Multidimensional Measures of Child Poverty

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Introduction

In 2000, the United Nations Children's Fund, UNICEF, commissioned the Townsend Centre for International Poverty Research to produce the first ever scientific estimates of child poverty in the developing world. The team, led by Professors David Gordon and Peter Townsend, was based at the University of Bristol and included Christina Pantazis, Simon Pemberton and Shailen Nandy. The research formed part of a UNICEF's wider *"Poverty begins with children"* campaign and sought to fill the considerable information gap on the extent and nature of child poverty around the world. The preliminary results were published by Gordon *et al* in 2003 and UNICEF drew heavily on this research for their 2005 "*State of the World's Children Report: Childhood Under Threat*", and the results on child poverty were reported in over 60 countries - both the *New York Times* and *Al Jazeera* carried major stories. In the UK both the *Independent* and the *Guardian* devoted their front pages to reporting this research.   Additional funding has been provided by the UK Department for International Development (DFID) to extend this multidimensional poverty research for both children and adults to sub-country level. This paper is based on both the UNICEF and DFID funded research.

The Idea of Ending Poverty

The idea that it is possible to end poverty is over 200 years old. The French enlightenment philosopher Marie Jean Antonine Nicolas de Caritat, Maquis de Condorcet argued in *Sketch for a Historical Picture of the Progress of the Human Mind* (published posthumously in 1794 by the government of the new French Republic) that poverty was not a result of natural laws or divine will but was caused by '*the present imperfections of the social arts*'[1]. He argued that poverty could be ended by the universal provision of pensions, grants to the young, sickness benefits and state education. Similar 'welfare state' solutions for poverty can also be found in Thomas Paine's *Agrarian Justice* (1785) and *Rights of Man* (1791) which argued for progressive taxation and death duties to fund child benefits, pensions and education. The need to end poverty was seen as necessary to reduce social and economic polarisation, which if allowed to persist would undermine the stability and unity of the democratic republic.

The possibility of ending world poverty during the 21st Century has gained increasing public support over the past decade. In 1985, Live Aid demonstrated the strength of public concern in the face of an inadequate response from many governments in the West[2] to poverty and starvation in Africa. In the early 1990s, Martin Dent and Bill Peters and 40 of Martin's students helped to found the Jubilee 2000 campaign to try to win remission of the unpayable debts of the world's 50 or so low-income countries. The idea was to revive and link the Jubilee concept - based on the old Judaic tradition of a jubilee year every fifty years when debts were cancelled - with the celebration of the new millennium. From these humble academic beginnings in the Politics department of Keele University in the UK the campaign went on to amass 26 million supporters in 60 countries and put the issue of international debt firmly on the political agenda[3].

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[1] quoted in Steadman Jones, G. (2004) *An End to Poverty? A Historical Debate,* Profile Books Ltd
[2] Particularly the administrations of Ronald Regan and Margaret Thatcher in the USA and UK.
[3] See http://www.new-politics.net/publications/interviews/martin-dent/

In 1995, the World Social Summit in Copenhagen (followed by the 1997 launch of the United Nations First Decade for the Eradication of Poverty) helped to raise international public awareness and lend political legitimacy and credibility to the anti-poverty campaigns of many NGOs.

At the beginning of the 21st Century the United Nations and the governments of 189 countries adopted the Millennium Development Goals[4] which included a target to tackle the problem of extreme poverty - by halving, between 1990 and 2015, the proportion of people whose income is less than one dollar a day; and to halve, between 1990 and 2015, the proportion of people who suffer from hunger. The Millennium Declaration[5] makes the following commitments;

"*We will spare no effort to free our fellow men, women and children from the abject and dehumanizing conditions of extreme poverty, to which more than a billion of them are currently subjected. We are committed to making the right to development a reality for everyone and to freeing the entire human race from want.*

We resolve therefore to create an environment – at the national and global levels alike – which is conducive to development and to the elimination of poverty."

Also in 2000, NGO's from around the world met at the UN "Copenhagen + 5" summit[6] and established the World Social Forum (WSF), the first meeting was held in 2001 with the support of the state and municipal governments in Porto Alegre, Brazil. Twelve thousand people attended the first WSF but by 2005 it had grown to over 200,000 participants from over 6,500 organizations from 151 countries[7].

Internationally there appears to be growing public support for increased action to help achieve the Millennium Development Goal targets to halve extreme poverty by 2015. Many hope that the agreements at the G8 Summit[8] in 2005 will eventually deliver a new 'Marshall Plan' of a doubling of aid, debt reduction for the poorest countries and fairer trade.

What is problematic about unidimensional measures of child poverty?
Child poverty is one of the greatest concerns of governments and international organisations. Poverty is a major obstacle for the survival and development of children. Poverty denies the most basic rights of children and its impact often causes permanent damage. Research has shown that, whilst the definitions may vary, all cultures have a concept of poverty (Gordon and Spicker, 1999). There are currently no consistent estimates of the extent or severity of child poverty in developing countries. Whilst many countries do have detailed anti-poverty strategies and statistics on child poverty, these estimates tend to use different methods and definitions of poverty which makes comparison extremely difficult. The World Bank has not produced any estimates of child poverty using its 'dollar a day' thresholds -

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[4] http://www.un.org/millenniumgoals/
[5] http://www.un.org/millennium/declaration/ares552e.pdf
[6] http://www.un.org/esa/socdev/geneva2000/index.html
[7] http://www.forumsocialmundial.org.br/
[8] http://www.g8.gov.uk

except for a few countries in Central and South America. There are, however, a number of reasons why this kind of approach to measuring child poverty in developing countries is far from ideal (see Gordon *et al,* 2003, for discussion).

1)   Little is known about the income/expenditure/consumption needs of children in most developing countries and how these needs may vary by age, gender and location. Therefore, any income or expenditure/consumption poverty threshold for children would have to be set at an essentially arbitrary level given the current lack of knowledge about children's needs. In particular, the World Bank's (1990) consumption-based poverty definition in terms of *the expenditure necessary to buy a minimum standard of nutrition* is inappropriate for measuring child poverty, particularly for young children who have low food requirements but numerous additional basic needs that require expenditure. Many academic commentators have severely criticised the World Bank's $1 per day poverty threshold for not being an adequate definition of adult's needs in developing countries (for example, Comparative Research Programme on Poverty, 2001). Therefore, setting an arbitrary child poverty income threshold is unjustifiable and would be likely to lead to incorrect policy conclusions.

