



Opportunities, Challenges and Strategies in Generating and Governing Longitudinal Data Learning from Two Decades of Research at Young Lives

Jo Boyden and Deborah Walnicki

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About Young Lives

Over the past 19 years (2001-2020), Young Lives has been studying the development and well-being of 12,000 children growing up in Ethiopia, India (in the United Andhra Pradesh, which was bifurcated into the states of Andhra Pradesh and Telangana in 2014), Peru and Vietnam through mixed-methods longitudinal research. The research aims to identify the determinants and outcomes of child poverty and explain how policies and programmes can best break inter-generational poverty cycles.

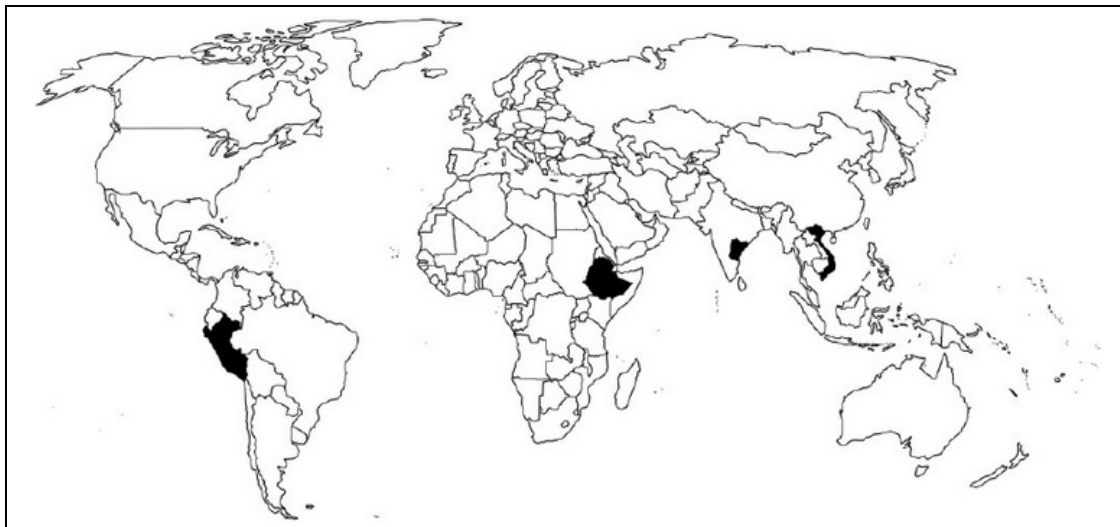
The sample consists of two age cohorts: a Younger Cohort born in 2001-2, being studied from infancy until early adulthood, and an Older Cohort born in 1994-5, studied from age 8. Data collection has so far comprised five rounds of individual and household [survey questionnaires](#) administered along with community questionnaires every three to four years to synchronise the ages at which the two cohorts are interviewed. At the fifth survey round the Older Cohort was aged 22 and the Younger Cohort was 15. A sixth survey round is planned for 2021 and a telephone survey is being conducted in 2020 during the COVID-19 pandemic. The surveys are complemented by four waves of nested longitudinal [qualitative research](#) in each country (five in Ethiopia) with a sub-set of around 50 boys and girls from the core sample, and a series of qualitative sub-studies covering specific topics, for example children's work and their experiences of violence.

In 2010, Young Lives also began conducting school-based surveys at both primary and secondary school level with the intention of deepening understanding of children's learning and school efficacy across a range of contexts and education systems. This involved around 30,000 school pupils, 4,377 of whom were from the Younger Cohort, and selected teachers. The school surveys make it possible in some contexts and rounds to link child and household data from the regular survey rounds with school data and, for boys and girls sampled in both surveys, to map their learning against their background characteristics and the features of the schools they attend.

The 19-year study span has so far given researchers unique insights into the determinants, pathways and outcomes of child poverty and inequality in different contexts, over time, and also allowed periods during the life course of heightened susceptibility to risk to be identified. Young Lives' findings highlight the association with household geographic location and socio-economic conditions, gender and other social characteristics, as well as external economic and environmental factors. The findings stretch across three generations of caregivers, young people and their offspring, allowing exploration of the dynamic intergenerational processes involved in the transmission of poverty. Collecting longitudinal survey and qualitative data across four countries simultaneously makes it possible to highlight commonalities and differences between countries. Where findings are consistent across the four countries, this increases the generalisability of conclusions to other countries and contexts. Where they differ, this prompts reflection and further analysis in countries that are lagging behind to understand why. Young Lives can also draw cross-cohort comparisons of the pathways and outcomes of two groups of young people born seven years apart.

Introduction

Figure 1: Map of the world with Young Lives study countries marked in black (Ethiopia, India (Andhra Pradesh and Telangana), Viet Nam, Peru)



Source: (Barnett et al. 2013)

Young Lives is the only study in the world that conducts mixed-methods longitudinal research simultaneously in four countries with comparable instruments and timing. Data governance is central to the study's successful execution, requiring strong coordination and management centrally, close collaboration with study-country institutions, and well-elaborated policies and procedures ensuring the highest possible standards in all aspects and at all stages of the research. Previously run by a UK-based academic consortium, Young Lives moved to the University of Oxford in 2005. Since then, it has been managed through a partnership structure, with the principles and policies concerning the study's data underpinned by a collaborative framework agreement that applies to all Young Lives staff at Oxford and in study-country partner institutions.¹

For Young Lives, data governance is not just about study and instrument design, data generation, management and analysis. Promoting the application of the data in policy and practice, and making selected data available to other researchers through public archiving, are crucial. In keeping with this broad agenda, the study's data governance policies encompass two key priorities: maintaining data quality research rigor, and maximising data use by researchers and policy stakeholders globally. The first priority centres on accountability to research participants and maintaining effective standards and procedures in research design, data collection and data management; the second on data democracy, data discoverability and development of capacity in data analysis.²

1 The University of Oxford is the custodian of personal data. The Agreement defines how the various organizations connected with the study relate to the data, together with their associated rights and responsibilities and covers all research and data tasks and all stages of the research.

2 Information on the Young Lives capacity development strategy will be provided in a separate report on research leadership, governance and impact.

Young Lives has published many technical reports and papers explaining the study's research design and methodology. This report complements these publications by drawing on the experiences and insights of Young Lives staff, past and present, to reflect on the data challenges and opportunities encountered during the research, the strategies used to address these challenges and the lessons learnt. It is part of a programme of methodological and operational learning funded by the Economic and Social Research Council (ESRC) that seeks to strengthen capacity and effectiveness in longitudinal research in low- and middle-income countries (LMICs) and contribute to a growing community of practice in this field. The report aims to inform the work of researchers and data and programme managers who are either planning or engaged in longitudinal cohort or panel studies across LMICs. It is the first of four companion pieces, each of which focuses on a critical area of methodological reflection. The three remaining reports, and other outputs, cover: research ethics; research leadership, governance and impact; and research design and methodology.

The first section summarises the Young Lives research design, while Sections 2 and 3 reflect on some of the implications of this design for the choice of instruments, data gathering and data management. Sections 4 and 5 address technological developments and operational considerations in survey administration and data management, while Section 6 focuses on data democratisation and discoverability. The first three sections are the most relevant for researchers and the latter three for data managers. Sections 3 and 4 are the most relevant sections for programme managers. The report touches on issues of accountability to research participants and standards and procedures in research throughout, and concludes by reflecting on the key methodological lessons from the study and implications for future research.

1. The Young Lives research design



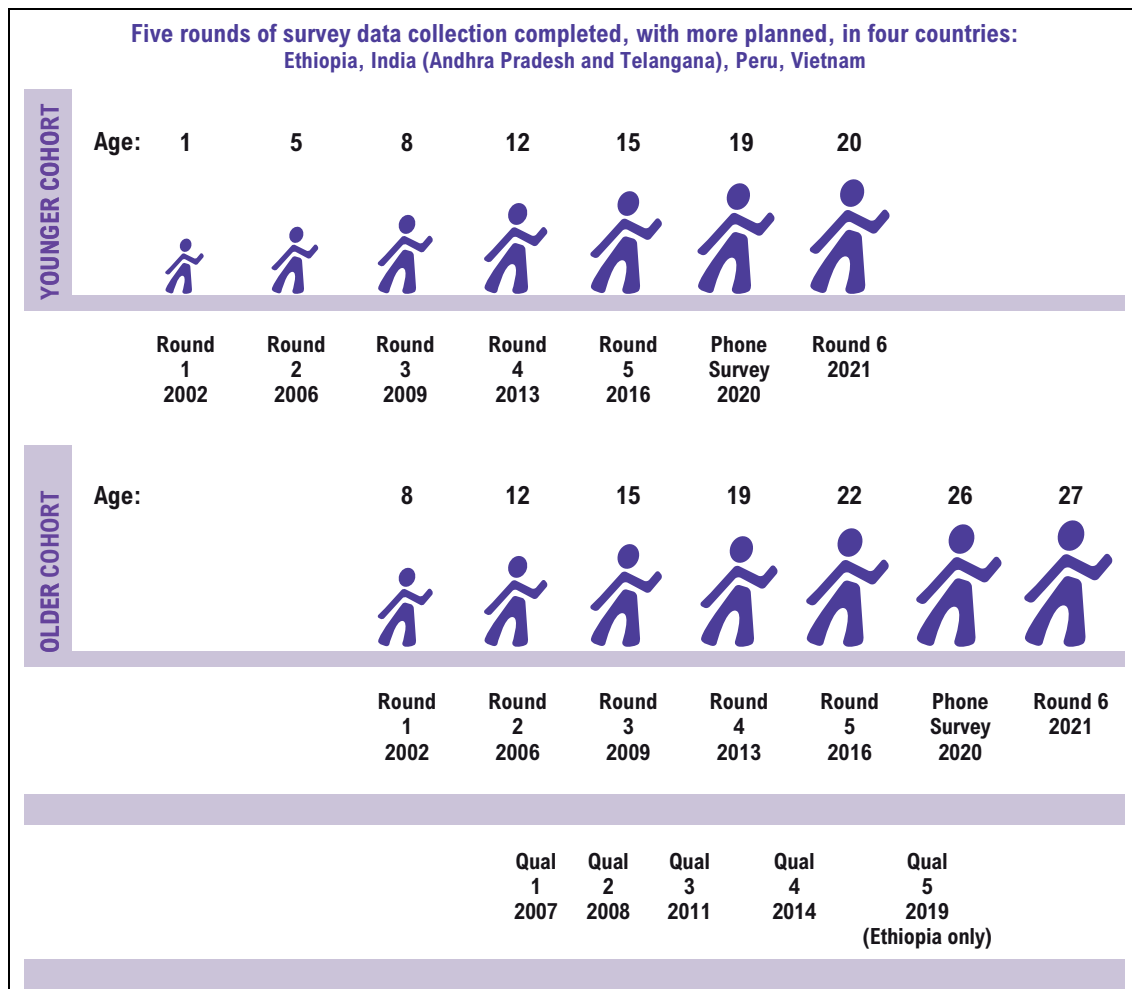
Enumerator weighs a Young Lives' child in Peru.

Young Lives employs a prospective, multidisciplinary, mixed-methods design featuring longitudinal cohort research, comparative research across four countries, pro-poor sampling, and a multidimensional view of human development. It is a hybrid model in which longitudinal and cross-sectional research components based on diverse units of observation and analysis at individual, household, community and school levels work together iteratively to enable triangulation of findings and allow topics arising in one component to be further probed in the others.

Young Lives draws on a bio-ecological life-course framework in researching the development, well-being and perspectives of a sample of children living in varied locations across four countries that represent very different sociocultural and political-economic conditions (Boyden et al. 2019).³ The study was created as a household panel of children and caregivers. The prospective, mixed-methods longitudinal design makes it possible to record continuity and change over time in children's circumstances and outcomes from both an emic and etic perspective; with the qualitative research providing an opportunity for research participants to share their understandings and views, and the surveys developed from the insights and viewpoint of the observer or researcher. The power of the analysis derives from the combination of descriptive

³ Ecological systems theory was developed by Urie Bronfenbrenner in the 1970s and has been much refined since (e.g. Bronfenbrenner and Morris 2006). In it, human development is understood as a dynamic process that involves progressively more complex reciprocal interaction between an individual and the interconnected environmental contexts, or ecological systems, in which that individual resides. These ecological systems operate at multiple levels in society, from the most proximal micro system, to the more distal macro system, with the 'chronosystem' comprising the environmental events and transitions that occur across the life course. These systems are changeable and have varying impact on individual development and functioning, whether direct, as with the family micro system, which is particularly influential in the early years of life, or indirect, as when their impact is mediated through their influence on someone or something that is close to that individual.

and inferential statistics derived from multiple respondent groups with qualitative data that provide in-depth understanding of the complexities and nuances underpinning the figures (Barnett et al. 2013). The main design features are outlined below.



Longitudinal cohort research. Young Lives is a dual-cohort study designed to collect information from the same sample of children, divided into two age groups, at regular intervals. Intervals between survey rounds are set at three to four years to minimise the burden on respondents and maximise comparability across the two cohorts, with the cohorts being surveyed at the same ages, though at different points in historical time. This design feature makes it possible to compare how children in the sample have fared at the same ages, given differences in the environment in which they live.

