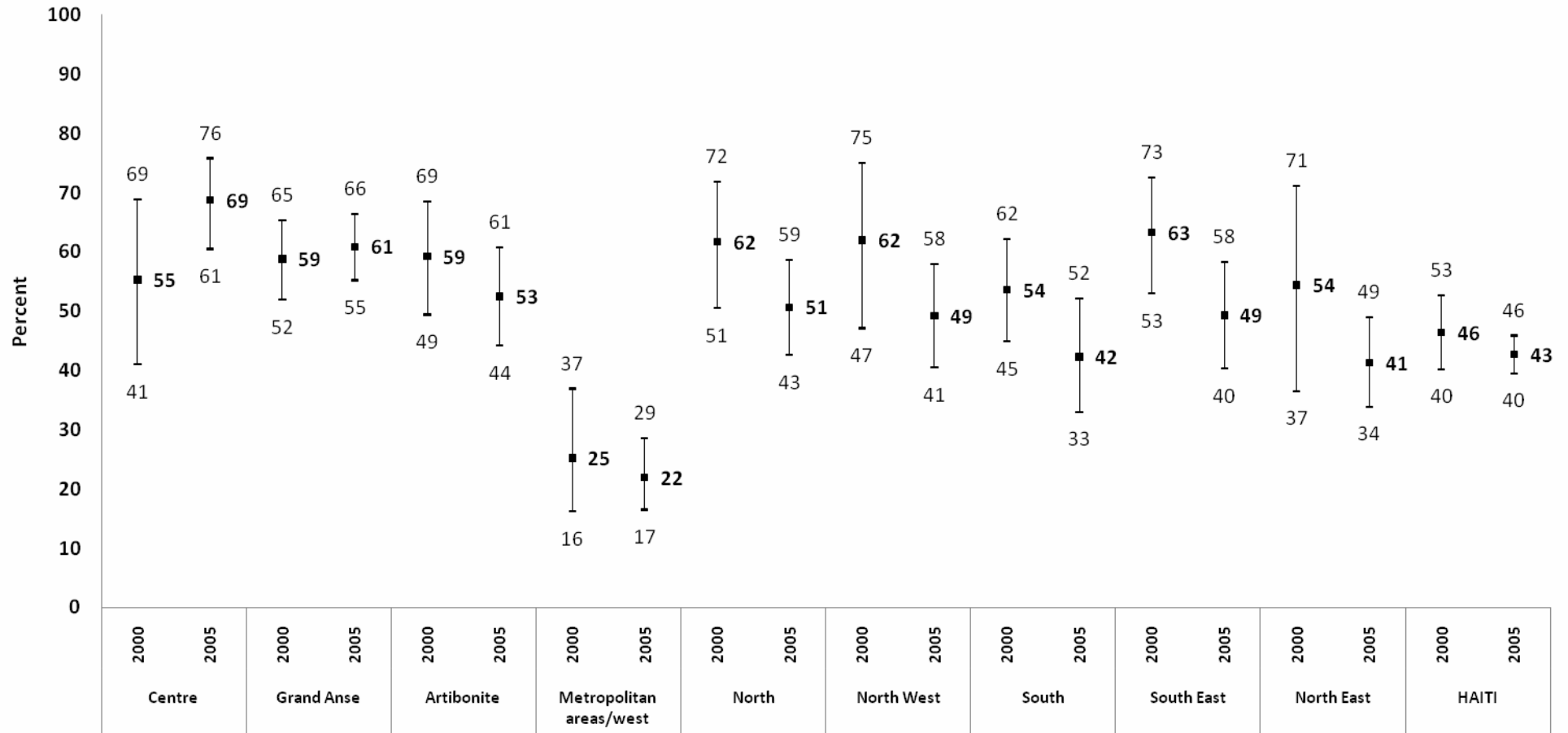


Figure 17 (below) gives a breakdown of the figures used to produce these maps. It shows that two Departments, Centre and Grand' Anse saw large increases in absolute poverty between 2000 and 2005. Large decreases in poverty were apparent in the North, North West, South, South East and North East. Relatively small decreases were seen in the Metropolitan area/West Department. The two maps of absolute child poverty at regional level in 2000 and 2005 clearly show these changes.

Whilst these changes need to be interpreted with a degree of caution, there is some consistent evidence that absolute child poverty may be falling slightly in rural areas and increasing slightly in urban areas. When the GPS data for 2005 become available this will make possible more sophisticated analyses.

**Figure 17: Changes in absolute poverty by Department, Haiti 2000 and 2005
(with 95% confidence intervals)**

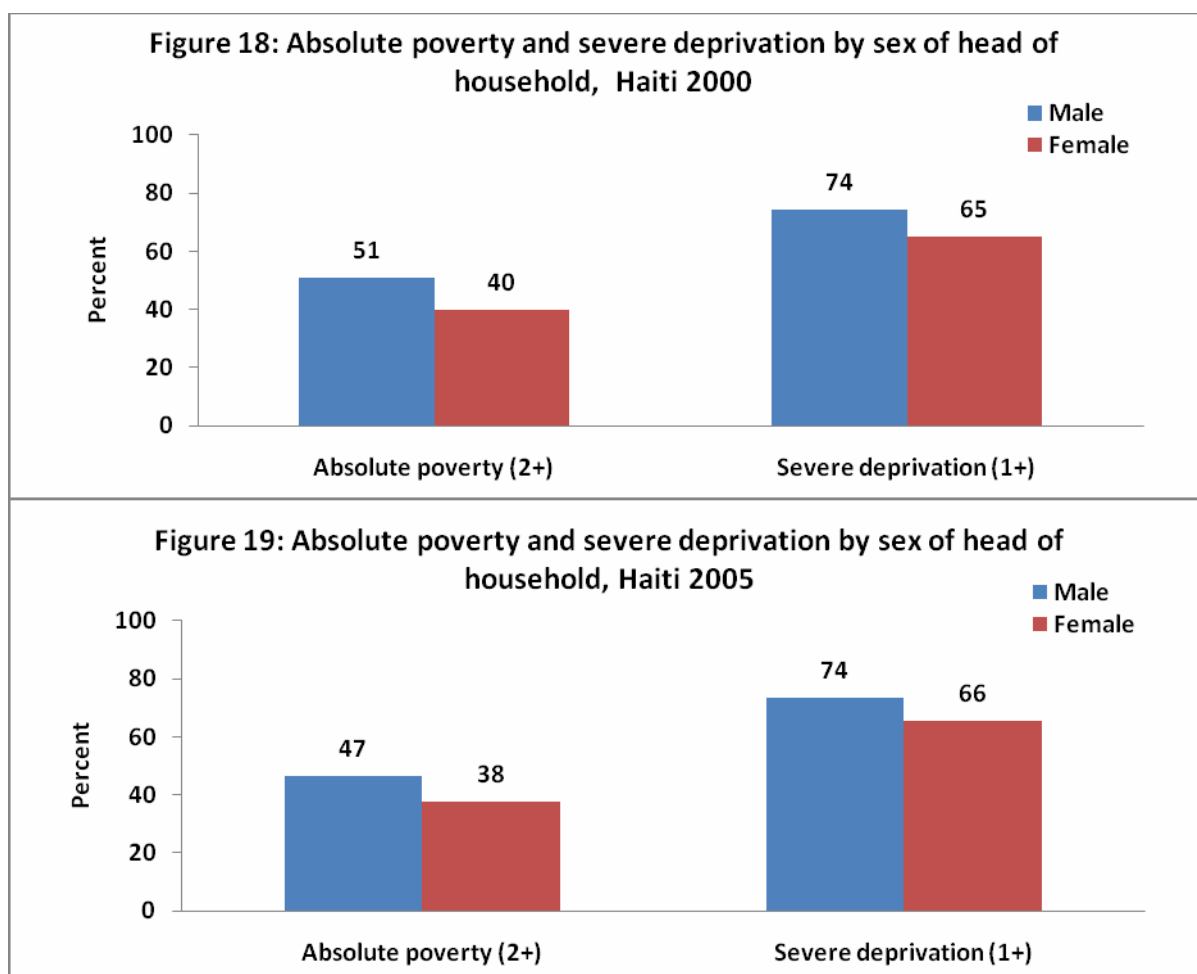


Analysis of Demographic and Socio-economic Disparities (2000 and 2005)

The analyses that follow are mostly based on household-level information. While certain dimensions are clear (e.g. number of household members), others require further explanation.

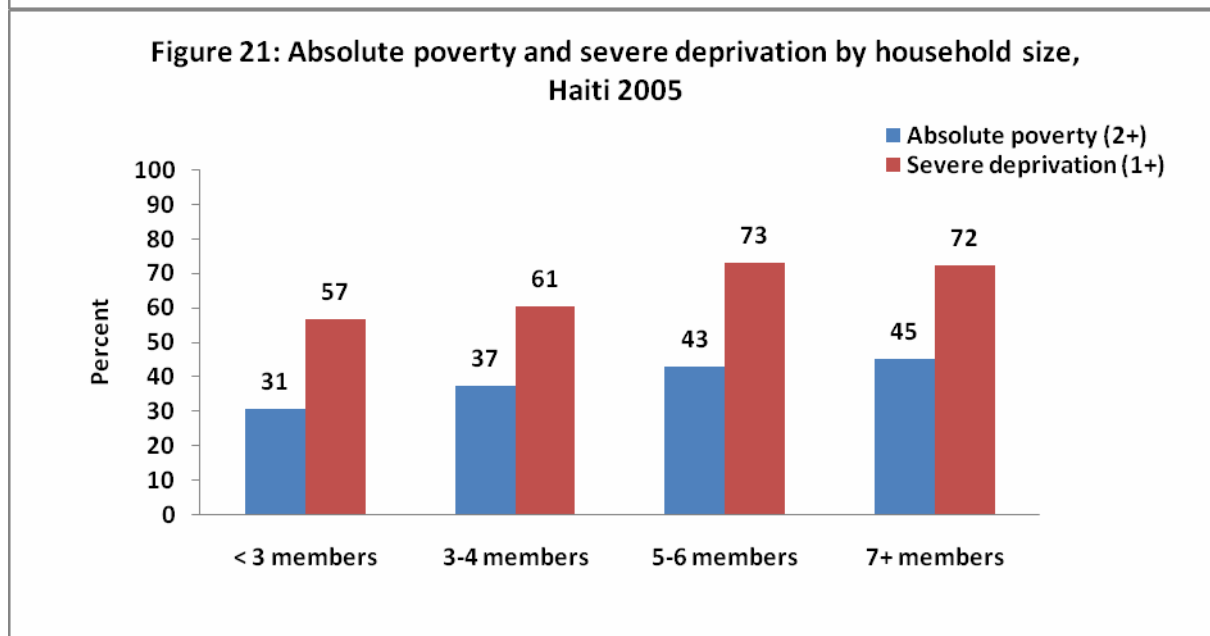
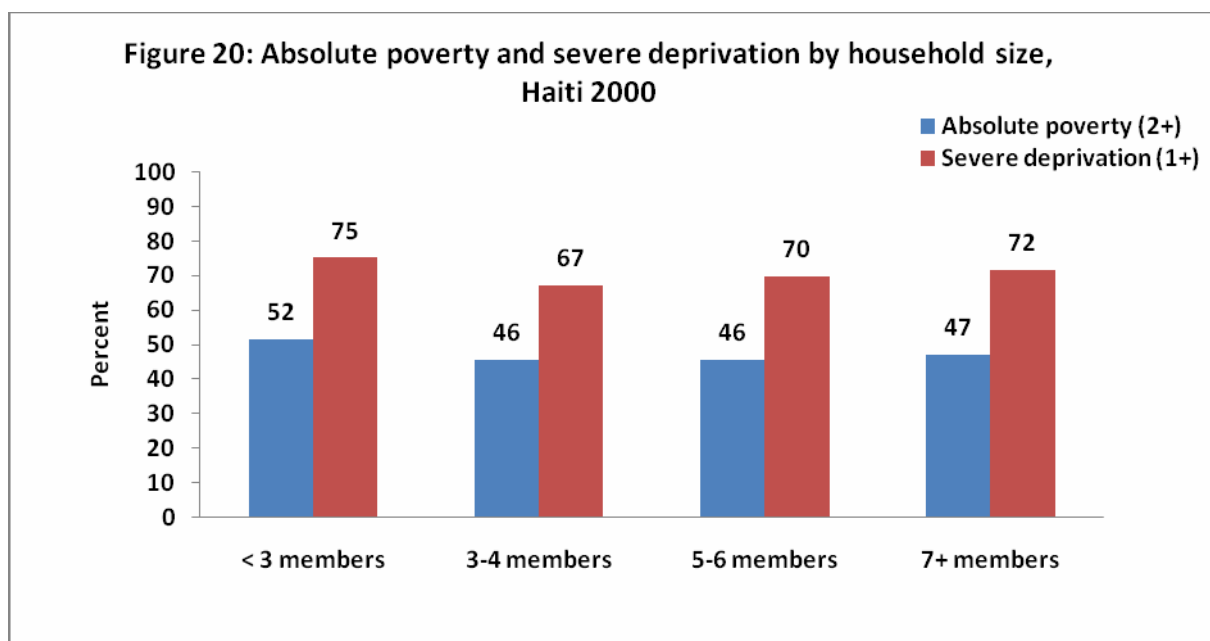
Sex of head of household

There is often concern expressed at the vulnerability of certain types of household, with particular attention paid to households headed by women. While some research suggests female-headed households in some parts of the world are more likely to be poor (Wilson 1987; Katapa 2006), others contest this (Barros, Fox et al. 1997). Based on the 2000 and 2005 DHS data for Haiti, it appears that rates of absolute poverty and severe deprivation are lower among households headed by women than by men (Figures 18 and 19).