2)   Household based income and expenditure/consumption 'poverty' analyses usually assume an equal sharing of resources within a household. This assumption is unlikely to be correct for many 'poor' and 'rich' households with children. In 'poor' families across the world, parents often sacrifice their own needs in order to ensure that their children can have some of the things they need (i.e. children are often allocated a disproportionate share of household resources). Conversely, in 'rich' households parents may spend less than expected on young children so as not to 'spoil' them.

3)   There are many technical problems involved in using either an income or expenditure/consumption approach to measuring child poverty in developing countries, for example, calculating equivalent spending power of national currencies using purchasing power parity, equivalisation by household type, controlling for infrequent, irregular or seasonal purchases, under-reporting bias and other measurement errors, data discontinuities, quantifying the benefits from 'home' production and the use of durables, etc. (see Buhman et al 1988; Atkinson, 1990; Nelson, 1993; Canberra Group, 2001; Reddy and Pogge, 2002, for discussion of these issues).

4)   The extent of child poverty is not just dependent on family income but also on the availability of infrastructure and services, such as health, education and water supply (Evandrou et al, 1992).

5)   Internationally agreed definitions of poverty are all concerned with outcomes (e.g. the effects of the of lack of command over resources over time) (see Gordon, 2002).

Neo-classical economic model which provide the underlying theoretical basis for unidimensional measures of poverty (such as the World Banks dollar a day) assume that wealth is a result of productivity and economic efforts (work and waiting). In

such models poverty is often assumed to be the converse of wealth i.e. the result of a lack of productivity and work/waiting (Clark, 2002). These models are clearly not appropriate to children, since from the perspective of the 'child', child poverty is a result of an inadequate redistribution of resources from adults to children. Extinction is an inevitable consequence for both households and societies in which adults do not transfer sufficient resources to ensure the survival of children.

International definitions of poverty
A major problem with many previous attempts to measure poverty on a global scale is that there was no agreed definition of poverty. This situation changed at the Copenhagen World Summit on Social Development (UN, 1995). Among the innovations agreed in the *Copenhagen Declaration and Programme of Action* was the preparation of national anti-poverty plans based on measures in all countries of 'absolute' and 'overall' poverty. The aim was to link - if not reconcile - the difference between industrialised and developing country conceptions, allow more reliable comparisons to be made between countries and regions and make easier the identification of acceptable priorities for action (Gordon and Townsend, 2000). In developing anti-poverty strategies, the international agreement at Copenhagen was a breakthrough with the governments of 117 countries agreeing to the two definitions of absolute and overall poverty.

Overall poverty takes various forms, including *"lack of income and productive resources to ensure sustainable livelihoods; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments and social discrimination and exclusion. It is also characterised by lack of participation in decision-making and in civil, social and cultural life. It occurs in all countries: as mass poverty in many developing countries, pockets of poverty amid wealth in developed countries, loss of livelihoods as a result of economic recession, sudden poverty as a result of disaster or conflict, the poverty of low-wage workers, and the utter destitution of people who fall outside family support systems, social institutions and safety nets.*

Women bear a disproportionate burden of poverty and children growing up in poverty are often permanently disadvantaged. Older people, people with disabilities, indigenous people, refugees and internally displaced persons are also particularly vulnerable to poverty. Furthermore, poverty in its various forms represents a barrier to communication and access to services, as well as a major health risk, and people living in poverty are particularly vulnerable to the consequences of disasters and conflicts."

Absolute poverty was agreed to be *"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."*

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 family income on children and the effects of inadequate service provision for children (Vandemoortele, 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 child poverty as low family incomes (Mehrotra *et al*, 2000; Minujin *et al*, 2002).

Multidimensional measures of child poverty in developing countries
Unidimensional measures of child poverty fail to adequately describe the true extent of children's well being (Ben-Arieh and Wintersberger, 1997) and it is often difficult for policy makers (and experts) to interpret what these measures mean i.e. what kind of life does a child have who consumes less than one dollar a day at purchasing power parity?

The agreed international definition of absolute poverty defines it as a *"a condition characterised by severe deprivation of basic human needs."* 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, 2002). Figure 1 illustrates this concept.

Figure 1: Continuum of deprivation
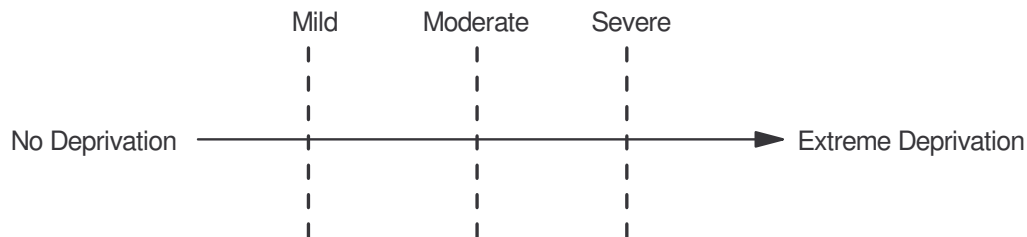
In order to measure absolute poverty amongst children, it is necessary to define the threshold measures of severe deprivation of basic human need for:

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

Theoretically, we can define '*severe deprivation of basic human need*' as those circumstances that are highly likely to have serious adverse consequences for the health, well-being and development of children. Severe deprivations are causally

related to 'poor' developmental outcomes both long and short term. 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.   Table 1 shows the idealised operational definitions of deprivation for the eight criteria in the World Summit definition of absolute poverty (modified from Gordon *et al*, 2003).

Table 1: Operational definitions of deprivation for children

Deprivation	Mild	Moderate	Severe	Extreme
Food	Bland diet of poor nutritional value	Going hungry on occasion resulting in moderate malnutrition	Severe Malnutrition	Starvation
Safe drinking water	Not having enough water on occasion due to lack of sufficient money	Unimproved water supply within 200 meters of dwelling or less than 15 minutes walk away	Long walk to water source (more than 200 meters or longer than 15 minutes). Unsafe drinking water (e.g. open water)	No access to water
Sanitation facilities	Having to share facilities with another household	Unimproved sanitation facilities	No sanitation facilities in or near dwelling	No access to sanitation facilities
Health	Occasional lack of access to medical care due to insufficient money	Inadequate medical care. Only limited non-professional medical care available when sick	No immunisation against diseases or medical treatment when sick.	No care when sick.
Shelter	Dwelling in poor repair. More than 1 person per room	Few facilities in dwelling, lack of heating, structural problems. Four or more people per room	No facilities in house, non-permanent structure, no privacy, no flooring, just one or two rooms. Five or more persons per room	Roofless – no shelter
Education	Inadequate teaching due to lack of resources	Unable to attend secondary but can attend primary education	Child is 7 or older and has received no primary or secondary education	Prevented from learning due to persecution and prejudice
Information	Can't afford newspapers or books	No access to broadcast media (eg radio, TV, etc.)	No access to radio, television or books or newspapers	Prevented from gaining access to information by government, etc.
Basic Social Services	Health and education facilities available but occasionally of low standard	Inadequate health and education facilities near by (e.g. less than 1 hour travel)	Limited health and education facilities a days travel away	No access to health or education facilities

It is rarely (if ever) possible to perfectly implement idealised definitions (such as those in Table 1 above) using survey data that were collected for other purposes. Some compromise always has to be made when dealing with survey data. In our previous research, we have demonstrated that Demographic and Health Survey (DHS) and Multiple Indicator Cluster survey (MICS2) data can be used to produce measures

of severe deprivation for children which are conceptually very close to our idealised measures (see Gordon *et al*, 2003).

