Uzbekistan
Pilot Multidimensional Poverty Index

Report 2023

Poverty and deprivation analysis using the Multidimensional Poverty Index (MPI)

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Acknowledgements

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Foreword

It is imperative to have a comprehensive understanding of poverty that goes beyond monetary measure. Given this, we are honoured to present this report on the pilot measure of MPI in Uzbekistan. This research project is the result of a collaborative effort between UNDP, OPHI, and CERR. The report serves as a crucial stepping stone to combat poverty and achieve sustainable development in Uzbekistan.

The pilot MPI in Uzbekistan takes a pioneering approach by considering multiple dimensions of poverty, including Basic Infrastructure and Living Standards, Health and Social Capital, Financial Inclusion and Employment. It provides a robust evidence base that can guide policymakers, practitioners, and stakeholders in formulating targeted strategies and interventions. By leveraging the insights presented here, we can work towards building a more inclusive, equitable, and prosperous society where no one is left behind.

We would like to extend our sincere gratitude to the Government of Uzbekistan for its unwavering commitment to addressing poverty and promoting social development. The collaboration and support provided by various ministries, agencies and research institutions have been instrumental in the success of this pilot measure.

We also commend the research team for their dedication, expertise, and tireless efforts in ensuring the accuracy and reliability of the findings. We acknowledge the individuals who participated in this study. Their willingness to share their experiences and perspectives has been invaluable in capturing the dimensions of poverty in Uzbekistan.

We encourage all readers to delve into the methodology, findings, recommendations, and lessons learned outlined in this report. Let us use this knowledge to advocate for positive change, foster collaboration across sectors, and empower individuals and communities to eradicate poverty in all its forms.

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Acronyms

AF	Alkire-Foster method
CERR	Center for Economic Research and Reforms under the Administration of the President of the Republic of Uzbekistan
CI	confidence interval
DHS	Demographic and Health Surveys
FIES	Food Insecurity Experience Scale
GNI	Gross National Income
HBS	Household Budget Survey
ILO	International Labour Organization
MICS	Multiple Indicator Cluster Surveys
MPI	Multidimensional Poverty Index
MPM	Multidimensional Poverty Measure
N-MPI	National Multidimensional Poverty Index
OPHI	Oxford Poverty and Human Development Initiative
SDGs	Sustainable Development Goals
SE	standard error
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UZS	Uzbek Soum
WB	World Bank

Glossary[1]

Adjusted Headcount Ratio
A share of total possible deprivations that poor people are experiencing, and the value ranges from 0 to 1. It is computed as the product of these two components: incidence and intensity [MPI or M0 = H x A].

Incidence, H
The proportion of people identified as multi-dimensionally poor; is also referred to as the "headcount ratio". It is the percentage of people out of the total population whose weighted deprivation score is greater than or equal to the poverty cut-off. Value ranges from 0 to 100%. Sometimes called the headcount ratio.

Intensity, A
The average proportion of indicators in which poor people are deprived – the average deprivation score across all poor people.

Unit of identification
The level at which deprivations are measured. It might be a person, a household, a region or an institution.

Unit of analysis
How the results are reported and analysed. It might be a person, a household, a region or an institution.

Indicators
The fundamental components of the MPI should capture deprivations in functionings that define poverty, according to the purpose of the measure.

Dimensions
Conceptual groupings of indicators that are used to communicate the final measure.

Deprivation cut-off
The minimum level of achievement that a household or individual must have to be considered non-deprived in each indicator. For instance, the deprivation cut-off for years of schooling could be six years, so a person is considered deprived if she has not completed at least six years of schooling.

Reference population
It is the population for which the achievement/deprivation is relevant (e.g., attendance only for school age children). Indicators have different deprivation cut-offs depending on the age group of the reference population.

Weight
The value that is given to indicators (and, by association, to dimensions) within the MPI. Weights, like dimensions, indicators, and cut-offs, are fixed over time. Setting weights plays a fundamental role in defining the relative importance of each deprivation in the final measure.

Poverty cut-off, k
It identifies those who are multidimensionally poor in at least k-weighted indicators. The value of k reflects the minimum level of deprivations or deprivation score an individual or household must be suffering simultaneously to be considered poor.

Uncensored Headcount Ratio
Percentage of people in the population who are deprived in a given indicator.

Censored Headcount Ratio
Percentage of people who are both poor and deprived in a given indicator.

Percentage contribution
The percentage of the MPI that each indicator contributes (sums to 100%).

Absolute contribution
The value of the MPI that each indicator contributes (sums to MPI value).

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1 UNDP (2019).

Approaches to identify poor

Union approach
A person is identified as poor if she or he is deprived in at least one indicator.

Intersection approach
A person is identified as poor if she or he is deprived in all indicators simultaneously.

Intermediate cut-off approach
A person is identified as poor if she or he is deprived in a specified number of indicators under this dimension.

Approaches to identify multidimensionally poor (setting the poverty cut-off, k)

Union approach
It identifies people as multidimensionally poor if they experience deprivation in at least one dimension.

Intersection approach
It identifies people as multidimensionally poor if they experience deprivation in all dimensions simultaneously.

Intermediate cut-off approach
It identifies people as multidimensionally poor at specific poverty cut-offs, k. It could reflect the weighting structure of the index. For example, if there are three dimensions, it would be natural to explore cut-offs of 33 percent and 34 percent – which translates to being deprived in at least one dimension or deprived in more than one dimension or the equivalent of weighted indicators.

Executive summary

Uzbekistan has experienced a steady GDP growth over the past two decades, gradually diversifying the economy, while poverty declined from 24percent in 2000 to 11.5 percent in 2020, equivalent to lifting 2.2 million people out of poverty. Unfortunately, due to the severe impacts of the COVID-19 pandemic, reportedly an additional amount of 1 million. people may have fallen into poverty. And the political, economic, and climate change crises (such as the tensions on the borders with Afghanistan and other neighboring countries, labour migration to Russia, energy crises and Aral Sea issues, and many others) have become quite frequent and are creating additional constraints in addressing poverty.

Moreover, a very ambitious goal of halving poverty by 2026 and achieving upper-middle-income status by 2030 has been set up by the Government in the New Uzbekistan Development Strategy for 2022-2026 and Uzbekistan-2030 Strategy. Yet, these ambitious goals will require even bigger efforts and investment towards achieving a sustainable and inclusive market economy.

Historically, poverty estimation has predominantly relied on income as the sole indicator. However, the Global Multidimensional Poverty Index (MPI), based on the Alkire-Foster (AF) methodology, captures overlapping deprivations in health, education, and living standards. It complements income poverty measurements because it measures and compares deprivations directly. The global MPI Report is jointly published by the Oxford Poverty and Human Development Initiative (OPHI) and the United Nations Development Programme (UNDP).

Currently, the Government acknowledges well that using national income data as the poverty measurement tool may not be sufficient for making effective and targeted policy decisions, and therefore it is essential to introduce multidimensional measurement instruments to analyze non-monetary deprivations and their interconnections. Using a multidimensional approach will enable the Government to understand better at both the regional and local level, as well as at a broader global context the scope of poverty in Uzbekistan, which would assist the Government institutions to make more effective decisions and take more practical steps to reduce poverty.

Uzbekistan is committed to SDG 1 – "by 2030, end poverty in all its forms everywhere". Given that, the country has initiated a pilot project on measuring national multidimensional poverty to complement the traditional monetary tool. A robust measurement will allow policymakers to accurately identify the extent and nature of poverty, and its drivers, and monitor progress in poverty reduction over time.

This report presents findings from the pilot national multidimensional poverty index (N-MPI) using the survey of 4,516 households initiated by the CERR in collaboration with the UNDP, OPHI, UNICEF, and UNICEF Office of Research – Innocenti. The report captures a snapshot of the breadth and depth of poverty experienced by the adult population aged 18 years and over in Uzbekistan.

In terms of the structure, the pilot N-MPI encompasses 13 indicators categorized into three distinct dimensions such as (i) Basic infrastructure and living conditions, (ii) Health and social capital, and (iii) Employment and financial inclusion.

Key findings

- Around 18.4 percent of the adult population (4.2 million) are multidimensionally poor because they experience deprivations in at least 34 percent of the weighted indicators.

- The average intensity is 43.7 percent meaning that each multidimensionally deprived adult is, on average, deprived in more than one-third of the weighted indicators.

- The pilot N-MPI amounts to 0.080, indicating that multidimensionally poor adults in Uzbekistan experience 8 percent of the total deprivations.

- The main contributors to the pilot N-MPI are Educational attainment (13.7 percent), Food security (11.7 percent) and Informal employment (11.5 percent).

- The highest proportion of the adult population that is poor and deprived is found in indicators such as Sanitation (14.0 percent), Bank account (13.9 percent), Educational attainment (13.2 percent), and Heating Fuel (13.0 percent).

- The Republic of Karakalpakstan (29.9 percent), Namangan region (27.5 percent), and Tashkent region (26.5 percent) have the largest proportion of multidimensional poor adults.

- The incidence in rural areas is significantly larger (23.2 percent) than in urban areas (13.9 percent).

- The incidence male population is higher (21.6 percent) than female population (15.2 percent).

Recommendations

- Incorporate the questionnaire applied for the pilot N-MPI with the HBS and then use the HBS for the national MPI going forward.

- Enable the final N-MPI as a 'poverty track tool' based on the frequent collection of the HBS data and ensure that it can be updated on a biannual basis.

1. Introduction

1.1. Uzbekistan's poverty landscape

In 2020, Shavkat Mirziyoyev, the President of the Republic of Uzbekistan recognised the issue of poverty in the country and prioritized poverty reduction efforts through the implementation of various policies and programs aimed at improving the well-being of the population. To effectively address poverty, Uzbekistan has emphasized the importance of data monitoring and evaluation. Following this, in 2021, the Agency of Statistics under the President of the Republic of Uzbekistan introduced a monetary national poverty line[2] based on the minimum average per capita consumption of food for 2,200 calories, as well as necessary non-food goods and services. The introduction of the renewed monetary methodology has enhanced the country's ability to track poverty levels, evaluate the impact of poverty reduction strategies and programmes, and ensure the efficient allocation of resources[3].

Today, Uzbekistan is classified as a lower-middle-income country based on its gross national income (GNI) per capita. In 2022, approximately 14 percent of the total population of over 36 million, equivalent to around 5.4 million people, lived in monetary poverty. This indicates that their monthly income fell below UZS498,000 ($40)[4]. The regions with the highest monetary poverty rates were the Republic of Karakalpakstan (19.7 percent), Syrdarya (19.5 percent), and Khorezm (19.1 percent) regions. In contrast, the lowest monetary poverty rates were in Tashkent city (8.5 percent) and Navoi region (9.2 percent)[5] (Ministry of Employment and Poverty Reduction, 2023).

Despite the governments' efforts towards poverty eradication, poverty has improved only modestly over the past two years, falling from 17 percent in 2021 to 14 percent in 2022. The government of Uzbekistan continues taking significant steps to tackle the issue of poverty within the country. These measures include the adoption of the 'Uzbekistan – 2030' strategy, which targets poverty reduction by two times by 2026. In addition, the approval of the Social Protection Strategy aims to establish a system that ensures a minimum level of social protection for all citizens. This will be achieved by expanding coverage and enhancing the targeting of social assistance. To date, all social protection mechanisms are consolidated under the newly established National Social Protection Agency, guided by the principles outlined by UNDP and UNICEF.

During the two International Poverty Reduction Forums that were held in Bukhara (2022) and Tashkent (2023), the Government reaffirmed its commitment to poverty reduction by tackling its different dimensions and root causes related to social protection gaps, job creation, entrepreneurship, human capital development, green transition, digitalization, infrastructure development and other.

Within the framework of the Roadmap, adopted as a result of this Forum, UNDP and OPHI have been supporting the Government to design and implement instruments & tools to measure national multidimensional poverty that aim to inform pro-poor policy-making programmes.

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2 The size social assistance cannot be lower than the minimum consumer expenditure.

3 Agency of Statistics (2023).

4 Ibid.

5 The Ministry of Employment and Poverty Reduction (2023).

1.2. Purpose of the study

Poverty is not solely defined by income or consumption; it encompasses a wide range of interconnected deprivations such as limited access to education, healthcare, clean water, sanitation, and other aspects of well-being that affect people in their daily lives. Sustainable Development Goal 1 sets up an objective "to end poverty in all its forms everywhere"[6] and Target 1.2 outlines "to reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions by 2030"[7]. To accelerate progress towards achieving SDG 1, Uzbekistan aims to adopt a holistic approach to poverty measurement, considering multiple dimensions beyond income. Thus, by developing a robust measurement, policymakers will be able to accurately identify the extent and nature of poverty, assess its drivers, and monitor progress in poverty reduction over time.