Household size

In many countries, researchers have found that larger families are more likely to be poor than smaller families. Households were divided into four groups: those with less than three members, those with three or four members, those with five or six members, and those with seven or more members. Rates of absolute poverty and severe deprivation by household size do not appear to follow a distinct pattern in 2000 (Figure 20), however, it appears from the 2005 data, that there is some ambiguous evidence for a gradient associated with increasing household size (Figure 21). That said, what might be a more important determinant of poverty is the number of children rather than the number of household members *per se*.



Education

The 2000 and 2005 data showed there to be a clear inverse relationship between level of education and poverty. The highest level of education of women (Figure 22) and any household member (Figure 23) were aggregated to household level and applied to the analysis. Children in households where no one had received any formal education are highly likely to be absolutely poor or severely deprived. In households where someone has received an higher education (post secondary), almost no children experienced absolute poverty, with only a small proportion experiencing one or more severe deprivations.

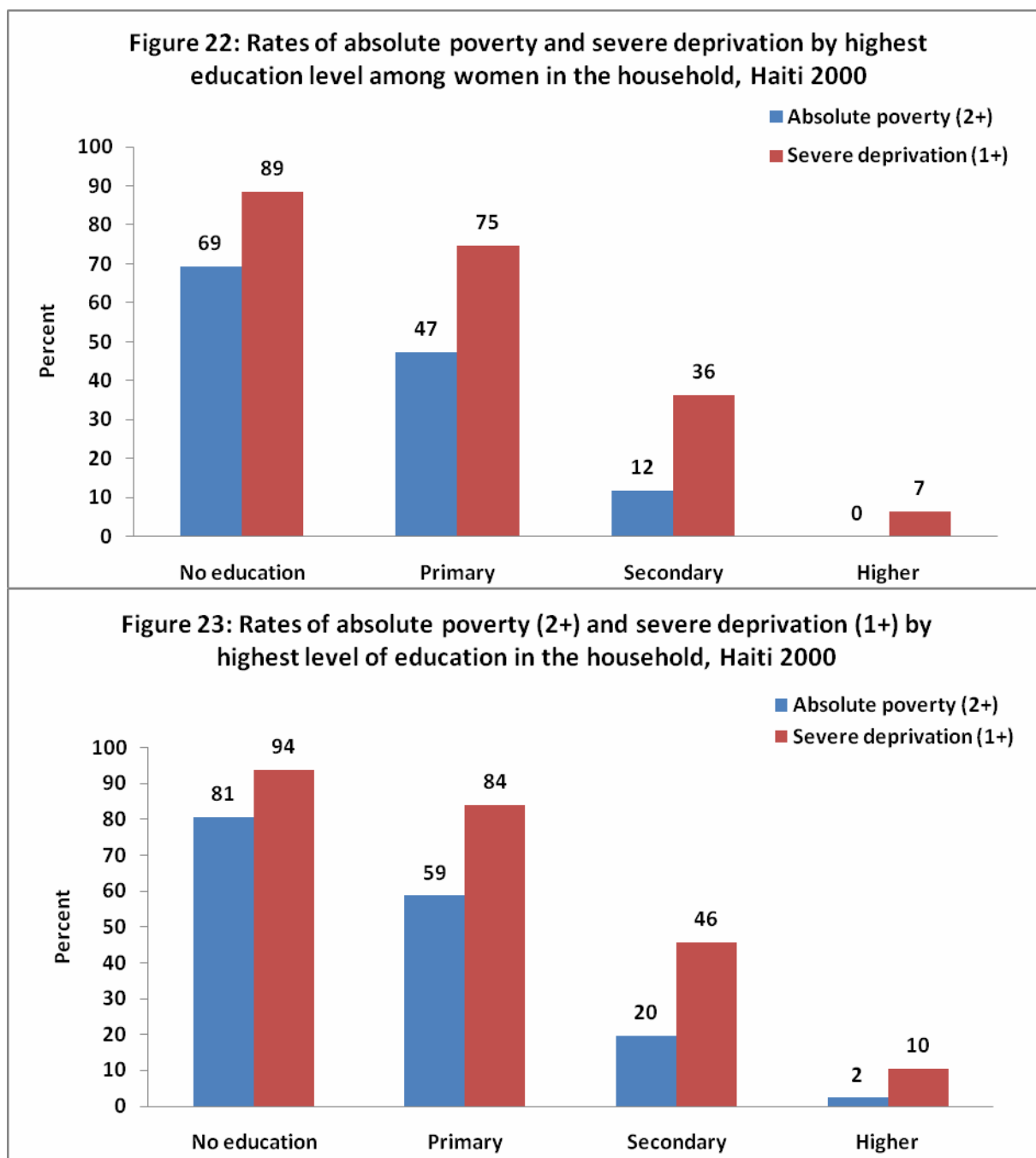
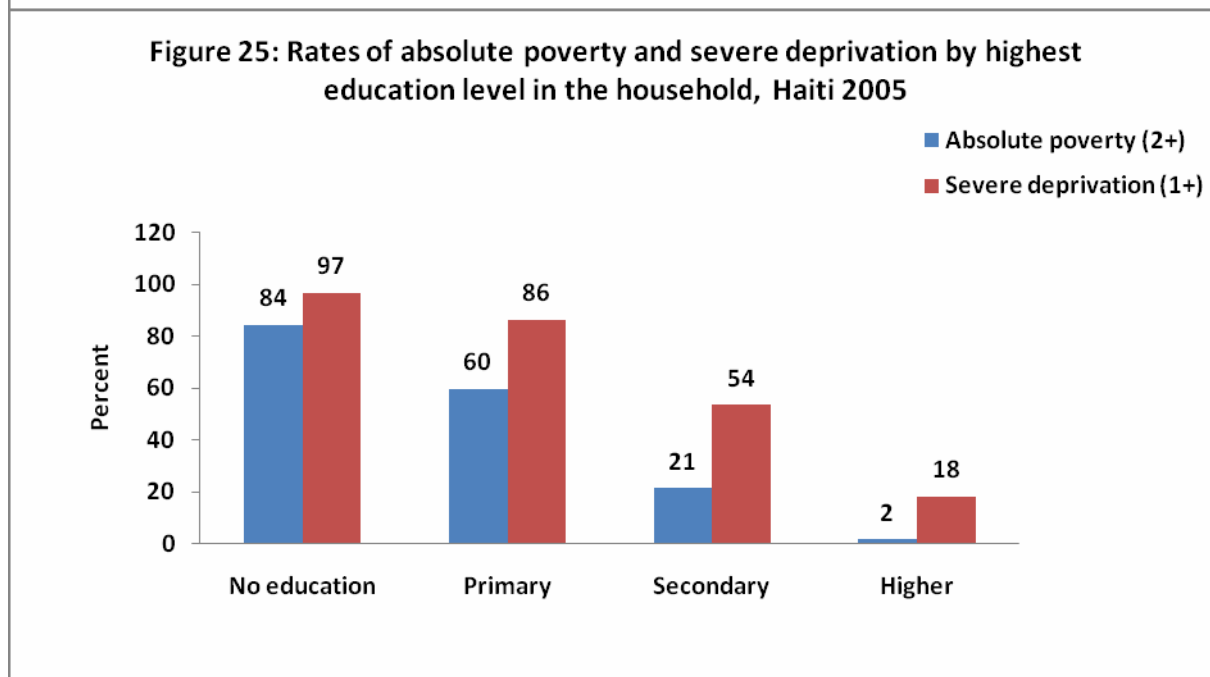
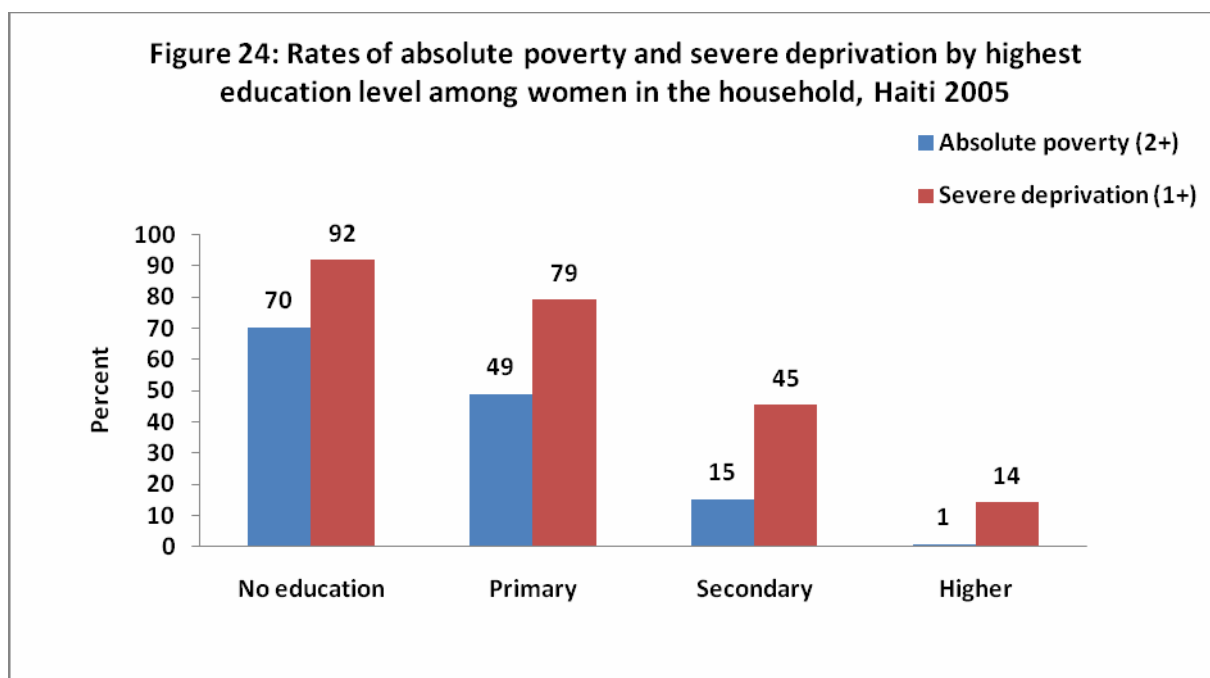
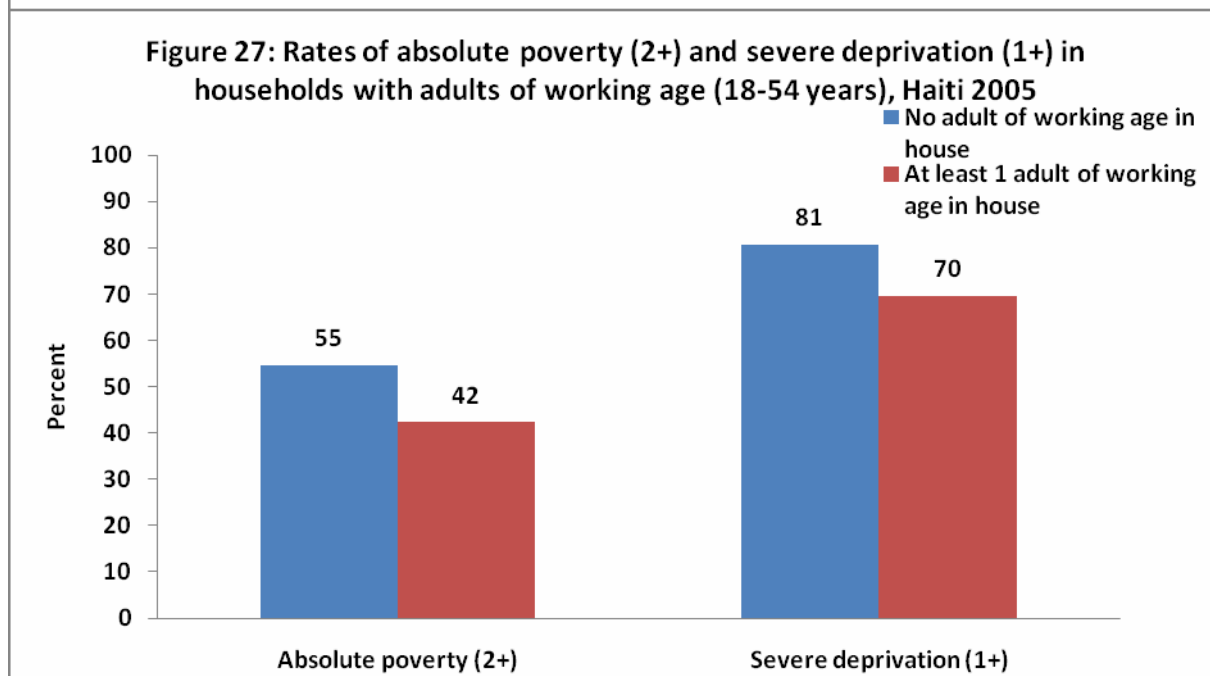
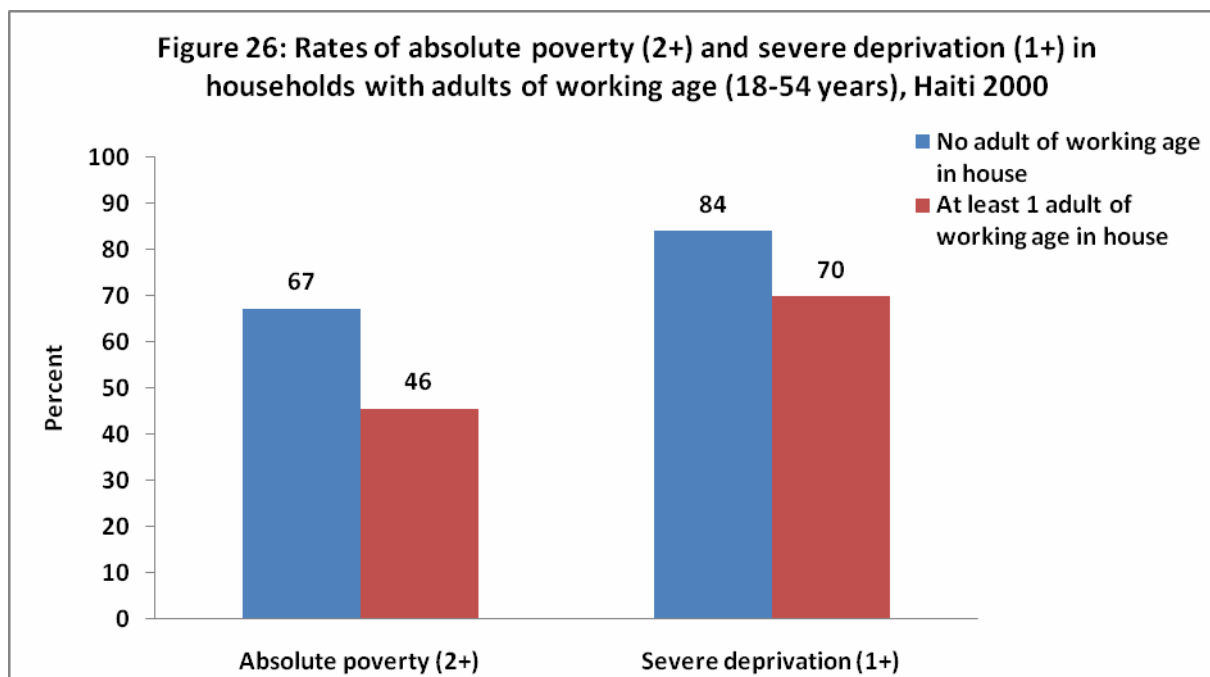