1) **Severe Food Deprivation**– children whose heights and weights for their age were more than -3 standard deviations below the median of the international reference population, i.e. severe anthropometric failure (Nandy et al, 2005).

2) **Severe Water Deprivation** - children who only had access to surface water (e.g. ponds, rivers or springs) for drinking or who lived in households where the nearest source of water was more than 15 minutes away.

3) **Severe Deprivation of Sanitation Facilities** – children who had no access to a toilet of any kind in the vicinity of their dwelling, including communal toilets or latrines.

4) **Severe Health Deprivation** – children who had not been immunised against any diseases or young children who had a recent illness causing diarrhoea or acute respiratory infection (ARI) and had not received any medical advice or treatment.

5) **Severe Shelter Deprivation** – children living in dwellings with five or more people per room (severe overcrowding) or with no flooring material (e.g. a mud floor).

6) **Severe Education Deprivation** – children aged between 7 and 18 who had never been to school and were not currently attending school (no professional education of any kind).

7) **Severe Information Deprivation** – children aged between 3 and 18 in households which do not possess a radio, television, telephone or computer.

Children who suffer from these levels of severe deprivation are very likely to be living in absolute poverty because, in the overwhelming majority of cases, the cause of severe deprivation of basic human need is invariably a result of lack of resources/income. However Gordon and his colleagues (2003) have argued that there may also be some children in this situation due to discrimination, (particularly girls suffering severe education deprivation) or due to disease (severe malnutrition can be caused by some diseases). For this reason, we have assumed that a child is living in absolute poverty *only* if he or she suffers from multiple deprivations (i.e. two or more severe deprivations of basic human need as defined above). Similarly, a household with children is defined as living in absolute poverty if the children in that household suffer from two or more severe deprivations of basic human need.

The purpose of the research for UNICEF was to measure children's living conditions that were so severely deprived that they were indicative of absolute poverty. Thus, the measures used represent more severe deprivations than the indicators frequently published by international organisations. 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', and so on.

We, in the tradition of Seebohm Rowntree (1901), 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 unacceptable.

The criteria used to select indicators were that they should be specific, easy to understand, available for many countries and conform with internationally recognised standards, norms or scientific traditions. There is not sufficient space available to explain the details of how and why each indicator of severe deprivation of basic human need was selected. However, the example of severe shelter deprivation is presented below as this the deprivation which affects the greatest number of children.

Indicators should ideally measure the two primary aspects of severe deprivations of basic human need, severe quantity deprivation and severe quality deprivation. For example, a child is defined as severely shelter deprived if they either live in:

1) a crowded dwelling (more than five people per room) – an indicator of severe quantity deprivation; or

2) a dwelling in which the rooms have mud or dirt flooring – an indicator severe quality deprivation..

Crowding
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 4.6% of the 4.2 million people in London were living in very crowded conditions of four or more people per room and that 31.5% 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 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 children that are a result of severe crowding, such as an increased risk of fire (firing) and accidents, that Booth described in 1895 are unfortunately still the same today (UNICEF, 2002).

In this research, we have defined severe housing quantity deprivation as five or more people per room thus we have erred on the side of caution by using a much harsher definition of crowding than that used by Charles Booth to estimate the number of 'very poor' people living in the worst slum conditions of 19th Century London.

Mud flooring
A mud floor represents a good indicator of severe deprivation of shelter quality for 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 South Asia which can have heavy rains (monsoon), 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. Mud floors also correlate highly with other indicators of 'very poor' quality housing such as an inadequate roof.

We know of no countries in the world where the building regulations consider it acceptable for children to live in dwelling with a mud or dirt floor.

Data Sources
Throughout the 1990s a number of international agencies, including the World Bank, USAID, WHO and UNICEF, successfully assisted national governments of developing countries to implement high quality standardised survey instruments (such as the DHS, LSMS and MICs). The results from these surveys are transforming the information base that allows policy makers to both identify priorities for anti-poverty polices and also enable monitoring of the effectiveness of these policies (for example, see Filmer and Pritchett, 1999; 2001; Miljeteig, 1997; Milanovic, 2002; Montgomery *et al*, 2000; World Bank, 1990; 2000).

Figure 2 shows the countries for which high quality micro-data are available, via the World Wide Web, from surveys which contain income, expenditure and deprivation information on children.

Figure 2: Countries with income, expenditure or deprivation survey data which are available for download via the World Wide Web
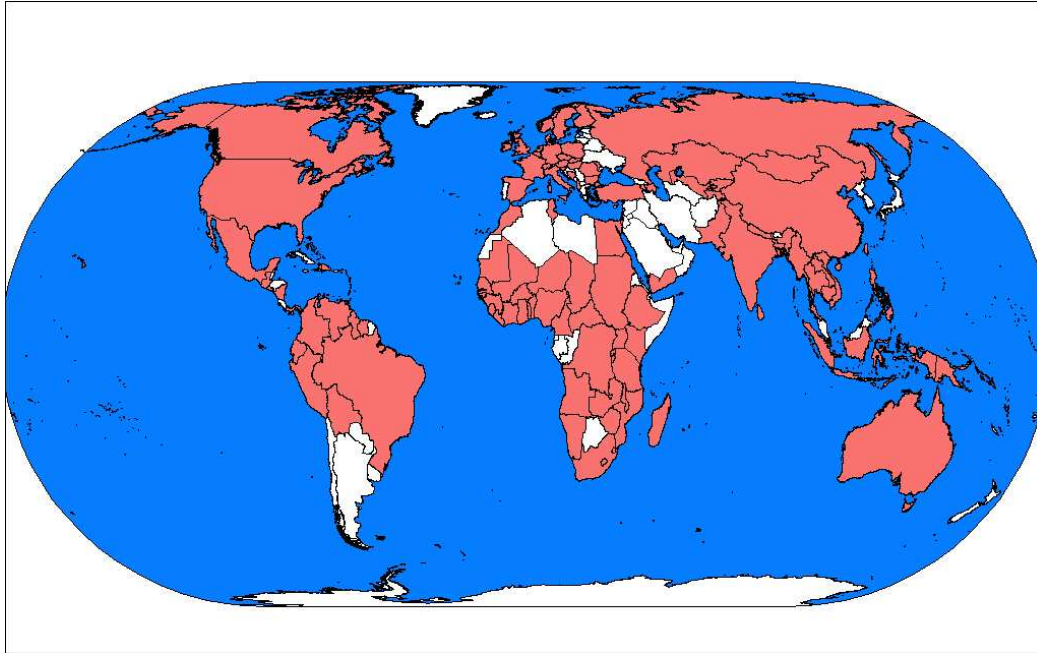
This research is based on a sample of over 2.5 million children in 77 developing countries collected within the ten-year period 1991 to 2001 (see Appendix 1 for details). This is the largest and most representative survey sample of children ever assembled and contains information on approximately twice as many children as the data analysed by Gordon and his colleagues (2003). In all the surveys the majority of information on the children's lives was reported by their mothers or main carers.