Uzbekistan has initiated a pilot project on measuring national multidimensional poverty (N-MPI). In collaboration with the UNDP, OPHI, UNICEF, and UNICEF Office of Research – Innocenti, the project aims to comprehensively analyze the breadth and depth of poverty, including child-specific ones. Therefore, 'Uzbekistan Pilot Multidimensional Poverty Index Report 2023' reveals the situation of multidimensional poverty in Uzbekistan. The report focuses on the adult population of Uzbekistan aged 18 years and oler. It presents an overall picture of poverty in terms of people's basic needs in the country and enables a closer and more in-depth analysis of 14 regions, settlement types, and gender groups. The report includes the following sections: (i) Literature review, (ii) Building a pilot N-MPI among adults, (iii) National results, (iv) Conclusions and Recommendations, (v) Lessons learned from the study.

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6 UN (2023).

7 Ibid.

2. Literature review

2.1. Multidimensional Poverty Index (MPI)

The MPI is a non-monetary tool of poverty measurement developed by OPHI. It is a means of measuring multidimensional poverty that captures both the breadth and depth of poverty, as well as an overall index. The unit of analysis and unit identification might be a person, a household, a region, or an institution. The global and most of the national MPIs use a household as the unit of identification because most data sources for poverty measurement do not have information for all individuals[8]. The index is computed using the Alkire-Foster methodology (AF method). By aggregating various dimensions of poverty into one index, the AF method estimates incidence (H), the percentage of multidimensionally poor people, and intensity (A), the average percentage of dimensions in which poor people are deprived. The MPI provides policy-relevant information: (i) easily disaggregated for different population sub-groups (e.g., rural/urban, regions, age group, ethnicity, etc.), (ii) gives information on the composition of poverty by indicator, (iii) can track progress in reducing poverty over time[9].

The Global MPI, developed jointly by UNDP and OPHI in 2010, is an internationally comparable measure of acute multidimensional poverty and can be used to track SDG 1 to complement the $2.15 a day measure. It covers 110 developing countries, or 6.1 billion people representing 77 percent of the global population and 92 percent of the population in the developing world[10]. The Global MPI incorporates 10 indicators across three dimensions: Health, Education, and Living standards[11]. Table 1 shows, that these indicators capture acute deprivations such as inadequate nutrition, lack of access to clean water and sanitation, limited educational attainment,

and insufficient access to basic services and resources. The MPI uses SDG principles as guidance for choosing dimensions and indicators. The same dimensions, indicators, deprivations cut-offs, weights and poverty cut-offs are used for all countries to build a comparable measure. The poverty cut-off is determined as one-third of the aggregated weighted indicators. Thus, the Global MPI considers individuals as "multidimensionally poor" if they experience deprivation in one-third or more of the ten weighted indicators[12].

According to the Global MPI country briefings (2023), the MPI value for Uzbekistan is equal to 0.006 with 1.7 percent of the population being multidimensionally poor, and having an average intensity of 35.3 percent as shown in Table 2. The global MPI is less informative in certain countries because of its primary focus on measuring acute multidimensional poverty, as well as its structure does not take into account country-specific contexts. Therefore, the design of a national MPI (N-MPI) should be guided by the purpose of the measure and national priorities, keeping in mind the specific context of each country when choosing their dimensions, indicators, weights and cut-offs[13].

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8 UNDP (2019).

9 Ibid.

10 All developing world regions: Arab States, East Asia and the Pacific, Europe and Central Asia, Latin America and the Caribbean and Sub-Saharan Africa. Countries with different levels of development (HDI, income classification).

11 OPHI (2023).

12 Ibid.

13 Ibid.

Table 1. Global MPI – Dimensions, indicators, deprivation cut-offs, and weights[14]

Dimension	Indicator	Deprived if living in a household where...	Weight
Health (1/3)	Nutrition	Any person under 70 years of age for whom there is nutritional information is undernourished.	1/6
	Child mortality	A child under 18 has died in the household in the five years preceding the survey.	1/6
Education (1/3)	Years of schooling	No eligible household member has completed six years of schooling.	1/6
	School attendance	Any school-aged child is not attending school up to the age at which he/she would complete class 8.	1/6
Living standards (1/3)	Cooking fuel	A household cooks using solid fuel, such as dung, crops, shrubs, wood, charcoal, or coal.	1/18
	Sanitation	The household has unimproved or no sanitation facility or it is improved but shared with other households.	1/18
	Drinking water	The household's source of drinking water is not safe or safe drinking water is a 30-minute or longer walk from home, roundtrip.	1/18
	Electricity	The household has no electricity.	1/18
	Housing	The household has inadequate housing materials in any of the three components: floor, roof, or walls.	1/18
	Assets	The household does not own more than one of these assets: radio, TV, telephone, computer, animal cart, bicycle, motorbike, or refrigerator, and does not own a car or truck.	1/18

Table 2. The most recent Global MPI results for selected countries and regions[15]

Country / Region	Survey year	MPI value	H, %	A, %
Uzbekistan	MICS 2021/2022	0.006	1.7	35.3
Kazakhstan	MICS 2015	0.002	0.5	35.6
Kyrgyzstan	MICS 2018	0.001	0.4	36.3
Tajikistan	DHS 2017	0.029	7.4	39.0

14 OPHI (2018).

15 Alkire, Kanagaratnam and Suppa (2023).

2.2. Multidimensional Poverty Measure (MPM)

The World Bank's Multidimensional Poverty Measure (MPM) draws inspiration and guidance from MPI and uses the Alkire-Foster method. The measure was developed in 2018 and it differs from MPI in one aspect: it incorporates monetary poverty below $2.15 per day, which is based on the New International Poverty Line at 2017 PPP, as one of the dimensions. The MPM includes the estimates for 121 countries and it is composed of 6 indicators mapped into 3 dimensions of well-being: Monetary, Education, and Basic infrastructure services as shown in Table 3. These six indicators are consumption, educational attainment, educational enrollment, drinking water, sanitation, and electricity[16]. All dimensions and each indicator within 3 dimensions are weighted equally. Individuals are identified as multidimensionally deprived if they do not meet the threshold in at least one dimension or in a combination of indicators that is equivalent to a full dimension in weight, or households will be considered poor if they experience deprivation in indicators that collectively account for 1/3 or more of the total weight. Since the monetary dimension relies on a single indicator, anyone who is income-poor is automatically considered poor according to the multidimensional poverty measure as well.

Table 3. Global MPM – Dimensions, indicators, parameters, and weights[17]

Dimension	Indicator	Parameter	Weight
Monetary	Consumption	Daily consumption or income is less than $ 2.15 per person.	1/3
Education	Educational attainment	At least one school-age child up to the age of grade 8 is not enrolled in school.	1/6
	Educational enrollment	No adult in the household (age of grade 9 or above) has completed primary education.	1/6
Access to basic infrastructure	Drinking water	The household lacks access to limited-standard drinking water.	1/9
	Sanitation	The household lacks access to limited-standard sanitation.	1/9
	Electricity	The household has no access to electricity.	1/9

17 Alkire, Kanagaratnam and Suppa (2023).

16 World Bank (2023).

3. Building the pilot N-MPI

3.1. Purpose and design

Purpose. The study aims to develop a pilot national MPI (N-MPI) to complement monetary tools that will help measure and monitor steps towards poverty eradication in Uzbekistan.

Research questions. The study addresses the following research questions: (i) what is the structure of the pilot MPI? (ii) what is the breadth and depth of the poverty? (iii) how does the level of poverty vary by subgroups (region, type of settlement, and gender)?

Research design. The 2022 survey identifies a definition of multidimensional poverty among 1,500 households. The 2023 survey conducted collected data from 4,516 households to empirically measure a pilot N-MPI in Uzbekistan.

3.2. Sample design for 2023 survey

Stratification. It includes 27 strata characterized by settlement type such as urban and rural areas. Two stratification aggregate marks are given to 14 regions of Uzbekistan excluding Tashkent city.

Sampling technique. The study applies the stratified two-stage random sampling technique prepared by the Agency of Statistics based on the recommendations of the World Bank and UNECE.

Sample size. The pilot N-MPI relies on data from the recent survey of 4,516 households conducted in 2023. The final analytical sample size[18] comprises 4,361 households. The data collected enables disaggregation by region, settlement type, and gender. Thus, it includes information on households from 14 regions, two settlement types – rural (48%) and urban (52%) areas, and gender – male (49%) and female (51%).

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18 After deducting missing values.

3.3. Data Collection

Method. The quantitative research method is applied to collect primary data through face-to-face interviews. Household observations were not used in the interview process. The data collected through the survey questionnaire uploaded in KoboToolbox[19] was displayed in Microsoft Excel and then analyzed using Stata MP 17.

Data collection instrument. The questionnaire was developed by CERR in collaboration with UNDP, UNICEF, UNICEF Office of Research – Innocenti, OPHI, and inputs from government ministries and agencies (Ministry of Employment and Poverty Reduction, Ministry of Public Education, Ministry of Higher Education, Science and Innovation, Ministry of Economy and Finance, Ministry of Health, etc.), and research institutions (Labour Market Research Institute, Institute for Macroeconomic and Regional Studies, Fiscal Institute under State Tax Committee, etc.) of Uzbekistan. The structure of survey questionnaire is composed of eight parts: (i) Household Passport, (ii) Household Roster, (iii) Individual Respondents' Selection, (iv) Household Questionnaire, (v) Adult Questionnaire (for participants aged 18 years and over), (vi) Child's Questionnaire I (for children aged 0-4 years), (vii) Boy/Girl's Questionnaire II (for children aged 5-14 years), and (viii) Boy/Girl's Questionnaire III (for children aged 15-17 years). A survey questionnaire uploaded in KoboToolbox collects data by using the last-birthday selection method. If respondents refuse to participate in the interview, the interviewers use a reserve list of households prepared by the Agency of Statistics. In case of delayed timing of the interview, the interviewers attended the household at least four times to complete the questionnaire before considering it incomplete and replacing it with the households from the reserve list.

Training. Seven thematic workshops were held for both interviewers and supervisors before fieldwork to ensure all personnel involved in the study had a clear understanding of the study objectives, the questionnaire, the software, and the data collection techniques. To achieve this, the following steps were taken: (i) develop instructions for both interviewers and supervisors; (ii) apply case studies, and group discussions; (iii) practice conducting interviews; (iv) provide feedback on the performance of interviewers and supervisors.

Pre-testing. The questionnaire was pre-tested through a pilot survey targeting 69 households. Pre-testing (i) assessed the length and complexity of the questionnaire, and the time required to complete the questionnaire; (ii) determined if the questions in the questionnaire were clear, unambiguous, and easily understandable by interviewers and respondents. The research team validated the pre-tested dataset by checking its quality, accuracy, and completeness in Stata MP 17 using descriptive statistics (frequencies, percentages, response rate, etc.) for each question in the survey questionnaire.

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19 KoboToolbox is an intuitive, powerful, and reliable software used to collect, analyze, and manage data for surveys, monitoring, evaluation, and research.

3.4. Methodology

The pilot N-MPI uses the Alkire-Foster (AF) method of multidimensional poverty measurement to analyze both the breadth and depth of poverty. The methodology enables the analysis of disaggregated data to show differences between regions, settlement type, and gender. The AF involves two steps: identification and aggregation[20].

Identification. It involves identifying the dimensions and indicators that are applicable for assessing poverty[21]. Each indicator will be assigned a deprivation cut-off, which determines whether a household or individual[22] is considered deprived or not. By applying these cut-offs, individuals or households can be classified into two categories: deprived and non-deprived. Indicators are classified according to binary variables where "1" refers to the presence of deprivation and "0" denotes the absence of deprivation.

Aggregation. This stage involves calculating the proportion of deprivations that an individual or household encounters among the chosen set of weighted indicators. An individual is classified as 'multidimensionally poor' if they experience a specific portion of deprivations from the overall indicators taken into account. This determination is made by first summing the number of deprivations experienced by each person into a weighted deprivation score, then applying a 'poverty cut-off'. The poverty cutoff is an evaluative judgment regarding the percentage of weighted deprivations that qualify a person as being multidimensionally poor. A robustness check is conducted to confirm the validity and reliability of this cross-dimensional cut-off.

Following the AF method, the MPI value is the product of two measures: the incidence (headcount ratio, H)) of multidimensional poverty and the intensity (depth or average intensity, A) of poverty (see Annex 1). MPI values range from 0 to 1, with 0 indicating that no one is deprived any indicators and 1 suggesting that everyone is deprived in all indicators. The headcount ratio of multidimensional poverty is the proportion of multidimensionally poor people in the population, whereas the intensity of poverty reflects the average proportion of the weighted component indicators in which multidimensionally poor people are deprived[23].

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20 UNDP (2019).
21 The selection of dimensions may vary depending on the study objectives and the data accessible.
22 Poverty measures usually use the individual or the household as the unit of identification, and nearly always use the individual as the unit of analysis. Using the person as the unit of identification means that any individual-level deprivations – for example, in nutrition, schooling or employment – are recorded for each person separately. This allows for clear comparisons by gender, age, ethnicity and other relevant individual characteristics. With individual unit of identification, one can analyze intra-household inequalities, such as differences between the levels of education of girls and boys, or employment participation for men and women. As the MPI requires a complete deprivation profile for each unit, information on all indicators must be available for each person and come from the same source of data. However, most existing data sources used for poverty measurement do not have information for all individuals or for all the indicators usually selected for national MPIs. An alternative, then, is to use the household as the unit of identification.
23 UNDP (2021).