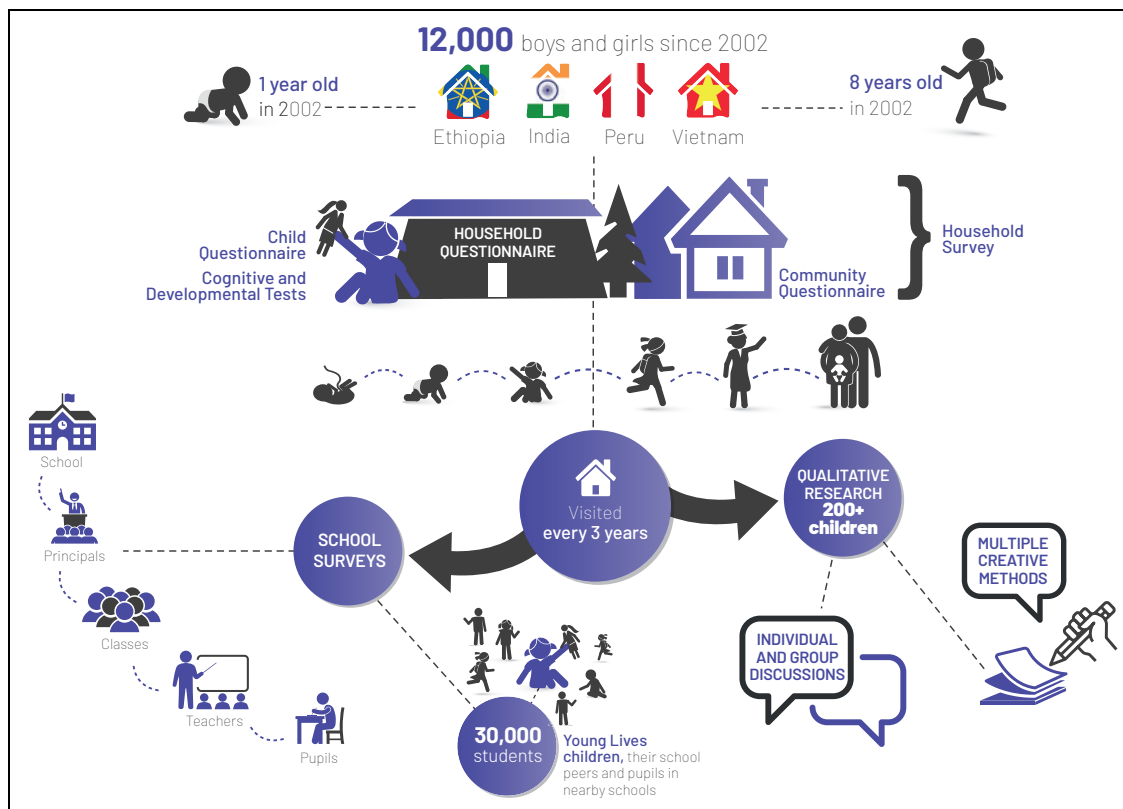
Comparative research. Young Lives was designed to monitor the effectiveness of the [Millennium Development Goals](#) (2000-2015) in reducing childhood poverty in varied political-economic and sociocultural settings. This led to the selection of four study countries, one from each of the main regions in the global South. Countries were chosen to allow cross-country comparison in children's outcomes across a range of criteria, including levels of economic development, different political formations and degrees of exposure to life-threatening conditions such as extreme weather events and conflict. Data are collected in the same year in all four countries, adjusting for seasonal differences and school schedules, whenever possible using the same questions, instruments and measures.

Sample frame. In each country, sites in poorer regions were over-sampled, with 20 sites per country. Children of the correct ages were randomly selected at the site level. The sample is relatively large and reflects the diversity of the national population in terms of ethnicity, language and other social markers. Although the sample is not nationally representative in any of the countries, this characteristic enhances the likelihood of findings being generalisable at national level. The inclusion of four countries increases the external validity of Young Lives' research, in other words the generalisability of findings to other populations and country contexts.

Multidimensional conceptual framework. Young Lives acknowledges the vital interactions between children's circumstances and experiences, and their development and well-being. It also recognises the synergies between different domains of child development. As such, Young Lives is designed as a general-purpose study. In light of the multidimensional framework, the selection of research tools has involved reviewing theoretical paradigms, constructs and measures in several disciplines, including developmental and educational psychology, neuroscience, anthropology and economics. This has been a lengthy and time-consuming process. It is also ongoing, in that the study needs to keep up with developments in thinking across different disciplines, and incorporate new instruments and measures as the children mature and transition out of childhood and new outcomes become relevant. Based on a first review of the literature, six broad child outcome areas were initially identified as key – physical health, nutrition, mental health, developmental stage for age, cognitive skills (literacy and numeracy), and children's perceptions of their well-being.⁴ Similarly, the use of a multidimensional definition of poverty necessitated tracking a wide range of explanatory variables at caregiver, household, community and school levels. The scope of the instruments has expanded considerably since the first survey round. The breadth of the research reflects Young Lives' commitment to producing data as a global public good, as the team asks questions beyond their own research agenda to allow other researchers to follow as many lines of enquiry as possible. The qualitative and school-based research has further expanded the scope, the former in part because respondents themselves help shape the topics covered.

Mixed-methods and multiple units of observation and analysis. Reflecting the multidimensional conceptual framework, data are gathered and organised according to four key research components, each operating to a distinct design, with distinct research methods, units of observation and analysis. The resulting research model is a hybrid design combining longitudinal and cross-sectional multi-methods data:

4 See Attawell (2004) for an account of the initial steps taken by Young Lives to ensure that the research design, methodology and tools were suited to a multi-purpose study of children's development. The paper offers some practical guidance for researchers.

Figure 2: *Young Lives; Research Components*

- ***Household-based surveys*** introduced in 2001 form the study's core. These involve household questionnaires (administered to the caregiver at the beginning and increasingly to the child respondents as they grow up); child questionnaire and child-development measures administered to the children; and community surveys, administered to a range of community representatives. Once Older Cohort respondents reached 15 years old (in Round 3) they answered more sensitive questions, for example those concerning risk behaviours, through a self-administered questionnaire (Favara and Sanchez 2017).⁵ Many of the young respondents in the household sample have become parents, so the study now gathers limited information on their children, providing an opportunity to explore intergenerational forces and outcomes. Similarly, data on selected siblings of the Younger Cohort make it possible to examine intra-household dynamics (Porter et. Al., 2012). A telephone survey with the core sample is being undertaken in 2020 in response to the COVID-19 pandemic.
- ***Longitudinal qualitative research***, introduced in 2006, is undertaken with a nested sub-sample of around 50 children per country drawn from the main household sample, together with selected peers, caregivers and community members (Crivello, Morrow and Wilson 2013). It documents respondents' detailed narrative accounts, reflecting on their past and present lives and their aspirations and goals for the future, as well as their perspectives on what has shaped their pathways through childhood, adolescence and beyond. The research uses a mix of audio-recorded interviews, focus group discussions and group activities, videos, hand-drawn community maps, daily diaries, and life-course drawings.⁶ This component is conducted in three to five sites in each country, chosen to capture variations in location

5 The self-administered questionnaire was only administered in Peru in subsequent rounds.

6 See Johnston (2008) for a discussion of some of the considerations and challenges Young Lives took into account in developing appropriate methods for use with children in the longitudinal qualitative research.

(rural/urban), social status (e.g. minority and majority ethnic groups), and social and economic circumstances (Crivello, Morrow and Wilson 2013). So far it has comprised four waves of research (five in Ethiopia), whenever possible using the same instruments at each wave.

- **School-based surveys**, introduced in 2010, examine how schools were shaping children's skills and learning outcomes.⁷ A 'value-added' approach examining and comparing the effectiveness of different school systems was adopted in later waves in all countries other than Peru.⁸ Data are collected at the school, principal, class, teacher and pupil levels, the latter including components of cognitive development (language and mathematical skills) as well as 'transferable skills' such as problem solving and critical thinking, measured in relation to a specified grade – usually that in which the majority of the Younger Cohort are enrolled (Iyer and Azabuikie 2017). Sampling procedures vary by country, but each survey visits either the schools attended by a sub-sample of children from the household sample, or a sample of the schools located within the geographical boundaries of the sentinel site. Sentinel surveillance systems collect data from a limited number of reporting sites. The extent to which findings can be generalised to a population is an important consideration. See Young Lives (2017).
- **Qualitative sub-studies** are administered with sub-samples of children selected from the core household sample. These permit detailed investigation of questions arising from analysis of the survey data or that address policy priorities at the national and international levels. A range of topics have been explored, such as children's experiences of violence (Chuta et al. 2019; Guerrero and Rojas 2016; Morrow and Singh 2016; Pells and Morrow 2018; Vu 2016), paid work (Pankhurst, Crivello, and Tiemelissan 2015), and, more recently, young marriage, cohabitation and parenthood (Rojas and Bravo 2020). School surveys have also included purposive qualitative sub-studies: for example, one investigated why so many children in Andhra Pradesh and Telangana switch between private and government schools (James and Woodhead 2014), and a classroom observation, again in Andhra Pradesh and Telangana, aimed to understand what effective teachers do in the classroom (Grijalva et al. 2018).

The different research components work together iteratively to enable triangulation of findings and allow topics arising in one component to be further probed in the others. For example, the school-based surveys assess the effectiveness of different school systems, thereby helping explain why some of the children from the household-based research perform better at school than others. The qualitative research permits deeper enquiry into the factors underlying patterns and trends that are evident from the statistical data, also foregrounding the perspectives of children and their families on how they actually experience events and situations – such as school, work, migration and marital life – that are recorded in the surveys.

7 Primary school surveys were conducted in India (2010), Peru (2011), Vietnam (2011-12) and Ethiopia (2012-13), and in 2016-17, a further round of school surveys was conducted at upper primary level (in Ethiopia) and secondary level (in India, Peru and Vietnam).

8 Peru was excluded because of financial constraints.

Figure 3: Multimodal qualitative research tools



The most taxing year in terms of data collection was 2016-2017, when Young Lives undertook:

- eight large-scale household-based surveys, administered with approximately 2,000 15 year olds and 1,000 22 year olds in each country, as well as with caregivers and community members.
- six school-effectiveness surveys, with two waves of surveys in Ethiopia, India and Vietnam, each involving 10,000 students. Survey teams visited schools at the beginning and end of each school year and conducted tests in maths, English and problem-solving skills.
- a qualitative sub-study in Andhra Pradesh and Telangana focusing on decision-making in relation to adolescent married girls' sexual and reproductive health and fertility, and access to sexual and reproductive health services information.

2. Implications of research design for instrument development

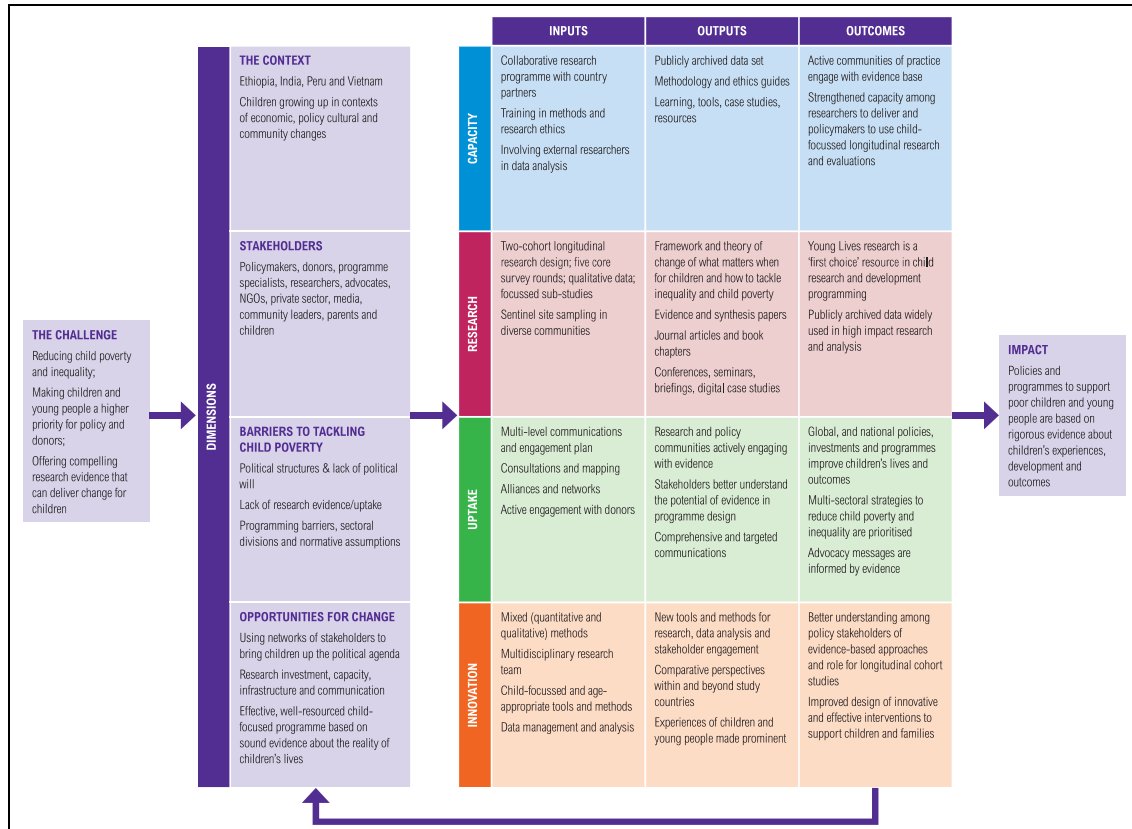
The Young Lives research design aims to be consistent over time, yet flexible enough to respond to changing environments and aging respondents. Research instruments have been created and adapted to remain relevant to children growing up in LMICs, across different languages, locations and socio-economic groups, and in diverse contexts. The hybrid, multi-component research design combines longitudinal with cross-sectional research to enable triangulation and new lines of enquiry into the data, without overburdening respondents.

