Young Lives: Ethiopia Round 2 Survey Report

September 2008

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An International Study of Childhood Poverty

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Contents

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List of abbreviations and acronyms

BMI   Body Mass Index

DHS   Demographic and Health Survey

EHRS   Ethiopian Rural Household Survey

EPRDF   Ethiopian People's Revolutionary Democratic Front

HICE   Household Income and Consumption Expenditure survey

MDGs   Millennium Development Goals

MOFED   Ministry of Finance and Economic Development

SNNPR   Southern Nations, Nationalities, and Peoples Region

WMS   Welfare Monitoring Survey

Summary

Young Lives is a long-term international research project investigating the changing nature of childhood poverty in four developing countries – Ethiopia, Peru, India (the state of Andhra Pradesh) and Vietnam – over 15 years. This is the time frame set by the UN to assess progress towards the Millennium Development Goals (MDGs). Through interviews, group work and case studies with children, their parents, teachers, community representatives and others, we are collecting a wealth of information not only about their material and social circumstances, but also perspectives on their lives and aspirations for the future, set against the environmental and social realities of their communities.

We are following two groups of children in each country: 2,000 children who were born in 2001-2 and 1,000 children born in 1994-5. These groups provide insights into every phase of childhood. Younger children are being tracked from infancy to their mid-teens and the older children to adulthood, when some will become parents themselves. When this is matched with information gathered about their parents, we will be able to reveal much about the intergenerational transfer of poverty, how families on the margins move in and out of poverty, and the policies that can make a real difference to their lives.

This report presents initial findings from the second round of data collection carried out in Ethiopia in late 2006 to early 2007. It does not aim to give a comprehensive overview of all the findings from Young Lives. Rather it gives a broad outline of some of the key indicators of childhood poverty and changes that have taken place in the children's lives between the first round of data collection in 2002 and the second. Data are mainly presented for the entire age group cohort, in most cases separated into wealth groups or by rural/urban location. The full richness of the data is not reflected in this preliminary report, but we hope that it contains enough information to prompt other researchers, policymakers and stakeholders to start to engage with the data.

Ethiopia is one of the poorest countries in the world and ranks among the lowest for most human development indicators. The economy has experienced a trend of sustained economic growth following the reform programmes implemented since 1991 when the military government was ousted. However, it is still largely dominated by agriculture, which is highly sensitive to rainfall. Ethiopia has low rates of urbanisation. Most people make their living as subsistence farmers. Millions of Ethiopians are dependent on food aid every year, and in 2008, at time of writing this report, the recent rapid global food price increases represent a further challenge. Despite the government's best efforts and the improvements since 1991, most of Ethiopia's children continue to live with 'not enough' in terms of household assets, food and other consumption goods, and basic services and opportunities.

From our survey data, there are signs that the economic growth and improved access to services have been broadly inclusive. We see that children's well-being – in all dimensions – is strongly linked to, and determined by, their socio-economic status and parents' backgrounds. Over the past 5 years, there have been obvious improvements in basic services, and school enrolment is up, although quality of education is now a key priority for the government. Nutrition remains a challenge, with high levels of undernutrition, although in other ways we have seen obvious recovery following the 2002 drought.

Levels of absolute and relative poverty

Although we see poverty as a multidimensional phenomenon, the material aspects are captured in this report by two measures of deprivation. We define absolute poverty as living on less than a minimum of 2200 kilocalories per day plus a lack of essential non-food items. Relative poverty is defined as the proportion of households with per capita consumption below 50% of median consumption (using the national poverty line of 1075 birr at 1996 constant prices).

When Young Lives was set up, the study sites were chosen because they are poor (having a food deficit). In this second round of data collection we find that they are still below the national average for consumption, despite three years of relatively good harvests between 2003 and 2005. Absolute poverty is higher in rural areas (where 85% of both older and younger cohort children live below the nationally defined poverty line) than in urban areas (where 44% of the younger cohort and 51% of the older cohort have less than the national average. However, while absolute poverty is higher in rural areas, relative poverty is higher in urban areas, suggesting greater inequality in the towns.

The prosperity of Young Lives households (measured by wealth and asset indices and by consumption) has increased for both cohorts between the first round of data collection in 2002 and the second round in 2006/7. This rise in wealth and assets is found in both rural and urban areas and across many of the regions of Ethiopia, and indicates recovery since the 2002 drought. The percentage of children from the younger cohort living in households in the lowest wealth and asset index categories decreased significantly in both rural and urban areas from 22 per cent of the total sample in Round 1 to 17 per cent in Round 2. The improvement in wealth categories holds in all regions of Ethiopia where the Young Lives study sites are found (Addis Ababa, Amhara, Oromia and the Southern Nations, Nationalities and Peoples region) except Tigray.

Access to services and infrastructure

Access to electricity and sanitation facilities to households has improved substantially between the two rounds, with 57 per cent of households now reporting access to sanitation (up from 38 per cent). Moreover, most growth in sanitation has been reported by the relatively poorer households: we found that 46 per cent of the poorest households now report access (up from 17 per cent), indicating that the government's health extension programme seems to be yielding success.

However, there continue to be stark rural-urban differences with only 43 per cent of rural households reporting access compared with 78 per cent of urban households. Similarly, while the improvement in access to electricity holds true across the country and for all regions (up from 35 per cent to 42 per cent of all households), rural access is quite low at just 11 per cent in Round 2, compared to nearly 90 per cent in urban areas.

Nutrition

Ethiopia has a long-standing problem with food security which is reflected in the nutritional status of children around the country. We find high levels of both stunting (a measure of chronic malnutrition) and underweight among the Young Lives children. Within the younger cohort, 31 per cent were classified as stunted with eight per cent of the children being severely stunted.

On a more positive note, both measures have declined significantly for the younger cohort, with stunting decreasing from 35 per cent to 31 per cent and the proportion of underweight children from 33 per cent to 24 per cent. This impressive change in a short period can be attributed to improvements in household wealth and increased access to health services and sanitation, although we should also note that the measures were high in Round 1 (a year of drought in many areas).

For the older cohort (the 12- to 13-year-olds) around 28 per cent of the Young Lives children were underweight in Round 1. The percentage increased to 36 per cent by Round 2. We also find high levels of severe wasting (11 per cent of the older children), with disparities between rural areas (13.5 per cent) and urban areas (7.5 per cent).

Our analysis shows that girls are less malnourished than boys (due to different growth patterns at this particular age, a finding that has been replicated in other studies in Ethiopia), while children in urban areas tend to be relatively better-off compared to rural children in terms of both level and changes in malnutrition. As expected, household wealth seems to have a positive impact on the nutritional status of children. Moreover, levels of parental education affect positively nutritional improvements.

Education

Literacy and school enrolment remain a challenge in Ethiopia. The 2004 Welfare Monitoring Survey reported that only 38 per cent of the total population are literate with a large disparity between rural (31 per cent) and urban residents (74 per cent). That said, Ethiopia has made great advances in terms of primary education in recent years. For the Young Lives survey we looked at enrolment rates in pre-school (for the younger cohort) and primary school for the older cohort.

Since kindergartens are rarely available in rural areas, virtually all the households that reported enrolling their children in pre-school are from urban areas. About 52 per cent of the 5-year-old children in urban areas have been enrolled in pre-school (compared with less than four per cent in rural areas). An analysis of the factors that influence pre-school enrolment in urban areas shows children with long-term health problems are more likely to be enrolled (perhaps because the parents feel this extra support will be helpful to their child). Education levels of both mothers and fathers are significantly associated with pre-school enrolment, which indicates the role that awareness and higher opportunity costs of childcare play in the decision to send a child to pre-school. We did not find any gender bias in pre-school enrolment. Households with more members in Round 1 were more likely to enrol their child in pre-school in Round 2.

School enrolment for the older cohort has increased tremendously from a mere 66 per cent to more than 94 per cent between the two rounds. The poorest households have made a substantial improvement in sending their children to school, with enrolment increasing from 56 per cent to 91 per cent. Not surprisingly, the children of parents with high levels of education had achieved almost universal enrolment, but the change and rate of enrolment of children with household heads that attained lower levels of education too has been impressive. Growth rate of enrolment looks higher in rural than in urban areas (since the rural areas start from a lower base), but no difference is observed in the growth rate of highest grade completed. Regional distribution of enrolment rate is highest in Addis Ababa followed by the Tigray region.

Given the very high rate of enrolment, we analysed correlates of years of schooling (not enrolment) for this group. Children who receive some help with their studies or come from

wealthier families, or whose mothers are better educated tend to have completed a higher grade. Children in rural areas, and from a larger family are more likely to be in a lower grade at school.

Child work

Many children in Ethiopia work both for pay, and informally without pay, generally within the household. The incidence of children working within the family rises sharply with age in Ethiopia with almost half of all 5- to 14-year-olds being involved in some kind of economic activity in 2001. For the purposes of the Young Lives survey, we measured children's involvement in paid work, giving us information which was broadly comparable with the first survey round for the older cohort.[1] We found that involvement of children in *paid* work has decreased from nine per cent in Round 1 to 5 per cent in Round 2. Disaggregating by wealth quartile, the percentage of children involved in paid work has declined compared with Round 1 and the difference is statistically significant for all wealth quartiles. When we look at parental education levels, fewer children are working for pay at all levels. The difference is statistically significant except for the group whose household heads' education is between grades 9 and 12. We found no children whose parents have post-secondary education working for pay in the second round. The reduction over time of child involvement in paid work is higher for girls than for boys, and relates to girls' role in unpaid domestic work.

Subjective well-being (older cohort)

Young Lives is one of the few studies of childhood poverty that assesses children's subjective perceptions of well-being. We asked the children whether they felt they were treated fairly by adults and found a significant reduction in the percentage of children who felt that they were treated badly or were treated worse than other children of their age.[2] Children's perceptions of how they were treated showed improvement across the wealth distribution. Over time, the perception of improvement was much larger for boys compared with girls. We also analyse the factors that influence subjective well-being for the 12-year-old children using their responses to questions about where they would position themselves on a ladder (a scale of 1 to 9). Children in households with more initial wealth, particularly in rural areas, felt better off in Round 2, as did rural children in male-headed households. Controlling for other factors, location was also important where children in urban areas felt worse off compared with rural children.

Two other indicators of subjective well-being (used only in Round 2) were based on the ladder question and asked the children where they felt they stood at present and would stand in four years' time. A comparison of these two indicators shows that the children are optimistic about the future, and expect their position to have improved. The conclusions hold when we make the comparison separately for rural and urban areas, for each region, for wealth quartile, and for parental education. However, girls are more positive about their current well-being and more optimistic about the future than boys.

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[1] This definition is narrow but gave us a comparative measure that could be used between the two rounds. More detailed analysis of children's time use gathered during the qualitative study gives a much deeper picture of children's work within their family and community.

[2] It should be noted that this is just one of the many possible indicators of subjective well-being of children. We used this because there were similar questions asked in both rounds which can be compared.

Looking to the future

In general, despite the fact that the Young Lives sample are poorer than the average Ethiopian households and children, their welfare measured in terms of nutritional achievement, enrolment in school, and involvement in paid work has improved over time. The improvement of wealth status of households is indicative of the pro-poor policies followed by the government as well as improved levels of provision of education and health services in the country.

While most of the changes in child welfare outcomes are observed across the whole socio-economic range within our sample, wealth and parental background remain strong determinants in terms of levels of nutrition and school enrolment. Relatively high growth in the period up to 2006 and improved services may have contributed to more inclusion, but this progress may be fragile if economic conditions change, even temporarily, such as in the recent context of high inflation. Vigilance and action is required to translate these improvements observed both in Young Lives and the national data into persistent progress in the form of better living conditions. As a longitudinal study, Young Lives will remain in a unique position to follow whether and how these improvements translate into better outcomes as the children reach adolescence and young adult lives.

1. Introduction

About Young Lives

Young Lives is a long-term international research project investigating the changing nature of childhood poverty in four developing countries – Ethiopia, Peru, India (in the state of Andhra Pradesh) and Vietnam – over 15 years. This is the timeframe set by the UN to assess progress towards the Millennium Development Goals. Through interviews, group work and case studies with the children, their parents, teachers, community representatives and others, we are collecting a wealth of information not only about their material and social circumstances, but also their perspectives on their lives and aspirations for the futures, set against the economic, environmental and social realities of their communities.

We are following two groups of children in each country: 2,000 children who were born in 2001-02 and 1,000 children who were born in 1994-95. These groups provide insights into every phase of childhood. The younger children are being tracked from infancy to their mid-teens and the older children through into adulthood, when some will become parents themselves. When this is matched with information gathered about their parents, we will be able to reveal much about the intergenerational transfer of poverty, how families on the margins move in and out of poverty, and the policies that can make a real difference to their lives.

The longitudinal nature of the survey and our multidimensional conceptualisation of poverty are key features of Young Lives. Much existing knowledge about childhood poverty is based on cross-sectional data that reflect a specific point in children's lives, or relate to only one dimension of children's welfare. Children's own views on poverty and well-being are seldom explored. Research is rarely tied in a systematic way to investigation of broader societal trends or policy changes.

The potential of the project lies in its focus on tracking children's progress throughout childhood – over 15 years. We collect quantitative data and qualitative data at the individual, household and community level. Quantitative data is gathered through comprehensive surveys that include interviews with the children themselves as soon as they are old enough to participate directly, with their parents and caregivers, and with key community members (such as teachers, village elders or elected council representatives). Data is collected in each round on households' economic circumstances, livelihoods, assets and social capital. The questionnaires also collect evidence related to coping strategies such as migration, parental education and other experiences, child outcomes and the extent to which children and their parents and caregivers use services such as healthcare, pre-school care or education. In this way we can create a detailed picture of children's experiences and well-being linked to information about their households and communities and set within the national context. This provides us with data suitable for in-depth analysis of children's poverty and the effectiveness of government policies that concern their lives and well-being.

Young Lives is a collaboration between key government and research institutions in each of the study countries with the University of Oxford, the Open University, and the Institute of Education (London) in the UK, alongside the international NGO Save the Children UK. The partners in Ethiopia are the Ethiopian Development Research Institute (EDRI), which is responsible for data collection, data management and analysis, and Save the Children UK, where our policy team is based. Yisak Tafere led the first round of qualitative research which took place in 2007.

About this report

This report presents initial findings from the second round of data collection which was carried out in late 2006 to early 2007. It does not aim to be a comprehensive overview of all the findings from Young Lives. Rather it gives an broad overview of the some of the key indicators of childhood poverty and changes that have taken place in the children's lives between the first round of data collection in 2002 and the second. Data are mainly presented for the entire age group cohort, in most cases separated into wealth groups or by rural/urban location. The full richness of the data is not reflected in this preliminary report, but we hope that it contains enough information to prompt other researchers, policymakers and other stakeholders to start to engage with the data.

The report also gives an overview of further work in progress by the Young Lives team. These all serve to highlight various aspects of the broad research questions that Young Lives seeks to answer:

1. What are the factors that act on children's lives to either increase or reduce poverty and its effects?

2. What effects does poverty have on children, during childhood and into adulthood?

3. To what extent are current international and national policies effective in reducing childhood poverty in the study countries?

Young Lives uses an innovative methodology, with multi- and interdisciplinary research and a mix of qualitative and quantitative methods. While this report focuses on the quantitative data from the second survey round, it is important to note that its interpretation will be strengthened and complemented by analysis of the qualitative data.

Report structure

The first section of the report introduces the socio-economic context of Ethiopia and the policies that have affected children and childhood poverty over the past 15 years. The second section gives an overview of the methodology used by Young Lives to collect quantitative data for Round 1 and Round 2 respectively. Greater detail is provided on the preparation and implementation of the Round 2 data collection. Post-fieldwork operations such as data entering, cleaning and archiving are also outlined.

The next section presents some preliminary analysis of data from the two survey rounds – both descriptive statistics and regression analysis – on several issues of interest. Indicators of child well-being examined include household wealth and consumption, health, education, child paid labour and subjective well-being. The factors behind these outcomes include a range of child, household and community characteristics.

Although the analysis is preliminary it gives important insights into trends between the two rounds, key factors affecting children in Ethiopia and the extent of inequalities between children of different groups. The analysis enables us to pinpoint policy implications for tackling childhood poverty in Ethiopia as well as important and interesting avenues for future research.

2. Poverty and childhood poverty in Ethiopia

Ethiopia is one of the poorest countries in the world and ranks among the lowest for most human development indicators. The economy has experienced a trend of sustained growth following the reform programmes implemented since 1991 when the socialist military regime was ousted by the Ethiopian People's Revolutionary Democratic Front (EPRDF). However it is still dominated by highly rain-dependent agriculture. Ethiopia has low rates of urbanisation and most people make their living as subsistence farmers. Millions of Ethiopians are dependent on food aid every year, and in 2008 at the time of publication of this report, the rapid global food price increases represent a further challenge.

This is not to say that progress has not been made in recent years. The government launched the second phase of its Poverty Reduction Strategy in 2005, which included a strong commitment to improving education quality (after impressive gains in primary school enrolment) and to increasing the numbers of Ethiopians with access to adequate sanitation and clean water. The Productive Safety Net Programme (PSNP) was rolled out in 2005 and represents a much more coherent and predictable programme of asset building than the previous system of emergency appeals for food aid.

2.1   Poverty and wealth: 2002 – 2006

Data on poverty has been collected in Ethiopia through the Household Income and Consumption Expenditure (HICE) surveys conducted by the Central Statistical Agency (CSA) in 1995/96, 1999/2000 and 2004/05. Using a consumption-based measure of poverty, 38.7 per cent of Ethiopians were poor in 2004/05, implying that 27.5 million people were living below the nationally defined poverty line of 1,075 birr per annum (adult consumption) at 1996 constant prices. Poverty was slightly higher in rural areas (39.3 per cent) than in urban areas (35.1 per cent) in 2004/05.