In order to produce World estimates on the extend of absolute child poverty the regional average score was assigned to countries without micro data. In the 'North Africa and the Middle East' region Sudan was excluded as an outlier when calculating the population weighted regional average, as Sudan's absolute child poverty rate was much higher than the other countries in the region. In the 'Eastern and Central Europe' region, Ukraine and Belarus were assumed to have the same absolute child poverty rate as the western regions of Russia. Croatia, Macedonia and Yugoslavia were assumed to have the same absolute child poverty rates as Bosnia and Romania was assumed to have the same poverty rate as Bulgaria.

The World estimates of absolute child poverty assume that there is no absolute child poverty in the high income countries[9]. Wealthy countries include all those defined as having a high income by the World Bank and the 25 member states of the European Union. It is however, likely that there are some groups of children from excluded
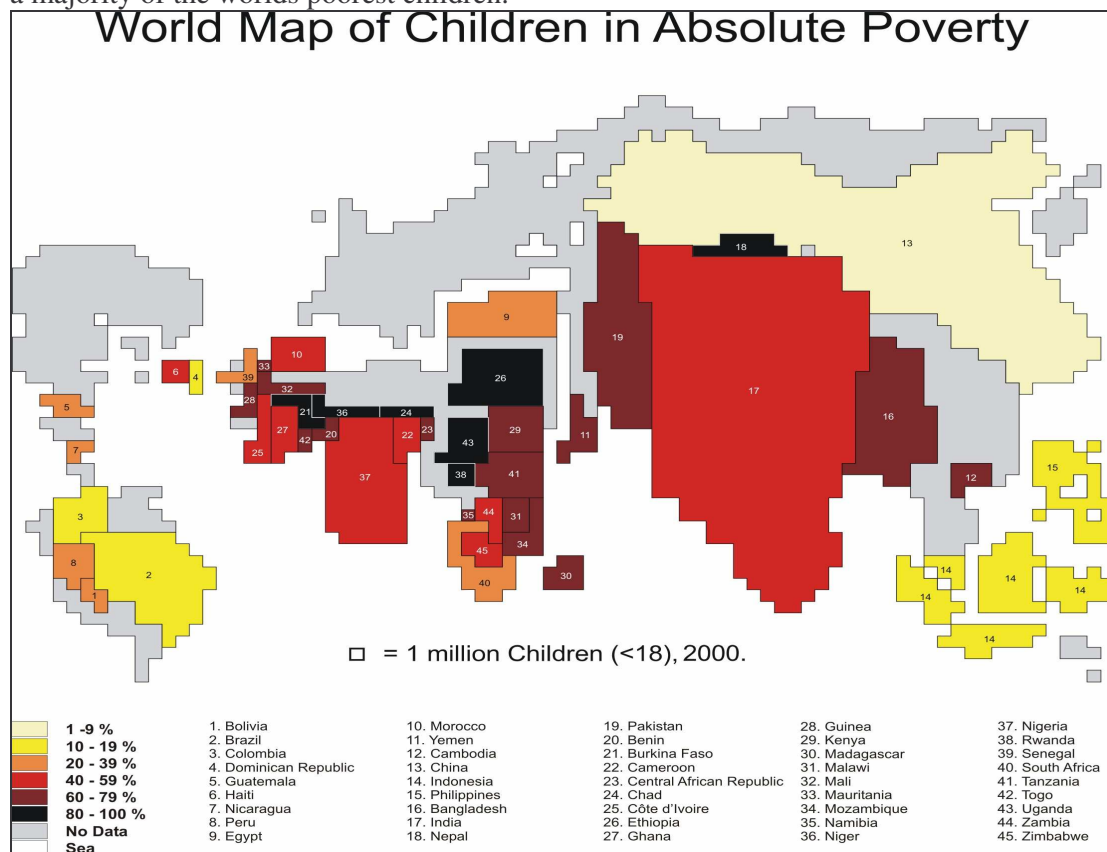
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[9] This assumption was checked using European Community Household Panel (ECHP) and Luxembourg Income Study (LIS) survey data.

minorities in wealthy countries who may suffer from absolute poverty (for example, homeless children in the UK, aboriginal children in Australia, the indigenous mountain children in Taiwan, Bedouin children in Israel, etc.). Our assumption that there is no absolute child poverty in wealthy countries is made to again err on the side of caution, therefore the results reported below should be treated as *minimum* estimates on the extent of absolute child poverty.

Absolute Poverty Results
Over one billion children – about half the world's children - suffer from severe deprivations of basic human need and 30% (650 million) suffer from absolute poverty (two or more severe deprivations). Rates of absolute poverty are highest in the Sub-Saharan Africa and South Asia regions, at 61% (195 million children) and 54% (302 million children) respectively. The lowest rates are in Latin America and the Caribbean and the East Asia and the Pacific regions at 15% and 4%, respectively. The low rates in East Asia are due primarily due to China's success in meeting the basic needs of its population, through the provision of housing, education, health care, safe water and effective sanitation.

Children in rural areas face significantly higher levels of poverty than urban children, with rates for absolute poverty rising to 74% (179 million) in rural Sub-Saharan Africa and 64% in rural South Asia (278 million). The cartogram - which expands the size of each country to reflect the size of its child population (see Dorling 2005) - shows the distribution of children living in absolute poverty in 45 developing countries (Gordon *et al*, 2003), with south Asia and sub Saharan Africa accounting for a majority of the worlds poorest children.

