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LSMS
Living Standards Measurement Study

The World Bank's Flagship Household Survey Program

Enhancing Living Standards Surveys in LMICs using Large Language Models

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Overview of today's presentation

Part I: Overview of the Living Standards Measurement Study (LSMS) program

Part II: Survey Methods and Measurement program

Part III: Using LLMs to enhance household surveys in LMICs

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Overview of the Living Standards Measurement Study (LSMS)

Living Standards Measurement Study (LSMS)

The World Bank's flagship household survey program

Data Production & Advisory Services

Survey Methods

Policy Research

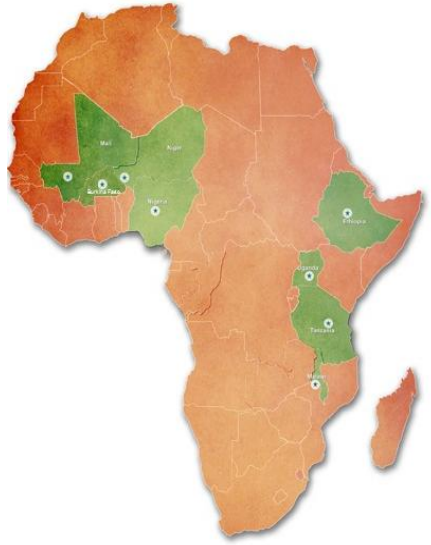
Training

OBJECTIVE

To provide a comprehensive approach to household surveys across the survey life cycle, producing timely and quality data for better-informed policy design and development investments.

LSMS Data production

8 Partner National Statistical Offices (2008-2024)

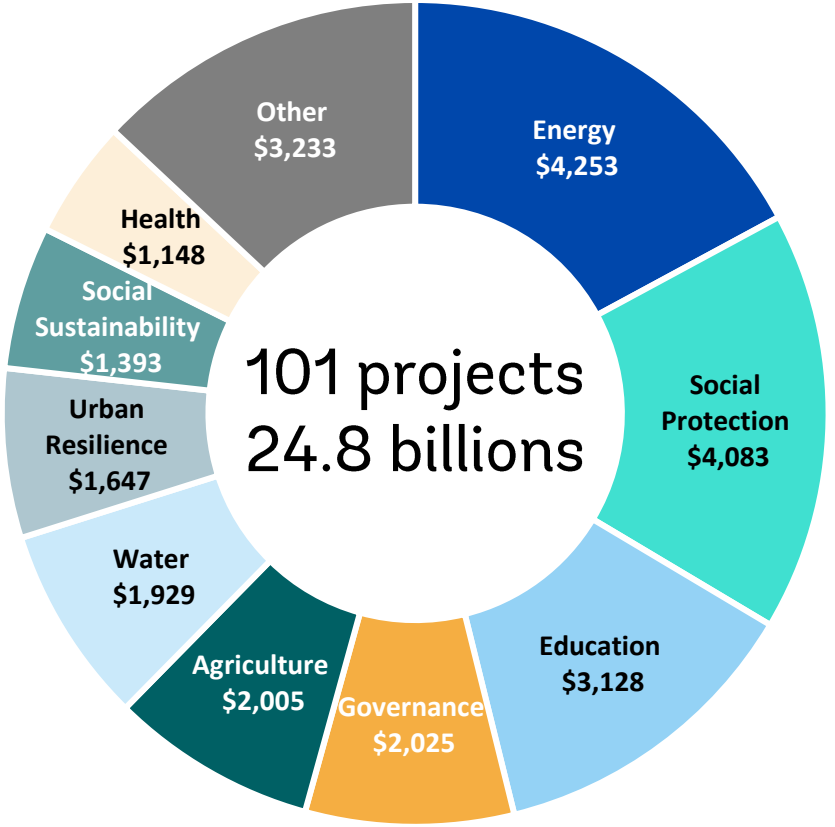


Burkina Faso, Ethiopia, Malawi, Mali, Niger, Nigeria, Tanzania, Uganda

Open-Acces Data:

- 33 face-to-face surveys (2008-2024)
- 124 phone surveys (2020-2025)
- 4 harmonized datasets
- 7,200 publications
- 117,000+ microdata library downloads
- 35% by African researchers

