

# CHILDREN'S LIVES: INTERNATIONAL CONFERENCE ON CHILDREN AND THEIR FAMILIES, USING THE MULTIPLE INDICATOR CLUSTER SURVEYS

Date/Time: Monday, 2 September 2024, 8:30 am to Tuesday, 3 September 2024, 5:00 pm  
Location: University of Bristol, Merchant Venturer's Building, BS8 1UB, Bristol, United Kingdom

## LIST OF SESSIONS AND ABSTRACTS

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### S01 Geographic and Spatial Analysis I (B1)

Paper No. 166

Title ***Estimating safely managed drinking water services using georeferenced cluster locations in Lao PDR***

Author(s)	Esther E. Greenwood	Swiss Federal Institute of Technology	Switzerland
	Nazim Gashi	UNICEF MICS Consultant	Kosovo
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Abstract The release of geo-referenced MICS data presents new opportunities for studying spatial and temporal variations in safely managed drinking water services (SMDWS), relevant for monitoring progress towards Sustainable Development Goal (SDG) 6. Here, we used anonymized geo-cluster-referenced household survey data, together with anthropogenic and environmental geospatial datasets to predict SMDWS use at settlement levels across months in the rainy and dry season in Lao People's Democratic Republic (PDR). We trained random forest models on a range of variables, including wealth indices, household head education level, household sanitation, and geospatial variables including night light intensity, meteorological and land-cover variables. We compared predictor importance and performance of models using either household or geospatial variables to models combining both variable types. Models predicting the sub-criteria of SMDWS use were developed with outcome variables defined as a drinking water source which is 1) improved, 2) accessible on premises, 3) available when needed, and 4) free of fecal contamination. We compared SMDWS models using displaced cluster centroids for anonymization to those using the original cluster coordinates which did not reduce model performance. Our results point towards relevant contributions of both household and geospatial variables for predicting SMDWS with the highest model performance, based on spatial cross-validation metrics, achieved when combining these (area under the curve of receiver operating characteristics= 0.71, max accuracy= 0.85). The most important predictor for SMDWS was the household wealth score, followed by urban built-up land-cover and population density. The probability of predicting SMDWS use increased by 52% between the rainy season (0.15) and November (0.22), the first month of the dry season, suggesting seasonal variations of SMDWS use. Our results highlight a range of viable use-cases for the application of machine learning models using geo-referenced MICS data to fill spatial and temporal data gaps on SDG 6.

Paper No. 210  
 Title ***Spatial variation on curative child healthcare utilisation in Sierra Leone: Integration of routine health data with household surveys***  
 Author(s) Pamela Bockarie University of Southampton United Kingdom  
 Jim Wright University of Southampton United Kingdom  
 Amos Channon University of Southampton United Kingdom  
 Osman Sankoh University of Management and Technology Sierra Leone

Abstract  
 Background: The implementation of the Free Health Care Initiative (FHCI) in 2010 in Sierra Leone, a programme exempting healthcare charges for children, decreased financial barriers to curative healthcare utilisation. However, child morbidity and mortality remain high in the country, which experiences one of the highest under-five mortality rates (105/1000 in 2021) in the world. Common diseases among under-fives include fever, diarrhoea and acute respiratory infection (ARI). Understanding the geographical variations in the utilisation of child healthcare services is critical for identifying locations not fully benefitting from the FHCI and the contextual and health system factors contributing to these patterns. The study aims to explore post-FHCI variation in curative child healthcare utilisation and examine health system factors for such variations. Methods: This study will use facility-level data from the Service Availability and Readiness Assessment (SARA) survey in 2017 alongside the 2017 Sierra Leone Multiple Indicator Cluster Survey (MICS) for children with common infectious diseases. Health facility metrics for child healthcare service availability including staffing, and equipment will be extracted from the SARA records. These metrics will be linked to the MICS data to quantify the interplay of disease episodes, healthcare-seeking, and functionality of healthcare services. Travel times from cluster locations to the nearest health facility providing child health services will be calculated and analysed using multi-level modelling. Preliminary Results: Out of 11,764 under-fives in the survey, 7.7%, 1.9%, and 21% had symptoms of diarrhoea, ARI, and fever respectively. Related treatment-seeking at a health facility was 69.5 nationally but lowest in Western region at 55%. Discussion/Conclusion: The spatial variation for the utilisation of healthcare services was lowest in the Western region and urban areas. Integration of the MICS and SARA data might reveal further insights into the counterintuitive utilisation rate given that urban areas have greater access to healthcare facilities and services.

Paper No. 213  
 Title ***KidSat: satellite imagery to map childhood poverty dataset and benchmark***  
 Author(s) Makkunda Sharma University of Oxford United Kingdom  
 Fan Yang University of Oxford United Kingdom  
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 Seth Flaxman University of Oxford United Kingdom

Abstract  
 Satellite imagery has emerged as an important tool to analyse demographic, health, and development indicators. While various deep learning models have been built for these tasks, each is specific to a particular problem, with few standard benchmarks available. We propose a new dataset pairing satellite imagery and high-quality survey data on child poverty to benchmark satellite feature representations. Our dataset consists of 33,608 images, each 10 km x 10 km, from 19 countries in Eastern and Southern Africa in the time period 1997-2022. As defined by UNICEF, multidimensional child poverty covers six dimensions and it can be calculated from the face-to-face MICS and Demographic and Health Surveys (DHS) Program. As part of the benchmark, we test spatial as well as temporal generalization, by testing on unseen locations, and on data after the training years. Using our dataset we benchmark multiple models, from low-level satellite imagery models such as MOSAIKS, to deep learning foundation models, which include both generic vision models such as Self-Distillation with no Labels (DINOv2) models and specific satellite imagery models such as SatMAE. We provide open source code for building the satellite dataset, obtaining ground truth data from DHS/MICS and running various models assessed in our work.