Although very high, poverty declined markedly between 1995/96 and 2004/05, mainly due to a reduction in rural poverty, with the gap between rural and urban areas narrowing. That said, there are marked differences in the changes across the regions of Ethiopia: from 1995/96 to 2004/05, headcount poverty fell in Amhara, SNNP and Tigray, while poverty increased in Oromia and Addis Ababa.

The HICE surveys show that real per capita consumption averaged 1,256 birr – US$195 – in 2004/05 (at 1995/96 constant prices). Food consumption accounted for just half of this (577 birr), with the remainder (non-food expenditures) averaging 678 birr. Between 1999/2000 and 2004/05, real per capita consumption increased by 19 per cent. Real per adult equivalent consumption in 2004/05 was 1,542 birr, an increase of 16 per cent since 1995/96 and 17 per cent since 1999/2000.

Looking at the depth of poverty, the poverty gap index was 8.3 per cent in 2004/05; again it was slightly higher (8.5 per cent) in rural areas than in urban areas (7.7 per cent). Similarly the poverty severity index is 0.027 with rural poverty severity index (0.027) slightly higher than that of urban areas (0.26).

The Ethiopian Rural Household Survey (ERHS) conducted in six rounds between 1994 and 2004 has shown that rural income increased from 1995/96 to 2004/05, and rural poverty

declined from 1995/96 to 1999/00, but remained stagnant after that until 2004/05 (Dercon, Hoddinott and Woldehanna 2005). According to the ERHS, rural income (measured by consumption per capita) increased from US$71 in 1994 and US$62 in 1995 to US$88 in 2004, but poverty has not declined from 1999 to 2004 (since the Young Lives younger cohort children were born) (Table B2.2 in Appendix B).

As noted above, Ethiopia's GDP growth rate is dependent on agricultural growth which remains volatile as a result of substantial variation in rainfall. In 1984 the world witnessed the worst famine in recent years which led to a drop in agricultural output of over 20 per cent.

A major drought in 2002, the year of the first round of Young Lives data collection, directly affected over 15 million people and reduced cereal and pulse output by 25 per cent resulting in a fall in real GDP per capita of over six per cent. For the four years between the first and second Young Lives survey rounds (2002 and 2006), the weather was generally good for agriculture underpinning real GDP annual per capita growth rates of seven to nine per cent. Thus, in interpreting the findings of this report, it is important to remember that Round 1 was conducted at a time when more rural households than usual were affected by lack of rain leading to non-existent or very poor harvests and shortages of livestock feed. Depending on the local efficacy of food aid programmes, this might have led to a depletion in household assets, particularly livestock and consumer durables, and a 'nutrition shock' for some of the under-eight-year-olds, while the general scarcity of food is likely to have affected urban prices with knock-on effects for the Young Lives children in urban areas.[3] By contrast, Round 2 was conducted during a generally good harvest.

2.2 Government policy and programmes 2002-2006

Between 1991 and 2002 the government, led by the Ethiopian People's Revolutionary Democratic Front, made a number of structural changes including the adoption of a new constitution, the introduction of a new decentralised federal system of government, and implementation of structural adjustment programmes supported by the World Bank and the International Monetary Fund. Investment in education, health and infrastructure increased, although not as much as planned because of the Ethiopia-Eritrea war (1998-2000), and not enough to get ahead of population growth. Even so, between 1991 and 2002 child mortality declined and gross primary school enrolment increased.

In 2002 the EPRDF introduced its first donor-supported poverty reduction strategy, the Sustainable Development and Poverty Reduction Programme (SDPRP). Between 2002 and 2005 policies and programmes related to human development, rural development, a revised food security strategy, decentralisation and capacity-building were introduced. In 2005 the second poverty reduction strategy came into being – the Plan for Accelerated and Sustained Development to End Poverty 2005-2010 (PASDEP). This took forward the SDPRP programme to achieve the MDGs by intensifying sectoral programmes in health, education, and infrastructure. PASDEP also introduced new programmes for food security – the Productive Safety Net Programme and other food security programmes – and introduced some improvements to the strategy of agricultural development-led industrialisation. It also introduced some new policies, particularly a massive push to accelerate growth and micro- and small-scale enterprise development (including micro-finance), development of a better balance between rural and urban areas, institutional development to enable private initiatives

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[3] Of the 12 rural sites, 5 have been regularly affected by drought and are food aid dependent. Three were listed in the Round 1 report as being particularly affected by the 2002 drought.

and good governance. Programmes to address the population challenge and promote women's empowerment were also put in place.

Between 2002 and 2006 government statistics show considerable improvements in gross primary enrolment rates (from 62 to 91 per cent), access to health services (up from 52 to 72 per cent), child mortality rates (with under-five mortality falling from 167 to 123 deaths per 1,000 children, and infant mortality falling from 97 to 77 deaths per 1,000 live births), and child nutrition. These government initiatives have undoubtedly contributed to the human development improvements reported for the Young Lives sample of children.

2.3   Contextualising the Young Lives sample in Ethiopia

Despite the government's best efforts and the improvements since 1991, most of Ethiopia's children continue to live with insufficient reproductive and productive assets, food and other consumption goods, access to basic services such as education and health, and with poor opportunities in life. Many children, particularly those who are more vulnerable as a result of their poverty, also suffer harm or 'ill-being' as a result of illnesses and accidents, work that is too heavy or long, insufficient time and opportunity to play, personal disempowerment, and social exclusion from peer groups.

In line with the Young Lives focus on childhood poverty, poor rural and urban sites were over-sampled in the selection of the 20 Young Lives study sites. This is starkly illustrated by the fact that, while the national annual average consumption expenditure at 1996 constant prices in 2004/5 was 1,541 birr in per adult equivalent terms, the equivalent figure for the younger cohort of Young Lives children was 1,045 birr and 974 birr for the older cohort. Similarly, 69 per cent of the younger cohort and 71 per cent of the older cohort children fell below the national poverty line compared with 39 per cent for the nation as a whole. This disparity is due to the Young Lives sampling methodology which deliberately selected children from food-deficit areas from within the four 'established' regions of Ethiopia (where 96 per cent of the population lives): Amhara, Oromia, the SNNPR and Tigray, along with Addis Ababa. This means that the Young Lives sample does not include some of the most vulnerable of Ethiopia's children, who are growing up in the 'emerging regions' of Afar, Benishangul-Gumuz, Gambella and Somali which are exposed to insecurity and conflict (often with the state) in some places accompanied by drought (Bevan 2006). In Afar and Somali pastoralist livelihoods predominate and children's access to government education and health services is very low. Pastoralism is also practised in the south of Oromia and SNNP Region and areas of Bernishangul-Gumuz, Gambella and Tigray.

As this report shows, within the Young Lives sample there are differences in children's life chances associated with differences in the gender of the child, household wealth, gender of household head, region, urban-rural location, ethnic group, and religion. There are also differences between the 20 Young Lives sentinel sites related to their respective livelihood systems, local culture, family systems, and the way in which local political systems work. Ethiopia is a country with more than 80 languages, often associated with different cultural systems. Establishing the relevance of diversity to child poverty experiences and impacts is important for the larger project of understanding child poverty in Ethiopia.

2.4 Prospects for the Young Lives cohorts 2006–2009

The third round of the Young Lives Survey, which will be carried out in mid-2009 when children will be aged 8 and 15, will pick up on events, policies and trends between 2006 and 2009, some of which we already know about. For example, at the time of writing this report, the failure in early 2008 of the short *belg* rains was particularly affecting areas in SNNP. Rapid international food price increases are also having an affect across Ethiopia and will continue to impact on the nutrition, health and education of children.

The older cohort will be reaching the age where they either continue into higher school or finish school and enter the labour market, so we will be looking at issues surrounding youth employment, educational achievement and what this means for children's future life chances, as well aspects of adolescent health, relationshiops and marriage. The younger cohort will be at the age the older cohort was when first interviewed in 2002, allowing interesting comparisons of changes in children's lives and the impact of policies over the last 7 years in Ethiopia.

3. Methodology

Young Lives is designed as a panel study that will follow 3,000 children in each country over 15 years. The sample consists of two cohorts: a younger cohort of 2,000 children who were aged between 6 and 18 months when the first survey round was carried out (in 2002) and an older cohort of 1,000 children then aged between 7.5 and 8.5.

The children were selected from 20 sentinel sites that were defined specifically in each country. The concept of a sentinel site comes from health surveillance studies and is a form of purposeful sampling where the site (or cluster, in sampling language) is deemed to represent a certain type of population or area, and is expected to show early signs of trends affecting those particular people or areas. For example, monitoring a typical slum area of a given city may detect events and trends which will have an impact on most slums in that city.

The first round of data collection took place in 2002, and this report gives an initial analysis from the second round of data collection in 2006. In each case, the child's caregiver was interviewed as well as the older cohort of children (the younger children were still too young in 2006, being aged 5). The height and weight of each child was measured and a community-level questionnaire was completed for each sentinel site to give contextual information about the children's lives and facilities available to them.

3.1 Young Lives sampling strategy and response rate

The first Young Lives survey was carried out in 2002 when the Ethiopia team selected a cohort of 2,000 children aged 6 to 18 months (referred to as younger cohort) and an older cohort of 1,000 children aged 7.5-8.5 using a sentinel site sampling approach. Twenty sentinel sites were selected across the country using a purposive strategy, and within each site households were randomly sampled until 100 and 50 children of the appropriate ages were found.

A purposive methodology was followed in the first stage to ensure that the sample had a pro-poor bias and to protect the sustainability of the project over the next 15 years:

1. *Woredas* (districts) with food deficiency status were over-sampled.

2. The profile of the selected districts/sites was intended, as much as possible, to capture Ethiopia's diversity across regions and ethnicities, in both urban and rural areas.

3. Sites were chosen which were relatively more accessible in order to make the cost of tracking children in the future more manageable and reduce the probability of attrition in remote areas.

Based on these criteria, the selection procedure followed four stages: [4]

1. The first stage was to select one city administration (Addis Ababa) and four states (namely Amhara, Oromia, SNNP and Tigray) from Ethiopia's 11 administrative regions in order to ensure national coverage. The 5 regions selected account for 96 per cent of Ethiopia's population.

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4 For further information on the sampling methodology used in Ethiopia, see:
http://www.younglives.org.uk/countries/ethiopia/sampling-methods

2. Next, between three and 5 districts (*woredas*) were selected in each region to represent the following groups of population: rural poor, urban poor, and relatively less poor for both urban and rural households. Among the food deficit districts, three *woredas* with the highest proportion and one district with the lowest proportion of people who need food aid were selected.

3. At least one Peasant Association (PA) (in rural areas) or *kebele* (in urban areas) – the lowest level of administrative structure in the country – in each district was picked. The selected PA or *kebele* could either be considered as a sentinel site in its own right or as a centre for creating a sentinel site along with adjacent PAs or *kebele*s depending on the number of eligible households nearby.

4. Finally, 100 children who were born between April 2001 and June 2002 and 50 children who were born between April 1994 and June 1995 were selected in each sentinel site using simple random sampling. There was no non-response (refusal by caregivers to participate) reported. This is typical of Ethiopian surveys, where households do not refuse during the first round data collection.

In Round 1 there were 26 communities. By Round 2 the number of communities had decreased to 24 as two communities had been merged.

3.2   Data collection in Round 2

Young Lives uses a mixed methodology combining large-scale quantitative studies with qualitative sub-studies with a smaller number of children. Various types of questionnaires were used in the second round survey including a preliminary interview (used for tracking before the main survey began). As in Round 1, four questionnaires were used in all four study countries:

- household questionnaire for caregivers of children born in 2001-02
- household questionnaire for caregivers of children born in 1994 -95
- child questionnaire for interviewing the children from the older cohort
- community questionnaires.

Table 1.   *Content of Young Lives Round 2 core questionnaires*

Child questionnaire
Section 1   School and activities
1a   Child's schooling
1b   Child's time use
Section 2   Child health
Section 3   Social networks, social skills and social support
Section 4   Feelings and attitudes
Section 5   Parents and household issues
Section 6   Perceptions of future, community environment and household wealth
Section 7   Child development

Household questionnaire

Section 1		Parental background
	1a	Parental background
Section 2		Household education
Section 3		Livelihoods and asset framework
	3a	Land and crop agriculture
	3b	Time allocation of adults and children
	3c	Productive assets
	3d	Income from agricultural and non-agricultural activities
	3e	Transfers, remittances and debts
Section 4		Household food and non-food consumption and expenditure
	4a	Expenditures on foods bought, supplied from own sources
	4b	Other expenditures – non- food items
	4c	Food security
Section 5		Social capital
	5a	Support networks
	5b	Family, group and political capital
	5c	Collective action and exclusion
	5d	Information networks
Section 6		Economic changes and recent life history
Section 7		Socio-economic status
Section 8		Child care, education and activities
Section 9		Child health
Section 10		Anthropometry
Section 11		Caregiver perceptions and attitudes
	11a	General
	11b	Maternal health
	11c	Child perceptions about own development

Community questionnaire

Module 1	*General module*
Section 1	General community characteristics
Section 2	Social environment
Section 3	Access to services
Section 4	Economy
Section 5	Local Prices
Module 2	*Child-specific module*
Section 1	Educational services (general)
Section 2	Child day care services
Section 3	Educational services (pre-school, primary, secondary)
Section 4	Health services
Section 5	Child protection services

Several new research topics were added to the Round 2 questionnaires to accommodate the fact that as children grow new aspects become important and relevant. For example, questions on schooling and child's time were added for the younger cohort. Some questions were no longer relevant for the two cohorts and could be removed, for example questions on maternity and breastfeeding practices.

The widening of the survey in Round 2 created more harmonised data compared with Round 1, although it means there are minor differences in the content of the questionnaire between the two rounds. These differences are mainly in livelihood, social capital and network, subjective well-being of the older cohort, literacy, numeracy, cognitive skills (using the Peabody Picture Vocabulary Test, PPVT), education of household members and anthropometry. A few of the major differences between the two surveys are summarised in table B1.2 of Appendix B.

Each Young Lives research team also included several country-specific research areas to the core modules. These additional questions or modules related to areas of particular policy interest in Ethiopia.

Table 2. *Country-specific topics in Young Lives in Ethiopia*

Household questionnaire
Section 3f   Credit support (social protection) programme
Section 3g   Cost of health care

Community questionnaire
Module 3   Country-specific community-level questions
Section 1   Conversion factors
Section 2   Migration
Section 3   Social protection programme
Section 4   Equity and budget management in education and health

3.3   Piloting, translation and field worker training

We were fortunate that all except two of the Round 2 supervisors had worked with us in Round 1. Almost all of the field supervisors had at least 5 years' experience in field work supervision and all were educated to university level.

For Round 2, training of field supervisors and one member of the data management team took place over ten days in Addis Ababa. The training, which was led by the research team and data manager, focused mainly on the community, household and child questionnaires, tracking schedule, preliminary interview, consent form, household roster and contact details. Immediately following the training, a pilot study was conducted so that the necessary amendments could be made to the questionnaire and organisation of the field work.

The household and child questionnaires were translated into the three main Ethiopian languages (Amharic, Oromiffa and Tigrigna) using an adaptive translation approach, and back-translation to check for accuracy. Then the field supervisors used the translated questionnaires to train their respective field enumerators in four groups over seven days.

Training was also provided to the 5 verifiers who were responsible for checking the completed questionnaire for consistency of responses and see if all relevant codes were filled, and to the 5 data entry operators who worked on inputting the data into the Access databases.

3.4   Data collection, questionnaire verification and data entry

The data collection was carried out between November 2006 and January 2007. In each phase the household and child data was collected from ten sentinel sites, each assigned to a field supervisor with a team of ten main enumerators and 2 reserve enumerators. In total, 113 enumerators were deployed, all of whom had completed at least high school level education and could speak English and the relevant local language.

Checklists were developed to help the field supervisors and field enumerators ensure their entries were clear and consistent. Once the questionnaires were returned to Addis Ababa, 5 data verifiers used the checklists and fieldworker manuals to verify the data. Unique codes were allocated to the field enumerators, field supervisors and data entry operators to assist in the verification and assure high standards of data quality and accuracy.

Data from each questionnaire were entered into two separate Access databases by separate data entry operators, before Epi-Info software was used to compare and look for discrepancies between the two database entries. The double data entry error rates for both the 5-year-old and 12-year-old databases were low at 0.6 per cent (less than the standard one per cent). Furthermore, data was transferred to SPSS version 15 and Stata version 9 software to generate descriptive statistics and identify outliers. Further data cleaning has been done using the information obtained from the outliers generated by the descriptive statistics.

3.5   Tracking and attrition

Prior to starting data collection, all Young Lives households and children were visited to check their registered address was still correct or whether any of the children had died. Households and children who had moved were tracked until they were found (if they were still in the country). The field supervisors also followed up with households that had migrated or had initially refused to continue with the study, and to re-collect information for variables that were missing or incorrect in Round 1.