World Map of Children in Absolute Poverty

☐ = 1 million Children (<18), 2000.

1 -9 %	
10 - 19 %	
20 - 39 %	
40 - 59 %	
60 - 79 %	
80 - 100 %	
No Data	
Sea	

1. Bolivia	10. Morocco	19. Pakistan	28. Guinea	37. Nigeria
2. Brazil	11. Yemen	20. Benin	29. Kenya	38. Rwanda
3. Colombia	12. Cambodia	21. Burkina Faso	30. Madagascar	39. Senegal
4. Dominican Republic	13. China	22. Cameroon	31. Malawi	40. South Africa
5. Guatemala	14. Indonesia	23. Central African Republic	32. Mali	41. Tanzania
6. Haiti	15. Philippines	24. Chad	33. Mauritania	42. Togo
7. Nicaragua	16. Bangladesh	25. Côte d'Ivoire	34. Mozambique	43. Uganda
8. Peru	17. India	26. Ethiopia	35. Namibia	44. Zambia
9. Egypt	18. Nepal	27. Ghana	36. Niger	45. Zimbabwe

(Source: Dorling 2005, Chapter 10)

The causes of absolute child poverty

The scientific study of poverty in industrialised countries, such as Britain dates back to the beginning of the 'scientific revolution' in the seventeenth and eighteenth century. The first detailed statistical research into the incomes and expenditure of both the 'poor' and other groups in English society was based on the analyses of tax records by Gregory King in 1696 and 1697 in his *Natural and Political Observations Upon the State and Conditions of England* (see Stone, 1997, Chapter 3 for discussion).

Since these pioneering studies of poverty over three hundred years of research has identified six groups as being particularly vulnerable to poverty in developed countries.

- The elderly
- The unemployed
- Sick and disabled people
- Low waged workers
- Large families
- Lone parent families

In the developing countries, we also have two additional groups at risk of poverty:

- Landless and small farmers
- Fishermen and fisherwoman

The causes of poverty, although often contested, are nevertheless well known and can be divided into four main groupings for analytical convenience when investigating survey data such as the DHS and MICS;

1) **Demographic factors**: such as age, gender, number of adults and children, family structure, etc – child poverty can result if there are too few adults compared with the numbers of children to both adequately care for the children and provide sufficient economic resources to prevent poverty.

2) **Social Class/Socioeconomic status**: such as occupation and educational attainment – child poverty can result from parental occupations with low earnings or a lack of earnings due to unemployment/landlessness

3) **Recognition factors**: such as ethnicity and religion – child poverty can result due to discrimination against low status ethnicities, religions, etc.

4) **Geographic factors**: such as rurality, region, etc. Child poverty can result due to a lack of resources in the geographic location. However, geographic location is often a proxy variable for historically contingent factors which cause poverty such a history of war/violence, underdevelopment, etc.

It is far beyond the scope of this chapter to provide analyses of the causes of absolute child poverty for all the countries in the World, however for the purposes of illustration Namibia will be used as a case example.

Absolute Child Poverty in Namibia

Namibia is a relatively small country in southern Africa with a population of approximately two million people (Figure 4). It only became an independent country in 1990 after decades of war.

Figure 4: Map of Namibia[10]

Analyses of the data on 15,700 children (under 18) in the Namibia DHS survey in 2000 showed that 63% were absolutely poor (suffering from two or more severe deprivations of basic human need).

Demographic Factors

There was little difference in the absolute poverty rate for girls and boys. As expected when all other factors were held constant in a logistic regression analysis the poverty rate increased with increasing numbers of children in the household and decreased with increasing numbers of adults – high absolute child poverty rates (over 80%) were found in household with two adults and six or more children. Single adult households with three or more children also had high poverty rates (76%).

Family structure was also found to be an important factor associated with poverty (Figure 5). Single generation family households had the lowest child poverty rates (42%) whereas households which contained three or more generations had the highest poverty rates (70%). This pattern occurred irrespective of whether the household contained other relatives (an extended family household).

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[10] Source http://www.cia.gov/cia/publications/factbook/geos/wa.html

Figure 5Absolute Child Poverty Rates by Family Structure in Namibia
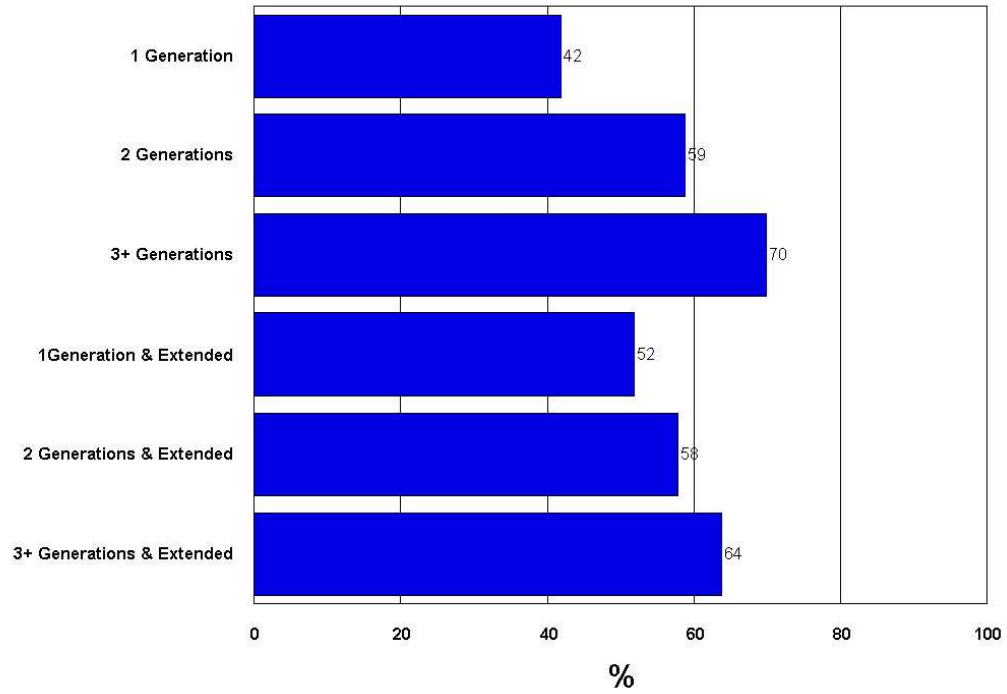
Socioeconomic Factors

Both social class (Figure 6) and education attainment of a child's mother or head of household (Figure 7) are important predictors of absolute child poverty in Namibia.