2.1. Longitudinal design

As a comparative longitudinal study across four LMICs, Young Lives has had to take into consideration the temporal design and adaptation of instruments and measures for administration with populations for which they were not originally designed.⁹ In terms of the temporal design, the timing and frequency of observations should ideally be driven by the research objective and theory of change, which in a cohort study like Young Lives concerns the factors that affect change and stability in children's development over time (Collins 2006, quoted in Dawes 2020). Given that different children and population groups in different locations and sociocultural contexts reach key developmental and institutional milestones at very different ages, it is hard to identify the age points at which observations are likely to be most meaningful; ultimately, logistical considerations played a part.

For example, it was not possible to design Young Lives as a birth cohort since this would have posed significant recruitment difficulties and risked high attrition due to infant mortality in early survey rounds; thus, the Younger Cohort was already between 6 and 18 months old at the first round. Similarly, limiting the number and frequency of household-based survey rounds – conducted every three to four years – is as much a reflection of concerns about reducing respondent burden and cost as it is developmental theory. More sustained and regular research interactions over a long period of time would also have risked influencing participants' understandings, attitudes and behaviours; for example, asking caregivers whether they have vaccinated their babies might raise awareness of the importance of vaccinations for health, thus potentially affecting behaviours.

⁹ See Dawes (2020) for a more detailed discussion of the considerations in relation to the timing, frequency, and spacing of observations in Young Lives, and the application of instruments and measures to diverse sociocultural groups.

Figure 4: *Theory of Change* (2015)

Currently being updated.

Retaining the same core content and constructs across data rounds is an important feature of the longitudinal qualitative and survey research as this permits direct comparison between data rounds as well as linking the different research components.¹⁰ Nonetheless, as a cohort study, instruments and measures have to be adjusted to remain in keeping with major life-course changes. Striking a balance between relevance for respondents' ages, developmental phase, and circumstances and the need for continuity of constructs and tools is challenging, especially with the study spanning such a long period and encompassing infancy through to early adulthood (Dawes 2020).¹¹ This is not a trivial task, especially considering that most of the instruments and measures designed for administration with children focus on early childhood, so it is often necessary to deploy tools devised for use with adults and adjust them to be relevant for children in middle childhood and adolescence. For instance, the scale used by Young Lives to gauge children's agency was adapted from a measure of locus of control developed for adults by Rotter (1966) and Bandura (1993) and cites life domains such as school, work and time use that are applicable to children specifically (Espinoza and Ogando Portela 2019). The initial idea behind the cohort-sequential design was that the Younger Cohort would be the primary sample and the Older Cohort would serve for testing the suitability of tools for administering with this cohort when they reached age 8, which is when the children were first asked questions directly. The intention was to drop the Older Cohort following the first round. However, realising that inter-cohort analysis offered huge potential for research on the environmental factors shaping

10 See León (2020) for a discussion of the procedures employed by Young Lives to achieve comparable cognitive measures across survey rounds and cohorts. Item response theory was used to examine the psychometric properties of these measures.

11 See Young Lives (2011) for information on the rationale for design changes to the household-based surveys made across rounds.

children's trajectories, the decision was taken to retain this cohort in the study for as long as the sample size allowed.¹²


Table 1: *Evolving survey content Round 1 and Round 5*

Round 1	Household questionnaire	Child questionnaire	Community questionnaire
Both cohorts	Household composition Caregiver background Child health Household livelihoods Economic changes and events Socio-economic status Social status Child height and weight		Physical environment Social environment Infrastructure and amenities Economy Health and education Prices
Younger Cohort only (age 6 to 18 months)	Pregnancy, delivery and breastfeeding Child care Caregiver mental health	Children too young to answer direct questions	
Older Cohort only (age 7 to 8 years)	Child mental health Child education and daily activities	Perceptions of well-being Social capital School and work Health Literacy, numeracy and child development	
Round 5	Topics		
	<ul style="list-style-type: none"> Youth Education Housing Specific social services: use and availability 	<ul style="list-style-type: none"> Time use General health and well-being Agriculture and rural industry Labour and employment Family life and marriage 	

An important advantage of the panel design is that experience in administering data rounds makes it possible to adjust instruments to improve their performance (e.g. increasing the precision of questions and scale responses and reducing the risk of recall error) and increase respondents' enjoyment of interviews as and when necessary. There are many examples of such adaptations in Young Lives. Validity and reliability checks start with extensive piloting at each research wave and in each country, with back translation in some cases. That said, there is no guarantee that instruments that perform well in the pilot will do well in the survey, even when piloting is conducted in communities with similar characteristics as those of Young Lives. Sometimes the number of questions and level of detail is an issue, as in Vietnam, where participants in earlier rounds became frustrated by the household expenditure, income and labour-market modules, which took a long time to administer and were perceived to be invasive. Abstract questions posed in the negative in Round 2 upset several children and were therefore framed positively in Round 3. A five-point answer scale used in Round 1 was replaced by a four-point scale in Round 2 to prevent the clustering of responses in the neutral middle option. Faces illustrating different moods were used to supplement words on some five-item answer scales as a means of putting respondents at ease and adding variety to the interviews.

¹² Tracking and researching two age cohorts whose circumstances and patterns of mobility differ widely is complicated conceptually and logistically. A particular challenge is that the Older Cohort sample, at an initial 1,000 individuals per country, is quite small and has diminished further with each round. This presents a growing problem for statistical analysis, especially when disaggregating data – for example by wealth or ethnicity.

Figure 5: *Child Questionnaire – Vietnam – Age 15*

SECTION 2 - FEELINGS AND ATTITUDES		
FIELDWORKER: ASK ALL CHILDREN THESE QUESTIONS		
FIELDWORKER: SHOW LADDER/PICTURE OF LADDER		
2.1	There are nine steps on this ladder. Suppose we say that the ninth step, at the very top, represents the best possible life for you and the bottom represents the worst possible life for you. Where on the ladder do you feel you personally stand at the present time? (RECORD STEP NUMBER 01-09, 77-NK, 88-NA)	[___] (STNPRS3)
Fieldworker: Show Chart #1 with 5 faces, starting from "Very sad" to "Very happy" and explain the meaning of answering each one. Say that in order to answer each question you must <u>point out</u> the face that best matches their answer		
 <p>01= Vey sad 02= A bit sad 03= Neither happy nor sad 04= A bit happy 05= Very happy</p>		

Despite the many advantages of longitudinal research, there are also limitations. A key limitation is that however comprehensive the initial design, it is impossible to anticipate at the outset all of the lines of enquiry that will subsequently emerge as important. Hindsight invariably brings awareness of opportunities missed. For example, had it been possible to predict the study's seminal findings around growth recovery following early childhood stunting, the team might have adopted a different design. In deciding not to study the Younger Cohort from birth and to collect data relatively infrequently (roughly every three years), there are constraints on what Young Lives can say about children's physical growth, particularly which children are likely to recover and which ones to falter in their growth, under what circumstances, and with which cognitive and learning outcomes. Study design also needs to take full account of factors external to the research. In LMICs, resource limitations and information gaps can constrain research design. For example, when Young Lives first went into the field in Andhra Pradesh and Telangana and Ethiopia, births were seldom registered and if they were, records were generally incomplete. This meant collecting birth data retrospectively, which most likely resulted in a degree of misreporting.

Longitudinal studies need to have flexibility in their funding and managerial systems and contractual arrangements in order to be able to respond effectively to changing contexts. The environment in which Young Lives' research is conducted has changed markedly over the 19 years of the study. Some developments have had a deleterious effect. For example, the decline in the value of sterling following the UK's *Brexit referendum* in June 2016 significantly increased the cost of Young Lives data collection at Round 5. Similarly, the COVID-19 pandemic has had devastating impact in all four Young Lives countries and required major design adjustments. These included postponing the sixth in-person survey round by a year (currently to 2021), and adding an interim data-collection wave using mobile phones (in 2020), designed to focus on the impact of the pandemic and to retain a degree of inter-cohort comparison. Other changes have been far more positive. Young Lives has benefitted from the significant infrastructural development that has taken place over the last two decades in many regions of the study countries. This has increased fieldworker mobility and access and reduced data-gathering costs, particularly in remote areas. Likewise, expansion of internet coverage and mobile phone and computer use has facilitated important data gathering and data-management efficiencies and improved data quality (see Section 4).

Figure 6: Example of phone survey for Ethiopia

INDIA

CHILDID AND DATE

0.1	INSERT CHILD ID	IN _____	CHILDID
0.2	DATE OF INTERVIEW	___/___/2020 (day) (month) (year)	DINT
0.3	PHONE NUMBER USED FOR THE INTERVIEW		PHNUMB

DATA HANDLERS

Fieldworker that initiates questionnaire	Name: @_____	Code: [_____]	FLWRIDPS
		Date of check: ___/___/2020 (day) (month) (year)	DINT
	ID: _____		ID
	Start time (Use 24 hours):	[____ : ____]	
Fieldworker that finishes questionnaire	Name: @_____	Code: [_____]	ENDFLDPS
		Date of check: ___/___/2020 (day) (month) (year)	ENDDINT
	ID: _____		ID2
	End time (Use 24 hours):	[____ : ____]	
Supervisor	Name: @_____	Code: [_____]	SUPRIDPS
		Date of check: ___/___/2020 (day) (month) (year)	SUPCDATED

COMMENTS/OBSERVATIONS:
@_____

2.2. Hybrid, multi-component research design

Despite the constraints associated with maintaining conceptual and instrument continuity in longitudinal research, it is sometimes possible to draw on the emergent evidence to develop new lines of enquiry and introduce new research modules and elements. The qualitative and school

components were later additions to the household panel and their inclusion resulted in a hybrid design that combines mixed-methods longitudinal and cross-sectional research. The idea to undertake nested school-effectiveness surveys arose out of the finding in the household panel that educational aspirations were extraordinarily high across the sample, among children and adults alike. Knowing that in many areas school systems are weak and the young must work, this came as a surprise. The expectation had been that levels of engagement with education would be relatively low, particularly in poorer rural regions. More surprising still was the coexistence of elevated aspirations with late school enrolment, intermittent attendance, grade repetition and early school departure. Thus, it seemed crucial to find out more about children's experiences in school and the effectiveness of different schools and school systems in building sets of skills.

Table 2: *Survey instruments administered*

Student outcome measures	Background instruments
<p>Mathematics test</p> <p>Repeated measures, administered at the beginning and end of the year. Assessing students' curriculum knowledge and ability to apply that knowledge in less familiar contexts.</p>	<p>Director questionnaire</p> <p>Collects background data on the director and the school.</p>
<p>Functional English test ('English')</p> <p>Repeated measures, administered at the beginning and end of the year. Assessing students' English reading and comprehension skills relevant to the contexts in which they may use the language.</p>	<p>Teacher questionnaire</p> <p>Collects background data on teachers, including teacher motivation and section-level information.</p>
<p>Functional Amharic test ('Amharic')</p> <p>Single measure, administered at the end of the year. Assessing students' Amharic reading and comprehension skills relevant to the contexts in which they may use the language.</p>	<p>Student questionnaire</p> <p>Collects background data on students (including academic support within and beyond school, psychosocial measures and perceptions of the classroom instructional environment).</p>
	<p>School facilities observation</p> <p>Collects data on school infrastructure and facilities.</p>
	<p>Teacher professional knowledge questionnaire</p> <p>Collects mathematics teacher performance on an assessment of specialised content knowledge for teaching.</p>

A hybrid mixed-methods design presents some complexity in terms of maintaining the internal consistency of data across research components.¹³ An ESRC-funded evaluation of Young Lives in 2008 expressed concern about the conceptual challenge of integrating qualitative with quantitative data, suggesting that the former could work against the latter. The reasoning was that categories and concepts emerging from local understandings might not match the predetermined questions and variables in the survey questionnaires. Aware of this risk, Young Lives relies on teamwork and multi-disciplinary collaboration to identify and reconcile distinct constructs arising from divergent perspectives. The team works continuously to integrate the mixed-methods data at a conceptual level, including by using qualitative data to refine questionnaires. For example, knowledge gained in the qualitative research about adolescents' mobility for school and work informed the development of a new migration module in the fourth survey round. When developing the qualitative protocols, researchers mapped questions in the qualitative instruments against correlating questions and variables in the survey questionnaires. For example, questions

13 At the same time, it is extremely important to guard against overburdening respondents when introducing new components. Cross-sectional data that permit deeper enquiry into specific topics need to be effectively linked with the longitudinal dataset and, whenever possible, use the same measures to gauge the same constructs.

in the survey aimed to capture subjective well-being were set against questions in the qualitative research aimed at eliciting children's own definitions and understandings of well-being and illbeing in their local contexts.