Figure 24 and 25 show that the clear inverse relationship between child poverty and household education level was also apparent in 2005.



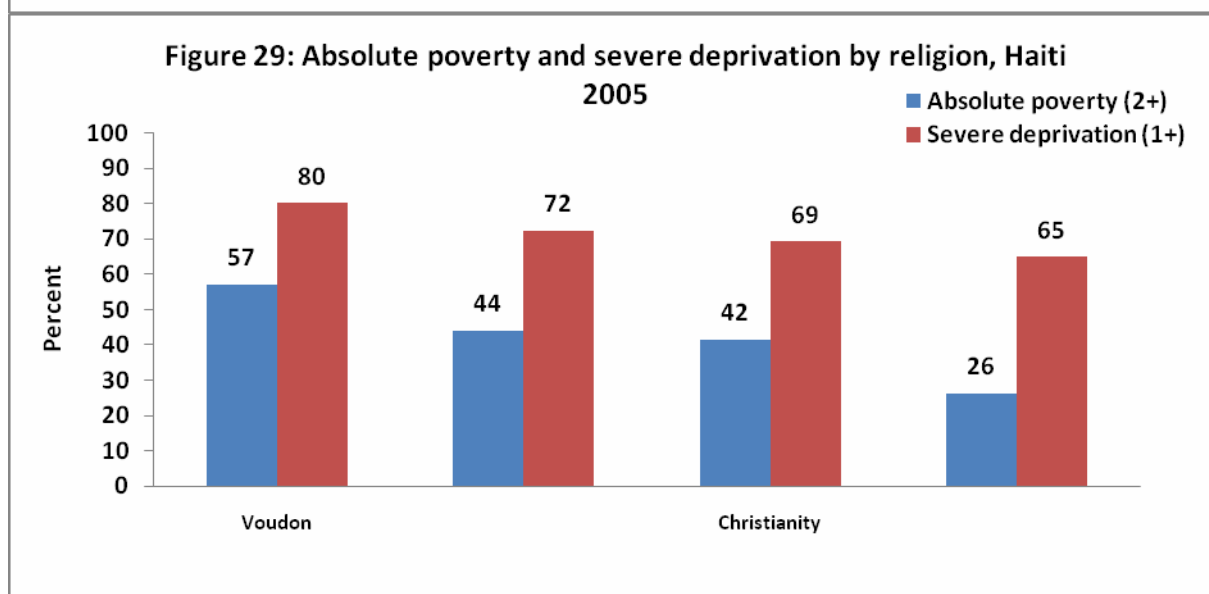
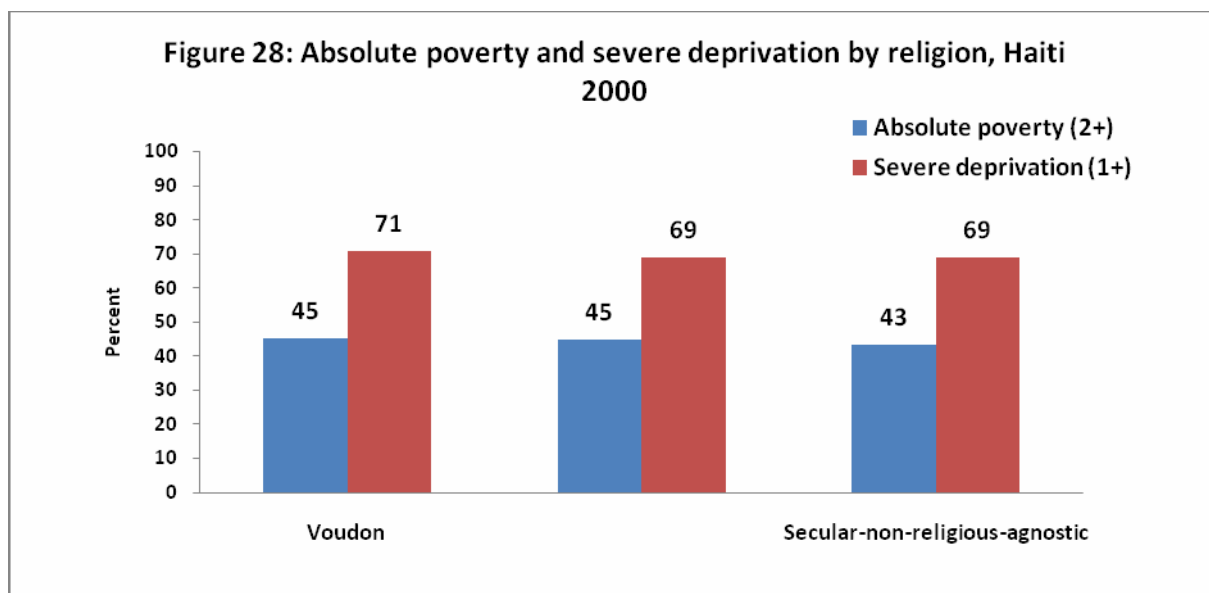
Households containing adults of working age

The presence of adults of prime working age (i.e. between the ages of 18 and 54 years) in a household can act as a protective factor against poverty in countries which do not have comprehensive pension and welfare provision. Figure 26 and 27 show that children in households where there was an adult of working age were considerably less likely to be poor or experience severe deprivation than children in households where there were no adults of working age, although the degree of difference was considerably less in 2005 than in 2000.



Religion

DHS surveys often collect information about the religious affiliation of household members. In 2000 and 2005, these data were collected for Haiti and this allows the analysis of absolute poverty and deprivation by the predominant household religion. In the year 2000, rates of poverty and deprivation appear quite consistent across all main religious groups in Haiti (Figure 28). In 2005, however, there appear to be differences between religious groups, with children in households where Voudon is the stated religion more likely to be living in absolute poverty (Figure 29).

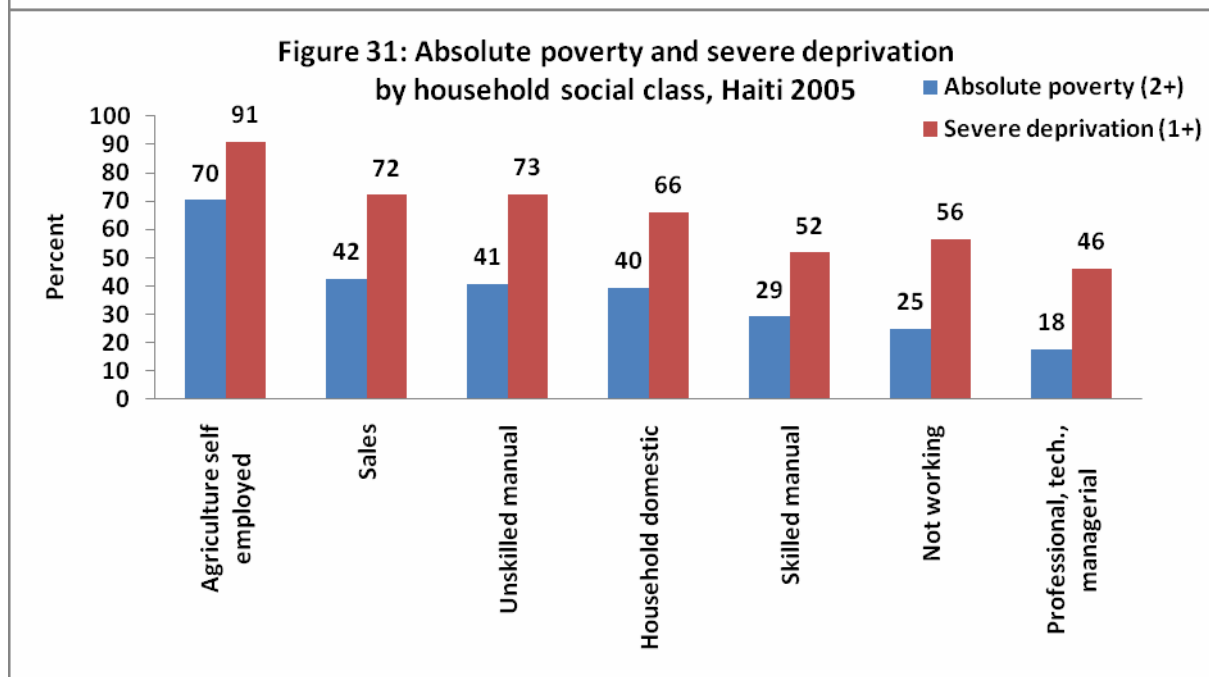
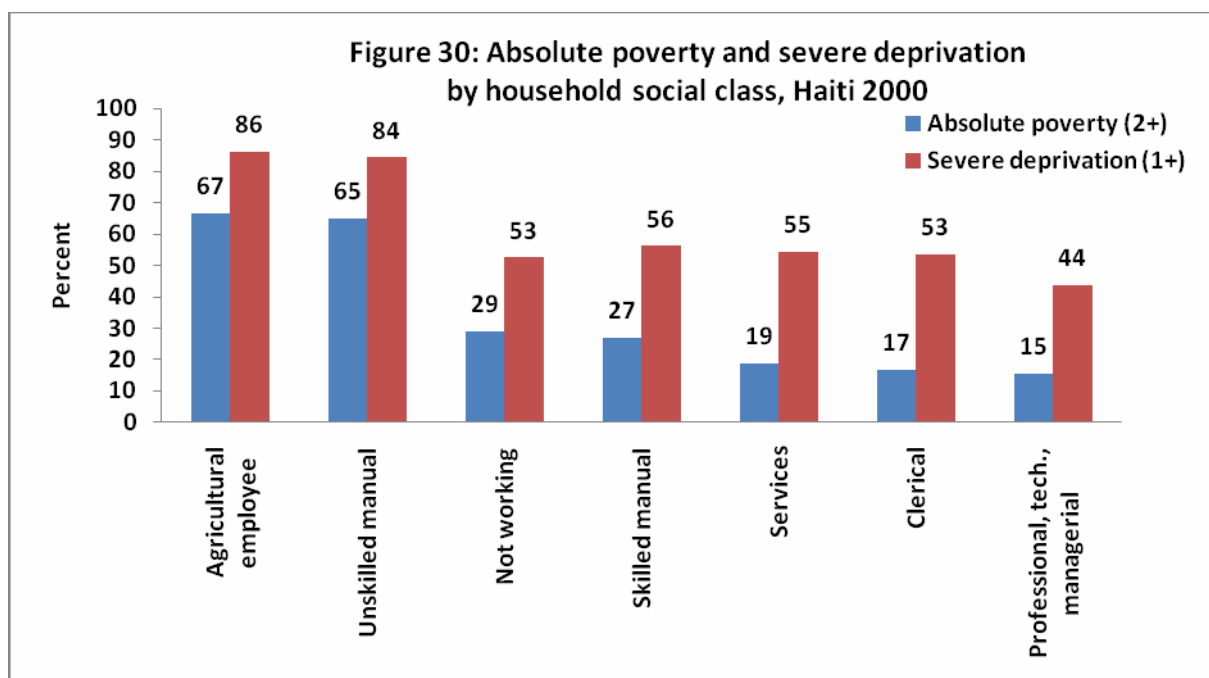