Table 3 indicates percentage of success rate for tracking and data collection using household questionnaires from all sites of the project including data from migrated households in the tracking done in 2004 and Round 2. It includes children who died, migrated children and untraceable children. Of the total sample of 2999 children in Round 1, 2892 were surveyed in Round 2 (96.43 per cent of the original sample, or 95.65 per cent of the younger cohort and 98 per cent of the older cohort). The death rate since Round 1 is 2.23 per cent for the total sample (3.05 per cent for the younger cohort and 0.6 per cent for the older cohort). Nine households refused to provide their consent for Round 2 while 31 have been deemed untraceable. Therefore, the total attrition rate is 1.33 per cent (1.3 per cent of the younger and 1.4 per cent of the older cohort). These attrition rates are less than those reported in the first tracking conducted in September 2004. Generally, the attrition rate in the Young Lives Project is low compared with other longitudinal studies.

Table 3. *Summary of attrition in Round 2*

	Initial sample size	Total questionnaires completed in R2	Total deaths since R1	Total refusals in R2	Total untraceable children	Attrition rate (%)
Younger cohort	1999	1912	61	3	23	
%		95.65%	3.05%	0.15%	1.15%	1.30
Older cohort	1000	980	6	6	8	
		98%	0.6%	0.6%	0.8%	1.40
Total	2999	2892	67	9	31	
		96.43%	2.23%	0.30%	1.03%	1.33

3.6 Representativeness of the Young Lives sample in Ethiopia

In order to better understand the Young Lives sample, a number of living standard indicators from Young Lives were compared with two nationally representative Ethiopian samples – the Demographic and Health Survey (DHS) and the Welfare Monitoring Survey (WMS) (Sanchez and Outes-Leon 2008). In the absence of up-to-date census information, these two surveys are the most reliable available source of socio-economic characteristics of the Ethiopian population. These surveys present complementary information on different dimensions of well-being, which allows a better understanding of possible biases in Young Lives sample. For instance, DHS provides information on child care practices and WMS provides more detailed information on household socio-economic characteristics. For our comparison, we used data from the DHS and WMS in 2000, which was the closest data collection year to the Young Lives baseline of 2002.

Our assessment indicates that Young Lives sample includes a wide range of living standards akin to the variability found in the Ethiopian population as a whole. On average Young Lives households appear to have a higher wealth index than the average Ethiopian household as measured by the 2000 DHS sample. These differences are partly accounted for by the higher proportion of urban sites in the Young Lives sample as well as by the secular time trends.

Further, statistical tests across a range of living standard indicators indicate that while Young Lives households are located at sites with relatively better access to services and utilities, they are poorer – in asset terms – than the average Ethiopian household, as measured by the WMS sample. This is found to be consistent with the sampling methodology applied by Young Lives in Ethiopia whereby more sites were chosen for their particular food deficiency status (according to the pro-poor aims of Young Lives) but from relatively more accessible areas in order to ensure the continuity of the study.

However, even if the poor have been over-sampled, the Young Lives sample covers the diversity of the children in Ethiopia in a wide variety of attributes and experiences. Therefore, while not suited for *monitoring* child outcome indicators, the Young Lives sample is an appropriate and valuable instrument in analysing *causal* relations and modelling child welfare and its longitudinal dynamics. The Young Lives data are mainly suitable for within-sample descriptive and exploratory analyses, including causal analysis of sub-types among the poor and non-poor.

3.7   Round 1 reports and data archiving

A preliminary country report was published in 2003 giving an outline of the explanatory and outcome variables (Alemu et al. 2003). Like this report, its intention was not to provide comprehensive interpretation of the data but to give enough information for other researchers and policymakers to gain an overview of the opportunity Young Lives offers and the possibilities for further analysis. The cleaned datasets for Round 1 were archived in Ethiopia and in the UK with the Economic and Social Data Service.[5] Hard and electronic copies of the questionnaires are kept at EDRI.

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[5] ESDS project ref: SN5307: http://www.data-chive.ac.uk/findingData/snDescription.asp?sn=5307&key=Young+Lives#doc)

4. Aspects of poverty for Young Lives children

Young Lives seeks to improve understanding of the causes and consequences of childhood poverty. Preliminary analysis of the data from Rounds 1 and 2 (in 2001 and 2006 respectively) addresses the following questions:

- How has child well-being of the Young Lives sample changed over time?

- What are the determinants of child outcomes such as nutrition, enrolment, child labour and subjective well-being?

- Are characteristics such as parental poverty, rural location, and gender important determinants of child outcomes?

These three questions are the basis for this section, which proceeds thematically. Firstly, trends and patterns in indicators of household wealth, expenditure and poverty are examined. Then patterns in and determinants of nutrition, education, child labour and subjective well-being are analysed.

The section presents descriptive statistics from both rounds. These statistics illustrate the prominent changes and trends in the sample as well as disparities by income, location, ethnicity and gender. Econometric results from Probit and Ordinary Least Square (OLS) regressions for child outcomes are also presented. Regression analysis has the benefit of incorporating multiple relevant variables at the same time, giving a better understanding of the processes at work. For example, a regression analysis makes it possible to analyse whether parental education has an impact on child nutrition separately from its indirect effect via household income.

It is important to note that no causality is claimed in this report. This requires more careful in-depth study, which is already in progress as Young Lives moves forward.[6] However, this preliminary work highlights interesting trends and correlations that will be a basis for future investigation. We have tried to avoid endogeneity problems (the possibility of making wrong inferences from the data) by regressing the child poverty outcome data from Round 2 against a set of initial socio-economic conditions from Round 1 (such as wealth index in Round 1, mother's and father's years of schooling, household composition in Round 1) and purely exogenous variables such as birth order, location and ethnicity.

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[6] For example, a Young Lives working paper assesses the links between social protection programmes, shocks and child labour and education outcomes (Woldehanna et al., forthcoming). A paper by Rozana Himaz looks at the impact of parental death on child schooling and subjective well-being, and a paper by Dercon et al. will look at the impact of the 2002 drought on child malnutrition and health in Ethiopia.

Table 4. *General characteristics of Young Lives sample children*

	Younger cohort	Older cohort
Child and household characteristics		
Male	52.82	50.61
Female	47.18	49.39
Urban	35.04	35.47
Rural	64.96	64.59
Child has long-term health problem	4.39	5.00
Number of older siblings	2.44	3.06
Number of younger siblings	0.70	2.08
Mother's education (years)	5.06	7.10
Father's education (years)	8.93	14.80
Household size (number of members)	6.04	6.50
Household head is male	81.17	74.23
Household head is female	18.83	25.77
Region		
Addis Ababa	14.64	14.59
Amhara	20.03	19.59
Oromia	20.14	20.41
SNNP	25.05	24.90
Tigray	20.14	20.51
Religion		
Catholic	0.42	0.71
Muslim	15.75	15.92
Mormon	0.05	-
Protestant	10.88	10.31
Orthodox	71.48	71.94
Evangelist	0.73	0.61
Other	0.68	0.41
Ethnicity		
Agew	0.31	0.31
Amhara	27.47	27.55
Gurage	7.69	7.96
Hadia	5.08	5.31
Kambata	0.26	0.31
Oromo	19.57	20.61
Sidama	5.34	4.90
Tigrian	21.61	21.84
Wolayta	6.02	6.53
Somali	0.05	-
Mixed	4.92	2.96
Other	1.67	1.73

% unless otherwise stated

4.1 Wealth, assets, consumption expenditure and poverty

Household wealth in Rounds 1 and 2 are approximated using a 'wealth index' that reflects the welfare of the household members in the sense of comfort related to their housing (the number of rooms and the materials the wall, roof and floor of the house are made of) and their use of durable goods (such as a radio, fridge, bicycle, TV, motorbike/scooter, motor car/truck, electric fan, mobile phone, landline phone, modern bed, table or chair and sofa). This measure of household prosperity takes a value between zero and one, with a higher value reflecting higher household wealth. We also construct an asset index that includes consumer assets and productive durables the household owns. This index also ranges from 0 to 1, with a higher value reflecting more assets. Appendix A describes the method for calculation for both indices in more detail,

Table 5 presents levels and percentage changes between the two rounds of the asset and wealth indices. Table B3.1 in the appendix presents the results by region. The average of both the wealth and asset indices have increased in Round 2 compared with Round 1 for both cohorts and the differences are statistically significant at the one per cent level. The smallest percentage change is for asset index (17.17 per cent) and the largest is for the wealth index (30.58 per cent), both for the older cohort. The favourable overall rise in wealth and assets is found in both rural and urban areas and across many of the regions.

Table 5. *Wealth and asset index by urban/rural and region*

	Rural			Urban			Total		
	R1	R2	% change	R1	R2	% change	R1	R2	% change
Younger cohort									
Wealth Index	0.08	0.13	60.39***	0.33	0.37	12.84***	0.18	0.23	25.42***
Asset Index	0.21	0.26	21.34***	0.12	0.16	26.93***	0.18	0.21	21.02***
Older cohort									
Wealth Index	0.08	0.14	62.80***	0.32	0.38	18.73***	0.18	0.23	30.58***
Asset Index	0.25	0.28	14.09***	0.13	0.16	25.46***	0.2	0.23	17.17***

% change refers to (R2-R1)/R1.
*Significant at 10 %, ** significant at 5%, and *** significant at 1%

Note that the wealth index as we have calculated it seems to capture mostly the types of wealth of urban households, while the asset index captures mostly income generating assets that rural households seem to have. So, for instance, urban areas seem to be 'wealthier' than rural areas in Round 2 with the wealth index being 0.37 compared to 0.13 for the younger cohort households. In contrast, households in rural areas seem to have more assets with the index being at 0.26, compared to the 0.16 of urban areas. Thus the wealth and asset indices, as we have defined them, do not seem to be easily comparable between rural and urban areas, but are best used to look at whether household prosperity overall has changed between rounds. Both the indices show that household prosperity for both the younger and older cohort households has indeed improved between the rounds.

A more suitable measure to compare between locations can be derived from consumption expenditure, which was only collected for Round 2. Table 6 presents consumption expenditure per adult both for the younger and older cohort. Consumption expenditure has been measured at 1996 constant prices to maintain consistency with the methods used by

the Ministry of Finance and Economic Development (MOFED) (for details of methods used see Appendix A2). For the younger cohort, the average per adult equivalent consumption expenditure measured in 1996 constant prices is 1,045 birr and in current prices it is 1,853 birr (Table 3.2). These figures are equivalent to US$118.5 in 1996 constant prices and US$210 in current prices. The per capita consumption expenditure in current price is 1,485 birr (US$168) and 838.5 birr (US$95) in 1996 constant prices. For the older cohort the average per adult consumption expenditure in 1996 constant prices is 974.22 birr and in current prices 1,730.13 birr. These figures are equivalent to US$110.46 in 1996 constant prices and US$196.16 in current prices. The per capita consumption expenditure in current prices is 1,475 birr (US$167.23) and 831.59 birr (US$94.28) in 1996 constant prices.

In general consumption expenditure is higher for urban areas than for rural areas for both food and non-food consumption expenditure. We also found that average per adult consumption expenditure and per capita expenditure in 1996 constant prices is the highest in Addis Ababa sites (all urban sites) followed by Oromia, SNNP, Tigray and Amhara (see table A2.10 in the appendix).

Table 6. *Consumption expenditure per adult (in birr)*

	Rural	**Urban**	**Total**
Younger cohort			
At 1996 constant prices	743.57	1499.32	1044.76
Current prices	1442.0	2472.3	1852.61
Older cohort			
1996 constant prices	737.7	1323.03	974.22
Current prices	1417.95	2190.52	1730.13

Although there are slight methodological differences which make it difficult to compare these results with those from government reports,[7] the average annual income/expenditure of Young Lives sites (for both older and younger cohort children) is lower than the 2004/05 national average income reported by MOFED. The MOFED national annual average consumption expenditure in 1996 constant prices is reported as 1,541 birr in per adult terms and 1,256 birr in per capita terms.

In order to look at households in poverty, we use several measures. One measure is to see what proportion of households lie below the wealth index threshold of 0.2. This is particularly useful for comparing between rounds. As Table 7 shows, 42 per cent of households were below the threshold of 0.2 of the wealth index in Round 1 compared to only 32 per cent in Round 2. Quite noticeably, the proportion of rural households that fall below the threshold is much higher than urban households. As discussed earlier, this may be due to the way in which the wealth index is calculated, reflecting mainly the type of 'wealth' urban households have access to rather than rural households. This contention is justified when we look at the corresponding asset index calculation where we notice that more urban households seem to be in poverty than rural households.

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[7] In the MOFED report, consumption of certain items obtained from community resources (e.g. fuel wood and water) are imputed at market rate, while in Young Lives information on these items was not collected.

Table 7. *Percentage of younger cohort children with wealth and asset index of below 0.2*

	Wealth index<0.2			Asset index<0.2		
Location	R1	R2	% change	R1	R2	% change
Urban	18.37	10.24	-44.29***	59.71	57.35	-3.96
Rural	92.78	77.74	-16.21***	16.09	7.22	-55.14***
Total	42	32.4	-22.9***	22.33	17.33	-28.85***

% change refers to (R2-R1)/R1

*Significant at 10%, ** significant at 5%, and *** significant at 1%

Household consumption expenditure, used to calculate Foster, Greer and Thorbecke (1984) style poverty measures (FGT) offer a more convincing classification of poverty, comparable between rural and urban areas.[8] This is more so when prices are adjusted for price differences. Consumption expenditure of each household is also adjusted for adult equivalence based on the energy required to sustain it. To obtain consumption expenditure per adult, consumption expenditure is divided by household size adjusted for adult equivalent.[9] Consumption expenditure to calculate poverty incidence (head count index), poverty gap (poverty gap index) and poverty severity (poverty gap index squared) are explained in more detail below:

Incidence of poverty (headcount index): This is the share of the sample whose income or consumption is below the poverty line, that is, the share of the population that cannot afford to buy the basic basket of goods and essential non-food items. The nationally defined poverty line used in this paper is 1,075 birr at 1996 constant prices.

Depth of poverty (poverty gap): This provides information regarding the distance between the poverty line and each household's condition. It captures the mean aggregate income or consumption shortfall relative to the poverty line across the whole sample. It is obtained by adding up all the shortfalls of the poor (assuming that the non-poor have a shortfall of zero) and dividing the total by the sample size. In other words, it estimates the total resources needed to bring all the poor to the level of the poverty line (divided by the number of individuals in the sample).

Poverty severity (squared poverty gap): This takes into account not only the distance separating the poor from the poverty line (the poverty gap), but also inequality among the poor. Thus, a higher weight is placed on households further away from the poverty line.

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[8] The three measures of Foster Greer and Thorbecke (FGT) poverty indices are poverty head count index, poverty gap index and poverty severity index. They are sometimes named as P_α measures of poverty. The mathematical formula the Foster, Greer, and Thorbecke (1984) P_α class of poverty measures is given by

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{Z - Y_i}{Z}\right)^{\alpha} \; ; \; \alpha \geq 0, \text{for } Y < Z.$$

Where Y_i real per-adult (per capita) household expenditure is ranked as $Y_1 \leq Y_2 \leq ....Y_q \leq Z <_{q+1} ....\leq Y_n$, Z is poverty line, n is the total population, and q is the number of poor. The Greek letter α reflects the policymaker's degree of aversion to inequality among the poor. If $\alpha = 0$, the corresponding poverty index is called the headcount index (P_0) and shows the fraction of individuals falling below the poverty line. If $\alpha = 1$, the poverty index is called the poverty gap index (P_1) and measures the aggregate poverty deficit of the poor relative to the poverty line. When $\alpha = 2$, we get the squared proportional shortfalls from the poverty line, which is commonly known as the Poverty severity index (P_2).

[9] For the details of poverty calculation see Appendix A2.

Tables 8, 9 and 10 present our measures of poverty for the Young Lives children, based on consumption in Round 2.

Table 8. *Consumption-based poverty estimates for rural/urban areas (younger cohort)*

		Headcount ratio %	Poverty gap ratio %	Index FGT(2.0) *100
Absolute poverty (percentage of households below the nationally defined poverty line)	Rural	85.04	38.06	20.32
	Urban	43.70	15.67	7.44
	Total	68.57	29.14	15.19
Relative poverty (50 per cent below the median consumption of the sample)	Rural	7.043	1.25	0.39
	Urban	16.27	3.99	1.41
	Total	11.03	2.07	0.62

Absolute poverty line is 1,075 birr at 1996 constant prices

Table 9. *Consumption-based poverty estimates for rural/urban areas (older cohort)*

		Headcount ratio %	Poverty gap ratio %	Index FGT(2.0) *100
Absolute poverty (percentage of households below the nationally defined poverty line)	Rural	84.59	37.23	19.86
	Urban	51.26	17.30	7.88
	Total	71.12	29.18	15.01
Relative poverty (50 per cent below the median consumption of the sample)	Rural	8.05	1.51	0.43
	Urban	11.87	2.54	0.76
	Total	9.90	2.17	0.68

Absolute poverty line is 1,075 birr at 1996 constant prices

4.1.1 Absolute poverty

Levels of absolute poverty are high among the younger cohort children where we find 85 per cent of households in rural areas living below the nationally defined poverty line and 43.7 per cent in urban areas. In total 69 per cent of the households live in absolute poverty (defined as being unable to consume a minimum of 2,200 kilocalories per day plus essential non-food items). In the older cohort, the overall percentage of people who are absolutely poor are 71 per cent (84.6 per cent in rural areas and 51.3 per cent in urban areas). As we can see, for both cohorts rural poverty is higher than urban poverty. Moreover, the poverty gap measure indicates that the depth of poverty is greater in rural areas, where it is around 38 per cent, compared to around 16 per cent in urban areas. Poverty is also more severe in rural areas compared to urban areas at 20 per cent and seven per cent, respectively.