The introduction of school surveys was complicated because they needed to be linked with the household survey. While the school surveys were intended to vary across countries in keeping with national education policies and priorities, consistency of design and instruments across research rounds and countries was crucial for the household survey. The plan was to study the schools attended by the Younger Cohort, while also researching their attainment in class, a design that was applied in Ethiopia (2010) and India (2010–11) (Boyden and James 2014). However, since the cohort was spread across schools and classes, and many participants were in lower grades or had dropped out, their schooling was less comparative, so that converting an age cohort into an effective school cohort resulted in inconsistencies in the numbers of children for each class and school.¹⁴ To ensure continuity in the child-level panel while also creating a dataset focused on specific schools, the design was adjusted to include children at both class and school levels who were not in the household sample. In Vietnam and Ethiopia, school value-added analysis was feasible, with the Younger Cohort sub-sample selected according to the grade and school in which they were studying.¹⁵ However, focusing solely on pupils studying at the appropriate age-for-grade risked introducing a systematic bias into the household-based sample by excluding those who enrolled late, repeated grades or progressed quickly.¹⁶

Figure 7: *Young Lives Survey Design and Sampling (Round 5) – Peru*



14 The most extreme case was Andhra Pradesh and Telangana, where in 2010 the Younger Cohort was dispersed across more than 900 schools, so that linking a random sample of the children to their schools would have generated an unworkable school sample.

15 This entails the design and application of curriculum-linked tests of children's core competencies conducted at the beginning and end of the school year, measurement (and comparison) of school leadership and management and teaching quality, and measurement and equating of school-related attitudes and dispositions across diverse contexts (Iyer and Azubuike 2017).

16 See Rolleston et al. (2013) for a discussion in relation to Vietnam.

2.3. Designing tools for comparative research

Young Lives' comparative design, together with the sociocultural diversity of country samples and their dispersion across rural and urban locations, means undertaking research in multiple languages and with varied population groups who do not necessarily share equivalent concepts and whose experience, worldview and levels of education are disparate. Although the qualitative research works to common themes and constructs, it is able to draw on and deploy the perspective of the subjects, or respondents, thereby shedding light on their feelings, norms and values, and revealing the rationale underpinning their choices and actions. On the other hand, all household- and school-based questionnaires and tests need to be adapted to ensure that they are reliable, valid and an equivalent measure of the skills, attitudes and traits under investigation in all population groups and also whether they have measurement invariance (Attawell 2004; Dawes 2020).

Most of the validated and reliable instruments and measures used for assessing human development and experience globally are designed in the high-income countries of the global North, which often limits their suitability for application elsewhere. There has also been far greater focus on early childhood than on middle childhood and adolescence. As just one example of the consequences, most children in high-income countries remain dependent on their family through adolescence and their lives are generally dominated by school education. Consequently, there is a tendency to test cognitive skills that are applicable to academic contexts, with far less attention to pro-social competencies such as sharing, empathy and volunteering that are often highly valued in rural LMIC communities in particular. Moreover, even though work is a common feature of children's lives in LMICs, there are very few measures for examining children's workplace responsibilities and tasks, and the degree of competence acquired and/or hazard experienced through their accomplishment.

The conceptual challenge involved in administering instruments across both languages and sociocultural contexts is huge. Young Lives has found that even some well-established and fully validated measures have not functioned well, requiring the introduction of new ones, with the risk of diminishing comparability across rounds. For example, the Raven Progressive Matrices, a non-verbal, multiple-choice measure of reasoning, was administered with the Older Cohort in the first survey round when they were age 8 (Raven et al. 2003). However, it did not perform well in rural Ethiopia, where children did not understand the test instructions and were not familiar with visual images, and were thus unable to interpret their content (Cueto et al. 2009). Piloting of several cognitive development and achievement tests for the second survey round led the team to administer the quantity sub-test of the Cognitive Development Assessment (CDA) and the Peabody Picture Vocabulary Test (PPVT1) with both cohorts, while reading, writing and mathematics items that had performed well in Round 1 were retained.

Young Lives' instruments and measures are developed in English and translated for administration in local languages. Spanish is used in Peru, Telugu in Andhra Pradesh and Telangana, and Vietnamese in Vietnam, with respondents who speak the lingua franca in each of those countries.¹⁷ In Ethiopia, questionnaires for Rounds 1 to 5 remained in English and were translated directly into local languages. For Round 6, the questionnaires will be in both English and Amharic. The general principle is that tools are translated into the main national language through double-translation involving two mother-tongue speakers who are proficient in English and confer in finalising the translated version prior to piloting on small samples. However, several

17 The language shown on the tablets used at the time of data collection varies across countries. Some country teams chose to show the questions in the local language, while other country teams use both English and the local language. The latter was deemed important when certain constructs did not translate well into the local language.

of the minority languages employed in the study are not written, nor are they widely spoken. In these cases, translation may occur on the spot during survey administration. Enumerators often have to rely on local interpreters to help with translation and a great deal of effort is made during training to ensure that they do not change the meaning of the questions when translating.¹⁸

Even so, the inclusion of children from different ethnic, language and religious groups determines what is feasible in terms of analysis. For example, there are risks and challenges in comparing outcomes between population groups. Test words used in PPVT1 have different levels of difficulty in different languages. Applying tests in minority languages with a small vocabulary may reduce the number of options in tests, making it easier for participants to perform well. The number of children in minority groups is not always sufficient to permit statistical analysis of what determines difference in the outcomes of different groups. Thus, it is often preferable to identify associations between test results and other variables within the same group. Nevertheless, it is possible to discern inter-group differences descriptively, for example comparing the proportion of a minority group that has completed primary education with the proportion of those in the majority population who have done so.

Another problem with comparing tests results, particularly across countries, is the diversity of skills levels in the sample. In Peru and Vietnam, where more children access good-quality education, a ceiling effect sometimes occurs, with children's results clustered towards the best possible score of the measure, while a floor effect, with results clustered around lower scores, is more common in Ethiopia and India due to the lower quality of education.



An enumerator uses the PPVT test in surveying a Young Lives' child

There are other challenges. For example, relatively abstract constructs, such as those relating to children's agency or sense of self-efficacy, are far harder to capture in surveys and far less likely

18 Cueto and León (2012) note the lack of standardisation of translation procedures applied with minority languages in Rounds 2 and 3, which raises questions regarding the reliability of scores and validity of the test (see also Dawes 2020).

to be applicable across sociocultural settings than are measures that are more concrete, such as time use.¹⁹ Furthermore, not all constructs of relevance to research on child development are appropriate for psychometric testing. Young Lives has tried to keep on top of this challenge through regular assessments of the psychometric characteristics of measures used in the research. Assessments of cognitive development and achievement instruments were made at the second and third survey rounds. Finally, quite a few tools used in assessing child development are protected by copyright and some are expensive to purchase. While obtaining permission to use them is not necessarily problematic, some tools are subject to conditions that are extremely hard to apply across LMICs.²⁰

Young Lives shelved a number of instruments and modules because they did not perform well across sociocultural settings, languages and/or population groups. A number of Vietnamese respondents found the psychosocial module too abstract, whereas in Ethiopia, questions on mental health posed to caregivers in Round 1 were considered too invasive and culturally inappropriate. In certain settings, and depending on the age and gender of participants, some information, for example around substance use and sexual activity, is perceived as highly sensitive and thus confidential. The self-administered questionnaire was intended to guarantee participants' privacy when addressing such topics (Favara and Sanchez 2017). However, the instrument did not perform well in either Ethiopia or India, especially in rural areas, and was therefore dropped in subsequent rounds. Low levels of literacy meant that enumerators had to read the questions out loud, defeating the purpose of self-administration.

19 Yorke and Ogando Portela (2018) outline the procedures involved in the selection, adaptation and administration of the psychosocial scales administered in the fourth survey round and some of the challenges in measuring these constructs in developing countries. [Dercon and Krishnan \(2009\)](#) also discuss these scales and their internal consistency.

20 For example, the Strengths and Difficulties Questionnaire, administered with 8 year olds in the first survey round, is strictly copyrighted. The instrument cannot be modified in any way and translations can only be done with the full cooperation of its primary designer.

3. Cohort maintenance

Despite challenges, cohort maintenance has been a major success in Young Lives due to efforts to limit the frequency of data rounds and track respondents. Country teams are key to this success. Their focus on relationship building and research reciprocity, in addition to the technical aspects of fieldwork, from training, tracking, piloting and data gathering, have all contributed to cohort maintenance.

3.1. Attrition

Sample attrition is one of the most significant threats to longitudinal studies as it can seriously undermine the feasibility of statistical analysis and authority of the research, especially when attrition is non-random. Young Lives collects a large amount of information from participants, returning to interview them every three to four years. Even though respondents consented at the first survey round to be followed up in future rounds and despite consenting to be interviewed at each visit, return visits raise the possibility that the study might become a burden to them. Thus, one of the main challenges to cohort maintenance in longitudinal studies is when participants decide against remaining involved. When this happens in Young Lives, field supervisors make every effort to re-recruit them. The study has even experienced the withdrawal of whole communities from the research. For example, during the first survey round the team in Ethiopia used vehicles belonging to an international non-governmental organisation to transport enumerators to isolated rural areas. Mistakenly perceiving the organisation to be Christian, a number of Orthodox participants in one region declined to participate. Use of hired vehicles in subsequent rounds resulted in these participants returning to the study, although hiring vehicles has entailed greater cost. Similarly, participants in one of the communities in Peru dropped out of the study when they came under the influence of a religious sect who opposed any interaction with outsiders. The team engaged in extensive discussions with community members, which again facilitated their re-recruitment and retention in subsequent rounds.

Another potential risk for tracking respondents and controlling attrition is that the study design required a large, heterogenous sample spread across different locations. In developing the initial Young Lives household sample, trade-offs were made between ensuring the feasibility of statistical analysis and level of detail needed to undertake the research, and working to budgetary and logistical constraints (Wilson, Huttly and Fenn 2006). Important considerations were the cost and operational difficulties of conducting longitudinal research in four countries with significant topographical barriers and limited infrastructure, transport and communications. This led to the decision to build the sample frame on a sentinel-site surveillance system. Even so, there have been a number of operational challenges in relation to cohort maintenance, all of which have magnified with successive data rounds.

Despite the sentinel-site structure, capturing distinctions in children's outcomes based on rural and urban location, as well as ethnicity, language, religion (and caste in Andhra Pradesh and Telangana), meant selecting a dispersed sample that included at least some sites that were distant and isolated.²¹ This is because populations that are marginalised socially and economically tend to live in more remote regions, as in the case of Scheduled Tribes in India and ethnic minority groups in Vietnam. Furthermore, even though study participants were originally clustered at site level, migration has resulted in the sample becoming increasingly scattered. The

21 At the same time, in several contexts, for example in rural Ethiopia, improved roads and infrastructure have reduced transport challenges.

sample in Peru, where the cost of living renders data collection the most expensive of the four countries, was more scattered from the outset, further increasing costs.

Migration is another major challenge. Every effort is made to track migrants who remain within the national borders. Due to the expense, it is not possible to follow up with those who have moved overseas. Even within-country tracking can be time consuming and it is not always possible to trace everyone. For example, migration for employment is extremely common in Hyderabad, India, and as the job market is highly competitive people frequently leave their homes at no notice and without informing neighbours of their destination. Where telephone numbers are available, the survey team in Andhra Pradesh and Telangana contacts migrant youth and offers to cover their round-trip travel costs to administer the survey to them in their original locality. Many of the young people welcome the opportunity to return home to visit their families, especially if the timing of fieldwork coincides with a holiday period.

Migration also presents challenges for research design, as it necessitates decisions about whether to collect data from origin or destination households. Young Lives policy is to collect data from the natal household if migration is temporary and the destination household if it is permanent. Similarly, community questionnaires are administered in all communities in Young Lives sentinel sites where children remain in their original location: in the case of migrants, a shorter version is administered.

Despite the many challenges, cohort maintenance has been a major success in Young Lives (Table 3). Refusal among selected households at baseline was very low (<2 per cent in all four countries) and, when it occurred, replacement sampling was used (Barnett et al. 2013), although this strategy has not been employed in subsequent rounds. Even though attrition has risen at each round, the rates have remained surprisingly low over the years; between Rounds 1 and 5 attrition averaged 4.9 per cent for the Younger Cohort and 12 per cent for the Older Cohort. Attrition has been consistently higher in the Older Cohort than the Younger Cohort, which mostly reflects important changes in the circumstances of the older group as they enter adulthood. Reasons for attrition include international migration, enlisting in the army, or in the case of some young women in India, moving in with in-laws who do not permit their continued participation.