Household social class

The DHS surveys ask eligible women (aged 15 to 49 years) in each household about their occupation and the occupation of their partner. Occupation has traditionally been used as an indication of ‘social’ or ‘occupational’ class, and those households in the higher class categories (i.e. professional, technical and managerial; clerical; services, etc) tend to be less likely to be poor. Those in lower class categories, including agricultural and unskilled manual workers, tend to be in the lowest paid jobs, and so are more likely to be poor.

Household social class in this analysis is based on the highest class group of anyone within the household. Figure 30 and 31 below show a clear relationship between social class and

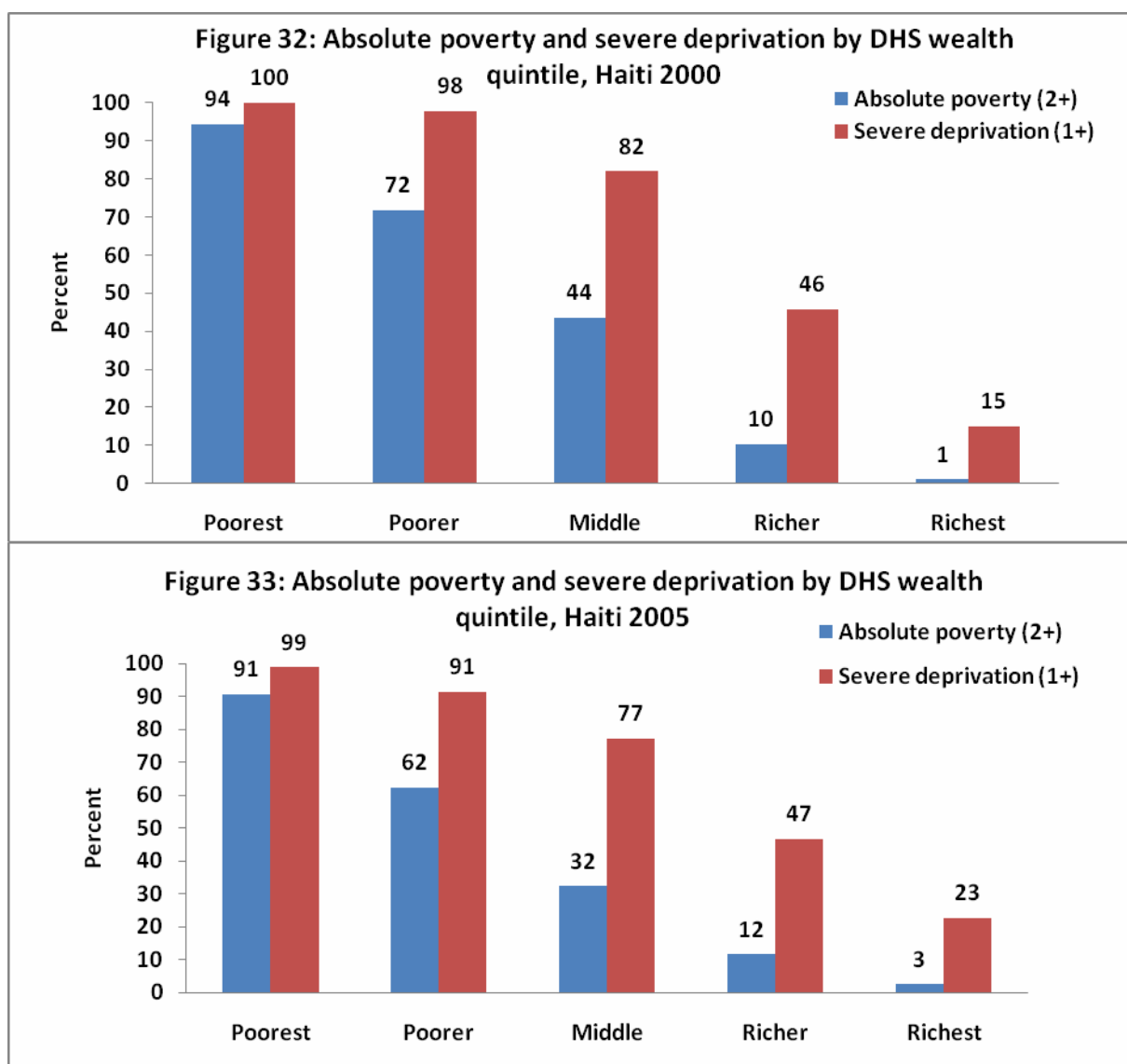
absolute child poverty, with children of unskilled manual and agricultural workers and self employed considerably more likely to be living in poverty or experiencing severe deprivation.



Inequality

The DHS surveys now include a wealth index which can be used to assess the extent of inequalities between groups in society. The index is based on household ownership of different assets and access to certain public services (Rutstein and Johnson 2004). The DHS wealth index is based upon a statistical methodology of dubious validity (Montgomery, Gagnolati et al. 2000; Falkingham and Namazie 2002) so, whilst the results should be interpreted with caution, it is used here as one measure of the extent of disparity and inequality in Haiti. It should be noted that the wealth quintiles are not comparable over time and are provided here merely for means of illustration. Any changes between 2000 and 2005 could be entirely a result of a statistical artefact.

Almost all children in households in the poorest wealth quintile in both 2000 and 2005 live in absolute poverty and experience severe deprivation. Conversely, almost no children in the richest quintile are poor. This steep gradient is apparent in both 2000 (Figure 32) and 2005 (Figure 33).



Summary

This section presented the results of analyses of the 2000 and 2005 DHS data for Haiti. In both 2000 and 2005, more than four out of ten children in Haiti were absolutely poor and seven out of ten were severely deprived. Apart from a tiny possible reduction in the rates of severe information and health deprivation, there is little evidence of any improvement in the situation of Haitian children during the first five years of the new Millennium.

The analyses suggest that, while the rate of absolute child poverty in rural areas may have fallen slightly (although not by a statistically significant amount), this has been at the expense of an increase in absolute child poverty in urban areas, particularly the capital.

The results clearly show that the extent of absolute child poverty and severe deprivation are worst in rural areas, in Departments away from the capital and among households where members have received little formal education. Children of workers and the self employed in the agricultural sector have the highest rates of absolute poverty.

Size of household appears to be less important, although there is some evidence that large households are more likely to have poor children. Surprisingly, female-headed households were less likely than male-headed households to be poor in both 2000 and 2005.

In both 2000 and 2005, the deprivations affecting the greatest number of children are shelter and sanitation. These are the most basic of human needs and the rights of all children everywhere to have these needs met are included in the 1989 UN Convention of the Rights of the Child. In order to eradicate absolute child poverty in Haiti, it will necessary to improve the squalid housing conditions with no sanitation facilities in which many children live, particularly in rural areas.

Conclusions

Children represent 50 percent of the population of Haiti but 100 percent of its future. It is not in the anyone's interest for seven out of ten Haitian children to suffer the harms caused by severe deprivation and for over four out of ten of them to grow up in the squalid conditions of absolute poverty. Ending absolute child poverty should not just be a policy priority, it should be *the* policy priority. The urgency of the situation cannot be over emphasised. Policies which will reduce poverty in 20 or 30 years are of no use to today's children. Their childhoods will be just a distant and painful memory by the time these policies have had an effect and the long term damage of child poverty will have already been done.

Neoclassical economic theory has a simple and elegant explanation for both poverty and wealth. Wealth is a result of work, waiting and economic efficiency and poverty is a result of the absence of productivity and the inability or unwillingness to work and wait (Clark 2002). Child poverty (and wealth) are entirely absent from this theory – children are not economically productive, they should not work and they cannot wait. Children do make an appearance in neoclassical economic theory in discussions of human capital. Investment in children's health, nutrition and education is needed so that they can grow up to become productive adult workers in the future. Children's current needs, agency and economic rights are invariably entirely absent from such discussion.

The absence of any useful economic theory of child poverty is not a result of the complex nature of this subject. In fact, the economics of child poverty are very simple and are entirely concerned with redistribution – where sufficient resources are redistributed from adults to children there is no child poverty; where insufficient resources are redistributed from adults to children child poverty is inevitable (Gordon, 2008).

Structural adjustment policies are designed to promote future economic growth and thereby reduce poverty rates. Typical adjustment policy packages include, controlling inflation, reductions in government expenditure (at least in the short term), privatisation and increased openness to international trade. The results are almost an invariable increase in poverty in the short term, but if the policies are successful poverty may fall in the medium or long term. Policies which increase poverty today in the hope of reducing poverty in the future are highly problematic from the perspective of the child. They may condemn the children of today to a childhood of abject poverty in the hope that the children of tomorrow may lead better lives. The morality of adjustment policies are therefore highly dubious from a child rights perspective.

The results presented in this report indicate the need for some key policies to alleviate the worst effects of severe child poverty and deprivation. In particular, there are severe problems of physical capital deprivation amongst children in rural areas of Haiti. Policies are needed to

improve squalid housing and provide safe sanitation and drinking water facilities. A third of all children in Haiti suffer from severe health deprivation despite improvements between 2000 and 2005. Therefore, continued efforts are needed to improve vaccination rates and access to good quality health care, particularly in rural areas.

A key problem faced by children living in absolute poverty and their families is a severe lack of economic resources (e.g. money). One lesson that can be drawn from the experiences of industrialised countries in reducing child poverty is that, after public infrastructure investment (in housing, sanitation and water), the most effective anti-poverty policy for children is the establishment of a child or family social security benefit (Gordon et al, 2003). All 'rich' countries with low rates of child poverty have some kind of universal child or family benefit paid in cash or in kind. Universal child benefits are easy and cheap to administer and do not require complex administrative machinery. These benefits are effective, cost efficient and extremely popular (and therefore politically sustainable). A global universal child benefit of the equivalent of \$1 US dollar per day per child would eradicate child poverty as measured by the World Bank. However, in the absence of international funding for a universal child benefit, it would need to be introduced in stages in Haiti. For example, for children under a given age – say 10 years, or five years or infants under two (Townsend, 2008). A scheme could be phased in and precedents in Nepal⁷, parts of Latin America, like the conditional cash transfers and, in South Africa, such as the child support grant could be copied and extended.

UNICEF and other international organisations (such as the ILO) should campaign for a legal right to child benefit under Articles 25 and 27 of the Convention on the Rights of the Child (Gordon et al, 2003).

In the past, both national and international policy makers have not given sufficient consideration to the needs of children and the impacts of even successful policies on their vulnerable lives. For example, in September 1991, the democratically-elected President Jean-Bertrand Aristide was overthrown by a military coup d'état. In response, the Organisation of American States (OAS) and, subsequently, the United Nations imposed economic and other sanctions, which eventually led in October 1994 to a multi-national peacekeeping force removing the military junta and helping to restore democracy. This could therefore be considered to be a successful policy intervention which supported political and civil rights in Haiti. However, the policy was not so successful from the perspective of the children of Haiti. Elizabeth Gibbons (Head of the UNICEF office in Port-au-Prince at that time) records that as a result of the international sanctions:

“Unemployment increased by half (from 50 percent in 1990 to 75 percent in 1994), agricultural output declined by 20 percent, prices for basic foodstuffs increased more than 100 percent while annual per capita income declined 30 percent, bottoming out at \$250. Child malnutrition doubled and thousands of children perished in a measles epidemic; maternal mortality increased by 29 percent; school enrolment dropped by a third; the number of street children doubled, and some 100,000 children were placed in domestic service to live as little more than slaves” (Gibbons 1999)

Gibbons subsequently posed the important question:

“which is worse – death from deliberate torture and violence or death from the deliberate withholding of a measles vaccine? Which is more immoral?”