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## S02 Education and Learning I (O1)

- Paper No. 127  
Title **Guiding education programming for the most disadvantaged children and adolescents in South Asia**  
Author(s) Matt Brossard UNICEF ROSA Nepal  
Matthew Townshend UNICEF ROSA Consultant South Africa  
Abstract In aid of the pursuit of Sustainable Development Goals 4.1 and 4.5, the objective of this study is to apply the available Multiple Indicator Cluster Survey (MICS) data to analyse the situation and trend of school enrolment, school attendance, and learning outcomes among adolescents in South Asian countries. The analysis is disaggregated per country according to core vulnerability factors (poverty; rural location; and disability) to help direct UNICEF programming priorities and policy dialogues with Governments towards the appropriate education responses for the most vulnerable adolescents in South Asian countries, including: catch up foundational learning programs; accelerated learning programs; formal secondary education; and vocational trainings. For those South Asian countries that applied the foundational learning module (for the 7-14 years old), the analysis will be supplemented with regression modelling to estimate: gender disparities in learning outcomes; the extent to which specific household and individual level variables contribute to better learning outcomes; and the extent to which a similar but wider set of household and individual level variables affect learning outcomes amongst genders. The intention is that UNICEF education officers, Government policy makers, and other stakeholders can apply the research findings to help inform cross-sectoral programs aimed at improving foundational learning outcomes in South Asian countries.
- Paper No. 152  
Title **Child fostering and school attendance in West Africa**  
Author(s) Pearl S. Kyei University of Ghana Ghana  
Abstract Informal fostering arrangements can relieve pressure on parents and promote social mobility for children from poor households in sub-Saharan Africa. However, the motivation of host households to invest in fostered children would determine the extent of the benefits. This paper uses MICS data on 86,803 children 6 to 12 years with both parents alive in five West African countries (Gambia, Ghana, Guinea-Bissau, Sierra Leone, and Togo) to assess the relationship between foster status and school attendance in two time periods 2005-2006 and 2017-2018. Multilevel logit regressions are used to estimate the likelihood of ever attending school. The results indicate that fostered children had significantly lower chances of attending school in the most recent surveys, a difference from a decade earlier period where no significant correlation was found. Further, the difference in the likelihood of attending school between fostered and non-fostered children increases with household wealth quintile. Finally, the household wealth gradient in school attendance has become less steep over time for both fostered and non-fostered children. These findings underscore the importance of directing focus towards children not living with their biological parents in this sub-region and gaining a deeper understanding of the implications of fostering children to wealthier households.
- Paper No. 192  
Title **Are private schools equipping children with more foundational literacy and numeracy (FLN) skills than public schools in South Asia?**  
Author(s) Rakibul Hassan Kobe University Japan  
Abstract With the rise of private schools in the global south, debates over the merits and demerits of the increasing presence of private schools are intensified in academic and policy circles. While the proponents of the rise of private schools argue that private schools can provide cost-effective and improved learning opportunities in the developing world where public schools are usually low performing, the critics counterargue that it can foster inequality in access to education. In addition, the critics argue that better learning outcomes in private schools are the effects of student's socio-economic backgrounds. However, in South Asia where the share of private schools is the highest in the world and most of the private schools are "low-fees schools", how the learning outcomes differs between private and public schools and how the difference is further stratified by student's socio-economic background is yet to be empirically investigated. This study examines the difference in foundational literacy and numeracy (FLN) skills between private and public schools in South Asia using the Multiple Indicator Cluster Survey (MICS) round 6 data for Afghanistan, Bangladesh, Nepal, and Pakistan. This study also examines how the differences in FLN skills between private and public schools are stratified by household wealth. Using Binary Logistic Model, this study provides evidence that the likelihood of having foundational literacy and numeracy skills is higher for private school going students compared to their public-school going counterparts. In addition, the findings show that the effect of school type is further stratified by student's household wealth. Therefore, this study implies that the better performance of private school students is the effect of student's household wealth.

Paper No. 241

Title ***Breaking the darkness: How multidimensional energy poverty affects child learning developing countries***

Author(s)	John Mefful	University of Cape Coast	Ghana
	Elizabeth Nsenkyire	University of Cape Coast	Ghana
	Jacob Nunoo	University of Cape Coast	Ghana
	Robert Naatey Angmor	University of Cape Coast	Ghana

Abstract Energy poverty has been an issue of concern for policy makers, especially in developing countries. Despite the increase in investment in energy to improve access and affordability of clean energy, energy poverty persists in sub-Saharan African countries including Ghana. In similar vein, learning poverty is on the rise as close to 90% of children in Africa are unable to read and write simple sentences at age 10. As opposed to existing studies, the present study examined the nexus between multidimensional energy poverty and child learning outcomes in Ghana using the Multiple Indicator Cluster Survey round 6. The two stage least squares instrumental variable estimation technique was used and corroborated with the Lewbel two stage least squares estimation techniques to ensure the estimates are identified and robust. We found that energy poverty reduces the ability of a child to know how to write, read, and understand comprehension stories. The effect was however more pronounced among female children, rural children and children with disability. We therefore recommend that policies should be targeted at reducing energy poverty in rural communities by increasing access to electricity and making it affordable in Ghana as a whole.

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## S03 Immunisation (O2)

Paper No. 25

Title ***Examining Equity in Never Vaccinated Under-Five Children: Insights from the Sixth Round of MICS Survey in South Asia***

Author(s) Kanchan Thapa Noble Shivapuri Research Institute (NSRI) Nepal  
Rita Adhikari The University of Tokyo Japan

Abstract Globally, immunization is the most powerful cost-effective public health intervention, preventing an estimated 5 million deaths annually and holding the potential to prevent over 50 million deaths from 2021 to 2030. Despite its profound benefits, there exists an equity gap in the utilization of vaccination services, particularly in South Asia. This study investigates children who have never received any antigen in South Asia through an equity lens. We utilized data from the sixth round of the Multiple Indicator Cluster Surveys (MICS) for this region. We employed weighted data for both descriptive and inferential statistics. We examined factors like age, sex, residence, birth registration, vaccination card possession, disability (child and caregiver), mother's education, health insurance, and campaign vaccination history. We further analysed these variables in relation to the children's wealth status. Our investigation revealed substantial disparities in antigen uptake across South Asia. The never receiver of any antigen were 41.9% (532 children) in Nepal, 61.1% (5622 children) in Afghanistan. Moreover, in Pakistan, never vaccinated child varied considerably by province. In Punjab, 34.2% (2060 children), Sindh (39.4%, 2282 children), Khyber (60.4%, 4639 children) and Balochistan (73.6%, 5574 children) were never vaccinated. Further, the data reveals that wealth heavily impacts vaccination across South Asia. Notably, the gap between the poorest and wealthiest populations was widest in Pakistan and narrowest in Nepal. Nepal's poorest children (28.9%) are nearly three times more likely to be unvaccinated than the wealthiest (11.1%). This gap widens in Afghanistan (35.2% vs. 7.4%) and Pakistan (Sindh: 38.4% vs. 5.0%). The variations were reported throughout the provinces in Pakistan. This study concludes a significant equity gap in childhood vaccination access across South Asia. Factors like mother's education, birth registration, health insurance, wealth, and areas played significant role in vaccine intake. The overall observed disparities urges the need for equity-focused interventions.