Table 3: *Young Lives attrition rate over 15 years (Round 1 to Round 5).*

Younger Cohort

	Ethiopia	India (Andhra Pradesh and Telangana)	Peru	Vietnam
Sample size Round 1 (2002)	1999	2011	2052	2000
Round 5 (2016)	1812	1900	1831	1938
Attrition rate, 2002-2016 (excluding deaths) %	5.4	3.5	8.2	2.4
Refused, untraceable, or living abroad	102	68	167	48
Number of deaths	85	43	25	12

Older Cohort

	Ethiopia	India (Andhra Pradesh and Telangana)	Peru	Vietnam
Sample size Round 1 (2002)	1000	1008	714	1000
Round 5 (2016)	814	922	597	910
Attrition rate, 2002-2016 (excluding deaths) %	17.8	6.9	14.1	8.5
Refused, untraceable, or living abroad	175	67	100	85
Number of deaths	11	19	6	5

There is evidence that many participants have developed a sense of pride in taking part in the study. Children in Peru declare with pleasure '*Soy un niño del milenio!*' ('I am a child of the millennium' – Niños del milenio being the name given to the study in Peru). When asked how she felt about participating in Young Lives, one 19-year-old girl in Ethiopia remarked that: 'If my ideas [that I have shared with the researchers] bring a change, then I will feel mature and with a better status in the community.' On the other hand, there is also the possibility that in some contexts and populations the research is perceived as somehow affiliated with government, so participants might feel less able to refuse despite the emphasis that enumerators place on consent and voluntary participation. Unfortunately attrition can occur due to the death of a Young Lives' child, which has been a particular issue in Ethiopia and has led to concerns about how to respond ethically to deaths, whether of children or their family members. The household-based sample in Ethiopia is quite concentrated at site level, so that when a child dies this raises the possibility that field teams returning to administer surveys with other children and households in the same village may exacerbate their parents' grief. The sensitivity and tact of field supervisors and enumerators is key in managing these difficult circumstances.

3.2. Strategies and lessons learnt in cohort maintenance: tracking and data collection

Many longitudinal studies use survey companies to gather data, with data access and use monopolised by the budget-holding institution, most often a university in the global North. The Young Lives institutional model is very different because country-partner organisations and their staff are vital to the successful accomplishment of all aspects of the study, including all data-related tasks. Low rates of attrition emphasise the pivotal role of the study's in-country teams. Cohort maintenance is the responsibility of study-country principal investigators, who work closely with survey coordinators in planning and supervising tracking, data collection and data entry, and recruitment and training of enumerators, while survey administration is managed by field supervisors. The study has strong ethical protocols, but it is down to data-collection teams to obtain the permission of local authorities to undertake the research and to build and maintain the trust and confidence of respondents. The main strategies for maintaining the sample and reducing attrition are: careful recruitment and extensive training of field teams; whenever possible, employing the same field supervisors and enumerators across rounds so that they are familiar with the research and the families, communities and authorities; tracking; keeping instrument length and frequency of data rounds to a minimum; and research reciprocity.

Many of the more senior enumerators have been involved for several rounds, which is an important factor in cohort maintenance. The team tries to recruit enumerators of both genders and different ethnicities, as well as with a broad mix of skills and experience and a wide age range, including a good number of young people (especially women) to interview children. The diversity of teams may be another factor in the low attrition rates, the intention being, whenever possible, to match respondent groups with enumerators who have the same or similar characteristics, thereby helping put respondents at ease during interviews (Barnett et al. 2013).²² That said, in some contexts it can be hard to recruit young women to travel unaccompanied, and often they are only able to undertake survey administration by working in pairs. When the Older Cohort in Andhra Pradesh and Telangana reached adolescence it became increasingly important to gender match enumerators and respondents.²³

22 Country principal investigators, survey coordinators and field supervisors put considerable effort into recruiting and training enumerators of the highest calibre, re-recruiting as many as possible at each round.

23 Field teams in Andhra Pradesh and Telangana are made up of six enumerators (three female, three male) and a supervisor. The field teams stay in shared accommodation, with men and women in separate areas. Although supervisors are responsible for safeguarding all

Thorough tracking is essential for keeping attrition to a minimum. Country teams give an enormous amount of attention to this task. Huge effort and coordination is needed to track and reach participants, in addition to the travel and accommodation costs for both tracking and data-gathering survey coordinators and training. Although respondents gave consent to be tracked at the beginning of the study, locating respondents can be extremely labour-intensive, especially where field sites are dispersed and there are no formal addresses. Led by field supervisors, data-collection teams make every effort to track children and young people who move away from the natal home, whether to set up new households, or for work or tertiary education.

Different countries use different approaches. Addresses and phone numbers are collected at each survey round and used for subsequent tracking, which is undertaken immediately prior to data collection. Respondents are contacted by phone or visited personally if this is not possible.²⁴ When respondents move and cannot be reached by phone the teams check whether neighbours know their whereabouts. In Peru, neighbours and other community members are shown photographs of the children. Technological advances have the potential to further facilitate tracking and the Peru team plans to use Facebook and other internet-based modalities to contact participants who were not found in the first call of the phone survey. Importantly, tracking has sometimes led to the successful re-recruitment of respondents who had dropped out in earlier survey rounds, due to the efforts of field teams. A number of those who migrated or joined the army returned to the study in subsequent rounds. Tracking for the 2020 telephone survey enabled Young Lives to reach a very high proportion of participants. For example, in Andhra Pradesh and Telangana 99.3 per cent of respondents from the fifth survey round were found and consented to take part in the telephone survey.

3.3. Strategies and lessons learnt in cohort maintenance: research reciprocity

Young Lives has evolved an explicit ‘research reciprocity’ strategy to help reduce the burden of the research and give something back to study participants. Country teams develop reciprocity strategies that are suited to their context and diverse approaches are used.²⁵ The multidimensional conceptual framework results in long survey questionnaires and data collection can take at least two hours per household. Field teams have sometimes raised concerns that instrument length could put cohort maintenance at risk, so generally administer the questionnaires over several visits and several days, adapting to respondents’ schedules and interviewing different respondents at each visit.²⁶

In all cases, data-collection teams make it clear that there is no personal benefit to be gained from participating in the study. However, participants are compensated financially for time spent in interviews, a policy agreed by country principal investigators and their teams in line with local norms. In Peru, children are given a small present, for example a rucksack or watch. In Ethiopia, young children are remunerated in kind, and adults and older children either in cash or through transferring a small sum to their mobile phones, although not at the level of local wages. Some families in Ethiopia have refused compensation. In India, children are given a small gift such as a wallet or vanity bag and in Vietnam they receive a modest cash sum. The amounts paid to

team members, it is not appropriate for young women to stay in accommodation or travel on their own, so if one of the female team members has to leave the field, there are still two women left to accompany each other.

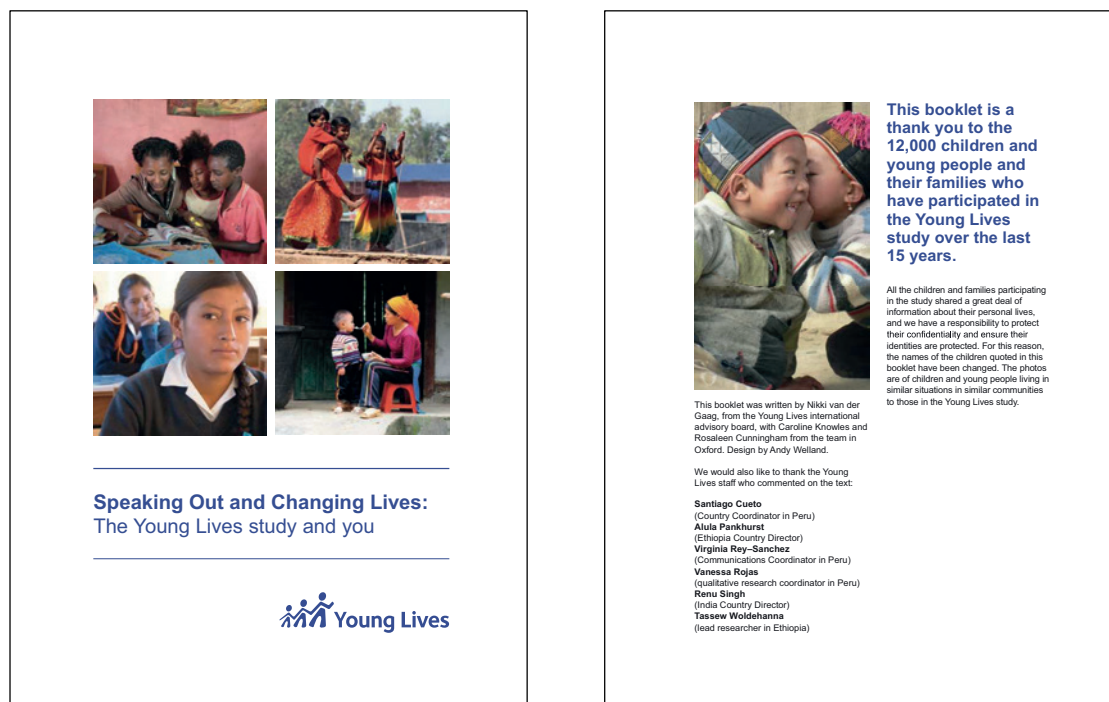
24 Except those who have migrated overseas.

25 See Young Lives (2020) for a summary of the approach to research reciprocity employed in the telephone survey.

26 As there is no need to keep collecting information that is unlikely to change over time, instruments have been shortened in later rounds. Also, once a body of data concerning children’s early circumstances has been created, instrument length can be reduced by focusing on outcome rather than explanatory variables in later rounds.

participants may vary within countries. Payments made to respondents in rural Vietnam were based on local wages, but the level of financial compensation on offer in urban areas was lower relative to local rates and did not always prove sufficient.

Figure 8: *Child Reciprocity Booklet- example of sharing research with participants*



The research reciprocity policy, aimed at giving something back to the children, families and communities for their participation in the research, takes varying forms. In Ethiopia it has mainly involved sharing findings and giving advice to local officials at a regional level, while one of the key partner institutions, the Policy Studies Institute, is a part of the Prime Minister's office, making it possible to feed evidence directly into central government planning. In Peru, Young Lives shares accessible summaries of research findings with participants in specially tailored information booklets, so that children and their families can understand the study's purpose and learn something from it. The information includes general suggestions on how to improve nutrition and school performance, such as where to access health, education, and justice services that are public and free. They also give the families photos of the children taken during data collection. These have proved very popular, as many families don't have access to cameras and have few photographs of their children. In Vietnam, the team evolved an innovative strategy in the early stages in which children from Children's Forums and Young Journalists Clubs, a nationwide programme run jointly by the Voice of Vietnam radio station and the Vietnam Youth Union, disseminated study findings directly to policy stakeholders in workshops and discussion fora. This mechanism enabled children to share Young Lives' findings and explore their implications for policy with local officials. However, the children in the clubs were not connected with Young Lives; this was intentional because the team wanted to avoid an intervention that might then shape their outcomes.

Fieldwork coordinators play a vital role in organising and coordinating survey administration and are essential to the accomplishment of all aspects of fieldwork, from training, tracking, piloting and data gathering to cohort maintenance. They have extensive experience of the research and detailed knowledge of research participants, and work together with principal investigators and field supervisors to ensure a culture of respect for participants, their families and communities.

Young Lives makes every effort to retain coordinators and to re-recruit survey team members, especially field supervisors, at each round. Many supervisors have been involved in several data rounds. Supervisors ensure the highest standards of data entry during data gathering, liaising with local authorities over permission to access respondents, and resolving any ethical dilemmas or logistical problems. Some have been visiting the communities regularly over the life of the study and are well received and respected within the communities, their relationships of trust with Young Lives' children and their families reducing attrition and strengthening the quality of the data. In addition to bringing experience and technical expertise, good inter-personal skills are critical for this role – for example in training sessions, working with local authorities, and managing the performance of field teams.

4. Technological development in survey administration

The advantages of CAPI include: faster data retrieval, easier data linking, and higher data accuracy through the data checks built into CAPI.

4.1. The introduction of CAPI

During the first two rounds of household-based surveys, Young Lives used paper-based questionnaires. Data had to be input manually into a computer and most data checks were done after data collection was completed, mainly using techniques such as double data entry.²⁷ However, at Round 3 the study transitioned to computer-assisted personal interviewing (CAPI). Working closely with the research team, the lead data manager oversaw this transition and supported piloting of the Round 3 survey in all study countries. Survey content was piloted prior to the testing of software. In the absence of suitable software, a bespoke programme was developed for use in Round 3. Surveybe software was introduced at Round 4 and used again at Round 5. Surveybe was an ideal choice for Young Lives, because it does not rely on internet access for recording and saving data, and in regions without internet coverage data are saved for subsequent uploading to a database. As a contingency, enumerators in Ethiopia are given mobile *dongles* to enable internet access.