⁷ <http://www.kantipuronline.com/kolnews.php?&nid=138156>

Fortunately, Haitian and international policy makers today are not faced with such a dilemma. The children of Haiti can be spared from the horrors of growing up in absolute poverty if simple policies are adopted and funded to improve housing conditions, access to safe water and sanitation facilities and to education, health services and social security. No Haitian child needs to have their health and development permanently impaired by severe malnutrition and all children can be provided with essential information about the outside world. The costs of implementing the policies required to end absolute child poverty are relatively low and the long term benefits for society as a whole are huge. No scientific innovations are needed before absolute child poverty can be eradicated - what is needed is political will.

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APPENDIX I: METHODS

Measuring child poverty

Research has shown that all cultures have a concept and definition of poverty although these definitions often vary (Spicker, Alvarez and Gordon 2007). A major problem with many previous attempts to measure poverty on a global scale was that there was no internationally agreed definition. This situation changed at the World Summit for Social Development in Copenhagen in 1995 (Langmore 2000). Among the innovations agreed by the governments of 117 countries was the preparation of national anti-poverty plans based on measures in all countries of ‘absolute’ and ‘overall’ poverty (UN 1995). In developing anti-poverty strategies, the international agreement at Copenhagen was a breakthrough and the governments of 117 countries agreed to on definitions of absolute and overall poverty. Absolute poverty was defined as:

"a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income but also on access to social services."

This study of child poverty in Haiti has used the methods developed by Gordon et al (2003) which produced the first reliable global estimates of child poverty by operationalising the internationally agreed definition of absolute poverty within the context of the child rights framework of the UN Convention on the Rights of the Child. More recently, the UN General Assembly reaffirmed and clarified the international definition of poverty specifically for children. On the 10th January 2007, the 61st Session of the UN General Assembly (United Nations General Assembly Sixty First Session: Third Committee, Agenda Item 63 (a) Promotion and protection of the rights of children) agreed that:

"Children living in poverty are deprived of nutrition, water and sanitation facilities, access to basic health-care services, shelter, education, participation and protection, and that while a severe lack of goods and services hurts every human being, it is most threatening and harmful to children, leaving them unable to enjoy their rights, to reach their full potential and to participate as full members of the society,"

These internationally agreed definitions make clear that, when measuring child poverty, income is important but access to public goods – safe water supply, roads, healthcare, education – is of equal or greater importance, particularly in developing countries. There is a need to look beyond income and consumption expenditure poverty measures and at both the effects of low income and inadequate service provision (Vandermoortele 2000). It is a lack of investment in good quality education, health and other public services in many parts of the world that is as significant a cause of absolute poverty as low family incomes (Mehrotra, Vandermoortele and Delamonica 2000).

UNICEF⁸ has argued that: *"The UN General Assembly has recognised the special nature of poverty for children, stating clearly that child poverty is about more than just a lack of money, and can only be understood as the denial of a range of rights laid out in the UN Convention on the Rights of the Child."*

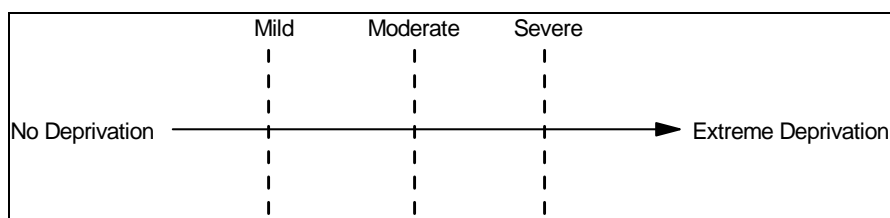
⁸ http://www.unicef.org/media/media_38003.html

According to this new definition, measuring child poverty can no longer be lumped together with general poverty assessments which often focus solely on income levels, but must take into consideration access to basic social services, especially nutrition, water, sanitation, shelter, education and information.

In the scientific literature, the lack of access to water, sanitation, shelter, education, etc is termed 'deprivation' or 'Unmet Basic Needs' (Rio Group 2006). The two concepts of poverty and deprivation are tightly linked but there is general agreement that the concept of deprivation covers the various conditions, independent of income, experienced by people who are poor, while the concept of poverty refers to the lack of income and other resources which makes those conditions inescapable or at least highly likely (Townsend 1987).

Deprivation can be conceptualised as a continuum that ranges from no deprivation, through mild, moderate and severe deprivation to extreme deprivation at the end of the scale (Gordon et al 2003). Figure 1A illustrates this concept.

Figure 1A: The continuum of deprivation



In order to measure absolute poverty using the World Social Summit definition, it is necessary to define the threshold measures of severe deprivation of basic human need for children. Theoretically, a 'severe deprivation of basic human need' can be defined as those circumstances that are highly likely to have serious adverse consequences for the health, well-being and development. Severe deprivations are causally related to 'poor' developmental outcomes both long and short term.

Many international measurements of poverty, such as the World Bank's \$1 per day poverty line (World Bank 1990; 2000), are at the household level and assume that need does not vary with age and that both adults and children have identical needs and share the same standard of living. These measures cannot be used to answer important scientific and policy questions such as whether children suffer from greater poverty than adults, whether women suffer from greater poverty than men, or whether younger children are poorer than older children. It is also of 'political' importance to produce age and gender specific measures of poverty. For example, the UN Convention on the Rights of the Child, which has been signed by every member state of the United Nations (193 countries), establishes that children have rights which are independent from and co-equal to those of adults. Therefore, aspects of child poverty which violate children's rights, such as being denied a primary education, need to be measured independently from adult poverty. Furthermore, measures of poverty need to be age and gender specific to reflect the fact that children's needs change as they grow and develop and that young women have different health care needs compared to young men. For example, it is not meaningful to describe a young baby as being severely educationally deprived, nor a man as being deprived of prenatal or antenatal medical services.

In order to measure absolute poverty amongst children, it is necessary to define age and gender specific threshold measures of severe deprivation of basic human need for:

- food
- safe drinking water
- sanitation facilities
- health
- shelter
- education
- information
- access to services

A taxonomy of severe deprivation is required, since a reliable taxonomy is a prerequisite for any scientific measurement. It is also desirable that the threshold measures for severe deprivation, as far as is practicable, reflect internationally agreed standards and conventions. When developing threshold criteria Gordon et al (2003) followed in the tradition of Seebom Rowntree (1901) and tried to err on the side of caution in defining these indicators of absolute poverty in such severe terms that few would question that these living conditions were harmful and unacceptable. Thus, the measures used in this study are typically indicative of much more severe deprivation than the indicators frequently published by international organisations and used in the MDGs. For example, ‘no schooling’ instead of ‘non-completion of primary school’, ‘no sanitation facilities’ instead of ‘unimproved sanitation facilities’, ‘no immunisations of any kind’ instead of ‘incomplete immunisation against common diseases’, ‘malnutrition measured as anthropometric failure below -3 standard deviations from the reference population median’ instead of ‘below -2 standard deviations from the reference median’, etc.

Similarly, in order to err on the side of caution we have only assumed that a child is absolutely poor if she suffers from two or more severe deprivation of basic human need. Children who suffer from one severe deprivation are very likely to be living in absolute poverty. However, while the cause of severe deprivation of basic human need is invariably a result of lack of resources/income, there will also be some children in this situation due to discrimination (e.g. girls suffering severe education deprivation) or due to disease (severe malnutrition can be caused by some diseases).

Definitions of severe deprivation of basic human need for children

This section first gives the definitions of severe deprivation of human need that were used in this research and then briefly describes the scientific evidence for these definitions. The definitions cover deprivation of food, drinking water, sanitation, health, shelter, education and information. Unfortunately, there was insufficient data available to produce estimates of ‘access to services’ deprivation.

- Shelter - children living in a dwelling with five or more people per room or with no floor material (eg mud floor).
- Sanitation facilities - children with no access to a toilet facility of any kind.
- Safe drinking water - children using surface water such as rivers, ponds, streams and dams, or who it takes 30 minutes or longer to collect water (walk to the water, collect it and return).
- Health - children who did not receive immunisation against any diseases or who did not receive treatment for a recent illness involving an acute respiratory infection or diarrhoea.
- Education - children (aged 7-18) of schooling age who have never been to school or who are not currently attending school.
- Information - children (aged 3-18 years) with no access to a radio or television or telephone or newspaper or computer/internet (i.e. all forms of information media).

- Food - children under five years old who are more than three standard deviations below the international reference population for stunting (height for age) or wasting (height for weight) or underweight (weight for age). This is also known as severe anthropometric failure. Teenage children (15 to 17) with a Body Mass Index of 16 or below.

Severe shelter deprivation

Shelter deprivation is a primary determinant of health and wellbeing. Chadwick, in 1842, estimated the life expectancy of people living in the squalid housing conditions of the cellars in Liverpool to be only 15 years. The impact of poor housing on people's health is well documented (Satterthwaite 1993; Marsh, Gordon et al. 1999; Evans and Kantrowitz 2002). Overcrowding has been linked to health problems, such as the resurgence of tuberculosis in both rich and poor countries (Jacobs and Eisenach 1993; Datta and Swaminathan 2001; Walls and Shingadia 2004) and children living in such conditions are also at greater risk of experiencing violence and sexual abuse (Dickstein 1988).

In developing countries, a lack of state housing provision has meant people have either had to construct their own homes or have homes built by contractors using poor quality materials. The urban slums and shanty towns which characterise many major cities consist of houses built from various materials, from concrete bricks, tin, wood and plastic sheeting (Aldrich and Sandhu 1995). In rural areas, building materials for poor household will include mud, thatch and straw, with families often sharing only one or two rooms.

The United Nations Centre for Human Settlements has shown how levels of overcrowding vary with income, with high income countries having on average less than one person per room, middle income countries having just under two people per room and low income countries having just under three people per room (UNCHS 1996). On this basis, UNHABITAT considers three or more people per room to be overcrowded⁹. Gordon et al (2003) used a much more severe threshold of five people per room to reflect overcrowding and this threshold is also used in this research.

The use of crowding (or overcrowding as it is sometimes called) as an indicator of shelter deprivation that is highly correlated with poverty, originated from the pioneering research of Charles Booth in the 19th Century. Booth undertook the first comprehensive scientific survey of poverty and living conditions in London, England. Work started in the autumn of 1886 and lasted 17 years with the results being published in 28 volumes between 1889 and 1903 (Stone, 1997). Booth divided the population of London into eight classes, from A 'lowest class' (vicious semi-criminal poor, loafers, homeless, street vendors) to H 'upper middle class' (professionals with servants). People in classes A and B were considered to be 'very poor', those in class C and D 'poor' and those in classes E to H were living 'in comfort'. Booth wished to check that he had got the apportionment of the population among his eight classes correct so, at his suggestion, a question was included in the 1891 National Population and Housing Census about crowded household conditions (Stone, 1997). Booth (1893) found that around 5% of the 4.2 million people in London were living in very crowded conditions of four or more people per room and that a third were living in crowded conditions (defined as two or more people per room).

Booth (1895) argued that:

“A man and his wife and one child, or a widow with two children may occupy only one room; or a family of six or seven may have only two rooms; and yet not be “very poor” in the sense of suffering “chronic want”. But when four or more persons live in one room or eight or more in two rooms, there must be great discomfort, and want of sufficient food, clothing, and

⁹ http://www.habitat.org/ap/pdf/Poverty_Housing_In_The_Asia_Pacific_Report1.pdf

firing must be a frequent incident. I have therefore drawn the line at this point, and find 188,000 people who are undoubtedly very poor. Further, of the 300,000 people who live three or from three to four in a room, it may be that half would correctly be placed in the same category. If so, we have 340,000 in all of "very poor" amongst the crowded, a number which compares closely with the 350,000 of the old classification."

The problems for adults and children that are a result of severe crowding, such as an increased risk of fire (firing) and accidents, described by Booth in 1895, are unfortunately still the same today (UNICEF 2002).

Echoing Booth's assessment of crowding, UBN studies in Latin American countries have defined housing quantity deprivation as more than three people per room (Rio Group 2006) – a circumstance that Charles Booth used to estimate the number of 'very poor' people living in the worst slum conditions of 19th Century London.