Paper No. 32

Title ***Examining wealth related inequality in childhood vaccination in Fiji using the UNICEF Multiple Indicator Cluster Survey (MICS) 2021***

Author(s) Connie Lam University of Sydney Australia  
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Rachel Devi Ministry of Health and Medical Services Fiji  
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Alexandra Martiniuk University of Sydney Australia

Abstract Despite a 95% national immunisation rate in Fiji, disparities exist in the distribution of immunisation coverage in children from different socioeconomic backgrounds. We use demographic and household wealth data from the 2021 Fiji Multiple Indicator Cluster Survey (MICS) to determine the extent that socioeconomic inequalities contribute to differences in immunisation coverage. Birth history, child history and household data modules from the 2021 Fiji MICS were used to calculate age-appropriate immunisation for children aged 12-23 months and linked with household and wealth data. Logistic regression was performed with factors of interest and a concentration index (CI) was calculated using the wealth quintiles, geographical region and household income to measure socioeconomic inequality. Out of 417 children aged 12-23 months; 85.6% (357/417) were fully immunised, 12.0% (50/417) partially immunised, and 2.4% (10/417) had no immunisations. Factors associated with increased probability of being fully immunized included being in a single child household and being in a household in the highest wealth quintile. Concentration indices for fully vaccinated children were found to be positive, whereas CI's were negative for partially vaccinated children. Results from this study can provide guidance on policy decisions over the delivery of immunisation services enable more equitable childhood immunisation coverage in Fiji.

Paper No. 133

Title **Socioeconomic inequalities in immunisation of 12-23 months old children in Malawi: A decomposition analysis**

Author(s) Bridget Naphiyo University of Malawi Malawi  
Jacob Mazalale University of Malawi Malawi  
Gowokani Chijere Chirwa University of Malawi Malawi

Abstract Background: Given the benefits of the Expanded Program on Immunisation (EPI) to Malawians' health and, consequently, Malawi's economic development, coverage and equity in immunisation are necessary to track. In the 2019-20 Malawi Multiple Indicator Cluster Survey (MICS), immunisation coverage of basic vaccines among 12-23-month-old children was at 72%. However, disaggregated immunisation coverage in some groups of children was below or above 72%. The disparities compelled the need to investigate the extent of socioeconomic inequalities drivers in child immunisation in Malawi. Study Design: This study uses secondary data sets from three of Malawi's national representative cross-sectional surveys: the Malawi MICS 2013-14, the Malawi MICS 2019-20 and the Malawi Service Provision Assessment (MSPA) 2013-14. The MSPA 2013-14 was used to estimate the shortest distance between a MICS 2019-20 cluster and a facility offering immunisation services. Methods: The study utilized the concentration index to measure socioeconomic inequality and the Wagstaff decomposition to measure the marginal contributions of socioeconomic factors to inequality. Results: The study found no socioeconomic inequality in 2013, but pro-rich inequalities existed in 2019 (0.065 for basic immunisation; 0.09 for age-appropriate immunisation), statistically significant at  $p < 0.01$ . Wealth, maternal education and place of residence were significant factors contributing to the pro-rich inequalities in 2019. Conclusion: The results call for interventions that improve affordability and accessibility of vaccines and interventions that educate caregivers of the benefits of child immunisation to ensure equity. The results, therefore, suggest that to improve equality in health outcomes, the Government of Malawi needs to embrace wider policies that do not only address the consumption of healthcare services but also policies that affect socioeconomic determinants of health.

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**S04 Living Arrangements, Child Outcomes and Life Satisfaction (B1)**

Paper No. 45  
Title ***Impact of Adolescent Motherhood, Poverty, and Childrearing on Developmental Outcomes in Early Childhood: Cross-sectional Analysis of Household Surveys from Latin America and the Caribbean***

Author(s) Arachu Castro Tulane University USA  
Laura V. Sánchez-Vincitore Universidad Iberoamericana Dominican Republic  
Daniel Cubilla-Bonnetier Universidad Iberoamericana Dominican Republic

Abstract Background: The prevalence of adolescent pregnancy poses significant implications for the health and developmental outcomes of children born to young mothers. We sought to understand how adolescent motherhood affects early childhood development (ECD) across Latin America and the Caribbean. We had four study aims: 1) determine if the use of violent discipline is more frequent among adolescent mothers than among older ones; 2) confirm the association between adolescent motherhood and ECD; 3) explore the impact of living with a partner and its interaction with adolescent status at the time of giving birth on ECD; and 4) analyze the impact of mothers' beliefs about physical punishment and partner violence on ECD, considering the mother's adolescent status. Methods: We conducted a secondary analysis of MICS data from thirteen Latin American and Caribbean countries with rounds 5 and 6 surveys. Results: Children's age, wealth quintile, and maternal education are significant predictors of ECD scores across countries. Negative discipline practices are less prevalent among mothers aged 20 and above, with some countries showing statistically significant differences. In most countries, children of mothers aged 20 and above have higher ECD scores than children of adolescent mothers. The interaction between maternal adolescent status and living with a partner showed significance in some countries; where significant, the effect sizes range from small to moderate. Finally, a mother's belief in physical punishment and justification of partner violence is associated with lower ECD scores. Conclusions: Consistent with previous research, mothers aged 20 and above tend to have children with higher ECD scores. This may reflect more mature developmental stages among these mothers, leading to better parenting practices and economic stability, facilitating optimal child development. These findings underscore the potential benefits of policies that help delay the age of motherhood.

Paper No. 220  
 Title **Protective Factors for Vulnerable Children Around the World: An Introduction to IPUMS MICS**  
 Author(s) Anna Bolgrien IPUMS Global Health University of Minnesota USA  
 Elizabeth Heger Boyle University of Minnesota USA  
 Mehr Munir IPUMS Global Health University of Minnesota USA  
 Abstract Tens of millions of children have been separated from or lost one or both parents, making them vulnerable to harmful outcomes, such as dropping out of school, child labor, or inability to access health services. Nearly all research on vulnerable children compares these children to children who have not lost or been separated from a parent. While such research provides a valuable foundation for understanding inequalities, it cannot identify which children, among those who are vulnerable, are faring better or worse. To answer that question, analyses that focuses solely on vulnerable children is necessary. Using a pooled sample of vulnerable children from across MICS, our research goal is to identify protective factors. We will focus on family structure and community characteristics as potential avenues for buffering vulnerable children from harm. Our research uses IPUMS MICS, a collaboration between UNICEF and IPUMS, which simplifies analyzing the MICS data across time and space. During the presentation, we will demonstrate the value of IPUMS MICS for many types of research questions that involve pooling data and/or making comparisons across MICS samples, while focusing on the case of vulnerable children. IPUMS MICS eliminates most data management tasks when pooling MICS data across time and space, preventing inadvertent errors and allowing researchers to move quickly to their core statistical analyses. IPUMS MICS generates customized code that, when executed locally, creates tailor-made datafiles with MICS variables harmonized across time and place. IPUMS MICS' online documentation and user-friendly website provide instant data discovery (e.g., which samples include a particular module?) and immediate answers to researcher questions about the data (e.g., how did the wording of a question vary across samples?).