In general, these poverty figures are much higher than the ethional figures reported by MOFED (2006) which are 38.7 per cent in total (39.3 per cent for rural areas and 35.1 per cent for urban areas). This is not surprising given the Young Lives sampling methodology which deliberately selected sites in food-deficit communities. Moreover, MOFED includes the imputed value of items obtained from community forests which reduces the incidence of poverty. Comparison of poverty incidence (head count index) by region indicates that poverty

is the highest in the Amhara sites and lowest in the study sites within Addis Ababa. The second highest poverty incidence is observed in Tigray, followed by the SNNP and Oromia regions. This regional breakdown is similar to figures from national-level studies, although the MOFED study finds the incidence of poverty to be highest in Tigray rather than in Amhara (see Table A2.12 in the Appendix).

4.1.2 Relative poverty

We define relative poverty as 50 per cent of the median consumption per adult equivalent (or 317.5 birr for rural sites, 601.40 birr in urban areas and 384.86 birr on average) and find that 11 per cent of the younger cohort and 10 per cent of the older cohort are relatively poor compared to their peers. However, unlike absolute poverty, relative poverty is higher for urban than for rural areas, indicating that inequality is much higher in urban areas, consistent with the poverty report prepared by MOFED.

4.1.3 Access to safe water, electricity and sanitation facilities

Lack of adequate shelter, poor sanitation, insufficient and unsafe water supply, inappropriate sanitary facilities and inadequate housing in general characterise poverty in Ethiopia. While around 82 per cent could access drinking water in less than one kilometre distance, around six per cent of rural people need to travel for 5 to nine kilometres to fetch water for daily use. As expected, accessibility in urban areas is much better with only 0.9 per cent of the Young Lives children living 5 or more kilometres away from the nearest source of drinking water.

Access to safe sanitation (i.e. households using a pit-latrine or flush toilet) has improved markedly between rounds from about 38 per cent in Round 1 to 57 per cent in Round 2 (Table 10). The improvement in access is particularly notable in rural areas, where it has leapt from a low 16 per cent in Round 1 to 43 per cent in Round 2. In terms of levels, 17 per cent of the poorest had access to safe sanitation in Round 1 compared to 67 per cent of the richest quartile. In Round 2, 46 per cent of the poorest quartile had access compared to 81 per cent of the richest. This shows that improvements in access to sanitation have benefited the poorer, and not just richer, households. Thus the government's health extension programme seems to be yielding fruits.

Table 10. *Changes in access to sanitation and electricity by wealth quartile (younger cohort)*

	Sanitation		Electricity	
	R1	R2	R1	R2
All households	37.9	57	35.5	42.5
Rural	15.8	43	3	11
Urban	71.4	78.1	83.9	89.9
Wealth quartile				
1 (poorest)	0.17	0.46	0.12	0.17
2	0.26	0.44	0.22	0.27
3	0.42	0.57	0.35	0.47
4	0.67	0.81	0.72	0.79

*Significant at 10%, ** Significant at 5% and *** Significant at 1%

In terms of fuel, about 71.1per cent of households use kerosene for cooking purposes, followed by firewood (15.7 per cent) and electricity (12.9 per cent). The sources of energy for light differ markedly between rural and urban residents, with a higher proportion of urban residents using electricity (75.3 per cent), while the use of kerosene (80.1 per cent) and firewood (18.5 per cent) is predominant in rural areas. Overall, access to electricity has improved between the rounds from 35 per cent to 42 per cent. However, rural access is still quite low at just 11 per cent in Round 2 compared to nearly 90 per cent in urban areas. Moreover, in terms of levels, the poorest households have the least access compared to the richer households with only 17 per cent of the poorest quartile having access to electricity in Round 2 compared to 79 per cent of the richest.

When we look at the results by regions of residence (Table B3.6 in the appendix), we found significant positive change in access to electricity only in Oromia and Tigray. Access to sanitation increased in Amhara, Oromia and SNNP and declined in Tigray. No significant change in access to sanitation is observed in Addis Ababa, which started off in a better position than the other sites.

4.2 Nutrition

We use several anthropometric indicators to glean insights with regard to child health and nutrition. The first of these is height-for-age z-scores for both cohorts.[10] Deficit in the height-for-age measure (stunting) corresponds to linear growth retardation – the inability to reach genetic potential in terms of height. This is viewed as a longer-term measure of deprivation than weight-for-height (wasting) which is more sensitive to short-term or seasonal variations in food availability. Height, and by extension height-for-age, is also said to have a strong relationship with mental function and mortality (Gopalan 1992). Secondly, we look at weight-for-age for the younger cohort and Body Mass Index (BMI-for-age) for the older cohort as measures of short-term nutritional status.

As noted in the introduction, Ethiopia has a long-standing problem with food security. This is reflected in the nutritional achievement of children around the country. According to the 2004 Welfare Monitoring Survey results, at country level 46.9 per cent of all children aged 3 to 59 months suffer from chronic malnutrition. The rate of stunting in urban areas fell from 58 per cent in 1996 to 30 per cent in 2004, and in rural areas from 67 per cent to 48 per cent (CSA: WMS 2004).

In 1999/2000 the prevalence of stunting, which is a reflection of long-term malnutrition, was 57 per cent in Ethiopia while severe stunting stood at 31.3 per cent. Both stunting and severe stunting are higher in rural areas. When compared between boys and girls, girls registered lower than average stunting figures. Despite the bleak backdrop, all four consecutive WMS surveys show a consistent decline in malnutrition over time, with a tremendous decrease in stunting in both urban and rural areas.

At the child level, malnutrition is measured in terms of stunting and under-weight for the younger cohort and height-for-age and body mass index for age for the older cohort.[11]

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[10] The z-scores were computed using the 2006 WHO standards. Under the new standards, weight-for-height z-scores (indicating wasting) can only be computed until the age of 60 months. Since a large proportion of children in the younger cohort, and all children in the older cohort, are above this age we do not report analysis of wasting here.

[11] For the definition of various types of malnutrition see Appendix A3.

- Stunting refers to low height-for-age (or shortness). It is identified by a z-score of height-for-age of more than two standard deviations (<-2 SD) below the median of the WHO reference population.

- Severely stunted is defined based on a z-score of height-for-age of more than three standard deviations (<-3 SD) below the median of the WHO reference population. This is not used in all countries, but is relevant in Ethiopia where levels of malnutrition are high.

- Underweight refers to low weight for age. A z-score of weight for age of more than two standard deviations (< -2 SD) below the median of the WHO reference population defines underweight.

- Severely underweight refers to extremely low weight for age. It is defined based on a z-score of weight for age of more than three standard deviations (< -3 SD) below the median of the WHO reference population.

- Wasting in the older cohort is defined based on z-score of BMI for age of more than two standard deviations (< -2 SD) below the median of the WHO reference population

- Severe wasting in the older cohort is defined based on z-score of BMI for age of more than three standard deviations (< -3 SD) below the median of the WHO reference population.

Table 3.6 shows that stunting and severe stunting are quite high in our sample of children. For example, 31 per cent of those in the younger cohort were classified as being stunted in Round 2, with eight per cent of the children being severely stunted. With regard to being underweight, nearly 24 per cent of the children fall into this category while four per cent are severely underweight.

However, on a more positive note both measures have declined significantly for the younger cohort (1- and 5-year-old children). The proportion stunted has declined from 35 per cent to 31 per cent and the proportion underweight has declined from 33 per cent to 24 per cent. This is an impressive accomplishment in the span of time elapsing between the two data collection periods, which can be attributed to improvement in wealth level of households and increased access to health services. One should, however, take note of the fact that malnutrition by these measures was quite high in Round 1 (a year of quite severe drought in many areas). Thus, what we observe could easily be one of recovery of child nutrition status.

Table 11. *Malnutrition among the younger cohort*

	Total		Rural		Urban	
	R1	R2	R1	R2	R1	R2
Underweight (WAZ <-2)	33.41	23.78	42.5	28.66	20.38	16.43
Severely under weight (WAZ <-3)	14.45	4.03	19.1	5.05	7.8	2.5
Stunted	34.84	31.33	41.34	36.41	25.03	23.65
Severely stunted	15.46	8.22	19.2	10.63	9.83	4.6

In the younger cohort, we see relatively larger improvement for rural children, although caution should be taken in interpreting this result since they started with a relatively higher incidence of malnutrition in Round 1. Moreover, the percentages for incidence of malnutrition are still higher in rural areas. Consequently, much needs to be done for rural children to catch up with their urban compatriots.

We calculated and report malnutrition in terms of the BMI for age for the old cohort (12 years old) in the Young Lives sample in Table 12. More than 27 per cent of our sampled children were underweight (wasted) in Round 1 and the percentage has increased by more than 29 per cent in the Round 2. Noting that this change is statistically significant, it triggers concerns on the well-being of these children. Moreover, the z-score of the body mass index has shown little change over the span of the two rounds. One possible explanation for the rise in wasting is that these children were at age when they usually grow faster, but did not gain weight. When we analyse the results for rural and urban areas, we found wasting increased by 26 per cent in rural areas and 33 per cent in urban areas, but only statistically significant for urban areas. When disaggregated by region, a statistically significant increase is observed in the Amhara and Tigray sites while a significant reduction is found in SNNP (Table B3.7). The same pattern is observed for extreme wasting.

Table 12 *BMI for age-based wasting and severe wasting (older cohort)*

	Total		Rural		Urban	
	R1	**R2**	**R1**	**R2**	**R1**	**R2**
Z-score BMI for age	-1.64	-1.64	-1.74	-1.76	-1.51	-1.45
Wasted	27.93	36.09	31.44	39.62	23.12	30.89
Severely wasted	12.6	11.04	12.31	13.38	12.99	7.59

Finally, we estimated a regression equation of malnutrition for the young cohort in the sample using the height-for-age z-scores and a number of possible explanatory variables. We tried three models where the dependent variable was specified as

a) the current (Round 2) z-scores for height-for-age

b) the difference of z-scores for height-for-age between Rounds 1 and 2

c) dichotomous (0,1) variable where unity was assigned if the change in the nutrition level was positive and zero otherwise and a probit model was used.

In economics, determinants of child malnutrition are theoretically inferred from child household health production function derived from a household's utility maximisation subject to income and time constraints (Becker 1965; Grossman 1972a, 1972b; Cropper 1977). Therefore, potential determinants of child malnutrition include health inputs (health seeking, health advice, illness, breast feeding, supplementary feeding etc.), household composition, child specific variables (age, sex, and birth order), household wealth, mother's education and community level factors. In practice various other social and cultural variables may interact with the above.

The results of this exercise are presented in Tables 13, 14 and 15. The regression in Table 14 includes dummy variables for the gender of the child, urban households and availability of safe toilets in the households, wealth index in Round 1 and education attainment of the child's parents. It also includes regional dummies where Addis Ababa was excluded from the regression.

The results show that except for the urban dummy, the other variables included in the model are significantly different from zero. However, the effects of these variables are quite small. This is to be expected as the dependent variable is standardised and has little variance. In fact, the reported White (robust) t-statistics (standard errors) are similar to the standard t-statistics (standard errors) one obtains from classical regression, implying that there is not a heteroscedasticity problem in our model (i.e. that the random variables have the same variance). Moreover, the marginal effects of the explanatory variables on the dependent variable are bound to be quite small.

In this light, boys seem to have a lower height-for-age z-score on the average compared to girls in our sample. Thus, girls are relatively less malnourished compared to boys, a finding replicated in other studies on Ethiopia. As expected, the wealth index calculated for Round 1 seems to have a positive impact on the nutrition attainment levels of children. Moreover, parental education attainment affects nutritional attainments positively.

Table 13. *Correlates of child nutrition (Dependent variable height-for-age z-scores) (younger cohort)*

Independent variables	Estimates	Mean
Dummy for sex of child; 1 = male	-0.134 (2.64)***	0.53
Dummy for urban; 1 = urban	-0.029 (0.37)	0.39
Wealth index in Round 1	1.464 (6.25)***	0.22
Years of schooling of mother	0.024 (2.67)***	2.31
Dummy for availability of safe water in the household	-0.260 (1.73)*	0.02
Dummy for Amhara Region (Amhara=1, else=0)	-0.009 (0.09)	0.20
Dummy for Oromo Region (Oromia=1, else=0)	-0.271 (2.61)***	0.21
Dummy for SNNP Region (SNNP=1, else=0)	-0.047 (0.50)	0.25
Dummy for Tigray Region (Tigray=1, else=0)	0.183 (1.72)*	0.20
Constant	-1.720 (16.11)***	
Observations	1811	
R-squared	0.08	

Robust t statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

The regression of changes in z-scores between the two rounds is a relatively weaker regression and we found only two variables (sex of child and fathers' educational attainment) to be significantly different from zero (Table 4.2). We tried a probit model on the changes in z-scores to see if it could improve on this result. Table 4.3 shows that there is little change in all variables, except that here the dummy for urban residence is now significant. If we go by these variables, we observe that boys have, on average, benefited more in terms of change in nutritional achievements compared to girls in both specifications. Moreover, the probit model indicates that the probability of improved nutritional achievement is higher for urban than rural children.

Table 14. *Correlates of changes in child nutrition (Dependent variable change in height-for-age z-scores between Round 2 and Round 1) (younger cohort)*

Independent variable	Estimates
Dummy for sex of child; 1 = male	0.241
	(2.81)***
Dummy for urban; 1 = urban	-0.017
	(0.13)
Wealth index in Round 1	-0.396
	(0.98)
Years of schooling of mother	0.006
	(0.41)
Dummy for availability of safe water in the household	-0.370
	(1.33)
Dummy for Amhara Region (Amhara=1, else=0)	0.320
	(2.08)**
Dummy for Oromo Region (Oromia=1, else=0)	0.002
	(0.01)
Dummy for SNNP Region (SNNP=1, else=0)	-0.234
	(1.58)
Dummy for Tigray Region (Tigray=1, else=0)	-0.240
	(1.47)
Constant	-0.185
	(1.17)
Observations	1811
R-squared	0.02

Robust t statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

Table 15 *Correlates of changes in child nutrition (Probit with 1 for positive change in height-for-age z-scores between Round 2 and Round 1) (younger cohort)*

Independent variable	Estimates
Dummy for sex of child; 1 = male	0.194
	(3.25)***
Dummy for urban; 1 = urban	0.122
	(1.33)
Wealth index in Round 1	-0.528
	(1.89)*
Years of schooling of mother	0.011
	(1.02)
Dummy for availability of safe water in the household	-0.233
	(1.04)
Dummy for Amhara Region (Amhara=1, else=0)	0.410
	(3.43)***
Dummy for Oromo Region (Oromia=1, else=0)	-0.073
	(0.63)
Dummy for SNNP Region (SNNP=1, else=0)	-0.132
	(1.19)
Dummy for Tigray Region (Tigray=1, else=0)	-0.063
	(0.53)
Constant	-0.171
	(1.40)
Observations	1811

Robust z statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

For the older cohort the story is a bit different. To begin with, the difference in the z-score for body-mass index for age between the two rounds is not different from zero in the statistical sense of the word. Thus, there is no need to report the regression of difference in this variable. We thus report only the determinants of z-score of the BMI for age index (Table 4.4). Not surprisingly we find that none of the variables included are significantly significant.

Table 16. *Correlates of Round 2 child nutrition (Dep. variable Body Mass Index for age z-scores)*

Independent variable	Estimates	Mean
Dummy for child sex; 1 = male	0.069 (0.98)	0.52
Dummy for urban residence; 1 = urban	0.150 (1.34)	0.39
Wealth index (Round 1)	0.492 (1.15)	0.17
Years of schooling of mother	-0.009 (0.74)	1.84
Dummy for availability of safe water in the household	-0.209 (1.37)	0.09
Dummy for Amhara Region (Amhara=1, else=0)	-0.564 (3.65)***	0.20
Dummy for Oromo Region (Oromia=1, else=0)	0.134 (0.92)	0.20
Dummy for SNNP Region (SNNP=1, else=0)	0.075 (0.54)	0.26
Dummy for Tigray Region (Tigray=1, else=0)	-0.459 (3.08)***	0.21
Constant	-1.638 (10.62)***	
Observations	925	
R-squared	0.09	

Robust t statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

4.3 Education

The Welfare Monitoring Survey (CSA: WMS 2004) has documented that only 37.9 per cent of Ethiopia's total population are literate with a large disparity between rural (30.9 per cent). and urban (74.2) residents. This variation might indicate different levels of accessibility of schools, quality of teaching and availability of teaching materials between urban and rural areas. A clear gender bias is also revealed. Literacy among males (49.9 per cent) is nearly double that of females (26.6 per cent). This discrepancy exists in both rural and urban areas with a wider gap among rural residents. Comparison of literacy rates over the last four survey years of the WMS (i.e., 1996, 1998, 2000 and 2004) reveals a general rising trend in literacy. In rural areas, for instance, literacy increased from 18.3 per cent in 1996 to 30.9 per cent in 2004. However, all four surveys revealed that rural residents and women and girls are disadvantaged in terms of literacy achievements.

In 2004 the net enrolment ratio for the country as a whole was 37.8 per cent at primary school level and 14.5 per cent at secondary school level (CSA: WMS 2004). Gender differences are evident in rural, urban and at country level, with higher rates of net enrolment for boys than girls at both primary and secondary level. Although enrolment rates for secondary schools in urban areas seemed to decline in 2004, net enrolment ratios generally showed an increase between in both urban and rural areas at both primary and secondary level between 1996 and 2004 (CSA: WMS 2004).

4.3.1 Younger cohort

The overall enrolment rate of the 5-year-olds from the younger cohort sample for crèche before the age 3 was 0.42 per cent and for pre-school-nursery after the age of 3 was 25 per cent (Table 3.10). For both crèche and pre-school, the enrolment rate was much higher for urban than rural areas and many of the children enrolled in crèche and pre-school are from Addis Ababa (about 55 per cent), while 23 per cent and 11 per cent are from SNNP and Oromia regions, respectively.