101 World Bank projects informed by LSMS-supported longitudinal face-to-face and phone surveys from 2008 to 2024



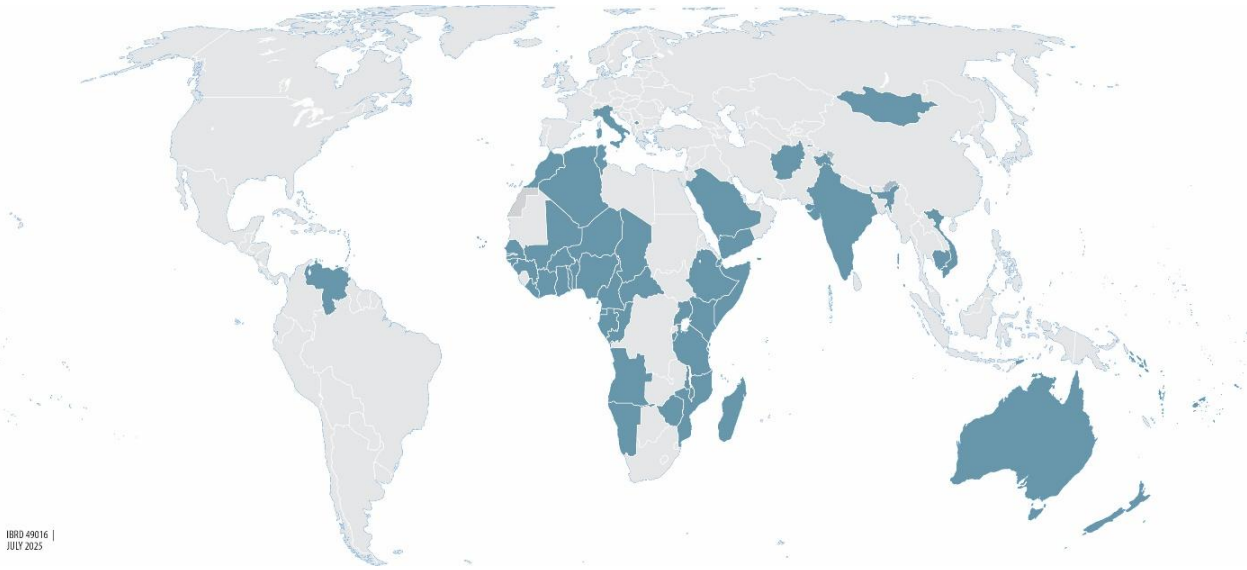
LSMS technical assistance and trainings

Global engagement:

- **Build technical capacity** in partner countries to strengthen household survey systems and improve the quality and use of microdata
- **C4D2 training initiative** to provide statisticians in LMICs with specialized skills

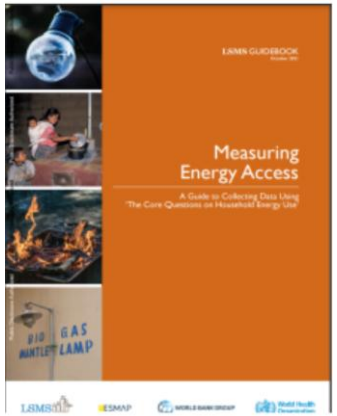
2025/26 Highlights :

- **Two training courses** under the aegis of the World Bank Data Academy
  - Mastering the Design & Implementation of Household Surveys
  - Introduction to Sampling: Theory & Practical Applications
- **60 countries received technical assistance** for face-to-face and phone surveys



LSMS Knowledge and R&D

Global outputs:



- **Guidebook series**
  - Designing household surveys
  - Employment
  - Energy Access, …
- **Publication** of peer-reviewed articles, working papers, synthesis reports, policy briefs on:
  - Policy research
  - Survey methods
- **Outreach and dissemination** of knowledge products in blogs, conferences, and seminars.