Paper No. 255  
 Title **Kinship structure, child gender and mother's life satisfaction in Malawi**  
 Author(s) Anna Barbeta Paris School of Economics France  
 Suanna Oh Paris School of Economics France  
 Seema Jayachandran Princeton University USA  
 Abstract Existing studies show that the impact of child gender on family outcomes varies with kinship structure. This suggests that child gender could affect women's life satisfaction and early childhood investments, shortly after the birth of the child. We examine how the gender of the firstborn child affects a young mother's life satisfaction in Malawi using the MICS 2014-2015 and 2019-2020 surveys. We find that having a daughter increases the mother's life satisfaction compared to having a son, but only among matrilineal households. We then test whether investments in children and their outcomes match the patterns in life satisfaction. Matrilineal households make more material investments for daughters than sons. While we do not detect any statistically significant differences in other investment types such as child health or parental time, we find that girls have better early child development index scores compared to boys, especially among matrilineal households. Our results suggest that kinship structure may impact early childhood outcomes via parental gender preferences.



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**S05      Nutrition I (B2)**

Paper No. 6

Title **Bayesian Spatial Modeling of Anemia among Children under 5 Years in Guinea**

Author(s)	Barry Thierno Souleymane	Pan African University Institute for Basic Sciences, Technology and	Kenya
	Oscar Ngesa	Taita Taveta University,	Kenya
	Nelson Owuor Onyango	University of Nairobi,	Kenya
	Henry Mwambi	University of KwaZulu-Natal	South Africa

Abstract Anemia is a major public health problem in Africa, affecting an increasing number of children under five years. Guinea is one of the most affected countries. In 2018, the prevalence rate in Guinea was 75% for children under five years. This study sought to identify the factors associated with anemia and to map spatial variation of anemia across the eight (8) regions in Guinea for children under five years, which can provide guidance for control programs for the reduction of the disease. Data from the Guinea Multiple Indicator Cluster Survey (MICS5) 2016 was used for this study. A total of 2609 children under five years who had full covariate information were used in the analysis. Spatial binomial logistic regression methodology was undertaken via Bayesian estimation based on Markov chain Monte Carlo (MCMC) using WinBUGS software version 1.4. The findings in this study revealed that 77% of children under five years in Guinea had anemia, and the prevalences in the regions ranged from 70.32% (Conakry) to 83.60% (NZerekore) across the country. After adjusting for non-spatial and spatial random effects in the model, older children (48–59 months) (OR: 0.47, CI [0.29 0.70]) were less likely to be anemic compared to those who are younger (0–11 months). Children whose mothers had completed secondary school or above had a 33% reduced risk of anemia (OR: 0.67, CI [0.49 0.90]), and children from household heads from the Kissi ethnic group are less likely to have anemia than their counterparts whose leaders are from Soussou (OR: 0.48, CI [0.23 0.92])

Paper No. 96  
 Title ***Growth faltering and correlates of child food poverty in Bangladesh***  
 Author(s) Mohammad Shahnewaz Morshed UNICEF Bangladesh Bangladesh  
 Deepika Sharma UNICEF Bangladesh Bangladesh  
 Mohd Aziz Khan UNICEF Bangladesh Bangladesh

Abstract Introduction: The paper identifies growth-faltering patterns in children 6-59 months and its association with Child Food Poverty (CFP)<sup>4</sup> in Bangladesh. Methods: Descriptive analysis was applied to Anthropometric and Infant and Young Child Feeding Modules (MICS 2019) to understand the growth patterns of children under 5 years. To identify the time of growth faltering regression analysis was used, followed by a Multinomial Logistic Regression for the drivers of CFP and its association with growth faltering. Results: Analysis of anthropometric data highlights that 27.6% of children are stunted (height for age), and 9.8% are wasted (low weight-for-height) (Figure 1), showing that growth faltering occurs at an early age. The Z-Scores faltered rapidly from 9 to 15 months, with a slower decline till 21 months, followed by some catch-up growth (Figure 2). The Z-scores then plateau and increase subsequently. It was alarming to note that at 6 months, half of the children suffered from severe CFP (Figure 3), indicating that they may be able to eat only one or two foods a day and sometimes nothing at all. The trend highlights that children are continuously deprived of nutritious and diversified food as they grow. Children living in poorest households suffer the most from severe food poverty, while mother's education was also found to be a driver. The age group 6-11 months is particularly vulnerable, showing a significantly higher likelihood of CFP. The model shows CFP as a key predictor of severe stunting, indicating the interconnectedness of malnutrition and CFP. Discussion: The analysis highlights the need to improve the dietary intake and timing of complementary feeding in young children during their early years. It underscores the critical role of government in ensuring that nutritious and safe foods are available, accessible, and affordable for children. The analysis helps in unpacking critical periods and factors contributing to CFP. The evidence makes a strong case for the caregivers and government to accelerate efforts to promote the timely initiation of complementary feeding and improve counseling. To mitigate the risks associated with CFP, a systems approach should be prioritized across sectoral strategies to improve complementary feeding.

Paper No. 143  
 Title ***Identifying shared determinants of the changing childhood stunting in Kenya, Tanzania, Zambia and Malawi using a machine learning***  
 Author(s) Sozo Esther Kazembe University of Portsmouth United Kingdom

Abstract Background: Childhood stunting is an important public health in sub-Saharan African region. Despite years of investments to improve child nutrition and reduce childhood stunting, the problem has remained high. Determining risk factors to inform/prevent measures is critical, especially where resources are limited. Objective: This study aims to develop a machine learning (ML) model to predict and identify important risk factors associated with childhood stunting in four Eastern African countries (Kenya, Malawi, Tanzania and Zambia). Methods: We used data from DHS and MICS, identified important features, and built models using six different machine learning methods. We assessed model performance using AUC, accuracy, sensitivity, and specificity, and applied these techniques to recent nationally-representative survey data. Results: The XGBoost model was the most accurate classifier for predicting stunting, with an AUC of 0.781, 0.794, 0.792, and 0.797 in Kenya, Malawi, Tanzania, and Zambia. The accuracy for the same country data was 71.8%, 73.0%, 78.6%, and 74.5%. In Kenya, the top predictors for stunting were the child's age, wealth index, twin status, sex of the child, and birth order. In Malawi, the most important predictors were wealth index, sex of the child, maternal education, diarrhoea, and child's age. In Tanzania, the key predictors were the child's age, size at birth, wealth index, twin status, and maternal education. In Zambia, the top predictors were the child's age, maternal education, wealth index, sex of the child, and twin status. Conclusion: Machine-learned models identify children at risk of stunting. Factors contributing to stunting occur at child, maternal, and household levels. Interventions should focus on providing essential nutrition and preventing diarrheal diseases.