Table 17. *Enrolment of 5-year-old children in crèche and pre-school (younger cohort)*

	Creche	Pre-school nursery
Urban (per cent)	0.66	57.48
Rural (per cent)	0.26	3.40
Total	0.42	24.90

Note: pre-school nursery enrolment starts at age 3; creche is for children below age 3

Correlates of pre-school enrolment for 5-year-olds

We estimate correlates of pre-school enrolment for the 5-year-old children. Since virtually all households that reported enrolling their children in pre-school are from urban areas, the analysis is done only for urban areas. The explanatory variables used in the regression of pre-school enrolment are gender of child; dummy for child with long-term health problem; sibling order; mother's education in Round 1; father's education in Round 1; dummy variables for ethnicity; dummy variables for religion; household size in Round 1 and wealth index in Round 1. The descriptive statistics for pre-school enrolment and its correlates used in the analysis are reported in Table 18. In Table 19 we estimate a probit model and report robust standard errors.

Table 18. *Descriptive statistics on pre-school enrolment and its correlates for 5-year-olds in urban areas*

Variable label	Mean	Std. Dev.	Min	Max
Attended pre-school (Yes=1, No=0)	0.52	0.50	0	1
Gender of child (Male=1, Female=0)	0.53	0.50	0	1
Child has long-term health problem (Yes=1, No=0)	0.11	0.31	0	1
Sibling order	2.77	1.83	1	10
Mother's education (Round 1)	4.19	4.22	0	16
Ethnicity (Amhara=1, Other=0)	0.29	0.46	0	1
Ethnicity (Oromo=1, Other=0)	0.22	0.42	0	1
Ethnicity (Tigrawi=1, Other=0)	0.14	0.34	0	1
Orthodox Christian (Yes=1, No=0)	0.69	0.46	0	1
Muslim (Yes=1, No=0)	0.08	0.27	0	1
Household size (Round 1)	5.76	2.17	2	14
Wealth index	0.33	0.15	0.01	0.76

The results show that there is no significant statistical association between the probability of a child being enrolled in pre-school and the child's gender. Children with long-term health problems appear to be more likely to be enrolled in pre-school. Though the nature of the health problem matters, this seems to suggest that parents of children with long-term health problems are probably trying to resolve the problem by sending them to pre-school. Sibling order has a statistically significant and negative association with pre-school enrolment, so that in households where there are more older siblings, a 5-year-old is less likely to be enrolled in pre-school. This is perhaps because children have more siblings to play with at home or to care for them. Education of the mother and father of the child in Round 1 are significantly associated with pre-school enrolment in Round 2 which indicates the role of better awareness and higher opportunity costs of childcare for more educated parents.

Children whose fathers are from the ethnic groups of Amhara and Tigrawi were more likely to be enrolled in pre-school, suggesting that parental ethnicity matters for the decision to send children to pre-school. There is a statistically significant and positive association between Muslim households and pre-school enrolment and households with more members in Round 1 are more likely to enrol their child in pre-school in Round 2. Wealth index of the household in Round 1 does not have a statistically significant association with pre-school enrolment of the child in Round 2.

Table 19. *Correlates of pre-school enrolment for 5-year-olds in urban areas*

	(1) Enrolment1	(2) Enrolment2
Gender of child (Male=1, Female=0)	-0.224	-0.210
	(1.55)	(1.64)
Child has long-term health problem (Yes=1, No=0)	0.635	0.679
	(1.63)	(1.92)*
Sibling order	-0.232	-0.238
	(4.19)***	(5.07)***
Mother's education (Round 1)	0.136	0.156
	(6.20)***	(9.38)***
Father's education (Round 1)	0.071	
	(3.97)***	
Ethnicity (Amhara=1, Else=0)	0.624	0.843
	(2.42)**	(3.48)***
Ethnicity (Oromo=1, Else=0)	0.334	0.365
	(1.21)	(1.44)
Ethnicity (Tigrawi=1, Else=0)	0.856	0.911
	(1.99)**	(2.37)**
Orthodox Christian (Yes=1, No=0)	0.125	0.085
	(0.48)	(0.36)
Muslim (Yes=1, No=0)	0.900	0.674
	(2.47)**	(2.12)**
Household size (Round 1)	0.168	0.134
	(3.55)***	(3.37)***
Wealth index for 1 -year-olds (Round 1)	-0.129	-0.026
	(0.26)	(0.06)
Constant	-1.321	-0.638
	(3.65)***	(2.13)**
Observations	594	735
Pseudo R2	0.528	0.517
Wald Chi2 (19/18)	253.41***	270.29***

Robust z statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%; Enrolment1 is when education of father is included and Enrolment2 is when it is not.

4.3.2   Older cohort

Since the official age for school enrolment in Ethiopia is seven it is not meaningful to discuss school enrolment for the younger cohort, so we calculated school enrolment for the older cohort only. As reported in Table 20, the poorest households have made a substantial improvement in sending their children to school. For the lowest quartile the growth has been more than 60%, while that of the second quartile has increased by 65 per cent. We should, however, note that the poorest families started with very low rates of enrolment in Round 1.

Not surprisingly, children with household heads that attained post-secondary education have attained universal enrolment. But the change and rate of enrolment of children with heads that attained lower levels of education too has been impressive, the difference ranging from 35 per cent for illiterate parents to ten per cent for children whose parents had high-school education (Table 21).

Table 20. *Rate of school enrolment by wealth quartile (older cohort)*

Wealth quartile	R1 (%)	R2 (%)
1 (poorest)	0.56	0.91
2	0.58	0.97
3	0.7	0.96
4	0.79	0.93

Table 21. *Rate of school enrolment by education of the household head (older cohort)*

	R1 (%)	R2 (%)
Illiterate	0.58	0.93
Grade 1-4	0.71	0.94
Grade 5-8	0.73	0.97
Grade 9-12	0.84	0.94
Post-secondary education	0.95	1

For the older cohort school attendance has increased by around 48 per cent for boys and 39 per cent for girls (Table 22). This increment is statistically significant for both. In fact, we have a larger increase for boys as they had a relatively lower proportion of attendance in Round 1. Otherwise, the enrolment rate is higher for girls.

Table 22. *Rate school enrolment by gender of child (older cohort)*

	R1 (%)	R2 (%)
Male	0.63	0.94
Female	0.68	0.95

We also see from Table 22 that school enrolment for the older cohort has increased tremendously from 63 per cent to more than 94 per cent between the two rounds. Obviously, this is a significant leap and shows progress towards universal school enrolment although we are referring to the same group of children over time. This is also complemented by the fact that the change in mean grade completed by the children increased by around 3.3, which is more or less equal to the number of years that elapsed between the two rounds. Disaggregating by rural-urban residence, the enrolment rate in rural areas was 55 per cent and grew to 93 per cent in Round 2, while in urban areas it grew from 83 per cent in Round 1 to 96 per cent in Round 2. Regional distribution in Round 2 shows that the highest enrolment is in Addis Ababa followed by the Tigray region. The growth rate is substantial in Tigray (79 per cent), starting from a lower base, and very small in Addis Ababa, starting from a higher base. The grade completed is roughly similar except in Addis Ababa where it is fourth grade, one higher than the average.

Table 23. *Enrolment rate and highest grade completed (years of schooling (older cohort)*

	Enrolment rate (%)		Highest grade completed	
	R2	R1	R2	R1
Rural	92.8	55.1	3.4	0.5
Urban	97.5	82.6	4.9	0.9
Total	94.7	66.2	4	0.6

Correlates of 12-year-olds' years of schooling

The data show that over 97 per cent of the 12-year-old children were enrolled at school. Given such a high rate of enrolment, we analysed correlates of length of schooling (and not enrolment) for this group. The explanatory variables used in the regression of years of schooling are gender of child; dummy for child with a long-term health problem; sibling order; mother's education in Round 1; father's education in Round 1; dummy variables for ethnicity; dummy variables for religion; household size in Round 1 and wealth index in Round 1.

Descriptive statistics on the relevant variables are reported in Table 24. We use ordinary least squares (OLS) methods to analyse the correlates of years of schooling for the full sample as well as for urban and rural areas separately. Robust standard errors are reported.

Table 24. *Descriptive statistics on years of schooling, subjective well-being and their correlates for 12-year-olds*

Variable label	Mean	Std. Dev.	Min	Max
Years of schooling of child	4.18	1.67	0	9
Subjective well-being	4.28	1.86	1	9
Gender of child (Male=1, Female=0)	0.51	0.50	0	1
Child has long-term health problem (Yes=1, No=0)	0.06	0.24	0	1
Sibling order	3.10	1.88	1	14
Single-sex school (Yes=1, No=0)	0.03	0.17	0	1
Time taken to go to school in minutes	24.88	18.40	0	120
Someone helps child with studies (Yes=1, No=0)	0.82	0.38	0	1
Mother's education level (Round 1)	2.31	3.50	0	14
Gender of head of household (Male=1, Female=0)	0.76	0.43	0	1
Orthodox Christian (Yes=1, No=0)	0.71	0.46	0	1
Muslim (Yes=1, No=0)	0.16	0.36	0	1
Household size (Round 1)	6.44	2.16	2	16
Wealth index (Round 1)	0.18	0.16	0.01	0.84
Urban site (Yes=1, No=0)	0.42	0.49	0	1

The literature on access to child schooling in developing countries suggests that child schooling depends on a variety of factors: (1) economic factors, including the level of household income, vulnerability to household economic shocks and the use of child labour (Tietjen 1998; Duraisamy 2000; Basu and Van 1998); (2) the accessibility of schools in terms of time and cost of travel as well as safety (Tansel 1997); (3) the relative importance of parental education (Duraisamy 2000); and (4) household composition, as well as perceived usefulness of schooling, whereby parents are often willing to make enormous sacrifices for schooling they feel will give their children a better future (Rosati and Rossi 2003; Shapiro and Tambashe 2001). Cultural norms may also have an influence on whether a child works or not, independent of household levels of income or education, if specific tasks (either household or outside the home) are culturally designated as children's (or girls' or boys') work, such as cattle herding or water collection in the case of Ethiopia.

Both for the full sample, and for each of the rural and urban areas, children who receive some help with their studies achieve better as reflected in their level of education, which suggests the importance of helping children with their studies. Children whose mothers were more educated in Round 1, particularly in urban areas, had a higher level of schooling in Round 2. Urban children with Muslim parents have lower levels of schooling (because they are often sent to religious school rather than pre- or primary school in the early years). For rural areas, children living in larger households have a lower level of education suggesting a negative contribution of household size to children's education level. Wealth index in Round 1 has a positive association with level of education in Round 2. The result suggests the importance of economic status as reflected by wealth. We see also the role of regional variation in the level of education of children. In particular, children from the SNNP region have a lower level of education, particularly in urban sites. We also find that children from urban areas have a higher level of education perhaps because they are more likely to start school earlier and schools are better in urban areas. The results also suggest that the

following variables do not have a statistically significant association with the level of education of the child: gender of child, health status of the child, sibling order, attendance at single-sex schools, time taken to go to school and gender of the household head in Round 1.

Table 25. *OLS estimates of correlates of 12-year-olds' schooling*

	(1) Full sample	(2) Urban	(3) Rural
Gender of child (Male=1, Female=0)	0.015 (0.15)	0.067 (0.47)	-0.043 (0.29)
Child has long-term health problem (Yes=1, No=0)	0.271 (1.12)	0.249 (1.02)	0.951 (0.56)
Sibling order	0.008 (0.28)	0.016 (0.38)	-0.007 (0.18)
Single-sex school (Yes=1, No=0)	-0.192 (0.60)	-0.189 (0.50)	-0.305 (0.46)
Time taken to go to school in minutes	-0.001 (0.31)	-0.006 (1.22)	0.004 (1.05)
Someone helps child with studies (Yes=1, No=0)	0.410 (2.91)***	0.160 (0.77)	0.544 (2.88)***
Gender of head in Round 1 (1 if male, 0 if female)	-0.047 (0.35)	-0.059 (0.34)	-0.046 (0.22)
Mother's education (Round 1)	0.042 (2.55)**	0.050 (2.63)***	0.038 (1.20)
Orthodox Christian (Yes=1, No=0)	-0.032 (0.18)	-0.247 (0.99)	-0.092 (0.36)
Muslim (Yes=1, No=0)	-0.134 (0.66)	-0.596 (1.80)*	-0.061 (0.22)
Household size (Round 1)	-0.045 (1.59)	0.030 (0.78)	-0.098 (2.46)**
Wealth index for 8-year-olds (Round 1)	1.255 (2.83)***	0.936 (1.86)*	2.139 (2.28)**
Amhara region (Yes=1, No=0)	0.163 (0.80)	0.185 (0.70)	0.435 (1.07)
Oromia region (Yes=1, No=0)	-0.306 (1.63)	-0.201 (0.87)	-0.115 (0.28)
SNNP region (Yes=1, No=0)	-0.853 (4.37)***	-1.317 (5.19)***	-0.490 (1.18)
Tigray region (Yes=1, No=0)	-0.054 (0.27)	0.034 (0.13)	0.101 (0.24)
Urban site (Yes=1, No=0)	0.696 (5.05)***		
Constant	3.866 (11.28)***	4.750 (10.49)***	3.750 (6.93)***
Observations	797	354	443
R-squared	0.25	0.19	0.12

Robust t statistics in parentheses:* significant at 10%; ** significant at 5%; *** significant at 1%

4.4 Paid child labour

According to the Central Statistical Agency (2002) half of all 5- to 14-year-olds, more than 7.5 million children, in Ethiopia, were engaged in economic activity in 2002 when Young Lives was established. The incidence of children working for pay rises sharply with age, but 40 per cent of even the youngest (5- to 9-year-old) children are involved in some form of economic activity. Rural children and male children are most likely to work. Among rural children aged 5 to 14, 54 per cent are involved in economic activity compared with only 15 per cent of their urban counterparts. The economic activity rate of boys exceeds that of girls by 20 per cent. However, this does not take into account household chores such as water and fuel wood collection, typically undertaken by girls. Girls were mainly engaged in domestic activities (e.g. collecting firewood and water, food preparation, washing clothes) while boys were involved in non-domestic activities such as cattle herding, weeding, harvesting, ploughing, petty trading and other waged work. The participation rate in non-domestic activities was 62 per cent for boys and 42 per cent for girls. For domestic activities, this figure was 22 per cent for boys and 44 per cent for girls. In rural areas, children were more frequently engaged in non-domestic activities than in domestic activities, whereas in urban areas the opposite was true.

Table 3.8 presents a comparison of paid child labour between the two rounds for the older cohort. Our definition of child labour refers only to work that is paid. While we acknowledge its importance, we exclude unpaid labour from analysis because we do not have data in both rounds. For this comparison we used the number of hours spent by the child on paid activities outside the home in a typical day (changed to a dummy variable which equals 1 if the number of hours is positive and 0 if not). For Round 1 we used responses to the question "Have you done anything in the last year to get money or things for yourself?" with responses coded as 1 if yes and 0 otherwise. We see from Table 3.8 that there is a 52 per cent reduction in the percentage of children who were involved in paid work in Round 2 compared with Round 1 and this difference is statistically significant at less than one per cent level. This reduction might be due to substantial change in wealth and asset level of households. A separate comparison for urban and rural areas also shows a statistically significant reduction in child labour (Table 26). However, a comparison by region shows that the reduction in paid child labour in Round 2 compared with Round 1 is statistically significant only for Addis Ababa and SNNP regions (Table B3.4).

Table 26. *Paid child labour (older cohort)*

	R1 (%)	R2 (%)
Urban	0.07	0.03
Rural	0.11	0.05
Total	0.09	0.05

We also note from Table 26 that the reduction in the involvement of children in paid child work measured as a percentage of children involved is higher for girls (58 per cent) than for boys (46 per cent).

4.5   Subjective well-being (older cohort)

Taking a multidimensional approach to childhood poverty, an individual's subjective assessment of their well-being as well as their material well-being as defined, for example, by living below the poverty line, is of interest. Young Lives is one of the few projects to collect measures of subjective well-being for children in developing countries.

The Young Lives questionnaire includes various instruments that can be used to measure aspects of subjective well-being. In this report we look at just two of these measures, used with children of the older cohort. The first explores the child's perception of being treated with fairness and respect in Round 1 and 2. In Round 1, the relevant question was "Do you think people in this area treat you badly?" with the responses coded as 1 if the answer is yes and 0 otherwise. The comparable question for Round 2 was a statement read out to the child: "Adults in my street treat me worse than other children of my age" with four possible responses: strongly agree, agree, disagree and strongly disagree. To make the responses comparable to Round 1 we changed these responses to a value of 1 if the child agrees or strongly agrees and 0 if not.

The question asked in Round 1 is assumed to be equivalent to the statement used in Round 2. Roughly ten per cent of children felt they were treated worse than their peers in Round 1 with this percentage halving in Round 2. More children in urban areas felt they were treated worse than others – 12 per cent of urban compared with nine per cent of rural children. However, this perception seems to have improved at Round 2, with only six and 5 per cent of children in urban and rural areas, respectively, reporting that they felt they were treated worse than other children of their age.