3.5. Structure

Unit of identification and analysis. The pilot N-MPI identifies the multidimensionally poor population at the individual level. It is constructed only for people aged 18 and over, using data from the household and individual adult questionnaires of the survey. The unit of analysis, meaning how the results are reported and analyzed, is the individual.

Dimensions and indicators. The pilot N-MPI constructed has three dimensions measured by 13 indicators covering deprivations in (i) Basic infrastructure and living conditions, (ii) Health and social capital and (iii) Employment and financial inclusion. It is crucial to highlight that the choice of indicators and deprivation cut-offs is influenced by the data availability. In general, the indicators selected for the proposed pilot N-MPI reflect the concept of poverty in Uzbekistan based on international standards, participatory dialogues, stakeholder discussions, and review of key national documents. Given Uzbekistan's high level of human development (HDI: 0.727 in 2022), indicators reflecting aspirations and more ambitious goals are included[24]. The pilot N-MPI structure for Uzbekistan is presented in Table 4.

Weights. All dimensions are weighted equally, receiving one-third of the total weight (1/3). Indicators are equally weighted within the Basic infrastructure and living conditions (1/18), and Health and social capital (1/12) dimensions. However, within the Financial inclusion and employment dimension, 'bank account' is assigned a weight of 1/18, 'unemployment' – 1/6, and 'informal employment – 1/9.

Poverty cut-off. The pilot N-MPI uses 34 percent as a poverty cut-off, and it means anyone identified as poor will have to be deprived in more than one dimension (one dimension equals 33 percent).

The justification for including selected dimensions and indicators is in Table 5. Based on the study of various indicators used in different countries around the world, specific set of indicators and dimensions were selected. In addition, selection of indicators also covered multiple consultations with many national stakeholders and development partners, such as UNDP, UNICEF, Agency of Statistics under the President of the Republic of Uzbekistan, CERR, the Ministry of Employment and Poverty Reduction, Ministry of Public Education, Ministry of Higher Education, Science and Innovation, Ministry of Economy and Finance, Ministry of Health, Institute for Macroeconomic and Regional Studies, Fiscal Institute under State Tax Committee, Labor Market Research Institute, Tashkent Institute of Finance, and others.

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24 Initially, the index comprised around 30 indicators, however, following online discussions with OPHI and its visit to Tashkent, most of the indicators were removed from the pilot N-MPI structure because of low deprivation level. These indicators are Access to electricity, Access to gas, Type of cooking fuel used, Mobile phone access.

Table 4. N-MPI – Dimensions, indicators, deprivation cut-offs, and weights[25\26]

Dimension	Indicator	Deprivation cut-off	Weight
Basic Infrastructure & Living Conditions (1/3)	Overcrowding	Adult is deprived if they live in a household that has less than 16 square meters[27] of living space per person, based on national standards.	1/18
	Housing	Adult is deprived if they live in a household that has inadequate housing materials in one of two components: floor[28] and walls .	1/18
	Heating fuel	Adult is deprived if they live in a household that has unsafe or unhealthy heating when a space heating is needed.	1/18
	Sanitation	Adult is deprived if they live in a household that has an unimproved sanitation facility or improved sanitation that has never been emptied.	1/18
	Drinking water	Adult is deprived if they live in a household that has no access to an improved source of drinking water on the premises.	1/18
	Assets' ownership	Adult is deprived if they live in a household that does not own all 4 assets (gas stove/oven, refrigerator, TV, and washing machine,) or have a has a car.	1/18
Health & Social Capital (1/3)	Affordability of medicine	The adult is deprived if has been ill in the last 3 months but could not obtain the medicine needed because of a lack of money or other resources.	1/12
	Food security	Adult is deprived if they live in a household that experienced any form of food insecurity in the last 12 months, based on the Food Insecurity Experience Scale (FIES) standards.	1/12
	Educational attainment	Adult is deprived if the highest completed level of education is primary or secondary or adult was enrolled in vocational or higher (bachelor) education but didn't attend classes this or the previous year.	1/12
	Communication and technology	Adult is deprived if they have no access to the Internet and mobile phone or computer/laptop/tablet.	1/12
Employment & Financial Inclusion (1/3)	Unemployment	The adult is deprived if he/she is of working age but currently not employed, and is able and willing to work, and actively looking for a job.	1/6
	Informal employment	Adult is deprived if employed in the informal sector; or employed in the formal sector but the entity is not legal and not registered in the Public Service Center.	1/9
	Bank account	The adult is deprived if they have no bank account (including a plastic card).	1/18

25 OPHI (2018).
26 Authors' calculations.

27 The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated February 26, 2019 #170 outlines that the social standard for housing area should be not less than 16 square meters of total area per person, and for persons with disabilities in wheelchairs – not less than 23 square meters.
28 The main material of the dwelling's floor surface is made of clay/sand (natural floor). The main material implies the one that covers the biggest area of the total living space.
29 The main material of the dwelling's walls is made of dirt (natural walls), stone with mud, uncovered adobe (guwala), plywood, and reused wood (rudimentary walls). The main material implies the one used to construct the biggest area of the dwelling's walls.

Table 5. Indicators included in some of the existing official global, regional, national and state-level MPIs[30]

Indicator	SDGs indicator	Global MPI	LAC-MPI	Arab MPI	Andhra Pradesh	Armenia	Bhutan	Chile	Colombia	Costa Rica	Dominican Rep.	Ecuador	El Salvador	Honduras	Mexico	Mozambique	Nepal	Nigeria	Panama	Pakistan	Philippines	Rwanda	Vietnam
Overcrowding	11.1.1		■	■		■		■	■	■	■	■	■	■	■				■	■		■	■
Housing	11.1.1	■	■	■	■	■			■	■	■	■	■	■	■	■	■		■	■	■	■	■
Heating fuel	7.1					■																	
Sanitation	6.2.1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■
Drinking water	6.1.1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■
Assets' ownership	1.4.2	■	■	■	■	■			■				■		■	■	■		■		■	■	■
Affordability of medicine	3.8.2					■		■	■				■		■				■	■			
Food security	2.1.2					■					■		■									■	
Educational attainment	4.1.1	■	■	■	■	■									■				■	■	■	■	■
Communication and technology	17.8.1								■										■				
Unemployment	8.5.2		■			■				■		■	■	■					■			■	
Informal employment	8.5.2					■			■	■	■							■	■				
Bank account	8.10.2																						

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30 UNDP (2019).

3.6. Limitations of the study

The pilot N-MPI for Uzbekistan uses individuals aged 18 years and over as the unit of identification. Even though methodology allows to use individual level as the unit of identification, most national MPIs use the household level just like monetary measures. This is not only due to data limitations: it is often argued that there may be 'sharing and caring' among household members. In addition, individual level measures tend to exclude certain populations because data is not available for all indicators from everyone. For instance, children are often excluded. But a national measure 'should' ideally cover the whole population, hence why household measures tend to be used. This limitation will be mitigated after integrating the questionnaire used in this study with the HBS, to build the final N-MPI on the household level.

In addition, as the MPI requires selecting dimensions, indicators, and cut-offs to define poverty, these choices are subjective and can vary across contexts, potentially leading to different interpretations and comparisons. The selection of dimensions and indicators may not fully capture the nuanced aspects of poverty, and the cut-offs may not reflect the diversity of experiences within a population. Assigning weights to different dimensions and indicators is another limitation of the study. Weights reflect the relative importance of each dimension in determining poverty, but these choices can be subjective and may not align with the preferences and priorities of different stakeholders. The mitigation strategies for these two limitations include participatory dialogues and stakeholder discussions.

3.7. Peer review

The report was submitted to OPHI and UNDP for a comprehensive assessment of its content, methodology, findings, conclusions, and overall quality. Taking into account the feedback and comments provided, the report authors made revisions to address the identified issues, provide clarity where ambiguities existed, and enhance the overall integrity of the report.

4. Findings[31]

4.1. National results

Table 6 shows the key results of the pilot N-MPI for Uzbekistan. The incidence (H) of poverty indicates that around **18.4 percent of the adult population are multidimensionally poor (4.2 million)** because they experience deprivations in at least 34 percent of the weighted indicators. Meanwhile, the average intensity (A) is 43.7 percent meaning that each multidimensionally deprived adult is, on average, deprived in close to 44% of the weighted indicators.

The pilot N-MPI, which is a product of the incidence and intensity, amounts to 0.080 indicating that multidimensionally poor adults in Uzbekistan experience 8 percent of the total deprivations that would be experienced if all adults are multidimensionally poor and deprived in all indicators.

Table 6. The pilot N-MPI, Incidence (H) and Intensity (A)[32]

Poverty Cut-off (k)	Index	Value	Confidence interval (95%)		Population share	Number of multidimensionally poor (in thousands)
k=34%	MPI (M0)	0.080	0.080	0.080	100%	4,157
	Incidence (H, %)	18.4	18.369	18.392		
	Intensity (A, %)	43.7	43.702	43.712		

The pilot N-MPI is broken down by indicators, and its composition to look at the uncensored and censored headcount ratios, and the weighted contribution of each indicator to the N-MPI. Figure 1 represents the uncensored

headcount ratios of each indicator. This allows us to define the proportion of adults who are deprived in that indicator across the total population aged 18 and over. The highest levels of deprivation are seen in Heating fuel (50.0 percent), Sanitation (47.0 percent), and Bank account (42.4 percent). Educational attainment (34.5 percent) and Drinking water (30.8 percent) also have a significant level of deprivation. Meanwhile, Affordability of medicine (8.9 percent), Communication and Technology (5.6 percent), and Unemployment (4.3 percent) show the lowest level of deprivation.

Figure 1. Uncensored headcount ratios of the pilot N-MPI (%)[33]
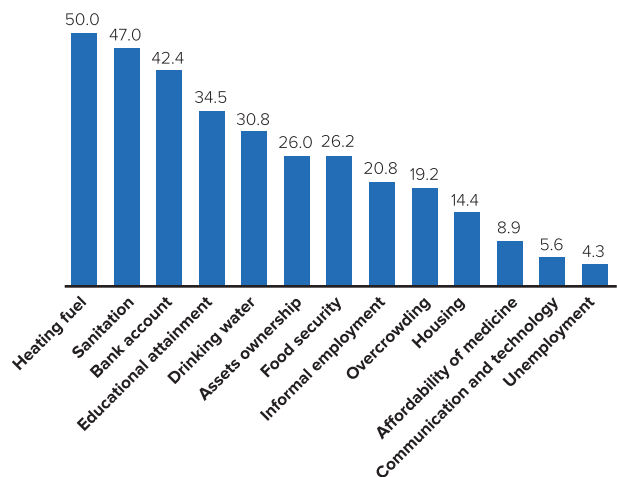
Figure 2 illustrates the proportion of the adult population that is poor and deprived in an indicator. The largest censored headcount ratios are found in Sanitation (14.0 percent), Bank accounts (13.9 percent), Educational attainment (13.2 percent), and Heating Fuel (13.0 percent). Deprivation levels are comparatively lower at the national level in the indicators such as Affordability of medicine (4.2 percent), Communication and Technology (3.0 percent), and Unemployment (2.5 percent).

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31 SEs and CIs for the national and disaggregation results can be found in Annex 2-6.

32 Authors' calculations.

33 Authors' calculations.

Figure 2. Censored headcount ratios of the pilot N-MPI (%)[34]
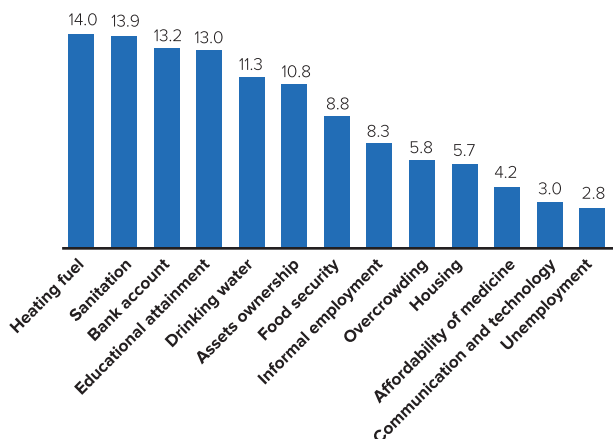
Figure 3 illustrates the composition of the pilot N-MPI, by showing the weighted percentage contribution of each indicator. It should be noted that while dimensions are equally weighted, higher-weighted indicators are likely to contribute more to the pilot N-MPI. Educational attainment (13.7 percent), Food security (11.7 percent) and Informal employment (11.5 percent) are the highest contributors to the overall multidimensional poverty.