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**S06 Female Genital Mutilation (O1)**

Paper No. 124  
Title ***Estimating the effect of maternal education on child health and female genital cutting using microdata from Africa***  
Author(s) Raphael E. Ayibor Kwame Nkrumah University of Science and Technology Ghana  
Stacey H. Chen University of Tokyo Japan  
Abstract This study uses DHS and MICS data to estimate the causal impact of increased education for African females on various aspects such as child health, marriage, fertility choices, health behavior, employment, and the reduction of genital cutting on daughters. In the past, economists used data from a single country. They exploited its Free Primary Education (FPE) reform to analyze the impact of maternal education across different birth cohorts using regression discontinuity methods. However, concurrent policies and preexisting trends in traditional practices may have affected the results. Therefore, this study employs data from twenty African countries implementing FPE and adopts instrumental-variable methods with a triple-difference design to isolate the impact of female school enrollment. The findings of this study have significant implications for policymakers, educators, and researchers. Exposure to FPE increases female education by one school year and has a slight positive effect on child health. It also substantially reduces daughters' genital cutting rates and changes women's attitudes toward the practice. These results suggest that increasing female education can improve child health and reduce harmful traditional practices.

Paper No. 145  
Title ***Mother agency for daughter circumcision outcomes: Cultural moderation across two multi-country MICS Studies***  
Author(s) Arianna Gonzales Washington State University USA  
Providence Maxwell Washington State University USA  
Justin Trang Washington State University USA  
Paul Strand Washington State University USA  
Abstract We explored how daughters' likelihood of experiencing female genital cutting (FGC; female circumcision) relates to the FGC attitudes of their mothers. Of interest is whether mother agency for daughter FGC outcomes—reflected in the association strength between daughter FGC outcomes and mother FGC attitudes—might differ across countries as a function of the cultural normativity of FGC practices. Data from MICS 5 and 6 were obtained on 175,180 mother-daughter dyads across 15 countries. We hypothesized that in countries in which FGC is less common, the correspondence between mother FGC attitude and daughter FGC outcome would be stronger than in countries in which FGC is more common. Moderation analyses supported this prediction across two multi-country samples (MICS 5 and MICS 6). Findings are consistent with greater agency on the part of mothers for influencing daughter FGC outcomes in countries in which the practice is less culturally normative.

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**S07 Water and Sanitation I (O2)**

Paper No. 92

Title ***Epidemiology of menstrual-related absenteeism in 44 low and middle-income countries***

Author(s)	Rebecca Harding	Walter and Eliza Hall Institute of Medical Research	Australia
	Miranda Starr	Walter and Eliza Hall Institute of Medical Research	Australia
	Ricardo Ataide	University of Melbourne	Australia
	Naomi VonDinklage	Walter and Eliza Hall Institute of Medical Research	Australia
	Sheela S Sinharoy	Emory University	USA
	Yasmin Jayasinghe	University of Melbourne	Australia
	Lucinda Manda-Taylor	Kamuzu University of Health Sciences	Malawi
	Jane Fisher	Monash University	Australia
	Sabine Braat	University of Melbourne	Australia
	Sant-Rayn Pasricha	Walter and Eliza Hall Institute of Medical Research	Australia

Abstract Background: Menstrual-related absenteeism from work, school, or social activities is an important functional indicator of poor menstrual health that disrupts women and girls' daily lives and exacerbates gender inequality. We sought to estimate the prevalence of and factors contributing to menstrual-related absenteeism. Methods: Cross-sectional data was analysed from 47 nationally representative Multiple Indicator Cluster Surveys across 44 countries. The study outcome was menstrual-related absenteeism from work, school, or social activities. Independent factors included women's age, household wealth, use of menstrual materials, availability of a private place to wash at home during menstruation, and contraceptive use. Univariable and multivariable associations between each factor and menstrual-related absenteeism were obtained using log binomial models. Prevalences and associations were pooled using a random effects meta-analysis. Findings: We included 673,380 women and girls aged 15-49 years in this analysis. The pooled global prevalence of menstrual-related absenteeism was 15.0% [95% CI: 12.7-17.3], with the highest region-pooled prevalence in South Asia and West and Central Africa. Girls aged 15-19 years had a higher prevalence of menstrual-related absenteeism compared to other age-groups. No association was observed for household wealth or use of menstrual materials. Having a private place to wash at home was associated with an increased prevalence (global adjusted Prevalence Ratio [PR] vs no place: 1.25 [1.05-1.48]). Menstrual-related absenteeism was less prevalent in those using contraception (global adjusted PR vs no contraception: 0.86 [0.82-0.90]), including those using hormonal contraception (global adjusted PR vs non-hormonal or no contraception: 0.85 [0.78-0.93]). Interpretation: Menstrual-related absenteeism is prevalent, particularly in adolescent girls. The protective effect of hormonal contraception suggests symptoms such as heavy menstrual bleeding or pain drive absenteeism. Results also suggest hygiene and sanitation facilities outside the home are suboptimal for management of menstruation. Future national surveys should include comprehensive menstrual-related modules to inform future research and global health priorities.

Paper No. 172  
Title ***Inequalities in drinking water service levels in low -and middle-income countries: insights from MICS surveys 2014-2023***  
Author(s) Robert Bain UNICEF MENARO Jordan  
Abstract Background: Safely managed drinking water (SMDW) services sets an aspirational benchmark for water services in the SDGs. A higher benchmark may inadvertently reduce attention on those furthest behind. Objectives: This study assesses levels of inequality in SMDW and its sub-components (accessible on premises, available when needed, free from contamination) by residence and wealth quintile and compares these with the MDG improved indicator. Methods and findings: Multiple Indicator Cluster Surveys which integrated water quality testing were used to calculate coverage of improved drinking water sources and SMDW for population sub-groups in >30 countries and to generate pooled estimates for low- and middle-income countries. We calculate and compare relative and absolute measures of inequalities (risk differences vs risk ratios, concentration indices) in access to drinking water services and identify household and community risk factors for lacking SMDW using modified Poisson regression. At national level, SMDW ranged from <5% to 60-70% in three countries. The magnitude of relative and absolute inequalities is strongly dependent on the level of service. Conclusion: Comparative assessment of the degree of inequalities depends on the metrics and service level used, underscoring the importance of continued monitoring of lower rungs in the Joint Monitoring Programme service ladder. Further work needed to compare inequality assessments using household and admin data and to examine inequalities within and away from home.