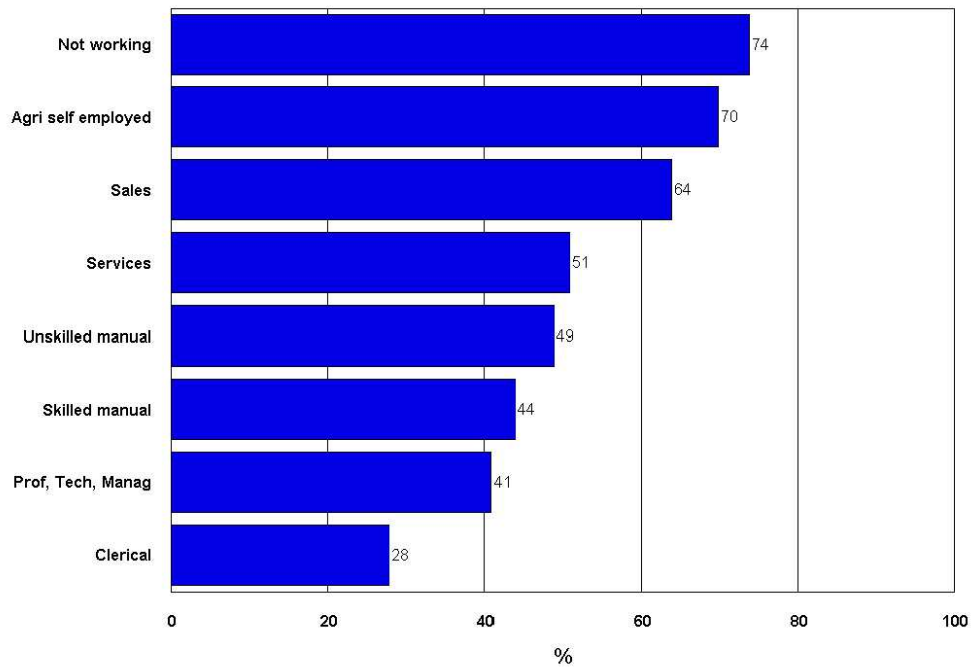**Figure 6: Absolute Child Poverty Rates and Social Class in Namibia**

Figure 6 shows that 74% of children with an unemployed father/mothers partner[11] suffered from absolute poverty as did 70% of children with fathers who were self employed agricultural workers (farmers). By contrast less than 30% of children with fathers in clerical occupations were absolutely poor.

Figure 7: Absolute Child Poverty Rates and Highest level of Education of the Child's Mother or Head of Household in Namibia
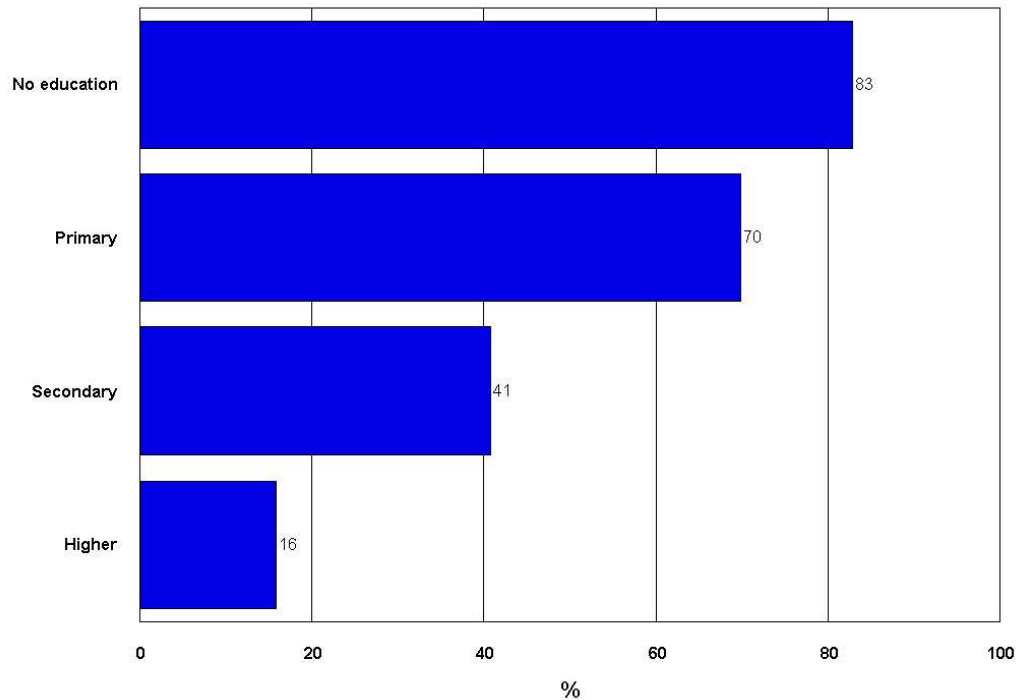

Figure 7 shows the unsurprising results that children whose mother's had no education were five times more likely to be absolutely poor than children of mothers with a higher education (83% compared with 16%).

Recognition Factors

Resources are often unequally distributed along recognition dimensions as a result of discrimination against certain ethnic groups or sometimes as a result of the lifestyle or economic history of these groups. Two key recognition dimensions are often ethnic group (Figure 8) and religion. It should be noted that surveys such as the DHS tend to classify respondents into a limited number 'official' government ethnic group and religious categories. However, these limited categories may not reflect the true levels of diversity that are present in society and in some cases the very existence of the most powerless and impoverished groups may not even be officially acknowledged and recorded (see Fraser 2000).

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[11] In cases where there was no information on mother's partners social class then the mothers social class or the head of households social class was used.