Additional indicators of housing deprivation that have been used in UBN studies are dwellings with inadequate floor materials (e.g. a mud or earth floor). Mud flooring is thought to be a good indicator of deprivation – particularly for households with young children – as:

- 1) Children spend much more time than adults sitting, walking and playing on the floor.
- 2) Children take several years to gain control over their own continence and mud floors can be hard to clean and keep hygienic.
- 3) Particularly in areas like which can have heavy seasonal rains, a wet mud floor is not a good place for a baby to be crawling or for a toddler to try to learn to walk or for older children to play.
- 4) Mud floors can cause sanitation problems (particularly for children) especially when there is limited water available for washing, e.g. children playing on a mud floor will likely pick up more harmful pathogens than on a concrete or wood floor. Hard to clean floors increase contact with pathogens especially for babies and young children. (Bartlett et al 1999; UNICEF 2002)
- 5) The presence of mud floors is easy to ascertain and it is a widely used indicator of a low standard of living. For example Arias and DeVos (1996), (Murison and Lea 1979; UNCHS and ILO 1995; Arias and DeVos 1996; Fiadzo, Houston et al. 2001)).

Severe sanitation deprivation

There is a sizeable literature on the relationship between child survival and sanitation, particularly concerning diarrhoeal disease, which causes millions of child deaths in developing countries (Esrey and Habicht 1986; Biddulph 1993; UNICEF 1995; Lee, Rosenzweig et al. 1997; Bosch, Hommann et al. 2001; Moraes, Cancio et al. 2003; Checkley, Gilman et al. 2004; Khosla, Bhanot et al. 2005; Vaid, Mammen et al. 2007). Poor children often live in homes which lack even basic forms of sanitation. The 2000 Global Water Supply and Sanitation Assessment (GWSSA) estimated that 2.6 billion people had their need for adequate sanitation unmet in 2004¹⁰. Rural populations are particularly badly provided for, with around 60% lacking access to improved sanitation (20% in urban areas).

The reasons why such large numbers of people lack adequate sanitation are manifold and the basic infrastructure of many cities in developing countries is struggling to cope with existing demand. In some slum areas and shanty towns, 'flying toilets' are a problem, with people having to resort to using plastic bags at night which are then thrown into the street (UNDP 2006). The cost of expanding existing or installing new sewerage systems is often too high

¹⁰ http://www.wssinfo.org/en/32_san_global.html (accessed 11th July 2007).

for individual communities, although a range of low-cost appropriate solutions do exist and have been used to great effect in countries like Bangladesh. Ventilated improved pit latrines provide a means to dispose of excrement in a safe and hygienic manner and mass public movements in many countries have begun to provide basic water and sanitation facilities for those who cannot afford them (U.N. HABITAT and UNEP 2002). The quality and effectiveness of sanitation facilities varies, from proper plumbing connected to a public sewage system, to drop-pit latrines overhanging ponds or rivers. The GWSSA considers improved sanitation facilities to be those connected to a public sewer or septic system, pour-flush, simple pit and ventilated improved pit latrines. Unimproved sanitation facilities include public or shared latrines, open pit latrines and bucket latrines. This research defines children as severely sanitation deprived if they lacked any facilities within or around the home, i.e. they were defecating in the open, e.g. in fields, bushes or along railway tracks. This is a more severe definition of deprivation than that used by the international community.

Severe water deprivation

The importance of water to people's lives cannot be overstated and yet every day hundreds of millions of people lack access to sufficient quantities of water to meet this most basic of human needs. The GWSSA estimated around 1.1 billion people were without access to 'improved' water – i.e. water considered suitable for human consumption, e.g. from pipes, protected wells and clean springs (WHO, UNICEF et al. 2000).

The relationship between water and health has long been recognised, as the work of Victorian campaigners like Edwin Chadwick noted the link between the conditions of poverty and poor health and called for the clearing of slums, the provision of clean water and effective sanitation (Chadwick 1842). Mortality rates in Europe and North America fell most rapidly in the 19th century after governments improved water supplies and sanitation (Szreter 1988). There is a large literature detailing both the impact of unsafe water on child health and survival (Checkley, Gilman et al. 2004; Gundry, Wright et al. 2004; Wright, Gundry et al. 2004; Burstrom, Macassa et al. 2005; Mulreany, Calikoglu et al. 2006; Teixeira and Heller 2006) and also the relationship between poverty and a lack of access to clean water (Feachem, Burns et al. 1978; Bosch, Hommann et al. 2001). The poor are the least likely to have adequate access to safe or clean water and this is a primary reason why they become sick and die young.

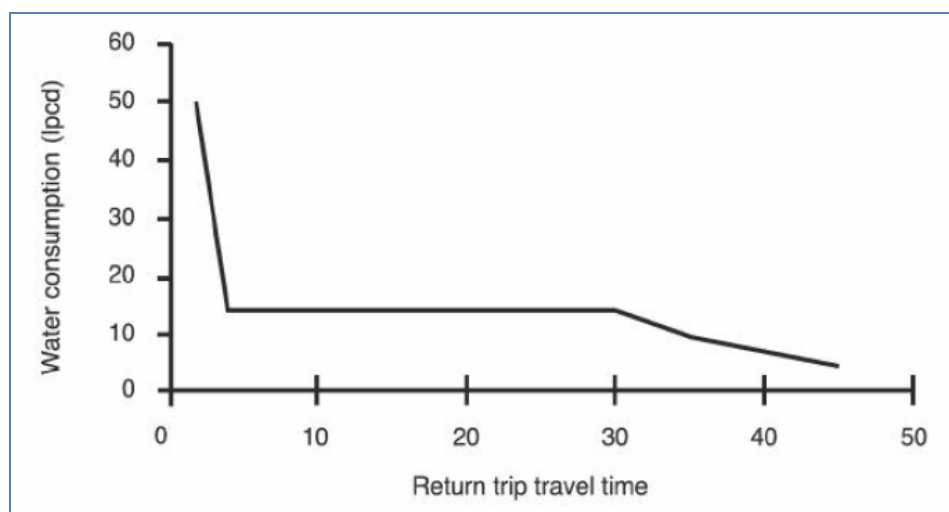
Governments and private providers are often unable (or unwilling) to provide the necessary capital infrastructure to areas in which the poor are forced to live (urban slums, peri-urban shanty towns, rural areas) and rapid rural-to-urban migration in many countries has meant cities are overcrowded and having to deal with the needs of much larger populations than before. In the absence of public provision, private water vendors often supply poorer areas, charging much higher rates for water to those least able to afford them (Satterthwaite, Hart et al. 1996; U.N. HABITAT 2003: 71).

The prospect of piped water remains a distant one for many rural communities and every day millions of people have to walk long distances to collect water from rivers, ponds and other 'unimproved' water sources. UNICEF and the WHO make recommendations on the amount of water people require to meet their drinking, cooking, and washing needs. These range between 20 and 50 litres per person per day (UNICEF 1995; WHO, UNICEF et al. 2000). It has been suggested, based on empirical studies, that to meet people's basic needs, a standard of 5 litres per capita per day (lcd) be set for drinking, 10 lcd for cooking and food preparation, 15 lcd for bathing and 20 lcd for sanitation and hygiene – 50 lcd per person per

day in total (Gleick 1996). These quantities are modest when compared to the 350 lcd used (on average) by people in North America and Japan and the 200 lcd in Europe¹¹.

Distance to water is an essential element in assessing access to water, however, until recently, international reports like the 2000 GWSSA did not consider distance in their estimates. Access was determined solely by the type of drinking water source. It is unsurprising that the amount of water used decreases the further away it is located (Figure 2A) and studies show that per capita use falls rapidly once the source is over five minutes away (Cairncross 1987).

Figure 2A: Water use and collection time



Source: (WELL 1998)

An extensive review of water quality and use in developing countries noted, in relation to the figure above:

“Once the time taken to collect water source exceeds a few minutes (typically around 5 minutes or 100m from the house), the quantities of water collected decrease significantly. This graph contains a well-defined ‘plateau’ of consumption that appears to operate within boundaries defined by distances equivalent to around 100 to 1000m or 5 to 30 minutes collection time. There is little change in quantity of water collected within these boundaries. Beyond distance of one kilometre or more than 30 minutes total collection time, quantities of water will be expected to further decrease, in rural areas to a bare minimum where only consumption needs can be met. In urban areas, where water supplies may be close but total collection times are very high, greater volumes may be collected that will support hygiene, although the overall impact on household poverty is significant.” (Howard and Bartram 2003: 18).

The WHO therefore considers ‘no access’ to water to be a 30 minute collection time (1000 metres): *“the no access group effectively have no household water security as the quantities collected are low, the effort taken to acquire water is excessive and quality cannot be assured”* (Howard and Bartram 2003: 22).

Severe water deprivation in this research is therefore defined as households using either unsafe sources of water for drinking such as rivers, lakes and ponds, or who have to travel a long distance to collect water (a 30 minute round trip).

¹¹ <http://www.worldwatercouncil.org/index.php?id=25&L=1%20%3E%20water%20council> (accessed 11th July, 2007).

Severe health deprivation

Severe health deprivation is closely linked to poverty, with poor children more likely to become sick and die (WHO and World Bank 2002). In 2000, around 11 million young children under the age of five died from mostly preventable causes. Of these, 99% lived in developing countries. Contributing to half of these deaths was undernutrition (Caulfield, de Onis et al. 2004) although the conditions associated with growing up in poverty – drinking unsafe water, living and playing environment contaminated with pollution, overcrowded housing leading to the transmission of infectious diseases – certainly play their part (Black, Morris et al. 2003).

The impact of poverty on children's health has been well documented, in both rich and poor countries (Kretchmer 1969; Pollitt 1981; Wise and Meyers 1988; Korenman, Miller et al. 1995; Spencer 2003; Wood 2003; Chopra and Sanders 2005). The WHO has argued that:

“The world's biggest killer and greatest cause of ill health and suffering across the globe is listed almost at the end of the International Classification of Diseases. It is given code Z59.5 – extreme poverty” (WHO 1995: 1).

Many of the most dangerous childhood diseases and causes of death can be prevented, using relatively cheap technologies which have been available for many decades. The most effective solutions would be the improving of access to sufficient quantities of nutritious food, safe drinking water, proper sanitation and decent housing. Health interventions such as anti-malarial drugs, insecticide-treated bed nets and immunisations against lethal diseases such as measles, tetanus, tuberculosis and whooping cough could save millions of lives and prevent tens of millions of sickness episodes. The use of oral rehydration salts (ORS) or therapy (ORT) to treat diarrhoea has also been shown to have a great impact (Misra 1981; Ueli 1993).

Many of these interventions were recommended nearly thirty years ago at the 1978 Health for All by the year 2000 conference. The ensuing Alma Ata declaration noted that *“governments have a responsibility for the health of their people which can be fulfilled only by the provision of adequate health and social measures”*, and that primary health care, based on practical, scientifically sound and socially acceptable methods and technology *“should be made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination”* (WHO 1978). In the years that followed, however, the capacity of health services around the world were limited by the impact of international economic crises and the structural adjustment policies (SAPs) which followed (Phillips and Verhasselt 1994; Lugalla 1995; Logie and Rowson 1998). International donors like the World Bank promoted the use of selective (rather than comprehensive) primary health care strategies which relied on vertical interventions such as immunisation campaigns (Rifkin 1986). One result of this was that countries were unable to successfully develop effective health systems and were reliant on donor funds and programmes to provide basic health care. Health and medical staff unable to work in their countries sometimes emigrated to staff the health services of rich countries – the ‘Brain Drain’ as it is sometimes termed (Marchal and Kegels 2003; Anyangwe, Mtonga et al. 2006; Kirigia, Gbary et al. 2006).

Measuring severe health deprivation is not straightforward as there are many ways to assess this broad concept (Bowling 2002). Different indicators have been used to reflect the effectiveness of health systems (e.g. proportion of children are fully immunised, proportion of mothers receiving assistance during child birth, etc.) and, while none are perfect, they do provide indicators as to whether those in need of care or treatment are receiving them. The WHO and UNICEF launched the GOBI strategy (growth monitoring, oral rehydration, breast

feeding, and immunisation) in the 1980s, with the aim of using simple preventative measures and technologies to avert unnecessary child and maternal deaths (Phillips and Verhasselt 1994). All children in the world were thus supposed to be provided with immunisations against the major preventable diseases and have access to medical care and treatment when ill.

Therefore, the indicator for severe health deprivation for children included young children who did not receive any immunisations against disease¹² or who did not receive medical care when sick. The DHS Surveys only collected data on health and nutrition on children under five years old and it is on this age group that estimates of severe health deprivation have been made.