Paper No. 222  
Title ***Economic impact of access to improved water and sanitation on diarrhoea reduction in early childhood in Argentina***  
Author(s) Vanesa D'Elia University of CEMA Argentina  
Matilde Karczmarczyk Universidad Nacional de La Plata Argentina  
Abstract Early childhood is a crucial stage for the cognitive, emotional, and physical development of individuals. Inadequate access to water and sanitation services increases the risk of children contracting diseases, compromising their physical integrity and ability to accumulate human capital. Empirical evidence links certain diseases (particularly diarrhea) to insufficient access to improved water and sanitation. This study aims to quantify the economic benefits derived from the reduction of diarrhea among under-five children in urban areas of Argentina through investment in water and sanitation infrastructure. Deaths and morbidity attributable to diarrhea were estimated in terms of disability-adjusted life years (DALYs) based on relative risks calculated in epidemiological literature. Then, a monetary value is assigned to the avoided DALYs based on labor income. Deaths and morbidities avoided due to diarrhea-related diseases were calculated based on the population's possibility to move to more appropriate scenarios with better sanitary conditions. To do this, the population was divided into different scenarios according to the type of water and sanitation access available in their homes using data from the multiple cluster survey carried out by UNICEF in 2019-2020. From the data, it appears that, at the national level, 98.5% of the total population has access to improved water, while 73.3% has access to improved sanitation. Geographic heterogeneities are found, verifying greater inequality in access to improved sanitation among different regions than in access to water services. There are also disparities in service access based on household wealth, with a positive correlation between wealth level and access to improved water and sewage services. Results show that between 77% and 91% of deaths and morbidity due to diarrhea in the country could be avoided through infrastructure improvements in water and sanitation. The economic benefits derived from avoided deaths and morbidity cases in the total population range between USD 460.5 million and USD 390.4 million, depending on the scenario, which are below the costs of the investment required to improve water and sanitation access. Of these benefits, 32% correspond to early childhood. Improve water and sanitation coverage to avoid deaths of under-five children has associated economic benefits ranging from USD 148.9 million to USD 126.9 million.

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**S08 Climate, Conflict, Resilience (B1)**

Paper No. 97

Title ***The long-lasting effects of bombing on environmental management: Evidence from Kosovo***

Author(s) Elda Celislami University of Reading United Kingdom

Abstract This study examines the long-term impacts of NATO's 1999 bombing campaign in Kosovo on environmental management and public health. The primary focus is on whether the conflict led to the conversion of waste landfills into health hazards and its correlation with infant mortality rates. The research utilizes data from the Kosovo MICS of 2013 and 2018, which include detailed records on children's birth years, death ages, household wealth, and maternal education levels. These data are linked to information on NATO bombing incidents and the locations of waste landfills constructed post-conflict, provided by Human Rights Watch and the Kosovo Environmental Protection Agency. A key aspect of the analysis is comparing infant mortality rates in areas within a 6 km radius of waste landfills to those further away. The results indicate a significant increase in infant mortality (0.033 pp) for children living close to waste landfills in heavily bombed areas. This pattern is explored using a triple Difference-in-Difference (DD) methodology, supported by simpler DD models. The findings suggest that the creation of waste landfills post-bombing exacerbates health risks, particularly in municipalities subjected to intense bombing. The study highlights the unintended consequences of conflict on environmental health management, revealing that heavily bombed areas not only suffer immediate destruction but also face prolonged health challenges due to inadequate waste management practices. The research underscores the need for comprehensive postwar recovery strategies that address environmental hazards to prevent long-term public health crises.

Paper No. 245

Title ***Child climate risk & resilience in Africa***

Author(s) William E. Rudgard University of Oxford United Kingdom  
Hernando Grueso Hurtado University of Oxford United Kingdom  
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Seth Flaxman University of Oxford United Kingdom  
Mandy Phuti University of Cape Town South Africa  
Stephanie Kauw UNICEF WCARO Senegal  
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Lucie Cluver University of Oxford United Kingdom

Abstract Climate hazards like flooding and drought severely impact the wellbeing of children across Western and Central Africa. SDG 13 calls for building resilience and adaptive capacity to climate hazards. This article presents comparative and transnational research that offers recommendations for countries to strengthen the resilience of children and families in the face of climate change. First, we present an evidence-based theoretical framework linking major climate hazards and child poverty. This section is backed by a literature review of the state of the evidence linking climate hazards to child outcomes in Africa. Secondly, we provide empirical evidence about the relationship between multidimensional child poverty, based on constitutive rights, and climate hazards across countries in Western and Central Africa. Child-level survey data was drawn from nationally representative MICS and DHS surveys and overlaid with climate hazard data extracted from public online databases, like the Global Flood Database. We describe the geographic distribution of multidimensional child poverty, and use regression methods to evaluate whether rates of child poverty are higher in regions exposed to flooding and/or drought. We adjust for key confounders including household elevation and urban/ rural household location. Thirdly, we discuss how our findings can be used to design climate-sensitive social protection interventions. These interventions should consider climate risk insurance and prioritize high-risk groups based on equity criteria, progressively working towards universal coverage. Environmental sustainability and financial constraints in low- and middle-income countries must also be considered. The findings provide valuable insights into the intersection of climate hazards, child poverty, and social protection. Our theoretical lens, proposed methodology, and empirical analysis offers new possibilities for generating evidence to inform innovative social policy models that respond to the specific needs of children and their families in the context of climate change.

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**S09 Data Use, Evaluation, and Policy Analysis (B2)**

Paper No. 218  
Title **Uses of MICS data by the Planetary Child Health and Enterics Observatory (Plan-EO)**  
Author(s) Josh Colston University of Virginia School of Medicine USA  
Abstract Diarrheal disease is the fourth leading cause of death in children under 5 years of age globally, responsible for 440,000 such deaths annually and with sequelae extending to undernutrition, impaired cognitive development, and costs to human productivity at individual and collective scales. While enormous progress has been made this century in reducing this burden, climate change threatens to undermine these gains, with increased rainfall variation, flooding and drought projected across many tropical, sub-tropical regions of the globe. The Planetary Child Health and Enterics Observatory (Plan-EO, pronounced “plan-ei-oh”) aims to provide an evidence base for the geographical targeting of interventions such as vaccines and manure management. Applying a big data modeling approach combined with geostatistical analyses and Earth Observation (EO)-derived climate datasets, Plan-EO produces generalizable estimates of the geographical distribution of enteric infectious diseases and their associations with environmental drivers disseminated via an interactive web-based dashboard. Plan-EO is compiling georeferenced PCR diagnostic results sourced from studies in diverse LMICs together representing the broadest, most representative range of currently available climate zones and environmental contexts. Plan-EO investigators use data from MICS and other nationally representative household surveys in two ways: (1) To impute and interpolate missing values for subject- and household-level covariates in the epidemiological dataset based on survey data from the same strata in which they were collected; (2) To model spatial variation in infectious diseases risk factors and social determinants of health using Bayesian approaches (initial preprint available here). MICS is a source of critical data inputs for the Plan-EO initiative, which serves as a use case for the invaluable data products that the programme provides.