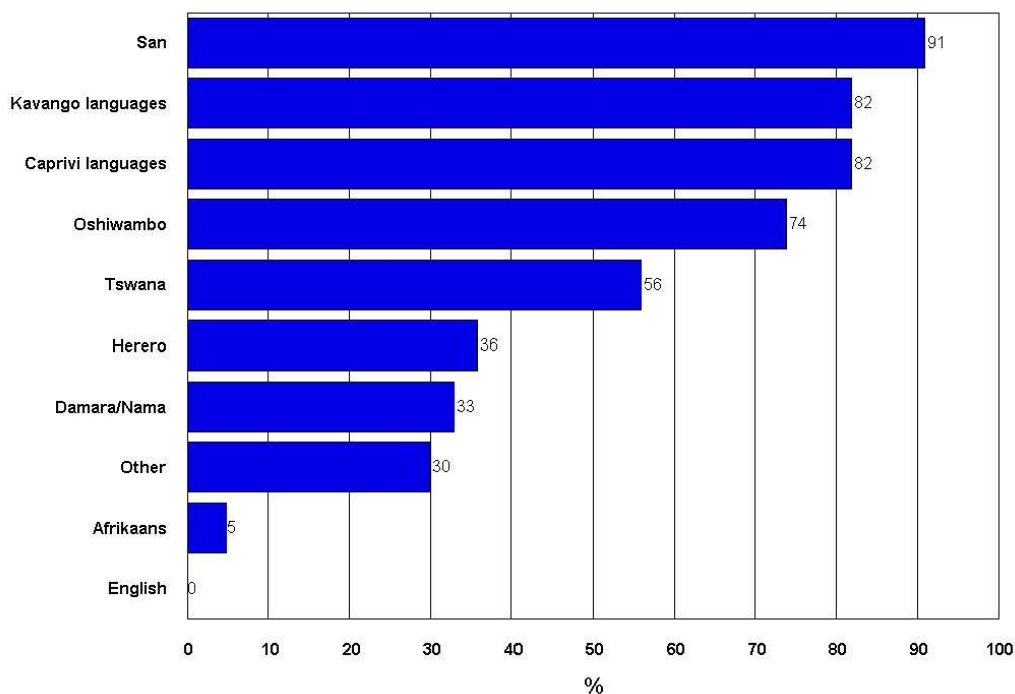**Figure 8: Absolute Child Poverty Rates by Ethnic Group**

Figure 8 shows that there are very large differences in the extent of absolute child poverty by ethnic group, over 90% of San children are poor whereas there were no poor 'English' children in the Namibia survey. By contrast in Namibia there was less difference in child poverty rates by religious affiliation.

Geographic factors
In Namibia, as in all sub-Saharan countries, children living in rural areas are much more likely to be poor (81%) than children living in urban locations (12%). However, in Namibia there are also considerable differences in the absolute child poverty rate by region above and beyond the urban/rural differences.

The map below shows that there are very high child poverty rates (shaded red on the map) in the far north of the country on the boarder with Angola. There are extremely high poverty rates – approaching 100% - in the Caprivi region in the far North East. During the 1970's and 1980's the Caprivi region was used by both the South African army and UNITA as a base for conducting wars in Namibia and Angola and in 1994 a separatist struggle broke out in this region. Unsurprisingly a long history of war and violence has resulted in high absolute child poverty rates. By contrast the much lower absolute child poverty rates (shaded blue) are found in the south west of Namibia.

Namibia Absolute Child Poverty in 2000
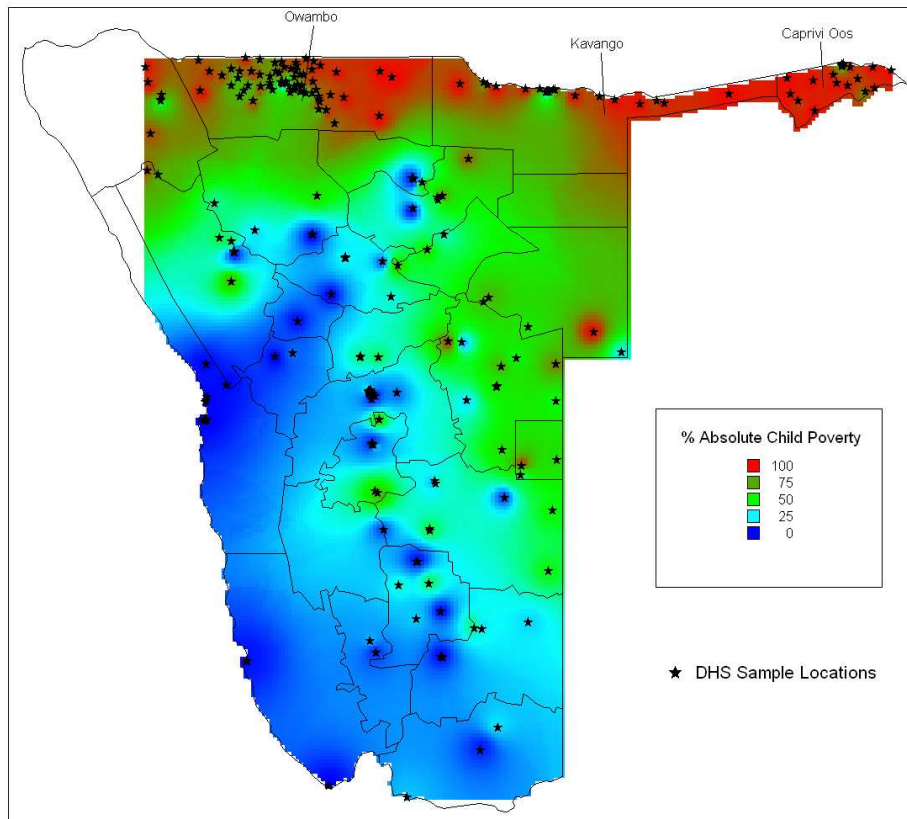
The map was produced using an interpolation procedure known as Inverse Distance Weighting (IDW). There are many advantages to taking spatial data beyond a purely descriptive display method, such as the thematic mapping of points using colours (*ie* a choropleth map). Child poverty is not constrained by regional boundaries, that is, child poverty usually does not dramatically fall from high levels on one side of a region boundary to low levels on the other. IDW interpolation 'smoothes' the gradations in levels of across regional boundaries to generate a more realistic picture of the distribution of poverty.

Interpolation is a mathematical process used to estimate values between known point observations, in this case the 260 primary sample locations used in the DHS 2000 survey of Namibia (marked as stars on the map). 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.

(1) **(2)** **(3)**
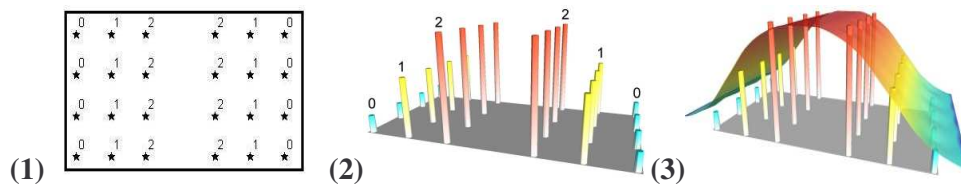
In illustration (1) above, 24 points are arranged regularly with attribute values ranging from 0 to 2. Any numeric attribute can be represented in 3D form, as depicted in the second illustration. This image is actually a rendered grid generated using IDW interpolation by sampling only one data point 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).