The benefits of using digital technologies in research are widely acknowledged (Dunn and Banati 2015). However, the use of multiple languages in Young Lives complicates matters because programming software in multiple languages is extremely demanding, particularly with languages that do not use the Roman alphabet, which is the option used in most software programmes. Nonetheless, the adoption of CAPI and Surveybe has helped in many other ways, with questionnaire development by researchers and programming by data managers taking place simultaneously. At least two data managers are involved in programming questionnaires and validating each other's work. Skip patterns are then piloted in the field, which also ensures country teams have the most up-to-date versions of the questionnaires.²⁸ This is a time-intensive process, relying on multiple people to confirm that the patterns are accurate, with some skip patterns taking days to programme. Since many questions have remained consistent across rounds, pre-populating data – for instance with the household roster or information on family members who have died – from earlier rounds is perhaps the most



An enumerator surveys a Young Lives' child using CAPI.

²⁷ With paper questionnaires, it could take up to a year to produce usable data in electronic form.

²⁸ Some survey questions are only relevant for certain respondents. A skip pattern is a question or series of questions associated with a conditional response, so that if a question does not concern a particular respondent the enumerator (or software in the case of questionnaires administered using CAPI) omits it and moves to the next question.

important task during this process. Pre-population of data ensures that discrepancies between current and previous rounds can be flagged and answers clarified by enumerators on the spot. Pre-loading data, particularly on the household, also saves time, as this allows enumerators to focus on changes since the last round, such as the arrival of new household members, or movements in and out of households.²⁹

CAPI has also played an important role in ensuring data quality since digitised data are transcribed and entered into a database or spreadsheet, and/or coded, and procedures for data entry are consistent and standardised throughout. Another advantage of CAPI is that it helps reduce the number of invalid answers. Data managers have developed the software with built-in validation rules, these being as simple as programming closed questions with a dropdown menu for a single response, and as complex as enabling or disabling entire parts of questionnaires based on respondents' responses. Moreover, data are ready for cleaning and validation almost immediately. Even though further cleaning is necessary after data collection is complete, this makes it possible for supervisors and local data managers to undertake checks while teams are still in the field and before sharing the data with the Oxford-based team.³⁰ Thus, the time involved in data validation is reduced and important feedback loops on data are provided, in turn increasing data accuracy and permitting faster delivery of usable data (Yabiku et al. 2017). Even so, digital technology places additional demands on field teams, researchers and data managers and involves certain risks that need consideration.

4.2. Risks associated with CAPI

The risks of introducing CAPI technology into a study include: cost, theft, technical glitches while in the field, translation, programming skip patterns, unfamiliarity of using computers among enumerators, and the possibility of introducing bias or influencing responses.

Concerns about the potential risks to survey administration and data management associated with the use of computers explains why the team only introduced CAPI at Round 3. Practical considerations included the fact that in the early 2000s computer access was not particularly widespread in LMICs, especially in rural areas. This led to a concern that their use might disrupt the interaction between enumerators and respondents, possibly leading respondents to withdraw their consent to remain in the study. Many rural sites were without electricity, presenting an obstacle for recharging computers. Similarly, internet coverage was extremely patchy, especially in rural areas, and without this transmitting data from the field to data managers and research assistants would not have been possible. There was also anxiety about the risk of loss or theft of computers, the latter potentially jeopardising the safety of enumerators. Additionally, enumerators were accustomed to annotating paper questionnaires with their reflections on the interviews – enriching the research findings – a facility not available with software. Another consideration was the inevitability of technical difficulties arising from the use of tablets, such as frozen screens and viruses.

Other challenges for the programme manager and data team included the cost of tablets and the complicated logistics involved in purchasing them, whether in study counties or the UK. Purchasing in the UK would also involve logistical and security procedures for transporting overseas. Moreover, an investigation into the suitability of the various software programmes

29 Household rosters continue to present challenges, for example the risk of causing distress by asking about household members who have died between rounds.

30 This requires updating the programme, uploading it to the drive shared by local data managers and supervisors, and supervisors reloading the programme on the tablets.

available for longitudinal research in LMICs prior to Round 3 revealed that none suited Young Lives' needs. Finally, there were also concerns about the amount of time needed for fieldworkers to learn to use the technology and data managers to programme the software.

Researchers were concerned that introducing CAPI could affect respondents' attitudes towards the study, thereby introducing bias. To test this hypothesis, the Peru team randomly assigned tablets to a portion of respondents in Round 3, while the remaining respondents continued to answer the paper-based questionnaire. Analysing the survey results, Escobal and Benites (2013) found that in most cases these were not biased by the introduction of CAPI. However, they noted the importance of the questionnaire design, arguing, for example, that it is not appropriate to include large and complex tables in a questionnaire administered with a small handheld device, and that larger devices like tablets are generally a better choice for CAPI surveys. Similarly, they held that appropriate skip patterns and data checks must be built into the survey design. They also highlighted the importance of training enumerators to ensure that their use of the technology did not impact their rapport with respondents and introduce a bias.

With time, it became clear that some of these concerns were unfounded, while others could be addressed relatively easily. For example, during Round 3, enumerators hid their computers inside books (by carving out a hole to house them) so that respondents would not become distracted by the technology. External battery packs were purchased to allow interviews to be conducted in areas without electricity, and where the likelihood of theft was high enumerators would either carry computers in a secure bag, or revert to paper-based questionnaires. For their protection, enumerators are instructed to quickly relinquish the tablets in the event of an attempted robbery.

Nevertheless, despite these adjustments the introduction of CAPI had significant implications for field teams. Unlike paper questionnaires, where changes can be more easily made, a lot more work was needed before going to the field as making changes in CAPI afterwards was far more complex. The change to CAPI also highlighted the importance of ensuring data-collection teams have diverse skills. While some enumerators who were unfamiliar with computers found the transition quite difficult, they brought their extensive knowledge of Young Lives' surveys and strong relationships with the children in the sample to bear. Many of the younger enumerators proved to be extremely agile with technology and were very keen to adopt CAPI as it gave an opportunity to enhance their experience, technical skills and CV, but they were new to the study so had less to offer in terms of local connections and insight.³¹

Given that retaining experienced and outstanding interviewers has always been a priority, at Round 3 Young Lives invested heavily in training and developing the capacity of enumerators to ensure they would be comfortable using both CAPI and the software. An insight from the training was that enumerators should first become familiar with the paper questionnaires before mastering the technology. This makes certain that they understand the research objectives and the content, logic, structure of the instruments – including the rationale behind skip patterns. It also helps flag any mistakes in either the skip patterns or the logic employed in the CAPI version.

31 One seasoned enumerator was unable to use a tablet simply due to poor vision, so the team purchased new glasses for him.

5. Data management

Effective data management in Young Lives is a complex and technical endeavour that ensures data quality and security. Young Lives has developed data management practices to facilitate cross-cutting analyses based on the mixed-methods, multi-component, longitudinal dataset.

5.1. Data management procedures

Managing a large, complex, mixed-methods longitudinal dataset generated from a wide range of instruments and measures that change over time, while also ensuring data security and quality throughout, requires considerable experience, technical agility and attention to detail. Directed by a central data manager in Oxford who matrix-manages the four study-country data managers, the data-management team works closely with principal investigators, research assistants and other researchers in ensuring that the data are well-organised, accessible, clean and of the highest quality. The team also plays a vital role in managing and developing policies and procedures for safeguarding respondents' personal data, these being any data that enable their identification, whether directly or indirectly.

Data management involves an array of tasks, specifically verification of questionnaires, construction of databases with built-in validation rules, and editing, cleaning, confirmation and crosschecking of data, as well as checking for logical relationships within and across data forms and rounds. Statistical analyses are undertaken to gauge frequencies, means, ranges and/or clustering, enabling detection of any errors or anomalous values. Similarly, a rigorous process of checking outliers in the survey data takes place at data entry and during cleaning, with the result that the incidence is very low.

Changes in the Young Lives' research agenda heightened data harmonisation demands and it took time for data management and research teams to ensure that the data-management structure facilitated links and cross-cutting analyses. The introduction of qualitative research was challenging. When Young Lives commenced this work in 2007 there were no guidelines on the management of longitudinal qualitative data. The data-management team had to develop a system, structure and associated procedures for this component from scratch. A universal file naming protocol was developed and then applied to all records, making it possible to identify the sex of the respondent and whether she is an index child or caregiver, which country and community she is from, as well as when, by whom and with which method the data were gathered. This system allows researchers to link the qualitative and survey data and to track all the data for a particular individual across the different waves of interviews.

Figure 9: Coding details representing a Young Lives' boy living in a particular Ethiopian community

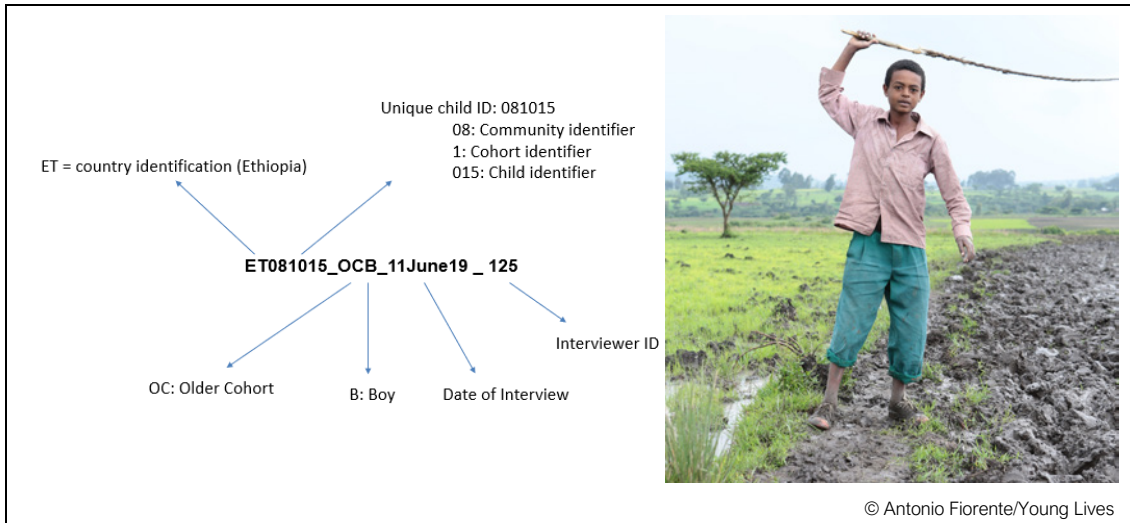
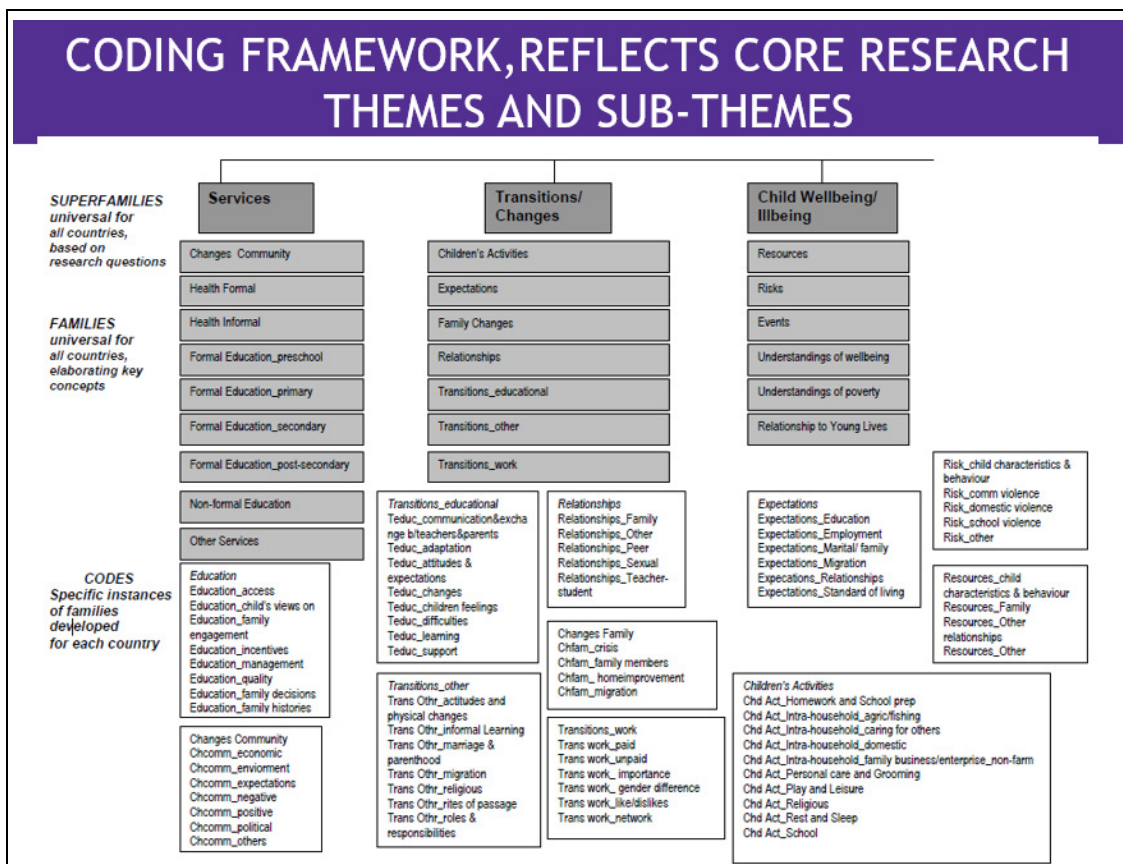


Figure 10: Coding Framework



Procedures were also established for encrypting audio files and transcripts. Integrating the qualitative data with the survey data brought to light several problems. For example, many children do not know their exact age so their age can change across waves. The lead qualitative researcher in Ethiopia has advised researchers using the Ethiopian qualitative data to use the year of birth recorded when the individuals were recruited into the study as the benchmark, although this approach is not consistent throughout the team.