Paper No. 238  
Title **Evaluative use of MICS data in Latin America and the Caribbean to inform programmes and policies**  
Author(s) Liliana Carvajal Velez UNICEF LACRO Panama  
Alejandra Beccaria UNICEF Argentina Argentina  
Michael Craft UNICEF LACRO Panama  
Felipe Diaz UNICEF Dominican Republic Dominican Republic  
Abstract The utility of MICS data by development partners is premised on the rigor of the process and its integration into evidence-based policymaking. MICS results are multi-sectoral, nationally representative, and respond to the Sustainable Development Goals (SDGs) Agenda of ‘leaving no one behind’. Accordingly, leveraging MICS results in country-led evaluations can provide an important pathway in the public policy space for informing national programmes, plans, and strategies targeting children, adolescents, and their families. Among various use dimensions, such evaluation exercises can support governments and development partners to enhance the measurement of public policy effectiveness and the achievement of child-sensitive SDGs. This paper will perform a comparative review of the use of MICS data in country-led evaluative practices. It will draw from MICS surveys from 2015-2022 in the Latin America and Caribbean region to identify challenges and strong practices in leveraging MICS data, with an emphasis on SDG assessment. Using a common assessment framework, the paper will examine institutional and contextual dimensions – including wider stakeholder engagement, linkages to national planning, as well as the MICS analysis and reporting phases – to generate learning across sampled case studies. This analysis will map enabling factors for the evaluative utility of MICS such as data relevance, institutional capacity, and political commitment to evidence-based policymaking. The paper intends to provide actionable insights for policymakers and practitioners to enhance the ultimate use of MICS in national evaluation efforts.

Paper No. 248  
 Title **Policy lessons from MICS data on children's status in self-reported BISP families in Punjab, Pakistan**  
 Author(s) Taj Muhammad GC University Lahore Pakistan  
 Abstract This study utilizes data from the MICS to derive policy lessons regarding the status of children in self-reported cash recipient families under the Benazir Income Support Program (BISP) in Punjab, Pakistan. The analysis aims to inform policymakers about the impacts of BISP on various dimensions of children's well-being and suggestions for improvements in the MICS data collection process in self-reported indicator of BISP. Our investigation focuses on critical indicators such as, health outcomes, nutritional status and educational participation that are very important indicators in human capital formation. The findings reveal that children in BISP recipient families show significant improvements across selected domains. Policy lessons drawn from this analysis emphasize the importance of sustaining and expanding cash assistance programs like BISP. The data underscores the need for targeted interventions that address the multifaceted aspects of poverty, ensuring that financial support translates into tangible improvements in children's well-being. Additionally, the study highlights some limitations in the self-reported BISP indicator in the MICS data. BISP started in 2010 and its beneficiaries were increased from 3.10 million in 2011-12 to 5.63 million till 2017-18 but MICS Punjab portrayed the opposite trend in the beneficiaries. In MICS 2011 wave there were 3406 BISP beneficiaries, in 2014 wave, there were 2649 beneficiaries and 2017 MICS wave reported only 464 BISP beneficiaries. This downward trend in the data imposes difficulties for the researchers to do the policy analysis that put the questions on data collection process of the MICS in Punjab and unveils the serious concerns for MICS data stakeholders.

## S10 Child Functioning: Anxiety and Depression (O1)

Paper No. 83  
 Title **Effect of parenting on child mental health: Empirical evidence from Ghana**  
 Author(s) Mohammed Gbanja Abdulai University of Cape Coast Ghana  
 Samuel Sekyi Simon Diedong Dombo University of Business and Integrated Ghana  
 Naasegnibe Kuunibe Simon Diedong Dombo University of Business and Integrated Ghana  
 Abstract Purpose: Violent parental behaviour is an important factor contributing to adverse mental health outcomes in children, which could significantly hinder their development and well-being. In this study, we investigate the relationship between parental behaviour on the mental health of children in Ghana. This study aligns with goal 3 of the SDGs aimed at ensuring healthy lives and promotion of the well-being of all ages. Methods: We use a bivariate probit model to estimate the effects of parental behaviour on the likelihood of children experiencing depression and nervousness. The model accounts for the potential correlation between the two mental health outcomes, providing more efficient and accurate estimates than separate univariate probit models. Findings: The results indicate that violent parental behaviour increases the likelihood of a child being depressed or nervous. Thus, exposure to parental violence behaviour is detrimental to children's mental health. We also find that exposure to long hours of work and having functional disabilities could be detrimental to mental health of children. Implications: These findings highlight the need for interventions to reduce parental violence and those that support the mental health of children in Ghana. Addressing this issue is essential for achieving SDG target 3.5, which relates to mental health and well-being. Value/Originality: The findings contribute to the existing literature on child mental health and underscore the importance of addressing parenting behaviour in promoting child mental health and well-being.



Paper No. 178  
 Title **Anxiety and depression among children in Bangladesh: The effect of mother and child's functional difficulties**  
 Author(s) Md. Hasibul Islam Jitu University of Dhaka Bangladesh  
 Awan Afiaz University of Washington USA  
 Raaj Kishore Biswas The University of Sydney USA

Abstract Background: There has been a global rise in mental disorder among children. This study examined how depression and anxiety in children are influenced by the functional difficulties of both children and their mothers in the context of Bangladesh. Data and participants: The data was obtained from the Bangladesh MICS 2019 on 26,461 children aged 5-14 years. Methods: The regional variations in depression and anxiety among the children in Bangladesh were visualized through spatial mapping. We created a joint exposure variable based on the presence of functional difficulties in children and their mothers. We then utilized survey-design adjusted logistic regression models to assess the prevalence of depression and anxiety in children for the joint exposure variable, adjusting for relevant sociodemographic factors. We further assessed relative importance among the predictors using a classification tree. Results: The spatial mapping demonstrated high regional variation across the administrative divisions for both depression (0.9% to 33.4%) and anxiety (0.6% to 16.2%). Children with functional difficulties whose mothers also reported having functional difficulties were associated with the highest odds for both depression (AOR=10.2 [95% CI: 6.91, 14.9]) and anxiety (AOR=9.44 [6.51, 13.7]) compared to child mother pairs without any difficulties. The large AOR values indicated presence of near-separation in the data induced by the joint exposure variable for the child-mother pair's functional difficulty status and highlighted the absolute importance of this variable. Classification tree analysis confirmed that the regional variation and joint exposure variables were the most important predictors. Conclusion: Our study revealed the association between children's mental disorder and functional difficulties experienced by both children and their mothers as well as highlighted the spatial disparity across Bangladesh. These results offer insights for future targeted policy recommendations to pursue SDG 3.4 (promote mental health and well-being) for children.