Figure 3. Percentage contribution of each indicator to the pilot N-MPI[35]
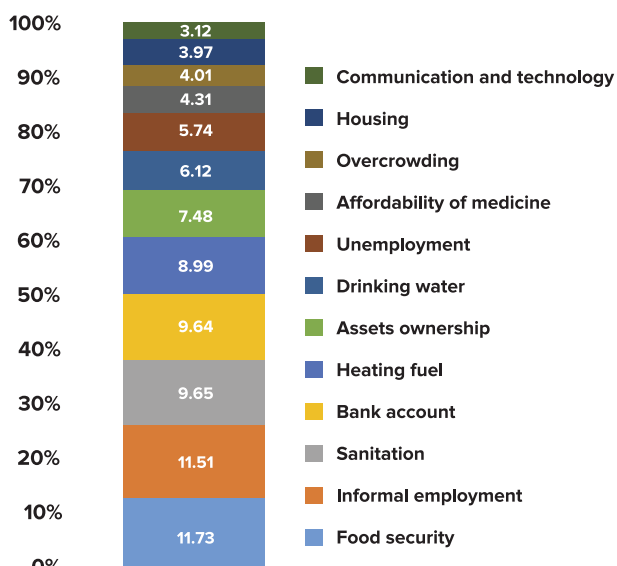
34 Authors' calculations.
35 Authors' calculations.

4.2. Disaggregation

The pilot N-MPI allows understanding of multidimensional poverty across regions, settlement type, and gender. This enables more effective resource allocation and tailored policy solutions to specific requirements.

Region level. Table 7 shows how the pilot N-MPI varies across the regional level. The highest N-MPI refers to the Republic of Karakalpakstan (0.136), Namangan region (0.127), Tashkent region (0.118), and Jizzakh region (0.111). Whereas, the Fergana region (0.054), Sirdarya region (0.056), and Tashkent city (0.010) exhibit the lowest MPI values. The observations made based on Figure 4 highlight the percentage proportion of multidimensional poor adults. The Republic of Karakalpakstan (29.9 percent), Namangan region (27.5 percent), and Tashkent region (26.5 percent) have the largest share of multidimensional poor adults, meanwhile, Sirdarya region (13.7 percent), Fergana region (12.4 percent), and Tashkent city (2.4 percent) have the lowest proportion of multidimensional poor adults. However, the largest number of multidimensional people is found in Tashkent region (521,799 adults), Namangan (498,010) and Samarkand (444,847) regions (see Table 7).

Figure 4. Incidence (H) of the pilot N-MPI by region (sorted by H, %)[36]
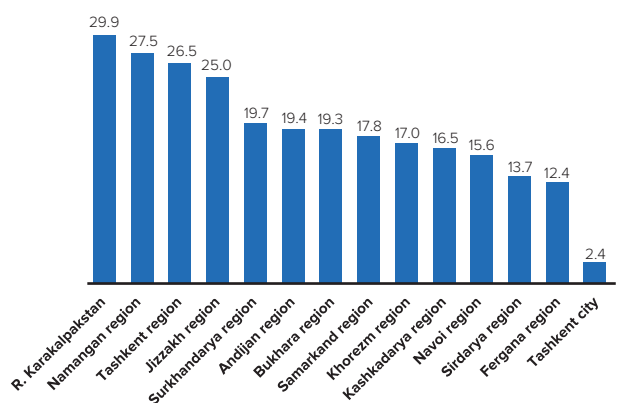
In terms of the percentage contributions to the pilot N-MPI, Figure 5 shows that Education attainment, Food security and Informal employment are the significant problems in Uzbekistan regions. The most contributing factors across

36 Authors' calculations.

regions are as follows. **Andijan region:** Educational attainment (17.8 percent), Informal employment (16.6 percent), Sanitation (13.1 percent). **Bukhara region**: Food security (16.4 percent), Educational attainment (14 percent), Informal employment (13.8 percent). **Fergana region**: Food security (13.8 percent), Informal employment (12.5 percent), Educational attainment (11.5 percent). **Jizzakh region**: Educational attainment (14.1 percent), Unemployment (11.4), Sanitation (10.9). **Republic of Karakalpakstan**: Food security (15.6 percent), Unemployment (14.9), Sanitation (11.2 percent). **Kashkadarya region**: Educational attainment (14.2 percent), Food security (11.3 percent), Informal employment (11.1 percent). **Khorezm region**: Food security (18.4 percent), Educational attainment (17.3 percent), Unemployment (9.5 percent). **Namangan region**: Educational attainment (13.6 percent), Sanitation (11.2 percent), Informal employment (11 percent). **Navoi region**: Informal employment (14.3 percent), Food security (11.93 percent), Sanitation (11.88 percent). **Samarkand region**: Educational attainment (16.17 percent), Informal employment (13.6 percent), Heating fuel (12.1 percent). **Surkhandarya region**: Educational attainment (16.22 percent), Informal employment (15.9 percent), Heating fuel (12.9 percent). **Sirdarya region**: Educational attainment (16.5 percent), Food security (15.5 percent), Informal employment (15.4 percent). **Tashkent region**: Food security (15.3 percent), Educational attainment (11.7 percent), Sanitation (11.6 percent). **Tashkent city**: Food security (16.9 percent), Affordability of medicine (14.7 percent), Unemployment (13.3 percent).

As depicted in Table 8, the censored headcount ratio shows focus areas where if a deprivation is eliminated, it will reduce the intensity of poverty among the poor as they will become deprived in one less indicator even if they remain poor. The highest percentage of adults who are both poor and deprived in a given indicator by region is provided as follows. **Overcrowding**: Tashkent region (17.5 percent), Republic of Karakalpakstan (11.7 percent), Andijan region (8.6 percent). **Housing**: Republic of Karakalpakstan (13.8 percent), Namangan region (11.8 percent),

Samarkand region (11.0 percent). **Heating fuel**: Namangan region (19.1 percent), Surkhandarya region (18.9 percent), Andijan region (18.8 percent). **Sanitation**: Republic of Karakalpakstan (27.5 percent), Namangan region (25.5 percent), Tashkent region (24.7 percent). **Drinking water:** Namangan region (16.2 percent), Surkhandarya region (15.1 percent), Jizzakh region (13.0 percent). **Assets' ownership**: Namangan region (18.5 percent), Jizzakh region (17.6 percent), Republic of Karakalpakstan (15.8 percent). **Food security**: Republic of Karakalpakstan (25.6 percent), Tashkent region (21.7 percent), Namangan region (16.6 percent). **Unemployment**: Republic of Karakalpakstan (12.2 percent), Jizzakh region (7.6 percent), Khorezm region (4.0 percent). **Informal employment**: Namangan region (12.5 percent), Andijan region (12.1 percent), Surkhandarya region (11.6 percent). **Affordability of medicine**: Tashkent region (8.8 percent), Namangan region (7.35 percent), Khorezm region (7.34 percent). **Educational attainment**: Namangan region (20.7 percent), Jizzakh region (18.8 percent), Andijan region (17.2 percent). **Communication and technology**: Namangan region (9.8 percent), Jizzakh region (6.0 percent), Tashkent region (4.7 percent). **Bank account**: Republic of Karakalpakstan (21.7 percent), Tashkent region (18.6 percent), Namangan region (17.5 percent).

Table 7. The pilot N-MPI by regions[37]

Region	MPI (M0)			Incidence (H, %)			Intensity (A, %)			Population share (%)	Number of multidimen- sionally poor (in thousands)
	Value	Confidence Interval (95%)		Value	Confidence Interval (95%)		Value	Confidence Interval (95%)			
National	0.080	0.080	0.080	18.4	18.369	18.392	43.7	43.702	43.712	100	4,157
Andijan region	0.081	0.081	0.081	19.4	19.322	19.411	41.7	41.656	41.688	7.9	346,763
Bukhara region	0.083	0.082	0.083	19.3	19.303	19.394	42.7	42.708	42.746	5.7	249,342
Fergana region	0.054	0.054	0.055	12.4	12.391	12.460	43.8	43.822	43.859	11.3	316,888
Jizzakh region	0.111	0.111	0.111	25.0	24.955	25.067	44.4	44.338	44.381	4.1	229,726
R. Karakalpakstan	0.136	0.136	0.137	29.9	29.818	29.928	45.7	45.660	45.697	5.8	392,208
Kashkadarya region	0.073	0.073	0.074	16.5	16.459	16.533	44.6	44.534	44.569	9.9	368,440
Khorezm region	0.071	0.070	0.071	17.0	16.907	17.000	41.6	41.597	41.634	5.5	211,145
Namangan region	0.127	0.127	0.127	27.5	27.456	27.553	46.1	46.068	46.100	8.0	498,010
Navoi region	0.069	0.068	0.069	15.6	15.509	15.609	44.1	44.049	44.108	3.1	108,817
Samarkand region	0.076	0.076	0.076	17.8	17.737	17.815	42.9	42.856	42.886	11.1	444,847
Surkhandarya region	0.081	0.081	0.082	19.7	19.630	19.721	41.4	41.361	41.393	7.7	342,949
Sirdarya region	0.056	0.056	0.056	13.7	13.622	13.724	40.8	40.793	40.839	2.5	78,757
Tashkent region	0.118	0.118	0.118	26.5	26.437	26.535	44.5	44.511	44.539	8.7	521,799
Tashkent city	0.010	0.010	0.010	2.4	2.395	2.431	40.8	40.801	40.866	8.7	47,700

Figure 5. Percentage contribution of each indicator by regions[38]

Legend:
- Overcrowding
- Housing
- Heating fuel
- Sanitation
- Drinking water
- Assets ownership
- Food security
- Unemployment
- Informal employment
- Affordability of medicine
- Educational attainment
- Communication and technology
- Bank account

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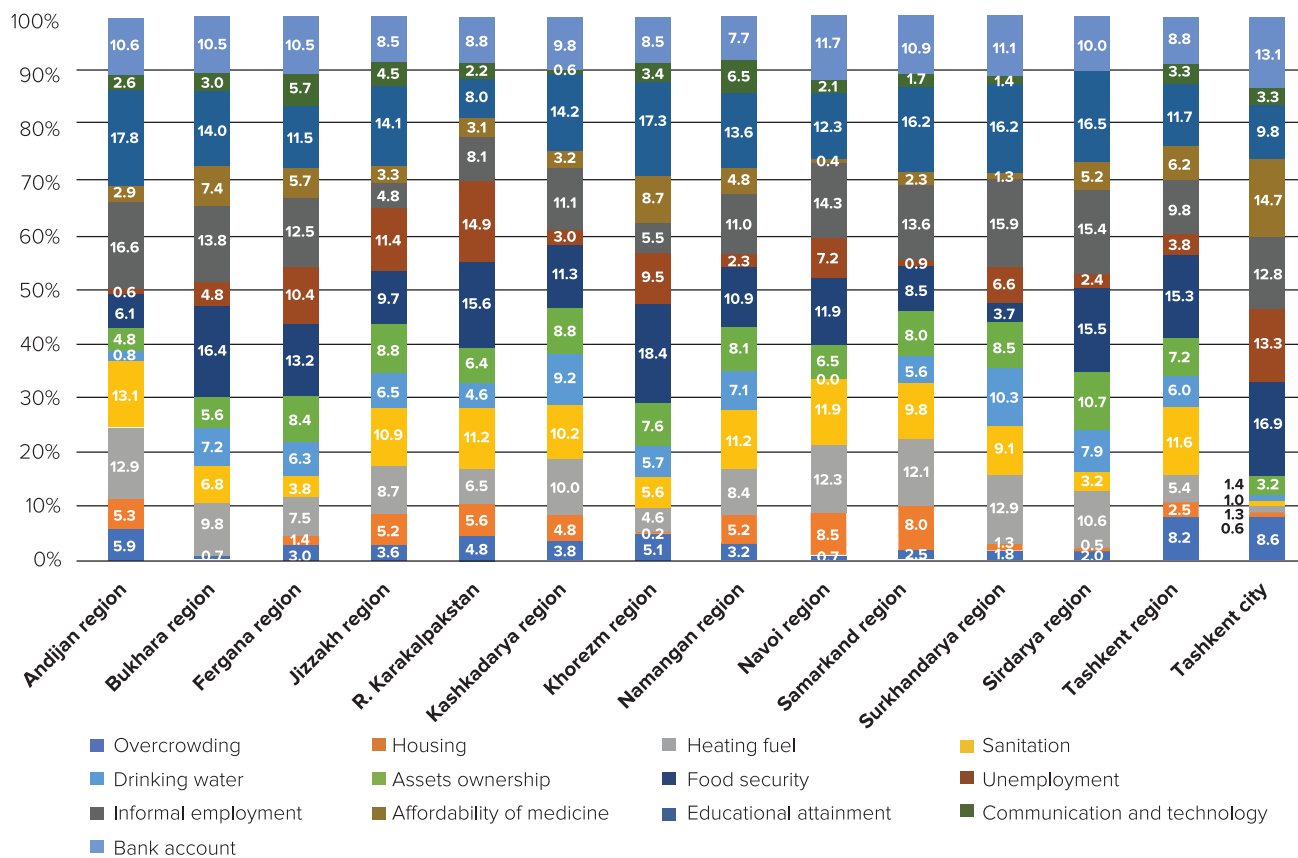
37 Authors' calculations.
38 Authors' calculations.