Severe education deprivation

Education has repeatedly been identified by researchers as both a key determinant of children's well being and an important determinant of national development and poverty reduction (Psacharopoulos 1972; Colclough 1982; Psacharopoulos 1988). The right to education is considered one of the most fundamental and is included in the 1948 Universal Declaration of Human Rights, the 1966 International Covenant on Economic, Social and Cultural Rights, and the 1989 UN Convention on the Rights of the Child. However, Watkins (2000) has argued that "*no human right has been so systematically or extensively violated by governments than the right of their citizens to basic education.*"

Children who do not receive an education may become illiterate adults and this can affect their lives in many ways. Children of illiterate parents are more likely to have poorer health, to drop out of school themselves and be working rather than attending school (DFID 2002). The 1990 World Conference on Education for All pledged universal access to education, with a focus on the need to increase the participation of girls and women. A decade later however, at the World Education Forum in Senegal, it was clear universal access to even primary education had not been achieved and that many millions of children were still being denied an education (most of whom were girls).

There are many reasons why universal access to education has not yet been achieved. For much of the 1980s and 1990s, many developing countries were spending more on debt repayments than they were on education and other basic services (Mehrotra, Vandermoortele et al. 2000; Vandermoortele 2000; Watkins 2000), which severely limited the expansion of education. The concurrent withdrawal of free state-provided education and imposition of user fees as part of the World Bank-directed structural adjustment policies resulted in children - and particularly girls - being withdrawn from school (Cornia, Jolly et al. 1987; Bentaouet Kattan and Burnett 2004). In addition, inequities in resource allocation meant disproportionate resources flowed to tertiary education instead of primary and secondary education. A review from the mid 1980s showed that, in developing countries as a whole, higher education which was used by 6% of students and received almost 40% of resources. In Africa, the university sector received over 35% of resources despite having less than 2% of students (Mingat and Tan 1985). These discrepancies persist, as reflected in the table below.

The table shows the average spent per pupil on (different levels) education as a % of GNP per capita. Thus, in sub-Saharan Africa, the average figure of \$190 spent on primary and secondary education is the equivalent of 8% of per capita GNP; spending on tertiary education at around \$1600, amounts to 68% of GNP per capita.

¹² All children should receive six immunisations within their first year of life under the expanded programme of immunisation (EPI)

Average public education spending per pupil by region, 1997 (estimated)						
	Average		Primary and secondary ^a		Tertiary	
	US\$	Percentage of GNP per capita	US\$	Percentage of GNP per capita	US\$	Percentage of GNP per capita
World	1,224	22	999	18	3,655	66
Advanced countries	5,360	21	4,992	20	6,437	25
Developing countries	194	16	150	12	852	68
Sub-Saharan Africa	252	11	190	8	1,611	68
Middle East	584	22	494	19	1,726	66
Latin America	465	14	392	12	1,169	35
East Asia	182	14	136	11	817	64
South Asia	64	15	44	11	305	73
Transition countries	544	26	397	19	603	33

Source: (UNDP 2001: 91).

Education deprivation can take different forms, from an absolute lack of provision to the provision of education which is of such poor quality that students choose to spend their time following more productive pursuits, often working. In some developing countries, resources are insufficient to pay teachers on a regular basis, leading to staff absences as teachers struggle to find paying work. The impact of HIV/AIDS on the education sector in Africa has been well documented (Coombe 2002; Amone and Bukuluki 2004). The cumulative effects of these problems has had a significant impact on the education of children.

Improving education is a key policy tool to reduce poverty and prevent it in the future. It is a fundamental human right, which all governments of the world have sought to fulfil. This research defines severe education deprivation as children of school age who have received no primary or secondary education and are not attending school. Again, this is a more severe definition than those traditionally used.

Severe information deprivation

In mentioning information deprivation, the 1995 World Summit for Social Development definition of absolute poverty raised an issue that hitherto had not been central to many people's concept of poverty. Statistical data are available on the number of radios and televisions per thousand and these are used to compare the exposure of people to mass media and thus information (UNDP 2001). Of course, possession of a radio or television does not guarantee the quality of what is broadcast and received.

That said, in every country of the world, urban centres are well served by radio, television and now the Internet, which means the quantity of information available now greater than ever before. Outside these urban centres, access to such technologies falls and costs rise. As a result, people in rural areas may be denied important information about political events, public health education or the price they can sell the food they produce in urban markets. This skewing of information has undoubtedly contributed to small farmers remaining poor. Non-governmental organisations like the Grameen Bank in Bangladesh have begun to address this need as part of their anti-poverty policies and provide rural women with the funds and technologies (a cheap mobile phone and access to a network) to run small businesses in their communities (Richardson, Ramirez et al. 2000). In other countries, community radio networks have been set up, providing people with information on a range of issues, from new farming methods, through to health education and adult literacy¹³ (Pepall, Earnest et al. 2007).

¹³ See <http://main.edc.org/newsroom/closer-look/interactive-radio-instruction.asp> (accessed 12th July, 2007).

Gordon et al (2003) operationalised an indicator of information deprivation and considered those children in household which either did not possess or have access to a radio, television, computer, telephone and newspapers to be information deprived. The intention was not to underplay or undervalue the contribution of more traditional information networks used by communities but rather to reflect the degree to which children were living with little or no access to world beyond their immediate communities.

Severe food deprivation

The inability to meet minimum nutritional needs has formed the basis for identifying the 'poor' for centuries (Rio Group 2006). The impact of insufficient food - or undernutrition - on children's well being and development is well documented, with children severely food deprived at much greater risk of impaired development, ill health and premature death (Chen, Chowdhury et al. 1980; Pelletier, Frongillo et al. 1995; Nandy, Irving et al. 2005). Food deprivation has been linked to worse learning outcomes with sick children having to take time off school. This affects their education, which in later life can affect their chances of securing jobs and so perpetuate their poverty.

Undernutrition may also occur as a result of illness and young children who experience diarrhoea or dysentery are liable to lose weight in the short term. Undernutrition, be it caused through a lack of food or ill health, is unequivocally linked to poverty (Osmani 1992; Svedberg 2000). There are two main methods used to assess nutritional status. The Food and Agriculture Organisation (FAO) of the UN has traditionally relied on survey data that looks at the calories consumed by households and estimate whether or not the levels of consumption are sufficient to cover nutrition needs (usually a minimum of 2,500 calories per adult per day). This method has been criticised by Svedberg (1999; 2000) as it ignores the calorie needs of children. Other limitations include the problem of collecting such data accurately.

The second main method uses anthropometric data of children (their heights and weights for a given age) and compares them to an international reference population, whom it is assumed provide the norms for child growth (WHO 1995). There has been concern about the appropriateness of what was called the NCHS reference population, as it was based on data from formula-fed infants from the United States (De Onis, Garca et al. 1997; Victora, Morris et al. 1998; Garza and De Onis 1999). The WHO has recently updated the international reference population, with data collected on breast-fed infants in different countries (De Onis, Victora et al. 2001; de Onis, Onyango et al. 2006). Anthropometric data are used to construct three main indices of nutritional status:

- **wasting** – low weight for height – reflects acute or short-term undernutrition;
- **stunting** – low height for age – reflects chronic or more long-term undernutrition; and
- **underweight** – low weight for age, which is used as an aggregate indicator of stunting and wasting.

Distinct thresholds are set, with measurements falling below -2 standard deviations of the reference population median classified as mild to moderate malnutrition, and measurements falling below -3 standard deviations of the reference population median classified as severe malnutrition (WHO 1995). These indicators are commonly used by governments and organisations to assess the prevalence of undernutrition among children and 'underweight among children under five years old' has been selected as an indicator of progress towards meeting the first MDG of eradicating extreme poverty and hunger by 2015 (United Nations Statistics Division 2006).

Despite their common use and acceptance, it should be noted that, when used on their own, each indicator provides a quite different picture of undernutrition in a population. For

example, in India in 1998/99, the prevalence of stunting among children 0-3 years was 45%, wasting 16% and underweight 47%. While the three indicators each provide useful information on quite distinct biological processes, what policy makers and planners often need to know is the overall extent of the problem. Given a certain degree of overlap between each of the indicators, it is possible that some children who are stunted are also underweight, some who are underweight might not be stunted but experience wasting, etc. Swedish development economist Peter Svedberg posited that this would mean current estimates of undernutrition would therefore be underestimates, as no single indicator would completely identify all undernourished children (Svedberg 2000). What was required was an aggregate indicator which was able to show the prevalence of stunting, wasting and underweight simultaneously. He termed this the composite index of anthropometric failure (CIAF). The Gordon et al (2003) study for UNICEF operationalised this idea and created for the first time estimates of undernutrition using the CIAF. When used on the same anthropometric data for India cited above, it showed that undernutrition in all its guises affected nearly 60% of children and that there were clear relationships between the experience of multiple anthropometric failures and poverty and morbidity (Nandy, Irving et al. 2005). The CIAF has begun to gather interest among researchers and has been used successfully in both Africa and India (Berger, Hollenbeck et al. 2006; Seetharaman, Chacko et al. 2007).

In this research, children are considered severely food deprived if the z-scores (distance from the reference median) for stunting, wasting and/or underweight are below -3 i.e. they are either severely stunted and/or wasted and/or underweight.

The Data

Demographic and Health Surveys (DHS)

The 1990s witnessed a revolution in the collection of high quality statistical information about the world's children and their families. A range of harmonised survey instruments, such as the Living Standards and Measurement Surveys (LSMS), the Demographic and Health Surveys (DHS) and the Multiple Indicator Cluster Surveys (MICs) have been used successfully in a large number of countries (see Gordon et al 2001, for discussion). However, despite these advances and increasing concern about the issue of child poverty, there are still few analyses of the standard of living and well-being of children in developing countries. In fact, there is a surprising lack of direct information on children *per se*. With the notable exception of basic health and education statistics, much of the statistical information on 'children' is derived from measures of the situation of the child's family or main carer. Children are routinely considered as a property of their household and are assumed to share equally in its fortunes (or misfortunes).

The data used in this research were from the 2000 and 2005 Haiti Demographic and Health (DHS) surveys. Since 1984, the DHS programme has conducted over 200 surveys in over 75 countries, using standardised stratified random cluster sampling methodology with each survey having typically between 150-300 primary sample clusters (Gordon 2002). Samples are nationally and regionally (i.e. sub-nationally) representative and data are collected at community, household and individual-level. The DHS were developed from the World Fertility Surveys (WFS), a collection of high-quality, internationally comparable surveys of human fertility conducted in 41 developing countries in the late seventies and early eighties.

A typical DHS survey will consist of several modules including a household questionnaire and a women's questionnaire. As a minimum, a nationally representative sample of women ages 15-49 are interviewed, however husbands may be interviewed as well.

The women's questionnaire contains information on the following topics:

- Background characteristics (age, education, religion, etc.)
- Reproductive history
- Contraceptive knowledge and use
- Maternity and breastfeeding
- Immunization of children
- Diarrhoea, fever, and cough in children
- Height and weight of children
- Marriage
- Fertility preferences
- Husband's background
- Respondent's work status

The Household Questionnaire is used to collect information about all the members and visitors in the household. Basic information is collected about the characteristics of each person, including age, sex, education, and relationship to the householder. In addition, information is collected about the dwelling, such as the source of water, type of toilet facilities, materials used to construct the house, ownership of various consumer goods.

Additional modules on a range of socio-demographic and health topics have been used in many countries. A major strength of the DHS is that they follow a standardized format which allows researchers to make comparisons among different countries and to estimate trends over time. DHS data has always been available to researchers however the relatively high cost of accessing the data was prohibitive to many potential users. However, since 1997 DHS data has been made available, free of charge, over the World Wide Web.

The household and children's sections of the DHS questionnaire cover a wide range of topics that are relevant to the measurement of child poverty such as; water availability, housing characteristics, household size and composition, household durables and sanitation facilities, children's education, measures of child malnutrition, access to information, etc. The broad focus of the DHS data, their extensive and up-to-date world coverage and the ease of access to survey data make the DHS the best single source of information for estimating the extent of child poverty in the developing world (Gordon et al 2002).

The Haiti Demographic and Health Surveys

There have so far been three DHS surveys in Haiti, in 1994/95, 2000 and 2005. This research uses data from both the 2000 and 2005 surveys. The 2000 survey interviews took place between March 2000 and July 2000 and included interviews with 9,595 households, 10,159 women aged 15 to 59 and 3,171 men aged 15 to 59 (Cayemittes et al 2001). The 2005 survey interviews took place between October 2005 and May 2006 and included interviews with 9,998 households, 10,757 women aged 15 to 59 and 4,958 men aged 15 to 59 (Cayemittes et al 2007).

Both surveys had a stratified cluster sampling design. In 2000, nineteen strata were defined: the nine regional departments of Haiti (split by urban and rural) and the metropolitan area of Port-au-Prince. At the first level of stratification, 317 clusters were selected from a list of numbered sections from the Multiple Survey Master Sample (EMEM) put in place by the Haitian Institute for Statistics and Computing based on the General Census of the Population and Housing for 1982 (Cayemittes et al 2001).