The launch of the school surveys in 2010 was another major milestone, bringing with it the requirement that children in the household surveys be linked to their schools in the school-survey

data.³² This was expected to be relatively straightforward because children had always been asked to name their school. However, it turned out that in many cases popular rather than official names were given for schools and some school names were misspelt, forcing data managers to validate all school names and re-code thousands of pieces of data. Linking household-based and school-based data is further complicated by the size of the school sample, the fact that only a sub-sample of Young Lives respondents is involved in both components, and that household and school surveys draw on different units of observation and analysis. While Young Lives' children and youth are the primary unit in the household-based research, the school is the primary unit in the school-effectiveness research. At a technical level, data managers rely on the study's file structure and naming protocol to ensure that links across the data types and research waves are conserved.

Data cleaning is an ongoing task in longitudinal research, since data entry errors can have a serious impact on research results. Data cleaning is conducted continuously across all data rounds, making it possible to check inconsistencies between rounds. Examples of data errors include cases in the household data where children's education history was inconsistent and different grades were given for the same years. Similarly, the variable 'rice' was omitted from the food frequency section in one round of the Vietnamese questionnaire. Unfortunately, by the time the latter error was detected, it was not possible to return to the field to address the gap. That said, it is not possible to achieve 100 per cent clean data with a dataset of the size and complexity of that of Young Lives. A cut-off point for analysing and archiving data has to be set wherein data quality and usability can be assured, although Young Lives does re-clean and re-archive data from early rounds at each new round.

While managing data complexity certainly poses significant quality assurance challenges, longitudinal research offers unique opportunities to improve data quality. Whenever feasible, researchers try to clarify irregularities with fieldwork teams and checking data in the field with CAPI has helped reduce the number of errors overall, so that Round 5 data are cleaner than those from previous rounds. Painstaking investigation of anomalies can pay off. In Peru, several communities changed from rural to urban status between rounds. Initially this was thought to be an entry error, but investigations revealed that it was due to the redrawing of district/administrative boundaries. Also in Peru, a skip pattern failed in the Round 5 survey and young women were not asked the age at which they had reached menarche. This information was crucial for investigating the factors shaping children's growth recovery following nutritional deficiencies in early childhood. Unable to return to the field to gather these data, researchers decided to phone participants to ask for this information. Interestingly, many participants were very happy to receive this call. Improvements in data management also helped with data quality. For example, at the third round, data managers devised a system for attaching round identifiers to variable names, which saved time and improved data accuracy. However, it did leave data managers with the task of retrofitting data from the first two rounds with round identifiers.

5.2. Data security procedures

Guaranteeing respondents' anonymity and confidentiality and ensuring that their participation is by informed consent are central features of accountability in research. This section briefly describes the steps taken by Young Lives to protect respondents' anonymity and confidentiality, while informed consent and wider ethical and safeguarding issues are addressed in a separate paper. Despite a strong legal framework governing data protection across the European Union, a significant body of social science and medical literature on research ethics, and a multitude of

32 Data linking also limits the burden on respondents as it ensures that they are not interviewed more often than is necessary.

protocols and guidelines around stewardship of data, sustaining accountability to research participants in longitudinal research is not always straightforward. Young Lives has had to continuously scrutinise and reflect on its research values and practice, and has had to respond to some major challenges on both fronts.

The main concerns in guaranteeing research participants' anonymity and confidentiality are securing their personal data and keeping their location secret. For Young Lives, personal data includes all GPS information, community and school names and locations, as well as the names, addresses and phone numbers of respondents. Protecting study sites and respondents means only making geographical identifiers available at the regional level in Ethiopia, district level in Andhra Pradesh and Telangana, and provincial level in Peru and Vietnam. The team does not release any location data on a lower level.

Importantly, Young Lives also designates all qualitative data as personal data – even after all obvious personal identifiers have been removed. This decision rests on the fact that these data risk revealing participants' identity and/or location indirectly. Visual representations often portray children's whereabouts, the people close to them and major episodes in their lives. Similarly, transcripts from individual interviews and focus groups frequently contain references to an individual's personal or family history. These sometimes contain very personal accounts of unusual happenings or circumstances, such as severe weather events, deaths and accidents, which are traceable to specific individuals, families and communities. Respondents may also cite the names of neighbouring towns (where young people migrate to), factories (where they work) or higher education institutions (where they study). Sometimes the qualitative research also reveals serious ethical concerns wherein a young person is at risk, for example through exploitation or abuse, requiring an intervention or referral.

The Young Lives' protocol for handling personal data conforms with the General Data Protection Regulation ((EU) 2016/679) and its implementing national legislation, including the UK Data Protection Act 2018. The protocol was developed by the University of Oxford's central Research Services department in recognition of the University's function as the data controller. It covers all research stages and activities and aims to prevent unauthorised access to and processing of data, whether through accidental loss, destruction, damage, or breaches.

As one means of preventing breaches of the protocol, access to personal data – all qualitative data and all identifiers for survey data – is restricted to those people who by the informed consent of study participants have a right to use the data and whose role in the study necessitates data retrieval. In effect this means restricting access to current staff: that is, Young Lives staff at Oxford as the data controller, and in study-country institutions as data processors. The team has found that the safest way to secure these data is by further limiting staff access on a 'need to know' basis. Thus, the lead data manager in Oxford is the only person who accesses the personal data of all research participants, while researchers, data managers and data-collection teams in partner organisations access the personal data relating to respondents in their countries for agreed purposes only. Working closely with data managers, local researchers are responsible for cleaning and anonymising all the data and preparing it for use by colleagues.

Secure information-technology systems for storage, transfer and archiving are key to preventing unauthorised data access. All personal data are stored and shared on encrypted, password-protected servers, data managers being the only staff holding the password, and data from study countries are uploaded to this central database. As a substitute for names, all individual respondents and households are assigned an identification code, as are schools in the school surveys. Codes facilitate data linking across the different research components and methods and research waves. The introduction of CAPI and Surveybe software made it possible to encrypt survey data directly into a file during data collection, preventing unauthorised access due to loss or theft of tablets. Codes are run in Surveybe to strip the data of personal identifiers, and string

variables that include locations, GPS data, names, dates of birth, or other personal information are erased. Only when fully anonymised are the survey data ready for analysis and archiving with the [UK Data Service](#) (UKDS).

Over the years several journalists have sought to interview and film Young Lives' children and families directly. There is considerable appeal in using personal narratives and images in communicating research evidence to policy and practitioner stakeholders and the general public. However, it has not been possible to grant these requests since they breach the study's data-security protocol. Aside from employing pseudonyms for individuals, families, schools and communities, none of the individuals and places filmed or photographed for Young Lives' research dissemination and policy engagement outputs are connected with the study.

6. Data democratisation and discoverability

Young Lives aims to democratise its study data by archiving them and making them open-access, therefore available as a public good. A constructed panel dataset of key variables across the five rounds of data collection is available to anyone, facilitating the ease of data analysis for other researchers. In addition, Young Lives has evolved a range of measures to increase discoverability of its survey data – raising awareness of the data’s existence and potential applications and promoting their use, including in study countries and by non-expert users. Young Lives has developed specific protocols to minimise the risks associated with open-access data.

6.1. Open access data

Data ‘democratisation’, or maximising data use by making them available as a public good, is an important goal for Young Lives and a requirement of the study’s main donor, the Foreign, Commonwealth & Development Office (FCDO). FCDO expects any data generated through research it funds to be accessed by as many users as possible and this is one of the key criteria against which Young Lives’ performance is monitored. The study’s primary means of achieving open access is by archiving all household and school-based survey data (excluding personal data) with UKDS at each round. Qualitative data are not archived for public use, for reasons outlined at the end of this section.

Interest in Young Lives’ data among external users is high. UKDS report that there were 6,598 downloads between 2016 to 2019, with the number of users increasing each year. Although 40 per cent of users are from the UK, Peru and India have the second and third highest numbers of users respectively, indicating that the data are a valued resource for study-country stakeholders.³³ An independent evaluation of Young Lives in 2019 confirmed that the ‘richness, availability and reliability of Young Lives’ data is what attracts students in the study countries - where no similar longitudinal datasets exist - to use this data for their dissertations’ (Ecorys 2019).

Archiving involves a number of steps, beginning with preparing the data and other accompanying documentation for submission to the UKDS for their review and feedback. Only when any questions or concerns they may have around quality or usability have been addressed can the data be uploaded for public use. As an aid to use, Young Lives archives extensive supporting documentation at each round, including enumerator manuals, justification documents,³⁴ data dictionaries and other information. Additionally, a series of technical papers and blogs documenting the study’s sample frame, methods, ethics, measures, lessons learnt from the fieldwork and other aspects of methodology are available on the Young Lives website, together

UK Data Service



33 There are relatively few users in Ethiopia and fewer still in Vietnam, where the dataset has been shared with users on CD-ROMs. In Vietnam, external researchers also access the data through the Data Manager.

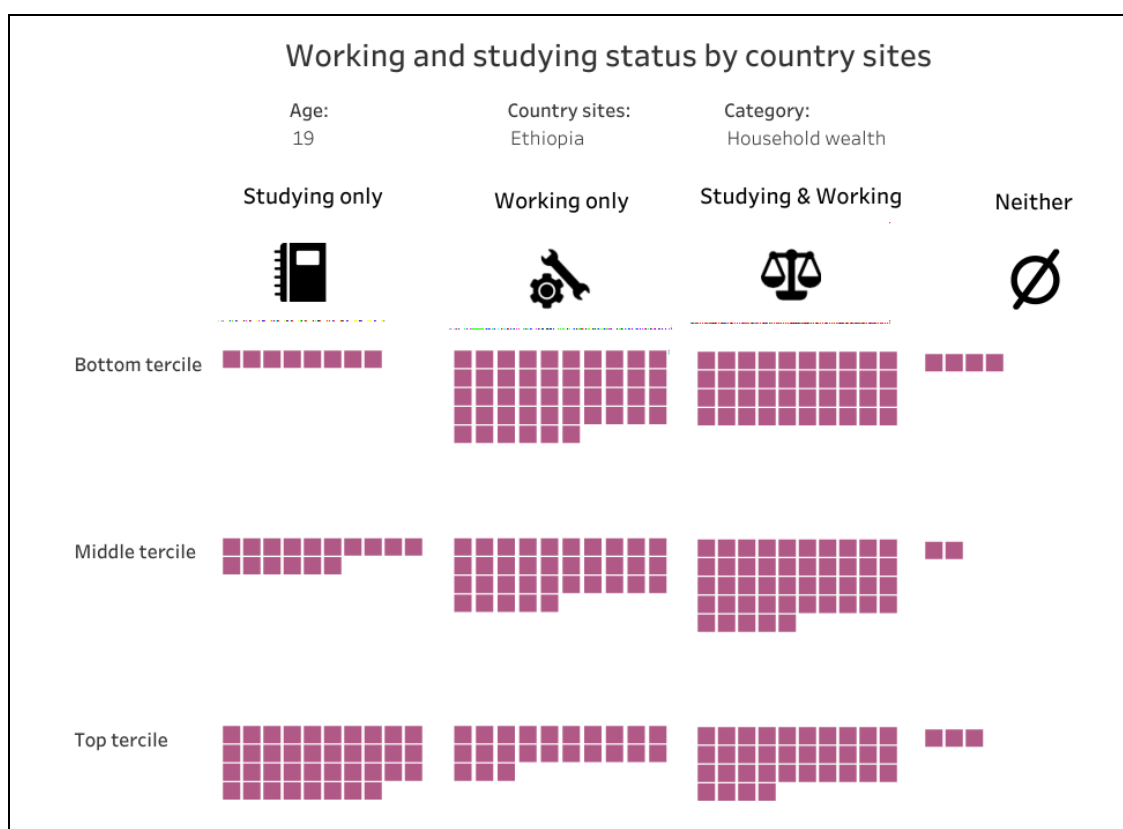
34 Based on a comprehensive review of the literature and current good practice, justification documents outline the choices made by Young Lives for inclusion or exclusion of specific topics and variables and how the information will be used.

with the [questionnaires](#).³⁵ Data use is also enhanced through links to archived data on the World Bank and Population Council websites, and each data release is announced on the Young Lives' website and via social media.