Table 8. Censored headcount ratios by region (%)[39]

Region	Overcrowding	Housing	Heating fuel	Sanitation	Drinking water	Assets' ownership	Food security	Unemployment	Informal employment	Affordability of medicine	Educational attainment	Communication and technology	Bank account
Andijan region	8.6	7.7	18.8	19.0	1.2	6.9	5.9	0.3	12.1	2.8	17.2	2.5	15.3
Bukhara region	1.1	0.0	14.6	10.1	10.7	8.3	16.3	2.4	10.3	7.3	13.9	3.0	15.6
Fergana region	3.0	1.4	7.3	3.8	6.2	8.3	8.6	3.4	6.1	3.7	7.5	3.7	10.3
Jizzakh region	7.2	10.3	17.3	21.8	13.0	17.6	13.0	7.6	4.8	4.4	18.8	6.0	17.0
R. Karakalpakstan	11.7	13.8	16.1	27.5	11.4	15.8	25.6	12.2	9.9	5.1	13.1	3.6	21.7
Kashkadarya region	5.0	6.3	13.3	13.5	12.2	11.6	9.9	1.3	7.3	2.8	12.5	0.5	13.0
Khorezm region	6.4	0.3	5.9	7.1	7.2	9.6	15.6	4.0	3.5	7.34	14.6	2.9	10.8
Namangan region	7.4	11.8	19.1	25.5	16.2	18.5	16.6	1.7	12.5	7.35	20.7	9.8	17.5
Navoi region	0.9	10.5	15.2	14.7	0.0	8.1	9.8	3.0	8.9	0.3	10.1	1.7	14.5
Samarkand region	3.4	11.0	16.7	13.4	7.7	10.9	7.8	0.4	9.3	2.1	14.8	1.5	14.9
Surkhandarya region	2.7	1.9	18.9	13.3	15.1	12.4	3.6	3.2	11.6	1.2	15.8	1.3	16.3
Sirdarya region	2.0	0.5	10.7	3.2	7.9	10.8	10.3	0.8	7.7	3.5	11.1	0.0	10.1
Tashkent region	17.5	5.3	11.5	24.7	12.8	15.3	21.7	2.7	10.4	8.8	16.6	4.7	18.6
Tashkent city	1.5	0.1	0.2	0.2	0.2	0.6	2.0	0.8	1.1	1.7	1.2	0.4	2.3

Settlement type. Table 9 presents the pilot N-MPI, the incidence and intensity of the adult population in urban and rural areas. As the confidence intervals are not overlapping, the findings show that the N-MPI of the rural population (0.103) is higher than for urban areas (0.059). It is also evident that the incidence and intensity in rural areas are significantly larger (23.2 percent and 44.4 percent, respectively) than in urban areas (13.9 percent and 42.7 percent, respectively).

Table 9. The pilot N-MPI by area[40]

Area	Index	Value	Confidence Interval (95%)		Population share (%)	Number of multidimensionally poor (in thousands)
urban	MPI (M0)	0.059	0.0594	0.0595	52.1	1,641
	Incidence (H, %)	13.9	0.1392	0.1395		
	Intensity (A, %)	42.7	0.4266	0.4268		
rural	MPI (M0)	0.103	0.1029	0.1031	47.9	2,517
	Incidence (H, %)	23.2	0.2319	0.2322		
	Intensity (A, %)	44.4	0.4438	0.4439		

39 Authors' calculations.
40 Authors' calculations.

Figure 6. Percentage contribution of each indicator by area[41]

Legend:
- Bank account
- Communication and technology
- Educational attainment
- Affordability of medicine
- Informal employment
- Unemployment
- Food security
- Assets ownership
- Drinking water
- Sanitation
- Heating fuel
- Housing
- Overcrowding
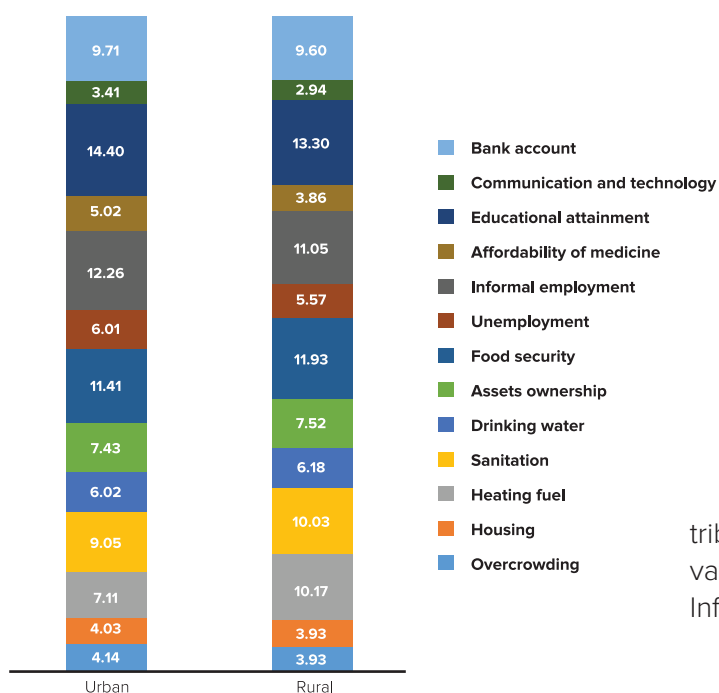
Figure 6 illustrates that the highest contributors to urban and rural N-MPI are the deprivations in Education attainment, Food security, Informal employment, and Sanitation.

Table 10. Censored headcount ratios by area (%)[42]

Locality	Urban	Rural
Overcrowding	4.4	7.29
Housing	4.3	7.28
Heating fuel	7.6	18.9
Sanitation	9.7	18.6
Drinking water	6.4	11.5
Assets' ownership	8.0	13.9
Food security	8.1	14.7
Unemployment	2.1	3.4
Informal employment	6.6	10.2
Affordability of medicine	3.6	4.8
Educational attainment	10.3	16.4
Communication and technology	2.4	3.6
Bank account	10.4	17.8

Table 10 depicts how the censored headcount ratio varies across urban and rural areas. The highest percentage of adults who are both poor and deprived in urban areas are observed in the following indicators: Bank account (10.4 percent), Educational attainment (10.3 percent), and Sanitation (9.7 percent); meanwhile, in rural areas are Heating fuel (18.9 percent), Sanitation (18.6 percent), and Bank account (17.8 percent).

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41 Authors' calculations.
42 Authors' calculations.

Gender. Table 11 shows that there is a significant difference in the pilot N-MPI between males and females the confidence intervals are not overlapping. Female adults experience slightly lower levels of multidimensional poverty (0.065) compared to male adults (0.096). Similarly, the incidence and intensity of the male population are significantly higher (21.6 percent and 44.2 percent, correspondingly) than the female population (15.2 percent and 43.0 percent, correspondingly).

Table 11. The pilot N-MPI by gender[43]

Area	Index	Value	Confidence Interval (95%)		Population share (%)	Number of multidimensionally poor (in thousands)
male	MPI (M0)	0.096	0.0956	0.0958	49.5	2,421
	Incidence (H, %)	21.6	0.2161	0.2165		
	Intensity (A, %)	44.2	0.4422	0.4424		
female	MPI (M0)	0.065	0.0653	0.0654	50.5	1,736
	Incidence (H, %)	15.2	0.1518	0.1521		
	Intensity (A, %)	43.0	0.4297	0.4299		

Figure 7. Percentage contribution of each indicator by gender[44]
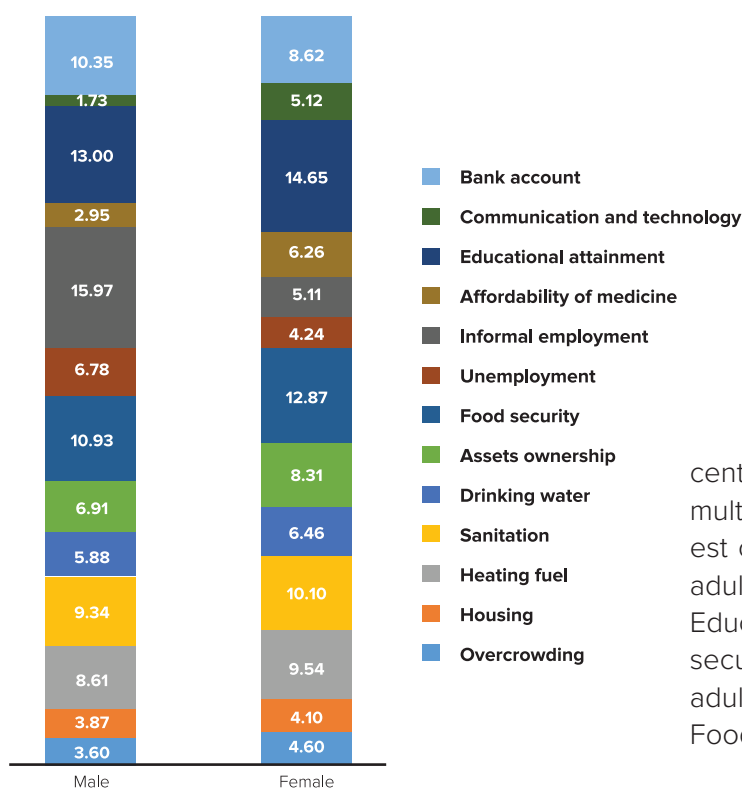
Figure 7 assesses the weighted percentage contribution of each indicator to overall multidimensional poverty by gender. The largest contributors to the pilot N-MPI among male adults are Informal employment (15.9 percent), Educational attainment (13.1 percent), and Food security (10.93 percent); whereas among female adults are Educational attainment (14.7 percent), Food security (12.9 percent), and Sanitation (10.1).

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43 Authors' calculations.
44 Authors' calculations.

Table 12. Censored headcount ratios by gender (%)[45]

Gender	Male	Female
Overcrowding	6.2	5.4
Housing	6.7	4.8
Heating fuel	14.8	11.2
Sanitation	16.1	11.9
Drinking water	10.1	7.6
Assets' ownership	11.9	9.8
Food security	12.6	10.1
Unemployment	3.9	1.7
Informal employment	13.8	3.0
Affordability of medicine	3.4	4.9
Educational attainment	15.0	11.5
Communication and technology	2.0	4.0
Bank account	17.8	10.1

Table 12 illustrates the censored headcount ratios by gender. The largest share of the male population who are poor and deprived is observed in the following indicators: Bank account (17.8 percent), Sanitation (16.1 percent), and Educational attainment (15.0 percent). Besides, female adults have higher deprivations in terms of Sanitation (11.9 percent), Educational attainment (11.5 percent), and Heating fuel (11.2 percent).

45 Authors' calculations.

5. Robustness checks

The robustness analysis is conducted to test for the choice of the k-value (poverty cut-off). Table 13 shows the estimates of the pilot N-MPI for the alternative cut-offs k=25 percent and k=50 percent. The analysis considers a pairwise comparison to be robust if the regional ordering established at baseline is preserved. It is found that 100 percent of the 91 possible pairwise comparisons of the N-MPI levels across regions are significantly different at the baseline, and around 72.5 percent are also significantly different under the alternative cut-offs and maintain the same ordering of which is more vulnerable. This shows that the regional orderings by the N-MPI levels are largely stable concerning changes in the poverty cut-off (Annex 7).

Table 13. Robustness tests[46]

Baseline	k = 34%
Alternative baselines	k = 25%
	k = 50%
Possible pairwise comparisons	91
Significant at baseline	91
Robust (sig. at baseline and alternative spec.)	100.00%
The ratio of significant pairwise comparisons	72.53%
Overall robustness ratio	72.53%
Significant only robustness ratio	72.53%

46 Authors' calculations.

6. Conclusions and recommendations

The pilot N-MPI unpacks the situation of multidimensional poverty among the adult population in Uzbekistan by evaluating 13 indicators across three dimensions: (i) Basic infrastructure and living conditions, (ii) Health and social capital, (iii) Employment and financial inclusion. At the national level, the findings reveal that approximately 18.4 percent of the adult population is multidimensionally poor, based on a poverty cut-off of 34 percent. Key contributing indicators to the pilot N-MPI include Educational attainment (13.7 percent), Food security (11.7 percent) and Informal employment (11.5 percent). The highest censored headcount ratios are observed in Sanitation (14.0 percent), Bank accounts (13.9 percent), Educational attainment (13.2 percent), and Heating Fuel (13.0 percent). Across regions, the Republic of Karakalpakstan (29.9 percent), Namangan region (27.5 percent), and Tashkent region (26.5 percent) have the largest percentage of multidimensionally poor adults. Rural-urban findings show that the incidence in rural areas is significantly larger (23.2 percent) than in urban areas (13.9). Gender level indicate a higher level of multidimensional poverty among males (21.6 percent) rather than females (15.2 percent).