In 2005, the availability of recent national Census data made a modification of this methodology possible. Twenty-one strata were defined: the 10 regional departments of Haiti split by urban and rural and the metropolitan area of Port-au-Prince. At the first level of

stratification, 339 clusters were selected from a list of numbered sections from the Multiple Survey Master Sample (EMEM) put in place by the Haitian Institute for Statistics and Computing based on the General Census of the Population and Housing for 2003 (Cayemittes et al 2007).

In both surveys, at the second level of stratification, the households were selected from lists established during the inventory. Height and weight measurements were taken for all women aged 15-49 and for all children under the age of five. In a sub-sample of half the households, all the women aged 15-49 and all the children under five were tested to provide estimates of the prevalence of anaemia.

At the second level of stratification, the households were selected from lists established during the inventory. Height and weight measurements were taken for all women aged 15-49 and for all children under the age of five in half of the households in the sample. In the same sub-sample of half the households, all the women aged 15-49 and men aged 15-59 were tested to estimate the prevalence of anaemia and HIV/ AIDS. In the same sub-sample, all the children under five were tested to provide estimates of the prevalence of anaemia.

All women aged 15-49 (usual residents or visitors), who were present in the household were surveyed individually. However, the sections of the questionnaire on HIV/ AIDS and on the status of women were only given to women aged 15-49 in every second household. Furthermore, among the women identified in every second household, only one individual was selected to answer the section concerning household relationships and domestic violence.

In a sub-sample of every third household, all the men aged 15-59 (usual residents or visitors) were surveyed (Cayemittes et al 2001; 2007).

In 2000, a total of 9831 households were selected for the household survey and among these, 9,678 were identified for survey. Of these, 9,595 were successfully surveyed, providing a response rate of 99.1%. Among the 9,595 surveyed households, 10,399 women were identified as being eligible for the individual level questionnaire and 10,159 were successfully surveyed, giving a response rate of 97.7%. In a sub-sample of every second household, a total of 3,414 men aged 15-59 were also identified for the men's individual questionnaire. Among the 3,414 eligible men, 3,171 were successfully surveyed, giving a response rate therefore of 92.9% (Cayemittes et al 2001).

In 2005, a total of 10,310 households were selected and among these, 10,038 were matched. Of these, 9,998 were successfully surveyed, providing a response rate of 99.6%. Among the 9,998 surveyed households, 10,892 women aged 15-49 were identified as being eligible for the individual level survey and 10,757 among them completed the questionnaire fully. The response rate was therefore 98.8%. In a sub-sample of every second household, a total of 5,094 men aged 15-59 were identified for the men's individual questionnaire. Out of these men, 4,958 were successfully interviewed at the individual level, with a response rate of 97.3% (Cayemittes et al 2007).

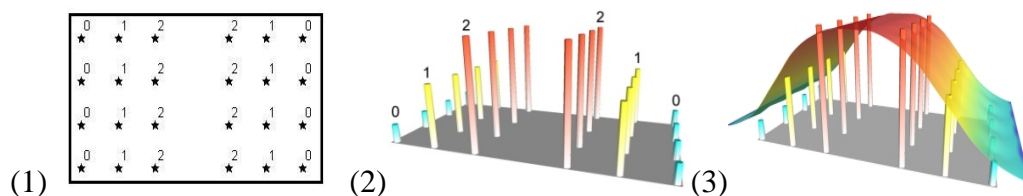
The analyses in this research made use of SPSS Version 15 and Mapinfo Version 8. DHS survey data on all children under 18 were selected and post-stratification population weights were calculated using the UNPOP median population estimates and applied to four age and gender groups (0-4, 5-9, 10-14, 15-17 for boys and girls).

Mapping Absolute Poverty at Sub-regional Level

The absolute child poverty and severe deprivation maps at sub-regional level made use of an interpolation procedure known as Inverse Distance Weighting (IDW). There are many

advantages to taking spatial data beyond a purely descriptive display method, such as the thematic mapping of points using colours (i.e. a choropleth map). Severe child deprivations are not constrained by administrative boundaries, that is, deprivation usually does not dramatically fall from high levels on one side of a district boundary to low levels on the other. IDW interpolation ‘smoothes’ the gradations in levels of deprivation across Primary Sampling Cluster areas to generate a more realistic model of poverty and deprivation. It also enables a spatial analysis of change over time in socio-economic data.

Interpolation is a mathematical process used to estimate values between known point observations. The IDW procedure converts point data into continuous grid layers (a trend surface) by calculating a value for each grid node by examining surrounding data points lying within a defined search radius. The node value is calculated by averaging the weighted sum of all the points, the weight being a function of inverse distance. Thus, data points that lie progressively farther from the node influence the computed value far less than those lying closer to the node. A technical account of IDW interpolation is given below.



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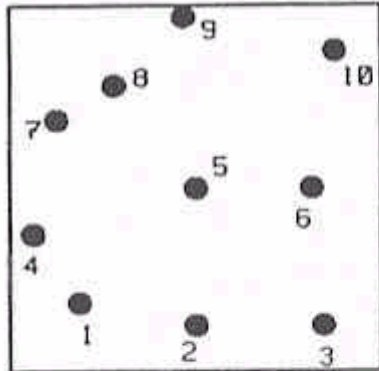
In illustration (1) above, 24 points are arranged regularly with attribute values ranging from 0 to 2. Any numeric attribute can be represented in 3D form, as depicted in the second illustration. This image is actually a rendered grid generated using IDW interpolation by sampling only one data point and using a very small display radius equal to the width of a single column. However, grids are usually used to build a *continuous* surface that connects data points in space, effectively removing gaps in the representation of data. IDW achieves this by generating a moving average or ‘smoothing’ of the data, as shown in illustration (3).

This kind of trend surface methodology is made necessary because of Spatial Autocorrelation. Areas next to each other are likely to be more similar than areas further away. Spatial autocorrelation can be defined as the clustering pattern in the spatial distribution of a variable which is due to the very fact that the occurrences are physically close together, that is, that they are in geographical proximity. They are not independent of each other, but are linked. The data are spatially dependent.

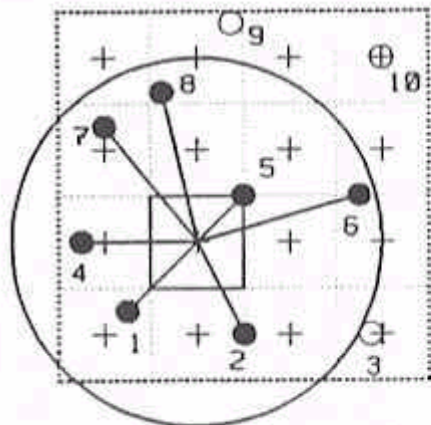
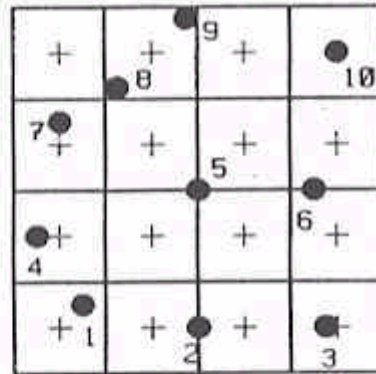
Spatial autocorrelation is widespread: rich people move to areas where other rich people live; disease can spread from one neighbour to another, etc. If the values in a poverty or health cluster are more alike than would be due to random processes, there exists a positive autocorrelation; if they are less alike than would occur through random processes, there exists a negative autocorrelation.

INVERSE DISTANCE WEIGHTING

DATA POINTS



GRID



● DATA POINT

+ CELL NODE

□ GRID CELL

○ SEARCH AREA

n WEIGHTING EXPONENT

$$Z_e = \frac{\frac{1}{d_1^n} v_1 + \frac{1}{d_2^n} v_2 + \frac{1}{d_4^n} v_4 + \frac{1}{d_5^n} v_5 + \frac{1}{d_6^n} v_6 + \frac{1}{d_7^n} v_7 + \frac{1}{d_8^n} v_8}{\frac{1}{d_1^n} + \frac{1}{d_2^n} + \frac{1}{d_4^n} + \frac{1}{d_5^n} + \frac{1}{d_6^n} + \frac{1}{d_7^n} + \frac{1}{d_8^n}}$$

Appendix II: Tables with 95% Confidence Intervals

All tables show results from 2000 and 2005 DHS, except where noted.

AII.1: Rates of individual deprivations

Deprivation	Year	%	95% CI	
			Lower	Upper
Shelter	2000	49	42	56
	2005	54	51	57
Sanitation	2000	41	36	47
	2005	44	41	48
Health	2000	39	36	41
	2005	31	28	34
Water	2000	23	18	29
	2005	23	20	26
Information	2000	15	12	18
	2005	5	4	6
Education	2000	13	11	15
	2005	11	9	12
Food	2000	9	7	11
	2005	12	10	14

AII.2: Rates of absolute poverty (2+) and severe deprivation (1+)

	Year	%	95% CI	
			Lower	Upper
Absolute poverty (2+)	2000	46	40	53
	2005	43	40	46
Severe deprivation(1+)	2000	70	64	77
	2005	70	68	73

AII.3: Rates of absolute poverty and severe deprivation (urban/rural)

		Year	%	95% CI	
				Lower	Upper
Absolute poverty (2+)	Urban	2000	9	6	13
		2005	15	12	17
	Rural	2000	65	60	70
		2005	58	54	63
Severe deprivation (1+)	Urban	2000	34	28	40
		2005	89	86	91
	Rural	2000	45	41	48
		2005	84	81	87

AII.4: Rates of absolute poverty by place of residence

	Place of residence	Year	%	95% CI	
				Lower	Upper
Absolute poverty (2+)	Capital city	2000	4	2	8
		2005	8	6	11
	Small city	2000	12	6	23
		2005	25	17	35
	Town	2000	23	18	28
		2005	20	17	25
	Countryside	2000	65	60	70
		2005	61	56	65

AII.5: Rates of absolute poverty by Department

	Department	Year	%	95% CI	
				Lower	Upper
Absolute poverty (2+)	Centre	2000	55	41	69
		2005	69	61	76
	Grand' Anse	2000	59	52	65
		2005	61	55	66
	Artibonite	2000	59	49	69
		2005	53	44	61
	Metropolitan areas/west	2000	25	16	37
		2005	22	17	29
	North	2000	62	51	72
		2005	51	43	59
	North West	2000	62	47	75
		2005	49	41	58
	South	2000	54	45	62
		2005	42	33	52
	South East	2000	63	53	73
		2005	49	40	58
	North East	2000	54	37	71
		2005	41	34	49
	HAITI	2000	46	40	53
		2005	43	40	46

AII.6: Rates of absolute poverty by household size

Household size	Year	%	95% CI	
			Lower	Upper
< 3 members	2000	52	39	64
	2005	31	24	38
3-4 members	2000	46	37	54
	2005	37	34	42
5-6 members	2000	46	39	52
	2005	43	39	47
7+ members	2000	47	41	54
	2005	45	42	49

AII.7: Rates of absolute poverty and presence of adults of working age (18-54 years)

Presence of adults of working age	Year	95% CI		
		%	Lower	Upper
No adult of working age in house	2000	67	58	75
	2005	55	48	62
At least 1 adult of working age in house	2000	46	39	52
	2005	42	39	46

AII.8: Rates of absolute poverty by gender of household head

Gender of Household head	Year	95% CI		
		%	Lower	Upper
Male	2000	51	45	57
	2005	47	43	50
Female	2000	40	33	48
	2005	38	34	41

AII.9: Rates of absolute poverty by highest education level in household

Highest education level in household	Year	95% CI		
		%	Lower	Upper
No education	2000	81	71	88
	2005	84	80	88
Primary	2000	59	53	64
	2005	60	56	63
Secondary	2000	20	15	25
	2005	21	19	24
Higher	2000	2	1	6
	2005	2	1	4

AII.10: Rates of absolute poverty by highest education level of women in household

Highest education of women in household	Year	95% CI		
		%	Lower	Upper
No education	2000	69	64	74
	2005	70	65	75
Primary	2000	47	40	55
	2005	49	46	52
Secondary	2000	12	9	16
	2005	15	13	18
Higher	2000	0	0	1
	2005	1	0	5

AII.11: Rates of absolute poverty by occupational social class, 2000

Household social class, based on occupation	%	95% CI	
		Lower	Upper
Agricultural employee	67	55	77
Unskilled manual	65	60	70
Not working	29	22	37
Skilled manual	27	20	36
Services	19	13	27
Clerical	17	11	25
Professional, technical, managerial	15	12	20

AII.12: Rates of absolute poverty by occupational social class, 2005

Household social class, based on occupation	%	95% CI	
		Lower	Upper
Agriculture self employed	70	66	75
Sales	42	39	46
Unskilled manual	41	35	47
Household domestic	40	26	55
Skilled manual	29	22	38
Not working	25	19	32
Professional, technical, managerial	18	15	21