2025/26 highlights:

- **38 knowledge products:** 16 journal articles, 12 working papers, 4 reports, 3 guidebooks, 3 policy briefs
- **2 expert convenings** – on climate adaptation and on jobs, informality and unpaid work
- **2 academic conferences (**on high-frequency survey data for development research in the polycrisis area and on survey methods)

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The LSMS Survey Methods and Measurement program

Background

- Household surveys remain the backbone of evidence generation on living standards in low- and middle-income countries (LMICs) and key tools to inform policy and investments
- But survey systems are under growing pressure to do more at lower cost as budgets contract while demands for data continue to rise: More content, more granular, faster, more frequently
- The result is growing strain on survey instruments, field teams, and respondents — with rising risks for data quality
- Innovative survey methods play key role in addressing these challenges by reducing costs and maintaining data quality and policy relevance → key principle: validation, then scale-up
- Building on previous efforts on methodological innovation in large-scale surveys, the LSMS has launched a five-year program to develop and validate a new wave of AI-enabled and AI-enabling survey methods for use in LMICs

Surveys and survey research in the LSMS

LSMS
Data
Production

- Platform for scaling up improved methods
- Learn what works in **low and middle income** and low-capacity contexts
- Help country partners **build capacity** in the latest survey methods
- Identify **new areas of study**

- Developing and validating **best practices (improved survey methods) → experimental validation**
- Developing **practical guidelines and tools** that are easily adoptable in low and middle income contexts based on the improved methods
- **Improve survey quality** through innovation and new technologies

LSMS
Research

Current Areas of Work

Methods

- Sampling for priority populations
- Mixed-mode surveys and high-frequency measurement
- Individual-level data collection
- Survey-to-survey imputation
- Surveys as ground truth for ML/AI models
- **AI and digital tools to enhance surveys in LMICs**

Topics

- Employment and small business
- Energy
- Agriculture & food security
- Resilience and adaptation
- Health

Field experiments for methods developement

- **Bangladesh**
  - Timeframe: Jan–Oct 2026
  - Method: Mixed Mode
  - Focus Areas: Adaptation and Resilience, Employment → AI
- **Nepal**
  - Timeframe: April–Dec 2026
  - Method: Sampling
  - Focus Areas: Small Business, Adaptation and Resilience, Agriculture → AI

- **Kenya**
  - Timeframe: Sep 2026–Jun 2027
  - Method: Sampling for hard-to-reach populations
  - Focus Areas: Small Business → AI
- **Malawi**
  - Timeframe: Jan-Oct 2026
  - Method: Phone
  - Focus Areas: Adaptation and Resilience, Small Business → AI