The research findings suggest incorporating the questionnaire applied for the pilot N-MPI with the HBS, and using use the HBS for the national MPI going forward. This will enable the construction of household-level N-MPI and possibly intrahousehold analysis. Also, the frequent collection of the HBS by the Agency Statistics could provide sustainability to the N-MPI and ensure that it can be updated on a biannual basis. By adopting these recommendations, policymakers and stakeholders can gain a deeper understanding of multidimensional poverty at the household level, track its dynamics over time, and design targeted interventions to address the specific deprivations faced by households in Uzbekistan.

Using a multidimensional approach will enable the Government to understand better at both the regional and local level, as well as at a broader global context the scope of poverty in Uzbekistan, which would assist the Government institutions to make more effective decisions and take more practical and targeted steps to reduce poverty. The ultimate goal of the new approach may be as follows:

- Allocate resources more effectively across sectors and regions, as well as ensure the efficiency of the resources allocated through monitoring tools;
- Improve policy design by knowing levels and interlinkages across deprivations once policy gaps are identified;
- Coordinate multisectoral policies and programmes;
- Monitor the effectiveness of policies over time;
- Target poor people as beneficiaries of services or social protection schemes.

Both measurements (monetary and MPI) are important and complement each other, since usually those who are non-monetary poor, might not be necessarily monetary poor (and vice versa), but some portions of the population are "both poor" and are actually the most vulnerable.

7. Lessons learned

The pilot N-MPI in Uzbekistan provided valuable lessons that can inform future efforts in measuring and addressing multidimensional poverty. Firstly, the N-MPI demonstrated the importance of adopting a holistic approach to poverty measurement. By considering multiple dimensions, the pilot N-MPI provided a more comprehensive understanding of poverty beyond income alone. This approach highlighted the diverse deprivations faced by individuals and households. Secondly, the findings of the pilot N-MPI revealed substantial regional disparities and rural-urban and gender divides in multidimensional poverty. This highlights the importance of targeted interventions and policies that address these disparities and cater to the specific needs of different areas. Finally, the report emphasizes the importance of cooperation and alignment among diverse stakeholders, including government ministries, agencies, non-governmental organizations, communities, and international organizations. It underscores the value of implementing a comprehensive approach that integrates various sectors, such as education, health, housing, and social protection, to effectively tackle multidimensional poverty.

The results from the N-MPI are expected to engender the monitoring of social progress of individuals and households towards meeting the national SDGs. This report is timely in Uzbekistan and will feed into public policy formulation and retooling to address emerging issues. The results of the N-MPI reveal significant differences between rural and urban areas. The national results reveal that multidimensional poor individuals face high levels of deprivation in access to improved sanitation, educational attainment, and bank accounts. N-MPI report underlines the Government's commitment to understanding, measuring, and addressing the many dimensions of poverty and leveraging this understanding as a key tool in policymaking. The pilot report of the national MPI has been pivotal in raising awareness among state governments, academia, civil society, and citizens about the significance of using multidimensional poverty measures as both a potent policy instrument as well as a mechanism to measure progress.

References

Agency of Statistics (2023). On the cost of minimum consumer spending. Agency of Statistics. doi: https://stat.uz/en/press-center/news-of-committee/41601

Norma.uz (2019). The Cabinet of Ministers of the Republic of Uzbekistan. The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated February 26, 2019 #170. doi: https://nrm.uz/contentf?doc=630741_polo-jenie_o_poryadke_ucheta_grajdan_nujday-ushchihsya_v_uluchshenii_jilishchnyh_us-loviy_raspredeleniya_i_predostavleniya_ji-lyh_pomeshcheniy_gosudarstvennogo_jilishch-nogo_fonda_(prilojenie_n_1_k_postanovleni-yu_km_ruz_ot_26_02_2019_g_n_170)&prod-ucts=1_vse_zakonodatelstvo_uzbekistana

Alkire, S., Kanagaratnam, U., and Suppa, N. (2023a). 'The global Multidimensional Poverty Index (MPI) 2023 country results and method-ological note', OPHI MPI Methodological Note 55, Oxford Poverty and Human Development Initiative (OPHI), University of Oxford.

Alkire, S., Kanagaratnam, U. and Suppa, N. (2018). 'The Global Multidimensional Poverty Index (MPI): 2018 revision', OPHI MPI Methodological Note 46, Oxford Poverty and Human Development Initiative, University of Oxford.

The Ministry of Employment and Poverty Reduction (2023). Камбағаллик даражаси. doi: https://mehnat.uz/uploads/news_content/files/2023/07/26/4EBfF5TIH40.pdf

Kun.uz (2030). Uzbekistan's population will reach 40 million by 2030. doi: https://kun.uz/en/news/2023/11/09/uzbekistans-popula-tion-will-reach-40-million-by-2030-senate

United Nations Development Programme and Oxford Poverty and Human Development Initiative (2019). How to build a National Multidimensional Poverty Index. doi: https://www.undp.org/publications/how-build-nation-al-multidimensional-poverty-index

United Nations (2023).Poverty Eradication. doi: https://sdgs.un.org/topics/poverty-eradication

United Nations Development Programme and Oxford Poverty and Human Development Initiative (2021). Technical note. Multidimensional Poverty Index. doi: https://hdr.undp.org/system/files/documents/mpi2021technicalnotespdf.pdf

World Bank (2023). Multidimensional Poverty Measure. doi: https://www.worldbank.org/en/topic/poverty/brief/multidimensional-poverty-measure

Appendix

Annex 1 – Technical note on Multidimensional Poverty Index

The headcount ratio (H) or incidence of multidimensional poverty is the proportion of multidimensionally poor people (q) in the population (n):

$$H = \frac{q}{n}$$

The intensity of poverty (A) reflects the average proportion of the weighted component indicators in which multidimensionally poor people are deprived. For multidimensionally poor people only (those with a deprivation score si greater than or equal to 33.3 percent), the deprivation scores are summed and divided by the total number of multidimensionally poor people:

$$A = \frac{\sum_1^q s_i}{q}$$

The deprivation score si of the ith multidimensionally poor person can be expressed as the sum of the weights associated with each indicator j (j = 1, 2, …, 10) in which person i is deprived, si = ci1 + ci2 + … + ci10.

The MPI value is the product of two measures: the incidence of multidimensional poverty and the intensity of poverty:

$$MPI = H \times A$$

The contribution of dimension d to multidimensional poverty can be expressed as:

$$Contrib_d = \frac{\Sigma_{j\epsilon d} \sum_1^q c_{ij}}{n} /MPI$$

Annex 2 – The pilot N-MPI: uncensored and censored headcount ratios[47]

| Indicator | National Uncensored Headcount Ratios | | | k=34% | | | |
| | Percentage of Population Deprived | SE | Confidence Interval (95%) | | Percentage Contribution of Each Indicator to National MPI | National Censored Headcount Ratios | | |
						Percentage of Population MPI Poor and Deprived	SE	Confidence Interval (95%)	
Overcrowding	19.2	0.006	19.238	19.262	4.01	5.8	0.004	5.793	5.808
Housing	14.4	0.005	14.353	14.374	3.97	5.7	0.004	5.731	5.745
Heating fuel	50.0	0.007	50.030	50.056	9.0	13.0	0.005	12.995	13.016
Sanitation	47.0	0.007	46.969	46.996	9.7	14.0	0.005	13.949	13.970
Drinking water	30.8	0.007	30.771	30.798	6.1	8.8	0.004	8.838	8.855
Assets' ownership	26.0	0.007	26.008	26.035	7.5	10.8	0.005	10.810	10.829
Food security	25.2	0.006	25.200	25.225	11.7	11.3	0.005	11.299	11.318
Unemployment	4.3	0.003	4.267	4.280	5.7	2.8	0.003	2.760	2.770
Informal employment	20.6	0.007	20.575	20.601	11.5	8.3	0.005	8.315	8.332
Affordability of medicine	8.9	0.004	8.898	8.915	4.3	4.2	0.003	4.150	4.162
Educational attainment	34.5	0.007	34.449	34.478	13.7	13.2	0.005	13.217	13.238
Communication and technology	5.6	0.003	5.643	5.656	3.1	3.0	0.002	3.005	3.015
Bank account	42.4	0.008	42.386	42.417	9.6	13.9	0.005	13.926	13.948

47 Authors' calculations.

Regional Uncensored Headcount Ratios

Region	Overcrowding	Housing	Heating fuel	Sanitation	drinking water on premises	Assets ownership	Food security	Unemployment	Informal employment	Affordability of medicine	Educational attainment	communication and technology	Bank account
Andijan region	31.9	15.4	86.3	85.3	6.4	15.1	11.4	0.7	30.2	6.6	39.0	5.2	53.3
Bukhara region	1.8	0.0	48.0	34.2	48.3	16.9	37.6	5.6	21.3	13.6	39.4	3.8	39.8
Fergana region	14.7	5.0	48.4	16.3	18.4	21.7	20.8	5.7	25.4	5.9	21.5	7.4	43.5
Jizzakh region	23.7	34.0	47.8	73.6	31.7	44.8	19.5	9.6	16.2	9.7	40.7	11.2	46.9
Republic of Karakalpakstan	27.3	36.4	32.4	73.5	23.0	31.6	48.6	19.1	19.5	8.5	23.7	4.7	48.0
Kashkadarya region	13.4	10.3	38.3	39.9	56.5	28.8	15.7	1.7	14.1	4.5	27.1	1.3	34.0
Khorezm region	25.1	0.9	22.4	24.0	38.7	30.1	39.6	7.4	16.2	18.7	38.9	5.7	42.7
Namangan region	13.6	30.5	55.4	86.0	36.8	34.3	28.5	2.4	23.3	10.6	43.5	15.2	44.1
Navoi region	6.6	21.0	68.9	70.3	2.4	19.3	23.1	3.0	13.8	1.3	28.9	2.5	36.5
Samarkand region	9.4	26.2	78.1	50.4	26.9	28.0	12.0	0.4	23.6	3.4	43.5	3.9	48.3
Surkhandarya region	14.1	2.9	84.4	36.9	54.4	34.3	5.7	3.5	21.7	2.7	43.8	2.2	46.9
Sirdarya region	6.3	0.5	50.7	15.5	20.2	31.6	23.1	3.1	20.0	4.8	37.6	1.9	50.7
Tashkent region	45.0	17.0	20.1	70.2	33.8	28.7	51.5	3.6	18.3	18.9	36.2	7.3	35.5
Tashkent city	23.4	3.5	0.2	4.6	3.9	10.1	19.6	2.2	15.0	15.5	19.5	4.7	30.7

SE

Region	Overcrowding	Housing	Heating fuel	Sanitation	Source of drinking water on premises	Assets ownership	Food security	Unemployment	Informal employment	Affordability of medicine	Educational attainment	Access to communication and technology	Bank account
Andijan region	0.006	0.020	0.019	0.020	0.014	0.020	0.018	0.005	0.027	0.013	0.027	0.011	0.029
Bukhara region	0.008		0.028	0.024	0.029	0.022	0.029	0.015	0.025	0.019	0.029	0.011	0.029
Fergana region	0.019	0.012	0.025	0.019	0.023	0.021	0.021	0.013	0.024	0.012	0.021	0.012	0.026
Jizzakh region	0.030	0.031	0.035	0.039	0.032	0.035	0.027	0.022	0.028	0.020	0.038	0.020	0.035
Republic of Karakalpakstan	0.028	0.029	0.027	0.025	0.026	0.028	0.030	0.025	0.025	0.016	0.026	0.012	0.030
Kashkadarya region	0.018	0.017	0.024	0.025	0.026	0.029	0.018	0.007	0.019	0.010	0.029	0.005	0.025
Khorezm region	0.027	0.005	0.025	0.026	0.031	0.029	0.031	0.017	0.025	0.024	0.030	0.013	0.031
Namangan region	0.019	0.025	0.027	0.019	0.027	0.026	0.025	0.009	0.024	0.016	0.027	0.019	0.028
Navoi region	0.019	0.029	0.028	0.029	0.011	0.029	0.029	0.014	0.026	0.007	0.030	0.010	0.033
Samarkand region	0.015	0.03	0.021	0.026	0.024	0.024	0.016	0.003	0.023	0.009	0.026	0.009	0.027
Surkhandarya region	0.018	0.009	0.020	0.027	0.028	0.027	0.014	0.011	0.025	0.009	0.028	0.007	0.028
Sirdarya region	0.019	0.005	0.034	0.028	0.031	0.035	0.032	0.014	0.031	0.015	0.036	0.010	0.038
Tashkent region	0.028	0.021	0.023	0.023	0.027	0.025	0.028	0.012	0.022	0.021	0.027	0.014	0.027
Tashkent city	0.024	0.030	0.002	0.010	0.010	0.017	0.021	0.009	0.021	0.019	0.022	0.010	0.026