Logistic regression modelling
Multi-variety logistic regression modelling was undertaken using the demographic, socio-economic, recognition and geographic variables described above using the SPSS (version 13.01) statistical software. The model fitted the data well and had a Cox & Snell pseudo R Squared of 0.48 and a Nagelkerke pseudo R squared of 0.65 (which is relatively high for a logistic regression model); 86% of cases were correctly classified by this model. The summary table below shows the ten most significant variables (ordered by the size of the odds) associated with absolute child poverty in Namibia in 2000.

The four most significant variables are region, rurality, mother's education level and ethnic group. Children living in the Caprivi region are 90 times more likely to be absolutely poor than children living in the Otjozondjupa region in the centre of the country after allowing for the effects of all other variables. Similarly, children living in the other two northern regions which boarder Angola – Ohangwena and Kavango – have high odds of being poor.

Children who's mother's had no education are almost 16 times more likely to be poor than children of mother's with a higher education and those with mothers with only a primary education are 8.6 times more likely to be absolutely poor.

Table 2: Logisitc regression results: the most significant ten variables associated with absolute child poverty in Namibia in 2000

Variable	Odds (exp ß)	95% CI (Lower)	95% CI (Upper)
Caprivi region	90.5	42.7	182.7
No education (Mother)	15.9	10.9	22.7
Rural	14.0	11.8	16.6
Ohangwena region	13.6	9.2	18.6
Primary education (Mother)	8.6	6.0	12.1
Kavango region	8.5	5.1	13.2
Kavango language ethnic group	7.5	2.9	18.5
Damara/Nama ethnic group	6.9	2.8	16.9
Oshiwambo ethnic group	6.1	2.4	15.1
San ethnic group	5.9	2.1	15.9

Note: comparator groups for region is 'Otjozondjupa', for mother's education level is 'higher', for rural is 'urban', for ethnicity is 'other'

Finally children in the Kavango language, Damara/Nama, Oshiwambo and San ethnic groups are between 5 and 8 times more likely to be absolutely poor than children whose ethnic group is recorded as 'other'.

Conclusion

This paper has shown how multidimensional measures of child poverty based on internationally agreed definitions can be produced at a global level using readily available survey data. Over half the children in the World suffer from at least one severe deprivation of basic human need and 30% of the World's children are absolutely poor. These are very stark result given that this research has consistently erred on the side of caution in choosing definitions of deprivation that are much more severe than those commonly used by international agencies. Similarly it has been assumed that there is no absolute child poverty whatsoever in any high income country. These finding would indicate that the current unidimensional measures of extreme poverty produced by the World Bank (the one dollar a day threshold) may well underestimate the true extent of World poverty.

This paper has also discussed by using the example of Namibia, how adverse demographic, socio-economic, recognition and geographic factors can combine to produce very high rates of absolute child poverty. In particular poverty rates are very high in the regions of Namibia which have suffered from a long history of warfare and violence. These analyses indicate that a 'one size fits all' approach to anti-poverty policy is unlikely to be effective and efficient as the causes of absolute child poverty vary with location. In different areas there are different combinations of problems which will require different policy solutions.

Given the scale and multidimensional nature of absolute child poverty in the World it seems unlikely that poverty can be eradicated quickly unless the issue of child poverty is given a higher priority by governments and international organisations.

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Appendix 1 Countries, survey years and number of children in the sample

Survey Year	Survey type	Country	Number of Children in Sample
		Sub Saharan Africa	
2000	MICS	Angola	16,535
1996	DHS	Benin	15,349
1999	DHS	Burkina Faso	22,541
2000	MICS	Burundi	11,656
1998	DHS	Cameroon	13,320
1994	DHS	Central African Rep.	14,278
1997	DHS	Chad	21,098
1996	DHS	Comoros	7,350
2000	MICS	Congo, Dem. Rep.	30,386
1994	DHS	Côte d'Ivoire	19,972
1999	DHS	Ethiopia	34,142
2000	MICS	Equatorial Guinea	10,340
2000	MICS	Gambia	14,191
1998	DHS	Ghana	11,500
1999	DHS	Guinea	19,188
2000	MICS	Guinea-Bissau	18,282
1998	DHS	Kenya	20,215
2000	MICS	Lesotho	14,352
1997	DHS	Madagascar	18,011
1992	DHS	Malawi	13,590
1996	DHS	Mali	27,791
2000	DHS	Mauritania	18,719
1997	DHS	Mozambique	23,508
1992	DHS	Namibia	14,025
1998	DHS	Niger	20,893
1999	DHS	Nigeria	20,265
1992	DHS	Rwanda	21,215
1997	DHS	Senegal	30,009
2000	MICS	Sierra Leone	11,541
1998	DHS	South Africa	28,376
2000	MICS	Swaziland	12,575
1999	DHS	Tanzania	9,786
1998	DHS	Togo	24,257
1995	DHS	Uganda	21,055
1996	DHS	Zambia	21,685
1999	DHS	Zimbabwe	14,657
		Central Asia	
2000	DHS	Armenia	8,281
2000	MICS	Azerbaijan	9,732
1995	DHS	Kazakhstan	5,728
1997	DHS	Kyrgyzstan	7,016
1995	RLMS	Russia	3,155
2000	MICS	Tajikistan	12,711
1998	DHS	Turkey	13,940
1996	DHS	Uzbekistan	8,421

		Eastern & Central Europe	
2000	MICS	Albania	7,014
2000	MICS	Moldova	8,870
2000	MICS	Bosnia	9,486
1997	BLMS	Bulgaria	1,305
		East Asia	
2000	DHS	Cambodia	34,555
1992	NSSC	China	666,872
1997	DHS	Indonesia	101,535
2000	MICS	Lao People's Dem. Rep.	19,394
2000	MICS	Mongolia	14,478
2000	MICS	Myanmar	51,645
1998	DHS	Philippines	36,426
2000	MICS	Viet Nam	14,757
		South America & Caribbean	
1998	DHS	Bolivia	25,933
1996	DHS	Brazil	22,719
2000	DHS	Colombia	17,996
1996	DHS	Dominican Rep.	21,541
1999	DHS	Guatemala	16,424
2000	MICS	Guyana	8,733
1994	DHS	Haiti	12,324
1997	DHS	Nicaragua	33,886
2000	DHS	Peru	56,572
2000	MICS	Suriname	6,603
2000	MICS	Trinidad & Tobago	4,983
2000	MICS	Venezuela	7,462
		North Africa & Middle East	
1995	DHS	Egypt	52,250
2000	MICS	Iraq	50,775
1992	DHS	Morocco	18,845
2000	MICS	Sudan	76,639
1991	DHS	Yemen	49,116
		South Asia	
1997	DHS	Bangladesh	27,221
1998	DHS	India	237,902
1996	DHS	Nepal	26,298
1991	DHS	Pakistan	26,940