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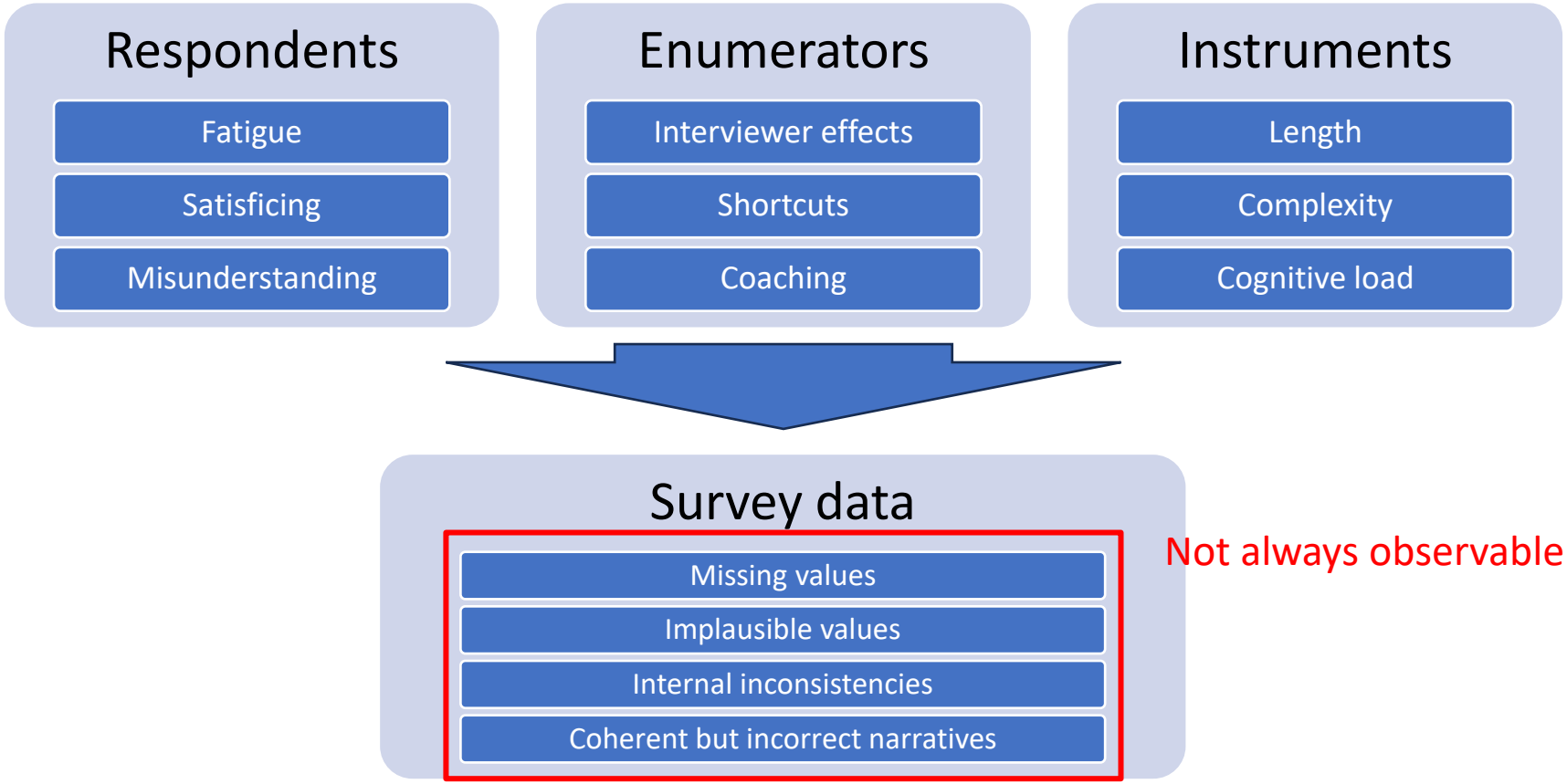
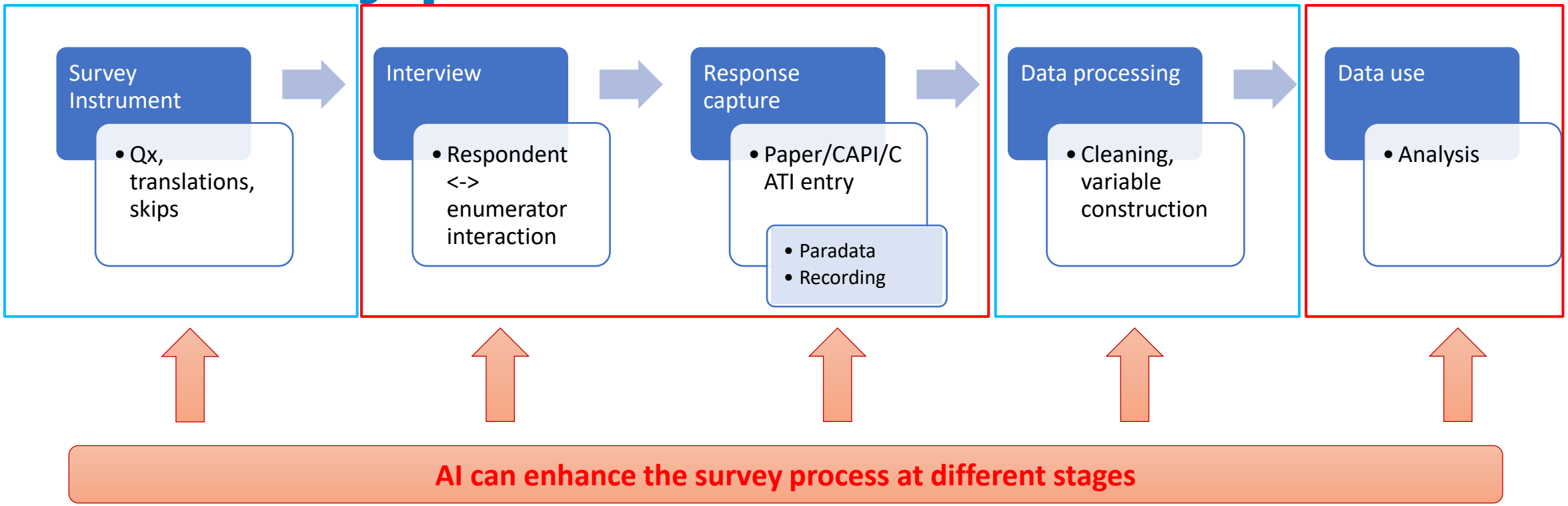
Using LLMs to enhance household surveys in LMICs