48 Authors' calculations.

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Region	Overcrowding	Housing	Heating fuel	Sanitation	Source of drinking water on premises	Assets ownership	Food security	Unemployment	Informal employment	Affordability of medicine	Educational attainment	Access to communication and technology	Bank account
Andijan region	31.896	13.354	86.276	83.242	6.404	15.061	11.328	0.680	30.178	6.543	38.897	3.150	53.329
Bukhara region	1.740		47.938	24.408	48.259	16.857	37.381	3.572	21.209	13.578	39.367	3.767	39.737
Fergana region	14.614	4.953	48.374	96.300	28.361	21.614	20.782	5.646	21.259	5.840	21.444	7.331	45.428
Jizzakh region	23.663	33.939	47.736	73.536	31.674	44.761	19.464	9.550	16.099	9.668	40.669	11.193	46.804
Republic of Karakalpakstan	27.280	36.373	32.377	78.447	22.982	31.942	43.514	19.082	19.491	8.431	25.601	4.723	42.962
Kashkadarya region	13.338	10.275	38.238	39.844	36.439	28.712	15.680	1.669	14.027	4.456	27.081	1.550	33.908
Khorezm region	25.048	0.907	22.343	23.961	38.592	30.003	39.514	7.404	16.193	18.608	38.847	5.706	42.614
Namangan region	13.592	30.435	55.331	83.595	36.766	34.258	28.485	2.388	23.290	10.543	43.413	13.125	44.040
Navoi region	6.812	20.947	68.797	70.219	2.385	19.279	23.063	2.930	15.754	1.244	28.842	2.469	36.479
Samarkand region	9.327	26.192	78.047	50.361	26.884	27.983	11.968	0.421	23.312	3.388	43.480	3.856	48.289
Surkhandarya region	14.096	2.894	84.336	36.811	34.383	34.243	5.666	3.434	24.848	2.699	45.733	2.216	46.837
Sirdarya region	6.221	0.505	30.615	15.407	20.091	31.484	23.079	3.088	19.978	4.745	37.496	1.895	30.668
Tashkent region	44.981	16.995	20.021	70.148	33.774	28.658	51.472	3.614	18.226	18.829	36.165	7.425	35.424
Tashkent city	25.313	3.479	0.219	4.562	3.841	10.049	19.587	2.186	14.528	15.504	19.413	4.682	30.686

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Region	Overcrowding	Housing	Heating fuel	Sanitation	Source of drinking water on premises	Assets ownership	Food security	Unemployment	Informal employment	Affordability of medicine	Educational attainment	Access to communication and technology	Bank account
Andijan region	31.996	15.433	86.352	85.323	6.438	15.140	11.398	0.678	30.285	6.585	39.004	5.194	53.341
Bukhara region	1.770		48.070	24.204	48.375	16.943	37.694	3.680	21.308	13.654	38.480	3.813	39.853
Fergana region	14.689	4.998	43.471	16.377	28.431	21.694	20.834	5.866	25.453	5.885	21.526	7.380	45.530
Jizzakh region	23.782	34.060	47.852	73.670	31.800	44.897	19.572	9.597	16.210	9.747	40.801	11.271	46.941
Republic of Karakalpakstan	27.389	36.491	32.482	75.545	23.033	31.653	45.631	19.190	19.390	8.498	25.703	4.772	43.081
Kashkadarya region	13.408	10.341	58.386	39.841	56.563	28.804	15.723	1.696	24.103	4.496	27.120	1.551	34.007
Khorezm region	25.133	0.928	22.411	24.065	38.712	30.116	39.635	7.472	16.290	18.702	38.864	5.758	42.736
Namangan region	13.666	30.535	55.456	85.990	36.871	34.362	28.582	2.425	23.386	10.608	43.519	15.200	44.149
Navoi region	6.589	21.059	68.908	70.392	2.377	19.391	23.178	3.003	15.857	1.273	28.961	2.508	36.608
Samarkand region	9.387	26.283	78.130	50.465	26.978	28.077	12.032	0.432	23.603	3.424	43.584	3.891	48.375
Surkhandarya region	14.168	2.930	84.415	36.919	54.446	34.350	5.720	3.406	21.745	2.734	43.884	2.246	46.949
Sirdarya region	6.285	0.525	50.748	15.518	20.213	31.622	23.204	3.152	20.102	4.804	37.637	1.933	50.817
Tashkent region	45.060	17.078	20.110	70.288	33.879	28.737	51.582	3.660	18.313	18.911	36.170	7.480	35.531
Tashkent city	25.407	3.519	0.228	4.601	3.880	10.117	19.622	2.222	15.012	15.377	19.499	4.671	30.739

Annex 4 – Regional censored headcount ratios (SE, CI)[49]

Regional Censored Headcount Ratios

Region	Overcrowding	Housing	Heating fuel	Sanitation	Source of drinking water on premises	Assets ownership	Food security	Unemployment	Informal employment	Affordability of medicine	Educational attainment	Access to communication and technology	Bank account
Andijan region	8.6	7.7	18.8	19.0	1.2	6.9	3.9	0.3	12.1	2.8	17.2	2.5	15.3
Bukhara region	1.1	0.0	14.6	10.1	10.7	8.3	16.3	2.4	10.3	7.3	13.9	3.0	15.6
Fergana region	3.0	1.4	7.3	3.8	6.1	8.3	8.6	3.4	6.1	3.7	7.5	3.7	10.3
Jizzakh region	7.2	10.3	17.3	21.8	13.0	17.6	13.0	7.6	4.8	4.4	18.8	6.0	17.0
Republic of Karakalpakstan	11.7	13.8	16.1	27.5	11.4	15.8	23.6	12.2	9.9	5.1	13.1	3.6	21.7
Kashkadarya region	5.0	6.3	13.3	13.5	12.2	11.6	8.9	1.3	7.3	2.8	12.5	0.5	13.0
Khorezm region	6.4	0.3	5.9	7.1	7.2	9.6	15.6	4.0	3.5	7.3	14.6	2.9	10.8
Namangan region	7.4	11.8	19.1	25.5	16.2	18.5	16.6	1.7	12.5	7.3	20.7	9.8	17.5
Navoi region	0.9	10.5	15.2	14.7	0.0	8.1	9.8	3.0	8.9	0.3	10.1	1.7	14.5
Samarkand region	3.4	11.0	16.7	13.4	7.7	10.9	7.8	0.4	9.3	2.1	14.8	1.5	14.9
Surkhandarya region	2.7	1.9	18.9	13.3	15.1	12.4	3.6	3.2	11.6	1.2	15.8	1.3	16.3
Sirdarya region	2.0	0.5	10.7	3.2	7.9	10.8	10.3	0.8	7.7	3.5	11.1	0.0	10.1
Tashkent region	17.5	3.3	11.5	24.7	12.8	15.3	21.7	2.7	10.4	8.8	16.6	4.7	18.6
Tashkent city	1.5	0.1	0.2	0.2	0.2	0.6	2.0	0.8	1.1	1.7	1.2	0.4	2.3

SE

Region	Overcrowding	Housing	Heating fuel	Sanitation	Source of drinking water on premises	Assets ownership	Food security	Unemployment	Informal employment	Affordability of medicine	Educational attainment	Access to communication and technology	Bank account
Andijan region	0.015	0.015	0.022	0.022	0.006	0.014	0.013	0.003	0.019	0.009	0.022	0.008	0.021
Bukhara region	0.006		0.020	0.017	0.018	0.016	0.021	0.009	0.019	0.015	0.020	0.010	0.022
Fergana region	0.009	0.007	0.015	0.010	0.013	0.014	0.014	0.010	0.013	0.010	0.013	0.009	0.016
Jizzakh region	0.013	0.019	0.023	0.026	0.022	0.024	0.023	0.019	0.014	0.014	0.026	0.014	0.025
Republic of Karakalpakstan	0.021	0.022	0.023	0.027	0.020	0.022	0.027	0.020	0.019	0.013	0.020	0.011	0.026
Kashkadarya region	0.011	0.013	0.017	0.017	0.016	0.016	0.015	0.006	0.014	0.008	0.017	0.003	0.017
Khorezm region	0.016	0.008	0.015	0.016	0.016	0.018	0.023	0.013	0.013	0.016	0.022	0.010	0.020
Namangan region	0.014	0.018	0.022	0.024	0.021	0.022	0.020	0.008	0.019	0.014	0.022	0.015	0.021
Navoi region	0.009	0.022	0.025	0.024		0.021	0.020	0.014	0.020	0.003	0.020	0.009	0.024
Samarkand region	0.009	0.016	0.019	0.018	0.014	0.016	0.013	0.003	0.016	0.007	0.018	0.005	0.018
Surkhandarya region	0.008	0.008	0.023	0.020	0.021	0.020	0.012	0.011	0.020	0.005	0.021	0.006	0.022
Sirdarya region	0.010	0.005	0.023	0.013	0.020	0.023	0.023	0.008	0.021	0.013	0.023		0.023
Tashkent region	0.022	0.013	0.018	0.024	0.019	0.020	0.023	0.010	0.018	0.015	0.021	0.011	0.022
Tashkent city	0.007	0.001	0.002	0.001	0.002	0.004	0.009	0.006	0.007	0.008	0.006	0.002	0.009

49 Authors' calculations.

Table: Ci_Ib

Region	Overcrowding	Housing	Heating fuel	Sanitation	Source of drinking water on premises	Assets ownership	Food security	Unemployment	Informal employment	Affordability of medicine	Educational attainment	Access to communication and technology	Bank account
Andijan region	8.349	7.690	18.766	18.968	1.962	6.898	5.896	0.287	12.016	2.817	17.206	2.492	15.298
Bukhara region	1.080		14.388	10.070	10.621	8.293	16.228	2.361	10.261	7.274	13.813	2.977	15.514
Fergana region	2.890	1.349	7.313	3.736	6.471	8.289	8.878	3.387	6.098	3.721	7.484	3.713	10.307
Jizzakh region	7.183	10.252	17.244	21.750	12.925	17.304	12.910	7.551	4.734	4.377	18.773	6.002	16.586
Republic of Karakalpakstan	11.692	13.783	16.037	27.438	11.378	15.727	25.524	12.169	9.877	1.062	13.104	3.372	21.660
Kashkadarya region	4.967	6.302	13.224	13.504	12.029	11.554	9.906	1.319	7.305	2.827	12.493	0.300	12.983
Khorezm region	6.396	0.271	5.827	7.068	7.157	9.612	15.513	4.008	3.484	7.309	14.561	2.898	10.728
Namangan region	7.365	14.787	19.098	22.436	16.497	18.446	16.554	1.726	12.302	7.348	20.672	9.801	17.308
Navoi region	0.879	10.468	15.130	14.619		8.082	9.781	2.930	8.842	0.335	10.059	1.726	14.487
Samarkand region	3.354	10.924	16.625	13.373	7.713	10.817	7.737	0.421	9.277	2.082	14.756	1.413	14.898
Surkhandarya region	2.658	1.858	18.829	13.237	15.091	12.357	3.595	3.211	11.595	1.238	15.805	1.334	16.200
Sirdarya region	1.961	0.505	10.612	3.178	7.874	10.743	10.302	0.802	7.699	3.466	11.036		10.042
Tashkent region	17.490	3.294	11.449	24.628	12.781	15.287	21.642	2.680	10.367	8.779	16.587	4.663	12.949
Tashkent city	1.309	0.096	0.219	0.181	0.241	0.567	1.978	0.778	1.123	1.723	1.146	0.390	2.309

Table: Ci_Ub

Region	Overcrowding	Housing	Heating fuel	Sanitation	Source of drinking water on premises	Assets ownership	Food security	Unemployment	Informal employment	Affordability of medicine	Educational attainment	Access to communication and technology	Bank account
Andijan region	8.609	7.750	18.854	19.056	1.185	6.955	5.918	0.288	12.091	2.852	17.291	2.523	15.379
Bukhara region	1.105		14.665	10.138	10.691	8.358	16.313	2.886	10.385	7.382	13.894	3.017	15.679
Fergana region	2.987	1.375	7.872	3.776	6.222	8.294	8.684	3.425	6.149	3.739	7.516	3.782	10.371
Jizzakh region	7.248	10.328	17.335	21.851	13.013	17.599	12.999	7.627	4.788	4.430	18.874	6.057	17.036
Republic of Karakalpakstan	11.778	13.868	16.126	27.344	11.437	15.844	25.628	12.249	9.952	5.112	13.184	3.616	21.762
Kashkadarya region	5.008	6.352	13.288	13.571	12.192	11.658	9.966	1.842	7.339	2.857	12.538	0.512	13.052
Khorezm region	6.439	0.281	5.885	7.127	7.220	9.682	15.604	4.054	3.336	7.371	14.648	2.936	10.806
Namangan region	7.422	11.858	19.185	25.531	16.279	18.531	16.694	1.759	12.577	7.379	20.759	9.862	17.592
Navoi region	0.924	10.554	15.229	14.710		8.113	9.862	3.003	8.891	0.348	10.140	1.760	14.533
Samarkand region	3.380	10.986	16.700	13.442	7.768	10.980	7.789	0.482	9.338	2.130	14.826	1.533	14.969
Surkhandarya region	2.690	1.888	18.918	13.315	15.173	12.433	3.643	3.233	11.672	1.239	15.887	1.357	16.306
Sirdarya region	1.999	0.525	10.701	3.224	7.959	10.824	10.350	0.833	7.781	3.518	11.127		10.133
Tashkent region	17.517	5.844	11.480	24.723	12.855	15.365	21.738	2.720	10.487	8.838	16.668	4.706	18.686
Tashkent city	1.536	0.100	0.228	0.186	0.251	0.584	2.013	0.795	1.149	1.755	1.172	0.400	2.345