Exploitation of household-based survey data is further facilitated through the construction of a panel dataset of key variables encompassing the five rounds. Archived along with the data, these constructed files comprise around 200 variables covering a range of concepts and topics that are widely deployed in longitudinal research (Briones 2018).³⁶ They include: anthropometric measures standardised using WHO 2006 growth charts; real values of total food and non-food consumption assembled using data from the household food and non-food consumption modules and deflated using local price data; and a wealth index constructed using data on access to services, ownership of durables and housing quality. Preparing the constructed files involves a lot of work. However, feedback shows they are greatly appreciated by users.

6.2. Data discoverability

Figure 11: *Data Visualisation Example*



Young Lives has also evolved a range of measures to increase discoverability of the survey data – raising awareness of the data's existence and potential applications and promoting their use, including in study countries and by non-expert users. Selected policy-relevant [visualisations](#) of the household-base survey data, constructed using Tableau software, are displayed on the

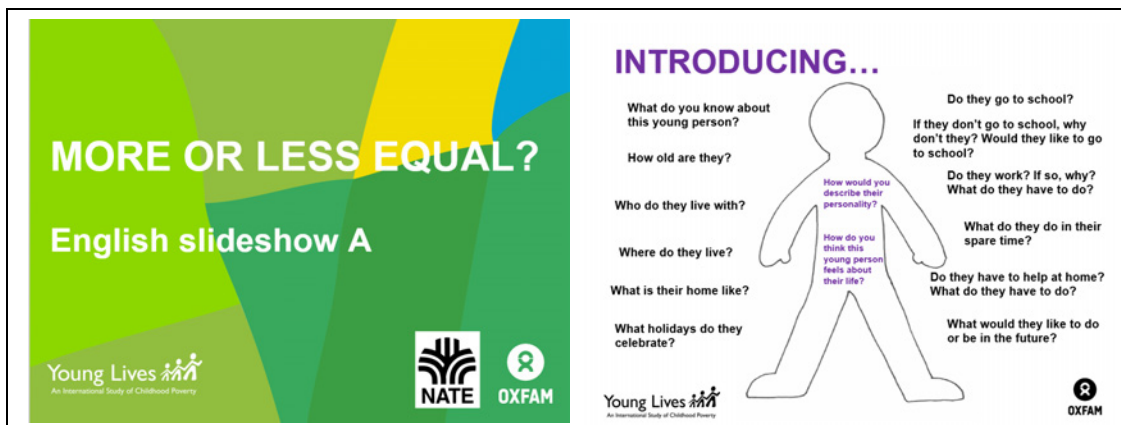
35 This practice is endorsed by Feranil, Gultiano and Adair (2008), who argue that the documentation of procedures from surveys as crucial for generating 'user-friendly datasets', insofar as the history of their creation can help outside researchers understand and analyse data.

36 This technical note accompanies the constructed files and outlines four broad groups of variables: identification and location variables; panel information; child characteristics; and household characteristics.

Young Lives website along with supporting narratives describing the findings. Covering the themes of nutrition, gender, education, skills and work, this [interactive tool](#) enables users to create a wide range of graphs and charts employing different variables from across the rounds and countries. The data visualisations are more attractive and accessible to work with than the far larger and more complex panel datasets archived with UKDS. Publicising them on social media platforms has also attracted the attention of researchers and policymakers to the broader Young Lives' findings.

Regardless of the steps taken to promote utilisation of the study's survey data, panel-data analysis requires a minimum level of technical expertise in statistics and econometrics, as well as the appropriate software. Capacity building in panel data analysis for researchers and policy stakeholders in study countries is another means of expanding data access and use. Country teams run in-country data-use workshops promoting the use of the survey data among researchers and policymakers working with children and young people. These workshops have trained hundreds of students, academics and other professionals in the use of Young Lives' data. The team in Peru teach university students and supervise undergraduate dissertations and postgraduate students. Also in Peru, training workshops have shown government staff how to access and use Young Lives' data for their own analysis and, eventually, for decision-making. For example, research officers from the Ministries of Education and the Economy and Finance used Young Lives' data to review the factors that contribute to youth unemployment. Additionally, the team in Oxford have held competitions for students and researchers to prepare papers based on new data following the release of data rounds, with the opportunity to win a small prize, and several of these calls are directed at students and researchers in the study countries. Young Lives has also collaborated with Oxfam to create [teaching resources](#) specifically designed to engage adolescent learners.

Figure 12: *More or Less Equal? Resources for English – Example of resources created with Oxfam*



Young Lives' survey data offer important opportunities for data linking with other, external databases. This involves identifying, matching and merging records from distinct databases that correspond to the same entities. When the study began collecting data in 2002 there were serious data limitations and few opportunities for data linking in the study countries. However, the situation today is much changed and there are numerous possibilities for linking Young Lives' data with census data, climate data, administrative data, intervention records, school census data and the like, especially in Peru and Vietnam. Data linking opens up the potential to increase the power of the research and its application to policy and programme planning and development.

6.3. Risks with open access data

Survey data

Making data available to external researchers presents certain dilemmas. As Young Lives' data have become better known, so demand for access has increased, with donors keen that they be archived swiftly to meet this end. However, giving external researchers early access can disadvantage Young Lives staff who have worked tirelessly on research design, data generation and management, many of whom only work part-time with Young Lives and have numerous other responsibilities. In recognition of the intellectual and practical contribution to the study made by staff, and in agreement with donors, Young Lives archives data a year after data collection is completed.

The team receives frequent requests from external researchers to access the personal data to enable data linking (or matching) with administrative and other datasets. While these requests are consistent with data democracy objectives, data linking requires the use of personal data and releasing them to external researchers would contravene the study's responsibility to safeguard respondent anonymity and confidentiality (Murtagh et al. 2018). Data linking can also be time consuming and technically demanding. For these reasons matching needs careful stewardship. Young Lives has developed a protocol to help accommodate data linking demands from external researchers as well as the study's collaborators, while also preventing breaches. The protocol details the terms under which collaborators and designated external researchers can commission Young Lives staff to do the matching, releasing the anonymised matched data to them for their own use. Since the team is small and matching can be time-consuming, there are limitations to this arrangement. For example, it is only possible to respond to requests that fit with the study's research priorities and associated costs must be covered by the commissioning agent.³⁷

Qualitative data

Research donors are increasingly requiring that qualitative datasets be open access. An independent evaluation of Young Lives commissioned by the ESRC in 2008 recommended strongly that Young Lives' qualitative data be archived publicly, arguing that interpretation of such data is subjective, and thus needs public scrutiny. It is sometimes assumed that secondary analysis of archived qualitative data is not just good practice but involves few ethical and analytical challenges. However, numerous considerations must be addressed, including responsibilities towards participants as well as the original researchers, and the need to counter risks of misinterpretation by those not involved in the original research or who may lack contextual understanding of the settings in which the data were generated (Morrow and Boddy 2014).

Recognising the merits of open access, Young Lives undertook a pilot exercise to assess what public archiving of qualitative data would entail given the requirement to maintain respondent anonymity and data quality, and minimise the risk of erroneous analysis by external users. Another consideration was that preparing the data for public archiving should not be overly burdensome. A selection of transcripts and other research outputs was made available for the pilot. Preventing identification of respondents required local research teams to read through and review these materials, identifying tracts of text and images that contained potentially sensitive or confidential information.

Although local research teams already had a system for sharing partially anonymised data with colleagues in Oxford, it transpired that full anonymisation for archiving necessitated an additional

37 This collaborative research and funding model proved extremely successful in the case of a major stream of Young Lives' research focused on child nutrition and growth, led by Professor Jere Behrman at the University of Pennsylvania and involving many Young Lives' researchers as well as a team of collaborators from various US universities.

level of scrutiny. This is because some of the details contained in these data that are useful for analysis and profiling of local communities by staff risked revealing respondents' identities. The task of shifting through and performing the second level of data cleaning proved extremely time-consuming because removing personal identifiers and checking translations is meticulous work. The pilot also highlighted the need for greater attention to translation, and translated texts would require thorough review and revision prior to archiving. Young Lives' researchers carry out analyses collaboratively and co-author papers with colleagues so that any questions arising over translation or contextual understandings can easily be resolved. As well, it became apparent that stripping out the contextual information significantly impaired the potential for data analysis, with the risk that researchers might draw erroneous conclusions – thereby undermining the argument for public scrutiny. Given the constraints and amount of work involved, the team decided against open access.

Conclusion: key lessons and implications for future research

Over the years, Young Lives has learnt a number of valuable methodological lessons, many of which are of relevance for future longitudinal research with children in LMICs. We list these below according to their applicability for different groups – specifically, researchers, programme managers and data managers.

Key lessons for researchers

- Though complex to administer, a multidisciplinary, mixed-methods study design that combines longitudinal with cross-sectional research allows effective triangulation of findings and provides greater granularity of data, while also facilitating new lines of enquiry without overburdening respondents.
- Good quality and strongly empowered country partners are of critical importance in generating high-quality longitudinal data, and also help ensure the research achieves policy impact nationally and globally.
- The frequency and timing of data rounds should, as far as possible, reflect the study's goal and its theory concerning the factors likely to affect change and stability in children's development over time. That said, schedules must take account of funding and logistical constraints to implementing research in LMICs, while also adjusting for children's institutional and social transitions and aiming to minimise attrition.
- Longitudinal research with children needs to be designed flexibly in order to ensure as much consistency as possible in constructs and measures administered across rounds, while at the same time, adapting instruments to respond to children's developmental changes, age-related responsibilities and any shifts in their external circumstances.
- Most instruments and measures administered with children are designed for application in high-income countries or with adults. Consequently, research with children in LMICs needs to take account the many aspects of their lives and development that are not typically provided for in these tools, particularly their social and economic roles and responsibilities, their transitions through childhood and beyond and their pro-social and life skills.
- In research administered across different languages and with different sociocultural groups, it is essential to ensure that instruments are reliable, valid and show measurement equivalence in constructs between groups. This calls for considerable attention to pre-piloting and piloting of tools at each research wave and may need double translation, plus the deployment of translators familiar with the local vernacular.
- Research reciprocity is vital to both cohort maintenance and data quality in longitudinal research, and researchers should develop clear strategies which guarantee that all exchanges with study participants are based on mutuality and respect.

Key lessons for programme managers

- Conserving respondent anonymity and confidentiality is of paramount importance in longitudinal research and necessitates the development of a strict protocol safeguarding their personal data and location, along with secure information-technology systems for data entry, storage and transfer. To be effective, such a protocol should define who controls and accesses which types of data (personal and anonymised) and to what ends, and specify the measures needed to prevent and address accidental loss, destruction, damage, or breaches.
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- It is essential for programme managers to work together with principal investigators, field coordinators and supervisors to ensure a culture of respect for study participants, their families and communities. Research reciprocity is key.
- A partnership approach to longitudinal research has many advantages over use of survey companies and is made much more powerful through joint leadership by LMIC and high income country (HIC) individuals and organisations, drawing on their particular roles, contributions, expertise and skills.
- Capacity building and retention of experienced field staff safeguards data quality and cohort maintenance in longitudinal research. Retaining fieldwork coordinators and field supervisors who are responsible for guaranteeing relationships of trust with respondents, as well as data collection logistics, training, tracking, piloting and cohort maintenance is a priority.
- Piloting and pre-piloting is most effective when undertaken by mixed teams comprised of researchers, data managers and experienced field supervisors (and when necessary, translators well versed in local languages and idioms).
- Programme managers must ensure that data managers have sufficient authority and support and the technical skills needed to enable them to monitor and apply in full all data procedures within a study.

Key lessons for data managers

- Responsible for administering information technology systems and data protocols, and in some cases also for data archiving and data visualisation, data managers are vital to the successful accomplishment of longitudinal research: they should be aware of and as far as possible involved in all data governance and data management decisions.
 - Data cleaning, anonymising, storing, transfer, consistency checks and matching all contribute to ensuring data quality and security, and it is extremely important for data management and research teams to have the necessary technical skills to oversee these tasks. They should have regular opportunities to learn about and whenever possible, take advantage of, new developments in the field.
 - It is essential to develop specific protocols to minimise the possibility of security breaches in relation to personal data and other risks to data associated with open-access data.
 - Effective data management facilitates cross-cutting analyses based on mixed-methods, multi-component, longitudinal datasets.
 - CAPI is a useful tool in survey administration and has distinct advantages over paper questionnaires, including: faster data retrieval, easier data linking, and higher data accuracy through the data checks built into the CAPI system.
 - It is vital for data and research teams to be aware of the risks of introducing CAPI technology into a study, which include: cost, theft, technical glitches while in the field, translation, programming skip patterns, unfamiliarity of computer use among enumerators, and the possibility of introducing bias or influencing responses.
 - Data democratisation, or anonymising and archiving data so that it can be made open access, is an important way of enhancing the profile of a longitudinal study and increasing its research outputs. Efforts focused on data discoverability and capacity building in panel data analysis can further increase the use and application of data by external researchers.
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