Data quality challenges in surveys



The survey process and AI



Principles of the LSMS AI work program

- Focused on measurement quality under constraints
- Combining engineering and survey methodology
- Relies on experimental validation
- Built for deployment, not demonstration
- Scale up in large-scale household surveys

Pillars of the LSMS AI work program

Foundational layer: Recording-Transcription-Translation pipeline

- Audio recording
- Transcription and translation using LLMs
- Linking text to micro- and paradata

Workstream 1: Detecting and reducing survey error

- Detect irregularities and faulty responses
- Patterns correlated with poor data quality

Workstream 2: Simplifying and enriching questionnaires

- Open-ended responses; automated coding
- Narrative data

Foundational layer: Recording-Transcription

Step 1: Recording of interviews

- Interviews take place in noisy, uncontrolled environments
- Devices, microphones, and field conditions vary widely → phone vs. in-person surveys
- Enumerator vs respondent audio
- Audio quality differs across enumerators, locations, and time

Challenge:

➢ How to obtain usable (and comparable) recordings across contexts?

Foundational layer: Recording-Transcription

Step 2: Transcription from speech to text

- Automatic speech recognition is imperfect in low-resource settings
- Transcription errors may be systematic, not random

Challenge:

- ➢ When is transcription good enough for downstream analysis?

Foundational layer: Recording-Transcription

Step 3: Translation

- Low-resource languages
- Translation introduces drift in meaning and emphasis
- Errors can compound with recording-transcription-translation

Challenge:

➢ How to preserve meaning and comparability across languages?

Foundational layer: Recording-Transcription

Step 4: Linking text to survey micro- and paradata

- Transcripts must align with questions, responses, and survey paradata
- Timing, skips, and corrections complicate alignment
- Misalignment undermines both quality control and analysis

Challenge:

➢ How do we reliably connect text to the underlying survey structure?

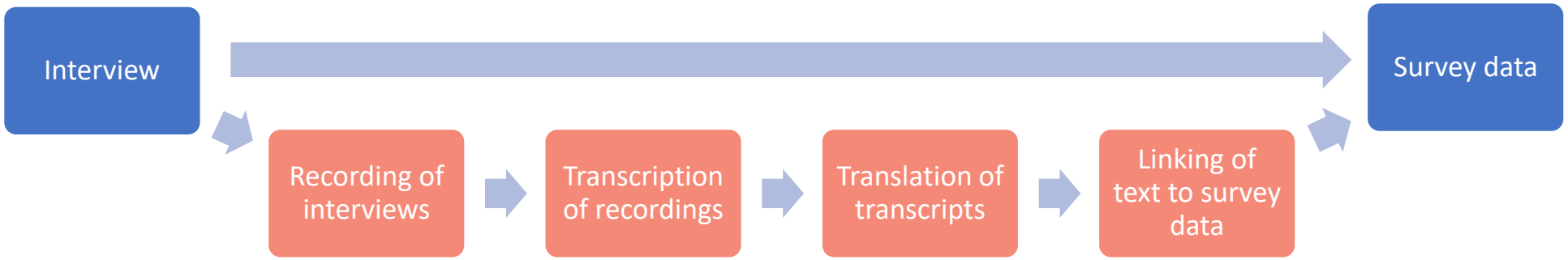
Foundational layer: Recording-Transcription