Annex 5 – Uncensored and censored headcount ratios by area (SE, CI)[50]

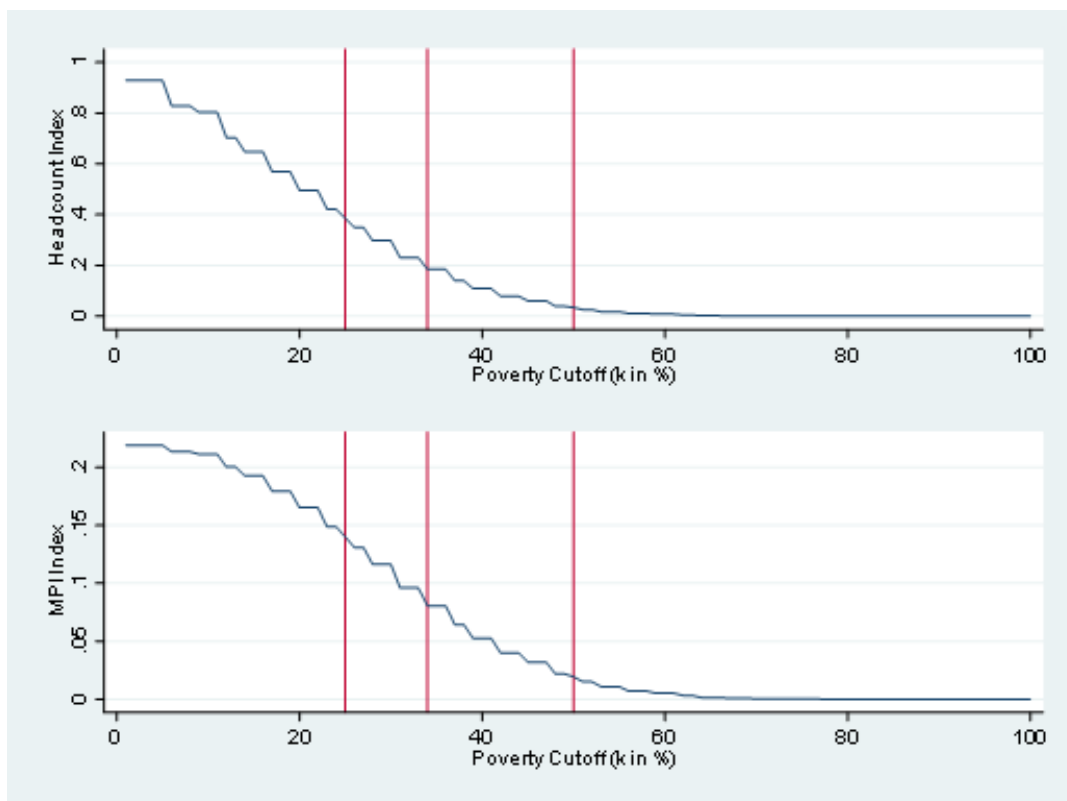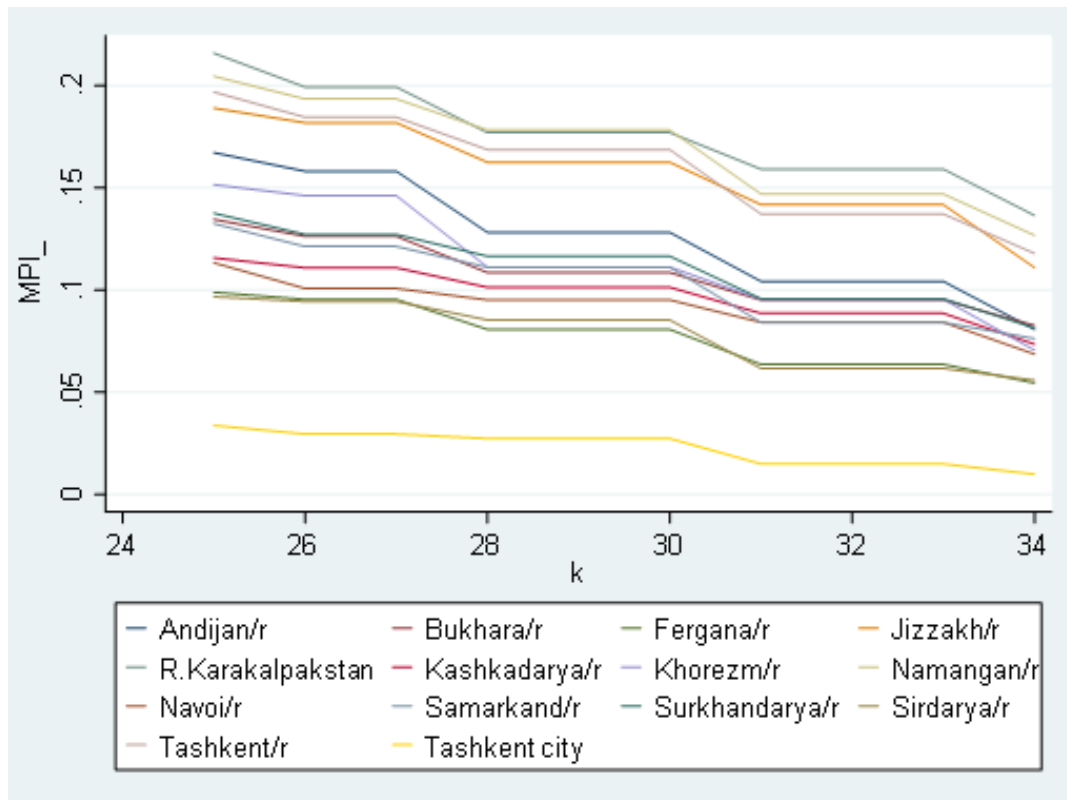| Locality	Censored Headcount Ratios	SE	CI		Uncensored Headcount Ratios	SE	CI	
Overcrowding								
city	4.43%	0.0000453	0.0442376	0.0444153	19.79%	0.000085	0.19771	0.19804
village	7.29%	0.0000589	0.0727427	0.0729736	18.67%	0.0000875	0.18649	0.18683
Housing								
city	4.32%	0.0000436	0.0431018	0.0432726	12.34%	0.0000689	0.12325	0.12352
village	7.28%	0.0000583	0.0726698	0.0728985	16.56%	0.0000817	0.16545	0.16577
Heating fuel								
city	7.61%	0.000058	0.0760055	0.0762328	31.95%	0.0000901	0.31933	0.31969
village	18.86%	0.0000887	0.1884342	0.1887821	69.68%	0.0000947	0.69665	0.69702
Sanitation								
city	9.68%	0.0000631	0.0967171	0.0969646	37.20%	0.0000906	0.37183	0.37219
village	18.60%	0.0000862	0.1858335	0.1861717	57.60%	0.0000988	0.57582	0.57621
Source of drinking water on premises								
city	6.44%	0.0000551	0.0643252	0.0645414	25.33%	0.0000913	0.2531	0.25346
village	11.46%	0.0000707	0.1144166	0.1146937	36.71%	0.0001053	0.36687	0.36728
Assets ownership								
city	7.95%	0.0000591	0.0793917	0.0796236	22.47%	0.0000907	0.22451	0.22487
village	13.93%	0.000077	0.1391944	0.1394965	29.88%	0.0001037	0.29857	0.29897
Food security								
city	8.14%	0.0000585	0.0813236	0.0815529	22.71%	0.0000856	0.22694	0.22727
village	14.74%	0.0000786	0.1472955	0.1476038	27.93%	0.0000951	0.2791	0.27948
Unemployment								
city	2.14%	0.0000329	0.0213728	0.021502	3.75%	0.0000427	0.03743	0.03759
village	3.44%	0.0000413	0.0343157	0.0344777	4.84%	0.00005	0.04831	0.0485
Informal employment								
city	6.56%	0.0000571	0.0654766	0.0657004	20.03%	0.0000931	0.20008	0.20044
village	10.24%	0.0000716	0.1022531	0.102534	21.20%	0.0000982	0.21178	0.21217
Affordability of medicine								
city	3.58%	0.0000389	0.035771	0.0359236	9.42%	0.0000594	0.09403	0.09427
village	4.78%	0.0000461	0.0476691	0.0478499	8.35%	0.0000595	0.08343	0.08366
Educational attainment								
city	10.27%	0.0000656	0.1025872	0.1028445	31.19%	0.0000986	0.3117	0.31209
village	16.44%	0.0000822	0.1642038	0.1645262	38.02%	0.0001083	0.37997	0.38039
Access to communication and technology								
city	2.44%	0.0000309	0.0242925	0.0244137	5.38%	0.0000446	0.05374	0.05391
village	3.63%	0.0000388	0.0362612	0.0364133	5.94%	0.0000498	0.0593	0.0595
Bank account								
city	10.39%	0.0000677	0.103756	0.1040217	38.53%	0.0001075	0.38511	0.38553
village	17.79%	0.000088	0.1777183	0.1780633	46.60%	0.0001156	0.46579	0.46624

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50 Authors' calculations.

Annex 6 – Uncensored and censored headcount ratios by gender (SE, CI)[51]

Gender	Censored Headcount Ratios	SE	CI		Uncensored Headcount Ratios	SE	CI	
Overcrowding								
male	6.20%	0.0000582	0.0618881	0.0621162	18.21%	0.0000929	0.18196	0.18232
female	5.41%	0.0000464	0.054003	0.0541848	20.26%	0.0000829	0.20248	0.20281
Housing								
male	6.67%	0.0000582	0.0666139	0.0668423	15.08%	0.0000848	0.15062	0.15095
female	4.82%	0.000044	0.0481349	0.0483073	13.66%	0.00007	0.13649	0.13677
Heating fuel								
male	14.83%	0.0000841	0.1481535	0.1484832	48.76%	0.0001131	0.48741	0.48785
female	11.22%	0.0000637	0.1120439	0.1122936	51.30%	0.0000936	0.51279	0.51315
Sanitation								
male	16.08%	0.000086	0.1606699	0.1610073	46.60%	0.0001131	0.46581	0.46626
female	11.88%	0.0000644	0.1186571	0.1189095	47.35%	0.0000945	0.47335	0.47372
Source of drinking water on premises								
male	10.12%	0.000072	0.1010563	0.1013386	30.59%	0.0001088	0.30572	0.30615
female	7.60%	0.0000532	0.0758919	0.0761005	30.97%	0.0000932	0.30953	0.3099
Assets ownership								
male	11.89%	0.0000758	0.1187847	0.1190821	25.64%	0.000105	0.25615	0.25656
female	9.77%	0.0000603	0.097567	0.0978033	26.40%	0.0000901	0.26381	0.26417
Food security								
male	12.55%	0.0000772	0.1253855	0.1256883	23.59%	0.0000978	0.23571	0.23609
female	10.09%	0.0000605	0.1007798	0.1010168	26.80%	0.0000879	0.26785	0.26819
Unemployment								
male	3.89%	0.0000462	0.0388098	0.0389909	6.04%	0.000058	0.06027	0.0605
female	1.66%	0.0000256	0.0165832	0.0166835	2.54%	0.0000312	0.02538	0.02551
Informal employment								
male	13.75%	0.0000828	0.1373786	0.1377031	34.10%	0.0001158	0.34078	0.34123
female	3.00%	0.0000351	0.0299792	0.0301168	7.35%	0.000054	0.07343	0.07364
Affordability of medicine								
male	3.39%	0.000042	0.0337812	0.033946	6.60%	0.0000562	0.0659	0.06612
female	4.91%	0.0000429	0.049012	0.0491803	11.16%	0.000063	0.11152	0.11177
Educational attainment								
male	15.01%	0.0000836	0.1489547	0.1502824	31.41%	0.0001097	0.31388	0.31431
female	11.48%	0.0000635	0.1146751	0.1149243	37.46%	0.0000979	0.37436	0.37475
Access to communication and technology								
male	1.99%	0.0000301	0.0197917	0.0199098	4.09%	0.0000422	0.0408	0.04096
female	4.01%	0.0000389	0.0400607	0.0402134	7.18%	0.0000516	0.07169	0.0719
Bank account								
male	17.82%	0.0000914	0.178043	0.1784013	44.87%	0.0001202	0.44844	0.44891
female	10.13%	0.0000616	0.1011992	0.1014409	39.99%	0.0001023	0.39966	0.40006

51 Authors' calculations.

Annex 7 – Robustness analysis: regional orderings by the N-MPI levels[52]

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52 Authors' calculations.