The second measure of subjective well-being used in this report relates to a 'ladder' question asked in Round 2. The question is one where children are asked to indicate where they feel they currently stand on a ladder of nine rungs ranging from 1 (the worst possible outcome) to 9 (the best). The children were then asked where they expected to be in four years' time, again in terms of the nine-rung ladder. Table 27 reports where urban and rural childen feel they stand now and hope to be in future. The table shows that children from urban areas indicate an average level on the ladder that is lower than that of rural areas across all wealth quartiles. This suggests that, overall, children from rural areas have a higher level of subjective well-being than their urban counterparts. This result is particularly interesting when placed next to the fact that material indicators of well-being – such as wealth, consumption and even anthropometric outcomes – were higher for children from urban areas.

The table also shows that the position on the ladder is higher for children from richer quartiles than poorer quartiles. On average, children are optimistic about the future and feel their lives four years on from the interview will be better.

Table 27. *Subjective well-being based on 'ladder' question by sector and wealth quartile in Round 2*

	Urban	Rural
Current position on a ladder ranging from 1 to 9 (1=lowest possible outcome, 9=best possible outcome)		
Wealth quartile 1 (poorest)	2.71	3.91
Wealth quartile 2	2.44	3.88
Wealth quartile 3	2.93	4.29
Wealth quartile 4 (richest)	3.76	4.83
Position in four years time on a ladder ranging from 1 to 9 (1=lowest possible outcome, 9=best possible outcome)		
Wealth quartile 1 (poorest)	4.71	5.87
Wealth quartile 2	4.82	5.63
Wealth quartile 3	4.83	6.81
Wealth quartile 4 (richest)	5.60	6.3

A comparison by region shows a statistically significant improvement only for the Amhara and Tigray regions (Table B3.4).

Table 28. *Changes between rounds in subjective well-being and child labour for pay by wealth quartile (Older cohort)*

	R1	R2	% change
First wealth quartile			
Subjective well-being (perception of fairness)	0.11	0.04	-63.39**
Subjective well-being (current)		3.88	
Subjective well-being (future)		5.84	
Paid child labour	0.08	0.04	-55.00**
Second wealth quartile			
Subjective well-being (perception of well-being)	0.08	0.04	-45.11
Subjective well-being (current)		3.72	
Subjective well-being (future)		5.49	
Paid child labour	0.14	0.06	-57.40**
Third wealth quartile			
Subjective well-being (perception of fairness)	0.10	0.07	-26.87
Subjective well-being (current)		3.50	
Subjective well-being (future)		5.34	
Paid child labour	0.11	0.06	-42.30*
Fourth wealth quartile			
Subjective well-being (perception of well-being)	0.12	0.05	-54.00**
Subjective well-being (current)		3.86	
Subjective well-being (future)		5.68	
Paid child labour	0.06	0.02	-57.14*

*Significant at 10%, ** Significant at 5% and *** Significant at 1%

Table 29. *Changes in subjective well-being and child labour by wealth quartile, urban/rural and region*

	Urban			Rural		
	R1	R2	% change	R1	R2	% change
First wealth quartile						
Subjective well-being (perception of fairness)	0.14	0.00	-100.00	0.11	0.04	-61.98***
Subjective well-being (current)		2.71			3.91	
Subjective well-being (future)		4.71			5.87	
Paid child labour	0.14	0.00	-100.00	0.08	0.04	-52.63**
Second wealth quartile						
Subjective well-being (perception of well-being)	0.13	0.04	-71.60	0.07	0.04	-39.35
Subjective well-being (current)		2.44			3.88	
Subjective well-being (future)		4.28			5.63	
Paid child labour	0.00	0.07		0.15	0.06	-63.46***
Third wealth quartile						
Subjective well-being (perception of fairness)	0.11	0.07	-37.09	0.09	0.08	-7.84
Subjective well-being (current)		2.93			4.29	
Subjective well-being (future)		4.83			6.01	
Paid child labour	0.11	0.06	-46.67	0.11	0.07	-36.36
Fourth wealth quartile						
Subjective well-being (perception of well-being)	0.13	0.05	-57.37***	0.00	0.04	
Subjective well-being (current)		3.76			4.83	
Subjective well-being (future)		5.60			6.38	
Paid child labour	0.05	0.01	-75.00**	0.08	0.13	50.00

*Significant at 10%, ** Significant at 5% and *** Significant at 1%

Finally, a regression analysis is used to investigate the determinants of child well-being, as measured by their rating of their place on the ladder for urban and rural areas separately. An Ordered Probit regression is used for this analysis since the dependent variable has ordinal values. The explanatory variables used in the regression of subjective well-being are gender of child; dummy for child has long-term health problem; sibling order; mother's education in Round 1; father's education in Round 1; dummy variables for ethnicity; dummy variables for religion; household size in Round 1 and wealth index in Round 1.

The results suggest that in rural areas children with a male head of household in Round 1 felt better off in Round 2. Both for the full sample and for the rural areas, the children of wealthier households in Round 1 (as reflected by the wealth index) felt better off in Round 2. In urban areas children from the Amhara and SNNP regions feel worse off than those from Addis Ababa, while those from Oromia feel better off. This suggests the presence of regional variation in subjective well-being of children after controlling for other variables. We also find that children in urban areas feel worse off compared with those in rural areas.

Table 30. *Correlates of 12-year-olds' subjective well-being – ordered probit (scale 1 to 9)*

	(2) Urban	(3) Rural
Gender of child (Male=1, Female=0)	0.035	-0.025
	(0.32)	(0.27)
Child has long-term health problem (Yes=1, No=0)	0.029	0.586
	(0.16)	(0.60)
Sibling order	0.007	0.016
	(0.23)	(0.61)
Gender of head in Round 1 (1 if male, 0 if female)	-0.053	0.254
	(0.39)	(1.72)*
Mother's education (Round 1)	0.005	-0.040
	(0.33)	(1.70)*
Orthodox Christian (Yes=1, No=0)	-0.327	-0.150
	(1.51)	(0.80)
Muslim (Yes=1, No=0)	-0.105	-0.152
	(0.39)	(0.86)
Household size (Round 1)	0.040	-0.006
	(1.29)	(0.21)
Wealth index for 8-year-olds (Round 1)	0.642	1.170
	(1.39)	(1.99)**
Amhara region (Yes=1, No=0)	-0.377	-0.105
	(2.05)**	(0.41)
Oromia region (Yes=1, No=0)	0.497	-0.129
	(2.66)***	(0.49)
SNNP region (Yes=1, No=0)	-0.493	-0.403
	(2.37)**	(1.52)
Tigray region (Yes=1, No=0)	0.296	0.158
	(1.52)	(0.59)
Urban site (Yes=1, No=0)		
Observations	362	473
Pseudo R2	0.028	0.015
Wald Chi2(14/13/13)	39.58***	25.4**

Robust z statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

5. Summary and conclusions

Assets, wealth and consumption (poverty)

Average wealth and assets have increased from Round 1 to Round 2 for both cohorts, in both urban and rural areas, and in most regions. The proportion of younger cohort children living in households with low wealth and assets decreased significantly, representing an improvement over time.

Average expenditure on consumption is higher for the younger than the older cohort. In general both food and non-food consumption expenditure is higher for urban areas than for rural areas. For both cohorts the average annual income of Young Lives sites is lower than that of the 2004/05 national average income reported by MOFED.

For the younger cohort the percentage of people who are absolutely poor – below the nationally defined poverty line – is 69 percent. This implies that 69 percent of these people are unable to consume 2,200 kilo calories per day plus essential non-food items. For the older cohort, the percentage of people who are absolutely poor is 71 percent. For both cohorts rural poverty is higher than urban poverty. In general, these poverty figures are much higher than the national average poverty figures reported by MOFED (2006). This is not surprising given that Young Lives chose sites which are mostly subject to food deficit.

A measure of relative poverty (fifty percent of the median consumption per adult) shows that 11 percent of the younger cohort and ten percent of the older cohort are poor compared to others in their area. While absolute poverty is higher in rural areas, relative poverty is higher for urban sites. This indicates that inequality is much greater in urban areas than in rural areas, which is consistent with the poverty report prepared by MOFED.

Access to services and infrastructure

Access to electricity and sanitation facilities to households have improved substantially between the two rounds. Moreover, the bulk of the growth in availability and use of safe sanitation facilities has been reported by relatively poor households. This might be partly due to the fact that fewer such households had these facilities in Round 1. Even after this big jump, more of the relatively better off households have access. Similarly, more of the relatively better off households had access to electricity to start with. This proportion has increased further, but the growth is more pronounced for relatively poorer households.

Health and nutrition

For the younger cohort, both stunting and underweight have declined significantly both in terms of magnitude and in the statistical sense as indicated by the t-tests. Stunting declined by around 10 per cent and underweight by some 50 per cent since Round 1. For the older cohort (children aged 12) around 28 per cent of the sample were underweight in Round 1 and the percentage has increased to 36 per cent in Round 2. This statistically significant change triggers concerns about the well-being of these children.

Our multivariate analysis showed that, controlling for other factors, boys seem to have a lower level of height-for-age z-score on the average compared to girls in our sample. Thus, girls are relatively less malnourished compared to boys. As expected, wealth seems to have a positive impact on children's nutritional attainment, as does the mother's years of education.

The regression of changes in z-scores between the two rounds is a relatively weaker regression and we found only one variable (sex of child) to be significantly affecting changes in stunting. We found that boys have, on the average, benefited more in terms of change in nutrition achievements compared to girls, although this is influenced by different growth patterns between boys and girls. Moreover, the probit model indicates that the probability of improved nutritional achievement is higher for boys.

Education

Virtually all households that reported enrolling their children in pre-school are from urban areas. About 52 per cent of the five-year-old children in urban areas have been enrolled in pre-school. Our analysis shows that there is no significant difference in enrolment in pre-school for boys and girls. Enrolment is more likely for children with long-term health problems and less likely for children who have older siblings, perhaps because such children have more siblings to play with at home or to care for them. Education levels of the parents are associated with pre-school enrolment in Round 2, indicating the role of better awareness and higher opportunity cost of time to care for children. However, richer households in Round 1 were not significantly more likely to enrol their child in pre-school by Round 2.

When we looked at involvement of children in paid work outside the home, we found that paid work decreased by 52 per cent compared with Round 1, regardless of the wealth of the household or education of the household head. However, the reduction is higher for girls than for boys (because of girls' involvement in domestic chores).

School enrolment among the older cohort has increased substantially, particularly in rural areas where is has leapt from 55 to 93 per cent between the two rounds. This is not only statistically but also substantively significant although we are comparing the same group of children over time. The increase in school enrolment holds for different levels of household wealth, and the change and rate of enrolment for children of parents with lower levels of education has been impressive.

The regional distribution of the enrolment shows that the highest enrolment is in Addis Ababa (99 per cent) followed by the Tigray region (96 per cent), with the lowest in Oromia (88 per cent) followed by SNNPR and Amhara. The growth rate is substantial in Tigray, which started from a lower base, and very small in Addis Ababa, which started from a higher base. The grades completed are broadly similar except in Addis Ababa, where the average grade completed, 4th grade, is one grade higher (see table AB3.8 in the appendix). This pattern is consistent with the national picture.

Given the very high rate of enrolment, we analysed correlates of years of schooling (and not enrolment) for this group. The results suggest that children who receive some help with their studies reach a higher level of education, as do children whose mothers were more educated in Round 1, particularly in urban areas. Households with better wealth in Round 1 had children with a higher level of education in Round 2. There is also variation in the level of education of children across location. In particular, children from SNNP region have a lower level of education particularly in urban sites. But generally, children from urban areas have a higher level of education perhaps because these children are more likely to start school earlier and the school facilities are better.

Subjective well-being

The percentage of children who felt they were treated badly, or worse than other children of their age – a measure of subjective well-being used with the older cohort – has fallen significantly. Another measure used in Round 2 assesses optimism about the future: children expect to have a higher level of well-being in the future than they have in the present, a finding which holds across rural and urban areas in all regions, all wealth levels and all levels of education of household heads. Better subjective well-being for the 12-year-old children in Round 2 is correlated with higher household wealth in Round 1, both for the full sample and for the rural areas.

Children's perceptions about the fairness of treatment by adults – used as an indicator of subjective well-being – show an improvement over time, which is much larger for male than for female children. Other indicators used to reflect current and expected future well-being show that both current and future well-being are higher for girls than for boys. This suggests that girls felt better off than boys at the time of the survey and are also more optimistic about the future.

In urban areas children from the Amhara and SNNP regions felt worse off on measures of subjective well-being compared with those from Addis Ababa, while those from Oromia felt better off. This suggests the presence of regional variation in subjective well-being of children after controlling for other variables.

To conclude, Young Lives households and children are found to be poorer than the average Ethiopian households and children. However, the welfare of children in the Young Lives sample households in terms of nutritional achievement, enrolment in school and involvement in paid child labour has improved, Perhaps as a result, most Young Lives children are optimistic about their future well-being. The improvement of children's welfare can mainly be attributed to the improvement of wealth status of the households in which they live and the pro-poor policies followed by the government and the improved provisions of education and health services in the country. The improvement in wealth status we have seen in Young Lives sample households and children is consistent with the general improvement of income conditions and nutritional achievements of children in the country. This implies that the Young Lives project has demonstrated that Ethiopia's economic growth is more or less inclusive of the poor.

References

Basu, K. and P.H. Van (1998) 'The Economics of Child Labor', *American Economic Review* 88(3): 412-27

Becker, G.S. (1965) 'A Theory of the Allocation of Time', *Economic Journal* 75(299): 493–517

Cropper, M.L. (1977) 'Health, Investment in Health and Occupational Choice', *Journal of Political Economy* 85(6): 1273–94

CSA: WMS (2004) *Central Statistical Authority, Welfare Monitoring Survey: Analytical Report,* Addis Ababa: Central Statistical Authority

CSA (2002) *Ethiopia Child Labour Survey 2001*, Statistical Bulletin 262, Addis Ababa: Central Statistical Authority

Dercon, Stefan, John Hoddinott, Tassew Woldehanna (2005) *Growth and Poverty in Rural Ethiopia: Evidence from Fifteen Communities 1994-2004, mimeo.*

Duraisamy, M (2000) *Child Schooling and Child Work in India*, Indian Institute of Technology

Foster, J., J. Greer and E. Thorbecke (1984) A Class of Decomposable Poverty Measures *Econometrica* 52(3): 761-6

Grossman, M. (1972a) *The Demand for Health: A Theoretical and Empirical Investigation*, Occasional Paper 119, New York: National Bureau of Economic Research

Grossman, M. (1972b) 'On the Concept of Health Capital and the Demand for Health', *Journal of Political Economy* 80(2): 223–55

Ministry of Education (2000) *Education Statistics Annual Abstract* 1992 E.C/1999-00/ Education Management Information Systems, Addis Ababa

Ministry of Education (2002) *Education Statistics Annual Abstract 1994* E.C/2001-02/ Education Management Information Systems, Addis Ababa

Ministry of Education (2003) *Education Statistics Annual Abstract 1995* E.C/2002-03/ Education Management Information Systems, Addis Ababa

Ministry of Education (2004) *Education Statistics Annual Abstract 1996*, E.C/2003-04/ Education Management Information Systems, Addis Ababa

MOFED (2002a) *Ethiopia: Sustainable Development and Poverty Reduction Program (SDPRP),* Addis Ababa: Ministry of Finance and Economic Development

MOFED (2002b) *Poverty Profile of Ethiopia,* Addis Ababa: Ministry of Finance and Economic Development

MOFED (2005) *Ethiopia: The Millennium Development Goals Needs Assessment Synthesis Report*, Addis Ababa: Ministry of Finance and Economic Development

MOFED (2005) *Survey of the Ethiopian Economy*, Vol II: 1999-2004, Education Management Information Systems, Addis Ababa

MOFED (2006) *Ethiopia: Building on Progress. A Plan for Accelerated and Sustained Development to End Poverty (PASDEP) (2005/06-2009/10). Volume II: Policy Matrix.* Addis Ababa: Ministry of Finance and Economic Development

MOFED (2006a) *Annual Report on Macroeconomic Development in Ethiopia (EFY 1998 (2005/06)),* Addis Ababa: Macro Economy Policy & Management Department, Ministry of Finance and Economic Development

MOFED (2006b) *Ethiopia: Building on Progress. A Plan for Accelerated and Sustained Development to End Poverty (PASDEP) (2005/06-2009/10)* Addis Ababa: Ministry of Finance and Economic Development

Outes Leon, I. and A. Sanchez (2008) 'An Assessment of the Young Lives Sampling Approach in Ethiopia', Young Lives Technical Note 1, Oxford: Young Lives

Rosati, Furio C. and Rossi, Mariacristina (2003) *Children's Working Hours and School Enrolment: Evidence from Pakistan and Nicaragua,* CEIS Tor Vergata - Research Paper Series 25

Shapiro, D. and B.O. Tambashe (2001) 'Gender, Poverty, Family Structure, and Investments in Children's Education in Kinshasa, Congo', *Economics of Education Review* 20: 359-75

Tansel, A. (1997) 'School Attainment, Parental Education and Gender in Côte d'Ivoire and Ghana', *Economic Development and Cultural Change* 45(4): 825-56

Tietjen, K. (1998) *The Demand for Primary Education in Rural Ethiopia*, USAID, Health and Human Resource Analysis for Africa Technical Paper 87

Woldehanna, Tassew and Nicola Jones (2006) *How Pro-poor is Ethiopia's Education Expansion? A Benefit Incident Analysis of Education since 1995/96,* Working Paper 23, Oxford: Young Lives

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Workneh Abebe: Access and Quality of Primary Education: Evidence from Young Lives Qualitative Research in Three Rural Communities of Ethiopia

Lita Cameron: Water, Sanitation, and Child Health in Ethiopia

Stefan Dercon: The Impact of the 2002 Drought on Child Malnutrition and Health in Ethiopia

Rozana Himaz: The Impact of Parental Death on Child Schooling and Subjective Well-being Outcomes: Evidence from Ethiopia

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Virginia Morrow and Yisak Tafere: Children's Time-use in Ethiopia: Using the Diary Method

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Yisak Tafere: Community Understanding of Child Transitions in Ethiopia: Contexts and their Implications for Life-Course Poverty

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Tassew Woldehanna: Employment Generation Schemes and Children's Time Use between Work and Schooling in Ethiopia.