Prototype development

- We have developed a prototype for the transcription pipeline that can handle low- and high-resource languages
- Built-in layer for model training + validation

From observability to measurement

- The foundational layer makes the interview itself analyzable
- Creates new signals/data beyond the entered responses
- The new data will be used to improve measurement and analysis



Workstream 1: Detecting and reducing error in survey data

Overview

- Goal: use AI to detect survey errors that standard QC misses
- Input: structured responses + interview text + paradata
- Output: actionable quality signals during or after fieldwork

Workstream 1: Detecting and reducing error in survey data

Step 1: Obtain ground truth

- Survey data rarely reveal whether a response is truly wrong
- Large-scale surveys contain plausible but incorrect responses
- Many errors pass standard range and logic checks

Challenge:

- How do we generate reliable training and evaluation data for error detection?

Workstream 1: Detecting and reducing error in survey data

Ground truth in Bangladesh study:

- Observable ground truth: housing, WASH, infrastructure
- Consistency checks across answers
- Inverted response scales

→ Less feasible in large-scale surveys

Workstream 1: Detecting and reducing error in survey data

Step 2: Representing survey interviews for AI systems

- Survey data + transcripts combine structure, language, and interaction
- Errors often emerge across questions, not within them
- LLMs require explicit choices about alignment, granularity, and context

Challenge:

➢ How do we represent interviews so that AI can reason about quality without losing structure or interpretability?

Workstream 1: Detecting and reducing error in survey data

Step 3: Using LLMs for quality control

- LLM outputs are probabilistic and non-deterministic
- Responses depend on prompt design and context length
- Reasoning is not always transparent or stable

Challenge:

➢ How can LLMs be used as diagnostic tools for data quality — in a replicable, transparent way?

Workstream 1: Detecting and reducing error in survey data

Step 4: Benchmarking and validation

- Rule-based QC is transparent but limited
- Statistical models detect patterns but lack semantic context
- LLM-based systems may flag new errors but risk overreach → can they identify behaviors that lead to error?

Challenge:

➢ When, where, and for which types of error do LLMs add value relative to simpler methods?

Workstream 2: Simplifying and enriching questionnaires

Problem

- Household surveys rely heavily on structured questions
- Structure makes data easier to analyze, but interviews longer and performs poorly for complex concepts (e.g. coping) → surveys can lack depth
- Long questionnaires increase burden and fatigue
- Structured formats often miss nuance and context

Workstream 2: Overview

- Goal: use AI to simplify questionnaires and interpret open-ended questions at scale
- Input: open-ended questions → interview transcript
- Output: classification/structuring of survey questions

Workstream 2: Simplifying and enriching questionnaires

Step 1: Designing effective open-ended questions

- Open-ended questions vary widely in response quality
- Some respondents give rich answers, others very little
- Enumerator prompting influences what is said → enumerator effects

Challenge:

➢ How to design short, robust prompts that work across respondents and settings?

Workstream 2: Simplifying and enriching questionnaires

Step 2: Interpreting open-ended responses at scale consistently

- Respondents express similar experiences in different ways
- AI must group diverse answers into shared categories
- Categories must remain stable across surveys and countries

Challenge:

➢ How do we ensure that AI interpretations are both meaningful and comparable?

Workstream 2: Simplifying and enriching questionnaires

Step 3: Benchmarking against traditional survey questions

- Structured questions are well-understood and standardized
- Open-ended approaches promise richness but add noise
- Gains must be demonstrated empirically

Key issue:

When do AI-processed open-ended questions perform better than traditional instruments — and when do they not?

Summary and Outlook

What we are building

- A new observability layer for surveys: Audio → text → structured linkage
  - ➢ Current status: prototype built for transcription, translation; work on matching to survey data → to be deployed in Bangladesh, Nepal, Kenya, Malawi

Two measurement applications

- Workstream 1: Detecting hidden error in survey data
- Workstream 2: Simplifying questionnaires and improving analytical depth of surveys

Looking ahead

- Open technical and methodological challenges in both workstreams
- Opportunities for collaboration and student research

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The LSMS website