Martin Woodhead et al.: Towards Successful Early Transitions: Evidence from Ethiopia, India and Peru

Appendix A. Annex to the main survey results

Appendix A1. Wealth and asset indices

Definition of wealth index

An important variable in Young Lives data is the wealth index, which attempts to measure the relative poverty status of households. The wealth index was constructed based on the following variables:

1. the number of rooms per person as a continuous variable

2. a set of eleven consumer durable dummy variables, each equal to one if a household member owned a radio, fridge, bicycle, TV, motorbike/scooter, motor vehicle, mobile phone, landline phone, modern bed, table or chair, and sofa

3. a set of three dummy variables equal to one if the house had electricity, brick or plastered wall, or a sturdy roof (such as corrugated iron, tiles or concrete)

4. a dummy variable equal to one if the dwelling floor was made of a finished material (such as cement, tile or a laminated material)

5. a dummy variable equal to one if the household's source of drinking water was piped into the dwelling or yard

6. a dummy variable equal to one if the household had a flush toilet or pit latrine

7. a dummy variable equal to one if the household used electricity, gas or kerosene.

The wealth index captures variables that are broader than production assets, such as home ownership and the durability of that home, plus access to infrastructure such as water and sanitation. The construction of the wealth index is summarised in the following table 5.2.

Table A1.1 *Construction of the wealth index*

Components of index and score	Contributing variables
H = Housing quality (/4)	Rooms/person, wall, roof, floor durability.
CD = Consumer Durables (/11)	Radio, fridge, bicycle, TV, motorbike/scooter, motor vehicle, mobile phone, landline phone, modern bed, table or chair and sofa.
S = Services (/4)	Electricity, water, sanitation, cooking fuel.
Wealth Index = (H+CD+S)/3	Range = 0.0 – 1.0

Method used to construct asset index

The asset index is constructed in such a way that the possible values of the index are between 0 and 1, possibly inclusive. It is calculated so that the asset index for Round 1 is comparable to that for Round 2. The asset index is calculated as a simple average of the following 5 separate indices (each of which are between 0 and 1): livestock, land held, house owned, consumer durables owned and productive assets. These 5 indices are in turn calculated as:

1. Livestock owned: livestock are classified into four groups, with the weights (tropical livestock units, TLUs) attached to each group indicated in parentheses: draught animals (1); cattle (0.7); sheep, goat and pig (0.15); and rabbit and poultry (0.05). For each of these four groups of livestock, the maximum number of livestock owned by a household in each cohort (and for both rounds) is also taken into account in the computation.

2. Land held: this index is calculated as the ratio of land owned by the household to the maximum land size owned by a household in each cohort (and for both rounds).

3. House owned: This is a dummy variable which is 1 if the household owned the house it lived in and 0 if it did not.

4. Consumer durables: This is calculated the same way it is calculated for the computation of wealth index. Thus, dummy variables for ownership of eleven items were assigned and the simple average of this variable is calculated.

5. Productive assets: There were two productive assets on which data exists about ownership in the two rounds. These are pump and sewing machine. We used dummy variables to identify those who owned the item (with a value of 1) from those who do not (with a value of 0). We also used the average prices reported for these items in the surveys as weights to calculate a weighted average

Table A1.2. *Older cohort: Wealth and asset index by location in Rounds 1 and 2 (mean values)*

Location	Wealth index		Asset index	
	Round 1	Round 2	Round 1	Round 2
Urban	0.32	0.38	0.13	0.16
Rural	0.08	0.14	0.25	0.28
Total	**0.18**	**0.23**	**0.2**	**0.23**

Table A1.3. *Older cohort: Wealth and asset index by region in Rounds 1 and 2 (mean values)*

Region	Wealth index		Asset index	
	Round 1	Round 2	Round 1	Round 2
Addis Ababa	0.36	0.41	0.08	0.11
Amhara	0.11	0.18	0.2	0.22
Oromia	0.14	0.26	0.24	0.3
SNNP	0.16	0.23	0.22	0.24
Tigray	0.18	0.14	0.2	0.26
Total	**0.18**	**0.23**	**0.2**	**0.23**

Table A1.4. *Younger cohort: Wealth and asset index by location in Rounds 1 and 2 (mean values)*

	Wealth index		Asset index	
Location	**Round 1**	**Round 2**	**Round 1**	**Round 2**
Urban	0.33	0.37	0.12	0.16
Rural	0.08	0.13	0.21	0.26
Total	**0.18**	**0.23**	**0.18**	**0.22**

Table A1.5. *Younger cohort: Wealth and asset index by region in Rounds 1 and 2 (mean values)*

Region	Wealth index		Asset index	
	Round 1	**Round 2**	**Round 1**	**Round 2**
Addis Ababa	0.38	0.42	0.08	0.11
Amhara	0.11	0.17	0.18	0.22
Oromia	0.13	0.24	0.2	0.26
SNNP	0.16	0.22	0.21	0.23
Tigray	0.18	0.13	0.17	0.22
Total	**0.18**	**0.23**	**0.18**	**0.22**

Appendix A2. Poverty

Method of calculating poverty

The Foster, Greer, and Thorbecke, FGT, (1984) P_α class of poverty indices are used as an aggregate measure of poverty that are measured based on consumption expenditure. Consumption expenditure are often used as income dimensions of poverty (Ravallion 1994). Consumption rather than income is the best measure of human welfare because consumption better captures the long-term welfare of individual than current income. Consumption may better reflect households' ability to meet basic needs. While income is only one of the elements that allows consumption, consumption reflects the ability of household's access to credit and saving at times when individuals fails to raise sufficient income. Hence consumption better reflects actual standard of living (welfare). Moreover, measurement of consumption involves relatively smaller error than that of income. Especially in most developing countries, income reports of households are believed to be understated compared to consumption expenditure reporting. Income is erratic and seasonal and it may be very difficult for respondents to recall.

An FGT measure of poverty requires establishment of a definition of the poverty line below which an individual is considered poor. The nationally defined poverty line (that is used in this report) is set by MOFED. The cost of basic need method is used to set the poverty line. First, the food poverty line is defined by choosing a bundle of food typically consumed by the poor. The quantity of the bundle of food is determined in such a way to supply the predetermined level of minimum caloric requirement (2,200 kcal). This bundle is valued at local prices (or they are valued at national prices if the desire is to get consistent poverty lines across regions and groups). Then a specific allowance for the non-food goods consistent with the spending of the poor is added to the food poverty line. To account for the non-food expenditure, the food poverty line is divided by the food share of the poorest quartile or quintile. The poverty line was estimated to be 1,075 birr at 1996 constant prices (see Table A2.1).

Table A2.1. *Poverty line used in this report (at 1996 constant prices in birr)*

	Absolute Poverty line	Moderate poverty line	Extreme poverty line
Food poverty line in birr per adult per year	647.81	809.76	485.86
Kcal per adult per day	2200	2750	1650
Total poverty line in birr per adult per year	1075.03	1343.78	806.27

Source: MOFED (2002)

Since the poverty line is set for an adult individual, our consumption expenditure should be converted into per adult term. In order to arrive at consumption expenditure per adult, consumption expenditure was divided by the household size adjusted for adult equivalence that reflects the age and gender of individuals (Table A2.2).

Since the poverty line is set at 1996 constant prices, we have to deflate consumption expenditure to 1996. To do this we use consumer's price (CPI) index with year 2000 as 100% as published by the Central Statistical Agency (CSA). We used the CPI of the survey months (November 2006 to May 2007) to determine price deflators to 2000. This deflators are dis-aggregated by region (Table 2). In order to deflate consumption expenditure to 1996, we use the CPI index published by CSA in 2000 (see Table A2.3).

Table A2.2. *Nutritional (calorie) based equivalence scales*

Years of age	Men	Female
0-1	0.33	0.33
1-2	0.46	0.46
2-3	0.54	0.54
3-5	0.62	0.62
5-7	0.74	0.70
7-10	0.84	0.72
10-12	0.88	0.78
12-14	0.96	0.84
14-16	1.06	0.86
16-18	1.14	0.86
18-30	1.04	0.80
30-60	1.00	0.82
60 plus	0.84	0.74

Source: Calculated from the World Health Organization (19985) by Stefan Dercon.

Table A2.3. *Consumer price index for 2004/05 with year 2000=100 for the survey months (November 2006 to May 2007)*

Region	Region code	Average food consumer's price index (fcpi)	Average non-food consumer's price index (nfcpi)
Addis Ababa	11	1.686	1.329
Amhara	12	2.015	1.260
Oromia	13	2.052	1.334
SNNP	14	1.757	1.241
Tigray	15	1.617	1.340

To deflate consumption expenditure from 2000 to 1996, we use the price index developed by MOFED (2002). See detail in Table A1 in the appendix.

Table A2.4. *Price index for 2000 at 1996 constant rice*

	Average price index
Country level	
General	111.7
Food	**113.4**
Addis Ababa	
General	105.5
Food	105.6
Non-food*	105.6
Rural Areas	
General	110.5
Food	112.5
Non-food*	107.6
Other Urban	
General	116.7
Food	117.2
Non-food*	116.1

*Source (MOFED 2002, aggregated using weights given by the CSA (Price Department)

Applying this poverty line on consumption expenditure per adult household member measured at 1996 constant prices, we estimated FGT measures of poverty known as the head count, poverty gap and squared poverty gap ratios.

The head count ratio also known as the incidence of poverty is the share of the population whose income or consumption is below the poverty line, that is, the share of the population that cannot afford to buy a basic basket of goods. The poverty gap ratio (***depth of poverty)*** provides information on how far households are far from the poverty line. This captures the mean aggregate income or consumption shortfall relative to the poverty line across the whole population. It is obtained by adding up all the shortfalls of the poor (assuming that the non-poor have a shortfall of zero) and dividing the total by the population. In other words, it estimates the total resources needed to bring all the poor to the level of the poverty line (divided by the number of individuals in the population). Squared poverty gap ratio (***poverty severity)*** takes into account not only the distance separating the poor from the poverty line (the poverty gap), but also inequality among the poor. That is, a higher weight is placed on those households further away from the poverty line.

We have also estimated FGT measures of relative poverty with the poverty line set at two-third of the median and half of the median consumption expenditure per adult.

Results

For the younger cohort, the average per adult consumption expenditure at 1996 constant prices is 1045 birr and at current prices it is 1,853 birr. These figures are equivalent to US$118.5 at 1996 constant prices and US$210 at constant prices. The per capita consumption expenditure at current price is 1,485 birr (US$168) and 838.5 birr (US$95) at 1996 constant prices. For the older cohort the average per adult consumption expenditure at

1996 constant prices is 974.22 birr and at current prices it is 1,730.13 birr. These figures are equivalent to US$110.46 at 1996 constant prices and US$196.16 at constant prices. The per capita consumption expenditure at current price is 1,475 birr (US$167.23) and 831.59 birr (US$94.28) 1996 constant prices. In general, consumption expenditure is higher for urban areas that for rural areas for both food and non-food consumptions expenditure. In both data sets, the average annual income of Young Lives sites is lower than that of the 2004/05 national average income reported by the Ministry of Finance. The national annual average consumption expenditure at 1996 constant prices is 1,541 birr in per adult terms and 1,256 birr in per capita terms.

Table A2.5. *Average per capita and per adult consumption expenditure at1996 constant prices (younger cohort)*

Expenditure type	urban	rural	Total
Per adult total consumption expenditure	1499.32	743.57	1044.76
Per adult food consumption expenditure	708.75	488.33	576.17
Per adult non-food consumption expenditure	790.56	255.24	468.59
Per capita total consumption expenditure	1216.87	587.82	838.51
Per capita food consumption expenditure	575.72	385.61	461.37
Per capita non-food consumption expenditure	641.15	202.21	377.14

Table A2.6. *Average nominal per capita and per adult consumption expenditure (younger cohort)*

Expenditure type	urban	rural	Total
Per adult total consumption expenditure	2472.3	1442	1852.61
Per adult food consumption expenditure	1374.56	1057.13	1183.64
Per adult non-food consumption expenditure	1097.74	384.87	668.97
Per capita total consumption expenditure	2006.54	1139.63	1485.13
Per capita food consumption expenditure	1116.22	834.81	946.96
Per capita non-food consumption expenditure	890.32	304.83	538.17

Table A2.7. *Average per capita and per adult consumption expenditure at1996 constant prices (older cohort)*

Expenditure type	Urban	Rural	Total
Per adult total consumption expenditure	1323.03	737.7	974.22
Per adult food consumption expenditure	635.15	471.38	537.55
Per adult non-food consumption expenditure	687.88	266.32	436.67
Per capita total consumption expenditure	1135.12	625.76	831.59
Per capita food consumption expenditure	545.23	398.87	458.01
Per capita non-food consumption expenditure	589.9	226.89	373.57

Table A2.8. *Average nominal per capita and per adult consumption expenditure (older cohort)*

Expenditure type	Urban	Rural	Total
Per adult total consumption expenditure	2190.52	1417.95	1730.13
Per adult food consumption expenditure	1234.84	1016.36	1104.65
Per adult non-food consumption expenditure	955.68	401.58	625.48
Per capita total consumption expenditure	1878.82	1202.82	1475.98
Per capita food consumption expenditure	1059.24	860.69	940.92
Per capita non-food consumption expenditure	819.58	342.14	535.06

Table A2.9. *Total, food and non-food consumption expenditure per adult at 1996 constant prices (by region in birr) (younger cohort)*

Region	Young Lives sample site average			National average (reported my MOFED		
	Total	Food	Non-food	Total	Food	Non-food
Addis Ababa	1675.45	879.05	796.40	2565.90	848.47	1717.44
Amhara	739.03	457.95	281.08	1380.62	627.12	753.50
Oromia	1087.80	554.26	533.54	1509.95	729.69	780.26
SNNP	998.03	489.07	508.96	1561.96	735.25	826.71
Tigray	905.33	603.80	301.53	1641.40	716.21	925.19
Total	**1044.76**	**576.17**	**468.59**	**1540.61**	**710.6**	**830.02**

Table A2.10. *Total, food and non-food consumption expenditure per adult at 1996 constant prices (by region in birr): older cohort*

Region	Young Lives sample site average			National average (reported my MOFED		
	Total	Food	Non-food	Total	Food	Non-food
Addis Ababa	1475.59	797.64	677.96	2565.90	848.47	1717.44
Amhara	633.31	398.83	234.48	1380.62	627.12	753.50
Oromia	1108.58	540.44	568.14	1509.95	729.69	780.26
SNNP	954.89	459.62	495.26	1561.96	735.25	826.71
Tigray	832.94	576.77	256.18	1641.40	716.21	925.19
Total	**974.22**	**537.55**	**436.67**	**1540.61**	**710.6**	**830.02**

In Young Lives sample sites using the younger cohort data, the percentage of people who are below the nationally defined poverty line is 85 per cent in rural areas and 43.7 per cent in urban areas. In total 69 per cent of the population in Young Lives sample sites is absolutely poor, implying 69 per cent of the people are unable to consume 2,200 kilo calorie per day plus essential non-food items. Using the older cohort data, the overall percentage of people who are absolutely poor is 71 per cent with 84.6 per cent in rural areas and 51.3 per cent in urban areas. In both data sets rural poverty is higher than urban poverty. These figures are

much higher than the national average poverty figures reported by the MOFED (2006) which 38.7 per cent in total while it is 39.3 per cent for rural areas and 35.1 per cent for urban areas. This is not surprising given Young Lives chose sites which are food deficit. When we analysed the poverty figures categorised by regional state, using the younger cohort data set, Young Lives sample sites located in Amhara scored the highest poverty head count ratio followed by (in ascending order of poverty head count index) Tigray, SNNP , Oromia and Addis Ababa.

Table A2.11. *FGT measures of poverty estimates by rural urban (younger cohort data set)*

Poverty line	Residence type	Headcount ratio %	Poverty gap ratio %	Index FGT(2.0) *100
absolute (nationally defined)	Rural	85.043	38.058	20.317
	Urban	43.701	15.67	7.442
	Total	**68.567**	**29.136**	**15.186**
1/2 of the median	Rural	7.043	1.249	0.386
	Urban	16.273	3.997	1.406
	Total	**11.036**	**2.067**	**0.617**

When we use the relative poverty line (50 per cent of the median consumption per adult) which is 317.5 birr for rural, 601.40 birr for urban areas and 384.86 birr for total, the relative poverty is found to be 11 per cent using the younger cohort data set. However, unlike the absolute poverty, the relative poverty is higher for urban than rural sites. This indicates inequality is much higher in urban areas which is consistent with poverty report prepared by the Ministry of Finance.

Using the older cohort data sets the absolute poverty is 71 per cent while the relative poverty is 10 per cent. As with the younger cohort data set, urban relative poverty is higher than rural.

Table A2.12. *FGT measures of poverty estimates by region compared to national level figures (younger cohort data set)*

Region	Young Lives sample site average			National average		
	Headcount ratio %	Poverty gap ratio %	Index FGT(2.0) *100	Headcount ratio %	Poverty gap ratio %	Index FGT(2.0) *100
Addis Ababa	29.6	8.1	3.1	32.5	6.3	1.9
Amhara	84.9	43.2	25.2	40.1	10.3	3.6
Oromia	64.7	24.4	11.4	37.0	7.6	2.4
SNNP	74.9	34	18.5	38.2	7.2	2.2
Tigray	76.6	29	13.7	48.5	10.0	3.1
Total	**68.6**	**29.1**	**15.2**	**38.7**	**8.3**	**2.7**

Absolute poverty line is 1,075 birr at 1996 constant price.

Table A2.13. *FGT measures of poverty estimates by residence for older cohort*

Poverty line	Residence type	Headcount ratio % (FGT(0)	Poverty gap ratio % (FGT(1)	Index FGT(2.0) *100
Absolute (nationally defined)	Rural	84.589	37.233	19.855
	Urban	51.263	17.298	7.876
	Total	**71.122**	**29.178**	**15.014**
1/2 (Median)	Rural	8.048	1.51	0.432
	Urban	11.869	2.535	0.762
	Total	**9.898**	**2.17**	**0.677**

Absolute poverty line is 1,075 birr at 1996 constant price.

Appendix A3. Anthropometric measures of nutritional achievement

A. Younger cohort: the 1-year-old (Round 1) and 5-year-old (Round 2) children

Weight-for-height (W/H). W/H (Wasting) measures body weight relative to height, and has the advantage of not requiring age data. Weight-for height is normally used as an indicator of current nutritional status, and can be useful for screening children at risk and for measuring short-term changes in nutritional status. Low W/H relative to a child of the same sex and age in a reference population is referred to as 'thinness'. Extreme cases of low W/H are commonly referred to as '*wasting;.* Wasting may be the consequence of starvation or severe disease (in particular diarrhoea), but it can also be due to chronic conditions. It is important to note that a lack of evidence of a wasting in a population does not imply the absence of current nutritional problems such as low height-for-age.

Height-for-age (H/A). H/A (stunting) reflects cumulative linear growth. H/A deficits indicate past or chronic inadequacies in nutrition and/or chronic or frequent illness, but cannot measure short-term changes in malnutrition. Low H/A relative to a child of the same sex and age in the reference population is referred to as 'shortness;. Extreme cases of low H/A, where shortness is interpreted as pathological, is referred to as 'stunting;. H/A is primarily used as a population indicator rather than for individual growth monitoring.

Weight-for-age (W/A). W/A reflects body mass relative to age. W/A is, in effect, a composite measure of height-for-age and weight-for-height, making interpretation difficult. Low W/A relative to a child of the same sex and age in the reference population is referred to as 'lightness' while 'underweight' is commonly used to refer to severe or pathological deficits in W/A. W/A is commonly used for monitoring growth and to assess changes in the magnitude of malnutrition over time. However, W/A confounds the effects of short- and long-term health and nutrition problems.

The construction of anthropometric indicators is based on comparisons with a "healthy" reference population. The international reference standard that is most commonly used (and recommended by the WHO) is based on data on the weights and heights of a statistically valid population (US National Center for Health Statistics (NCHS)) of health infants and children in the US.[3] The validity of this reference standard stems from the empirical observation that well-nourished and healthy children will have a very similar distribution of height and weight to the US reference population, regardless of their ethnic background or where they live. In other words, although there are some differences in growth patterns across ethnic groups, the largest part of worldwide variation in anthropometric indicators can be attributed to differences in socioeconomic factors.

Notwithstanding this empirical regularity, there is a long-standing debate about the appropriateness of the US reference standard for children in developing countries, in particular concerning the extent to which growth paths will depend on feeding practices. To accommodate such criticism, the WHO has recently developed a table (WHO 2007) to measure nutritional achievements based on USA, Ghana and other countries, This report uses the new table developed by WHO in 2007. These three measures are nutritional achievements mainly used to measure nutritional achievement of children below the age of 5. We categorised each of these three measures into three based on the z-score values. z-score less than -1 (to reflect wasted, stunted or underweight) and z-score less than -2 (to reflect extremely wasted, stunted or underweight) and z-score less than -2 (to reflect that the child is normal – not wasted, stunted or underweight)

B. Older cohort: the 8-year-old (Round 1) and 12-year-old (Round 2) children

Body mass index (BMI). BMI is a measure to define overweight and thinness. BMI is defined as the weight in kilos divided by the square of height in metres. In developing countries, the BMI is primarily used with age-independent cutoffs to identify chronic energy deficiencies (or obesity) in adults. Although there is some scope for using BMI for adolescents, the index varies with age for children and teens, and must therefore be interpreted in relation to BMI-for-age reference charts. Based on the 2007 World Health Organization's reference (WHO 2007), we categorised BMI for age into four categories: obese, overweight, possible risk of overweight wasted and severely wasted. The definition of these categories is given in Table A3.1.

Table A3.1 *Categorisation of height-for-age, weight for age, weight for height and BMI for age*

Z-score	Length/height-for-age (Stunting)	Weight-for-age (Underweight)	Weight-for-length/height (wasting)	BMI-for-age
Above 3	See note 1	See note 2	Obese	Obese
Above 2			Overweight	Overweight
Above 1			of overweight	of overweight
			(See note 3)	(See note 3)
0 (median)				
Below -1				
Below −2	Stunted (See note 4)	Underweight	Wasted	Wasted
Below −3	Severely stunted (See note 4)	Severely underweight	Severely wasted	Severely wasted

1. A child in this range is very tall. Tallness is rarely a problem, unless it is so excessive that it may indicate an endocrine disorder such as a growth-hormone-producing tumour. Refer a child in this range for assessment if you suspect an endocrine disorder (e.g. if parents of normal height have a child who is excessively tall for his or her age).

2. A child whose weight-for-age falls in this range may have a growth problem, but this is better assessed from weight-for-length/height or BMI-for-age.

3. A plotted point above 1 shows possible risk. A trend towards the 2 z-score line shows definite risk.

4 It is possible for a stunted or severely stunted child to become overweight.

Appendix B. Annex to the introductory sections

Appendix B1. Description of field work

Table B1.1   *Selective Comparison of Round 2 with Round 1 Survey, Young Lives*

Topic	Round 2 Coverage	Round 1 Coverage
The livelihoods data	Covers activities of all members of the household	Covers only the main caregiver; simple yes-no records were kept
Social capital data	Covers all household members' social capital	Covers only the main caregiver
Well-being child	Covers child subjective well-being along with a ladder indicator of the best/worst life, likes and dislikes, quality of life (subjective)	Simple question of whether child is happy
Literacy and numeracy (Peabody Picture Vocabulary Test – PPVT)	Covers a wide range of skills PPVT for the younger and older cohort index children	Only very simple literacy and numeracy tests
Education (Formal)	Recorded in detail for each member of the household	Is recorded in years and in local levels of achievement; not converted to nor comparable with international education measurement scales
Anthropometry	The height and weight of each child and mother measurements are recorded	Height and weight measurements are recorded for the child only

Table B1.2   *Summary of field worker training*

Group number	Region	Number of enumerators trained	Place of training	Language of training
I	Tigray	24	Mekelle	Tigrigna
II	SNNP	24 (+1 in the second phase)	Awassa	Amharic
	Amhara	24 (+ 4 in the second phase)	Addis Ababa	Amharic
III	Addis Ababa	24	Addis Ababa	Amharic
IV	Oromia	24 (+2 in the second phase)	Addis Ababa	Oromifa
	Total	127		

Appendix B2. Review of national statistics

Table B2.1 *Head count index over time in Ethiopia (1995/96, 1999/00 and 2004/05)*

	1995/1996			1999/2000			2004/05		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Tigray	0.579	0.457	0.561	0.616	0.607	0.614	0.510	0.367	0.485
Amhara	0.567	0.373	0.543	0.429	0.311	0.418	0.404	0.378	0.401
Oromiya	0.347	0.276	0.34	0.404	0.359	0.399	0.372	0.346	0.370
SNNP	0.565	0.459	0.558	0.517	0.402	0.509	0.382	0.383	0.382
Addis Ababa	0.404	0.3	0.302	0.271	0.362	0.361	0.299	0.326	0.325
National	0.475	0.332	0.455	0.454	0.369	0.442	0.393	0.351	0.387

Table B2.2 *Consumption and Poverty (US$) Consumption in 1994 prices*

	Mean Consumption per capita	Median Consumption per capita	Head count poverty	Poverty Gap	Squared Poverty Gap
1994	71.1	51.6	0.48	0.21	0.12
1995	62.0	45.3	0.55	0.24	0.14
1997	90.9	70.7	0.33	0.12	0.06
1999	88.3	64.5	0.36	0.13	0.06
2004	91.5	65.1	0.36	0.13	0.07

Source: Dercon, Hoddinott and Woldehanna 2005 calculated from the Ethiopian Rural Household Survey

Table B2.3 *Trend in education coverage in Ethiopia (1996–2004)*

Year	Literacy Rate	Gross Enrolment Rate		Net Enrolment Rate	
		Primary	Secondary	Primary	Secondary
1996	25.8	37.4	13	21	8.8
1998	26.6	52.3	15.6	28.7	10.2
2000	29.2	51.1	17.1	33.8	11.6
2004	37.9	74.2	23.1	37.8	14.5

Source: CSA: WMS 2004

Table B2.4 *Trends of Nutrition in Ethiopia (1996 – 2004)*

Indicator	1996	1998	2000	2004
Stunting (%)	66	55	57	47
Wasting (%)	7	10	10	8
Underweight (%)	45	45	45	37

Source: MOFED 2006b

Appendix B3. Regional level descriptive results

Table B3.1 *Wealth and asset index by region of residence*

Region	Wealth index			Asset index		
	Round 1	Round 2	% change	Round 1	Round 2	% change
Younger cohort						
Addis Ababa	0.38	0.42	9.42***	0.08	0.11	43.36***
Amhara	0.11	0.17	52.46***	0.18	0.22	21.06***
Oromia	0.13	0.24	87.36***	0.2	0.26	27.94***
SNNP	0.16	0.22	38.06***	0.21	0.23	11.12***
Tigray	0.18	0.13	-25.54***	0.17	0.22	29.90***
Older cohort						
Addis Ababa	0.36	0.41	14.53***	0.08	0.11	32.12***
Amhara	0.11	0.18	57.80***	0.2	0.22	9.23*
Oromia	0.14	0.26	86.61***	0.24	0.3	21.90***
SNNP	0.16	0.23	47.30***	0.22	0.24	5.3
Tigray	0.18	0.14	-22.36***	0.2	0.26	30.43***

Table B3.2 *Percentage of children with wealth and asset index of below 0.2 by region (younger cohort)*

	Wealth index<0.2			Asset index<0.2		
	Round 1	Round 2	% change	Round 1	Round 2	% change
Addis Ababa	4.64	0.36	-92.31***	85	82.5	-2.94
Amhara	80.68	65.27	-19.09***	26.63	20.1	-24.51**
Oromia	75.84	41.04	-45.89***	20.78	14.03	-32.50**
SNNP	68.48	58.87	-14.02***	17.95	18.58	3.49
Tigray	68.83	72.99	6.04	34.81	17.92	-48.51***

*Significant 10, ** significant at 5%, and *** significant at 1%

Table B3.3 *FGT measures of poverty estimates by region compared to national level figures (younger cohort)*

Region	Young Lives sample site average			National average		
	Headcount ratio %	Poverty gap ratio %	Index FGT(2.0) *100	Headcount ratio %	Poverty gap ratio %	Index FGT(2.0) *100
Addis Ababa	29.6	8.1	3.1	32.5	6.3	1.9
Amhara	84.9	43.2	25.2	40.1	10.3	3.6
Oromia	64.7	24.4	11.4	37.0	7.6	2.4
SNNP	74.9	34	18.5	38.2	7.2	2.2
Tigray	76.6	29	13.7	48.5	10.0	3.1
Total	68.6	29.1	15.2	38.7	8.3	2.7

Absolute poverty line is 1075 birr at 1996 constant price

Table B3.4 *Subjective well-being and paid child labour (older cohort) in per cent*

	Subjective well-being (perception of fairness)			Paid child labour		
Region	R1	R2	% change	R1	R2	% change
Addis Ababa	0.13	0.08	-40.6	0.07	0.03	-60.00*
Amhara	0.15	0.05	-68.41***	0.09	0.06	-35.29
Oromia	0.07	0.05	-36.01	0.11	0.07	-38.41
SNNP	0.06	0.08	35.93	0.15	0.05	-64.43***
Tigray	0.11	0.01	-86.97***	0.04	0.01	-62.69

*R1=Round 1; R2=round 2; % change= ((R1-R1)/R1))*100; *Significant 10, ** significant at 5%, and *** significant at 1%*

Table B3.5 *Distribution of measures of malnutrition by region (younger cohort)*

		Addis Ababa	Amhara	Oromia	SNNP	Tigray
Weight for height z-score less than -2	Round 1	9.75	17.24	26.43	27.81	18.06
	Round 2	11.46	14.73	5.52	7.25	14.94
	% change	17.55	-14.57	-79.13***	-73.92***	-17.30
Weight for height z-score less than -3	Round 1	1.81	5.86	8.72	16.56	5.93
	Round 2	2.08	2.33	0.00	1.55	6.49
	% change	15.42	-60.33*	-100***	-90.61***	9.50
Weight for age z-score less than -2	Round 1	13.72	37.80	41.58	37.58	31.27
	Round 2	12.50	31.07	20.89	24.06	27.27
	% change	-8.88	-17.80***	-49.76***	-35.98***	-12.77
Weight for age z-score less than -3	Round 1	4.33	14.78	20.11	17.20	12.67
	Round 2	1.79	5.48	3.13	5.23	3.64
	% change	-58.78*	-62.89***	-84.42***	-69.59***	-71.30***
Height-for-age z-score less than -2	Round 1	21.94	47.12	38.99	31.14	32.88
	Round 2	21.07	31.85	42.30	32.22	26.23
	% change	-3.97	-32.40***	8.48	3.45	-20.22**
Height-for-age z-score less than -3	Round 1	8.63	18.36	18.30	17.37	12.40
	Round 2	2.86	4.70	12.53	12.55	5.97
	% change	-66.90***	-74.40***	-31.52**	-27.75**	-51.82***

Table B3.6 *Distribution of access to electricity and availability of safe toilet of households (young cohort)*

	Access to electricity			Access to safe toilet		
	Round 1	Round 2	% change	Round 1	Round 2	% change
Addis Ababa	99.00	99.64	0.65	87.67	90.00	2.66
Amhara	20.70	21.41	3.44	19.70	46.48	135.91***
Oromia	21.30	47.01	120.68***	27.32	60.00	119.63***
SNNP	30.80	32.15	4.38	34.80	72.03	106.97***
Tigray	22.61	30.13	33.24**	33.33	21.82	-34.55***

Table B3.7 *Distribution and changes of selected malnutrition indicators for the old cohort children by Region*

	BMI-for-age z-score			Wasted children (%)			Severely wasted children (%)		
	Round 1	Round 2	% change	Round 1	Round 2	% change	Round 1	Round 2	% change
Addis Ababa	-1.00	-1.32	32.75**	18.44	26.06	41.31	7.09	7.04	-0.70
Amhara	-1.40	-2.09	49.64***	23.53	58.33	147.92***	3.27	20.31	521.56***
Oromia	-1.30	-1.37	5.60	23.04	21.61	-6.20	4.19	3.52	-16.02
SNNP	-2.67	-1.42	-46.84***	42.15	27.46	-34.85***	33.47	6.97	-79.18***
Tigray	-1.36	-1.95	43.57***	25.27	46.77	85.07***	5.91	17.41	194.44***

Table B3.8 *Older cohort: Enrolment rate and highest grade completed (years of schooling) by region*

	% of children enrolled			Highest grade competed		
	R1	R2	% change	R1	R2	change
Addis Ababa	90.9	99.3	9.23	1.0	5.3	4.28
Amhara	70.8	93.2	31.62	0.7	4.2	3.51
Oromia	61.5	88.5	43.90	0.6	3.6	2.94
SNNP	62.7	92.2	47.06	0.5	3.4	2.89
Tigray	53.2	95.5	79.44	0.5	4.0	3.58
Total	66.2	93.4	40.99	0.6	4.0	3.37

Young Lives is an innovative long-term international research project investigating the changing nature of childhood poverty.

The project seeks to:

- improve understanding of the causes and consequences of childhood poverty and to examine how policies affect children's well-being
- inform the development and implementation of future policies and practices that will reduce childhood poverty.

Young Lives is tracking the development of 12,000 children in Ethiopia, India (Andhra Pradesh), Peru and Vietnam through quantitative and qualitative research over a 15-year period.

Young Lives Partners

Young Lives is coordinated by a small team based at the University of Oxford, led by Jo Boyden.

Ethiopian Development Research Institute, Ethiopia

Centre for Economic and Social Sciences, Andhra Pradesh, India

Save the Children – Bal Raksha Bharat, India

Sri Padmavathi Mahila Visvavidyalayam (Women's University), Andhra Pradesh, India

Grupo de Análisis para el Desarollo (Group for the Analysis of Development), Peru

Instituto de Investigación Nutricional (Institute for Nutritional Research), Peru

Centre for Analysis and Forecast, Vietnamese Academy of Social Sciences, Vietnam

General Statistics Office, Vietnam

The Institute of Education, University of London, UK

Child and Youth Studies Group (CREET), The Open University, UK

Department of International Development University of Oxford, UK

Statistical Services Centre, University of Reading, UK

Save the Children UK (staff from the Rights and Economic Justice team in London as well as staff in India, Ethiopia and Vietnam).

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