Paper No. 193  
 Title **Twist and turns: Heterogeneity in socioeconomic inequality and determinants of depression and anxiety among children in SADC countries**  
 Author(s) Gowokani Chijere Chirwa University Of Malawi Malawi

Abstract Background: The importance of not leaving anyone behind is emphasized in SDG 10. Children are often overlooked in many respects as their lives depend on others. However, children constitute a significant portion of the population in most African countries, and their mental well-being is crucial for the future. Recent studies have neglected the mental health of children, particularly childhood depression. Understanding the current factors affecting children and identifying inequalities in their mental health is essential for their future. This paper focuses on Southern African Development Community (SADC) countries, where little is known about child depression despite the availability of recent data on child health. This evaluation is crucial as it aligns with the sustainable goals of SDG 3 and SDG 10. Objective: This paper analyzes trends in childhood depression and assess socioeconomic disparities in depression among children. Methods: Data from multiple rounds of the MICS were utilized. We employ concentration indices to measure socioeconomic inequalities and the probit regression model to assess the determinants. Using multiple rounds of data enables comparisons across countries and highlights progress in various regions. Results: Among the approximately 10,000 children assessed, the results reveal various factors contributing to depression across different countries. However, wealth status proved to be a crucial factor in most cases. The trends indicated significant heterogeneity across countries, with child depression rates rising in some countries and declining in others. Socioeconomic inequality in depression showed that it is concentrated among underprivileged children. Heterogeneity exists among the inequality contributors. Conclusion: The results suggest that there are "twist and turns", and that some children will be left behind as we progress towards attaining SDGs. This issue requires urgent attention, as depressed children may grow up with mental health challenges, which are detrimental to any society and economy.

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## S11 Inequality, Children in Poverty and Social Protection I (O2)

Paper No. 68

Title **Multidimensional child poverty in Argentina using MICS Data**

Author(s)	Alejandra Beccaria	UNICEF Argentina	Argentina
	Sebastian Waisgrais	UNICEF Argentina	Argentina
	Carolina Aulicino	UNICEF Argentina	Argentina
	Jorge Paz	National Scientific and Technical Research Council (CONICET) and the National University of Salta	Argentina

Abstract There is consensus on the idea that general poverty, and child poverty in particular, is a phenomenon that involves multiple dimensions beyond income poverty. The multidimensional approach to poverty is a rights-based approach that considers the rights that should be effectively exercised by children but, in practice, are not. Knowing how many children and adolescents live under multidimensional poverty, who are those children affected by it, with whom they live and what are the characteristics of their households, is a necessary starting point to understand its causes and the ways to eradicate it. This paper presents an estimate of multidimensional poverty in Argentina based on data from the MICS Survey conducted in 2019 and 2020. For this purpose, 12 dimensions are defined, 6 of which are “shared dimensions”, i.e. refer to household characteristics that affect the entire group of individuals residing in them (household crowding, connectivity, quality of construction materials, habitat, water and sanitation), and 6 are individual dimensions focused on attributes of children and adolescents (education, nutrition, health, social protection, early motherhood and internet use). The paper has two main objectives: to deepen the diagnosis of the situation of children and adolescents in Argentina and, as a differential contribution, to use a highly relevant source of information for the measurement of multidimensional child poverty, as is the MICS Survey.

Paper No. 173

Title **The impact of women's constraints on child deprivation in Lesotho**

Author(s)	Monyatsi Fako	National University of Lesotho	Lesotho
	Ratjomose P Machema	National University of Lesotho	Lesotho

Abstract Background: Child poverty is defined as all persons under 18 years living in low-income, low-consumption, or low-expenditure households. Children aged 0-15 years are among the most vulnerable and impoverished in most developing countries, showing that one in every three children in the developing world lacks access to basic sanitation, and one in every five lacks access to safe drinking water. Reports show that more than two out of every five Basotho children are multidimensionally poor. Aim: The paper aimed to investigate the impact of women's constraints on child deprivation, specifically domestic violence and limited information access using the 2018 MICS. Contribution: SDG indicator 1.2 calls for halving child poverty by 2030, reports have shown that Basotho children are deprived while Basotho women face constraints of lack information and face domestic violence. The gap to be filled by this study is how these constraints affect child-wellbeing which will help provide policy that will help attain SDG indicator 1.2. Method: MODA which recognizes a child as a unit of analysis was used to categorize children into deprived and not deprived according to the cutoffs. The paper employed an IV-Probit regression to correct for endogeneity on a sample of 5625 children and 8281 women and compared LPM and Probit results. Results: Statistics show that on average, 84% of children are deprived of three or more dimensions and 83.1% of children in rural areas are deprived of housing while only 16.9% in urban areas are deprived of the same dimension. The results of the IV-probit revealed that women domestic violence and limited information access have a significant negative impact on child deprivation. Conclusion: The conclusion is that Basotho children are deprived, and constraints faced by Basotho women contribute significantly to deprivation.

Paper No. 223

Title **Quantifying economic disparities: A comprehensive asset index analysis from Multiple Indicator Cluster Surveys in Pakistan (South Asia)**

Author(s) Tanveer Ahmed Naveed University of Gujrat Pakistan  
David Gordon University of Bristol United Kingdom

The capability approach emphasises expanding opportunities and freedoms to improve the well-being of children and their families. Income methods may overlook essential aspects of poverty, fundamental to individuals' prosperous lives. To reduce poverty, promote inclusive growth, and foster social cohesion, it is essential to tackle household-level asset disparities within South Asian countries. South Asia represents one of the fastest-growing regions and a substantial contributor to global economic growth and stability. The asset index is considered superior to expenditure and income approaches for estimating household well-being, as it represents households' long-term income and offers a more comprehensive and stable measure of a household's capacity to sustain its living standards and resilience to economic shocks. The main objective of this research study is to construct a household-based, valid, reliable asset index using MICS microdata from South Asian countries. The asset disparities are estimated by applying the Gini-coefficient and Palma Ratio. This paper has applied robust statistical techniques, including Tetrachoric Principal Component Analysis (PCA) and Exploratory Factor Analysis (EFA), to ascertain the dimensional structure of household assets, subsequently applied Classical Test Theory and Item Response Theory to confirm the reliability of the asset index. The results show significant regional asset disparities within and across the countries of South Asia. Households in urban areas have relatively higher economic capacity and resilience than rural ones. The study highlights the need for targeted policy interventions to address the economic disparities.

Paper No. 266

Title **Multidimensional child poverty in Arab States: regional trends and options for integrating disability and gender in the regional framework**

Author(s) Robert Bain UNICEF MENARO Jordan  
Lucia Ferrone Università degli Studi di Firenze Italy  
Margherita Squarcina University of Göttingen The Netherlands  
Leonardo Menchini UNICEF Jordan Jordan  
Jamil El Khoury UNICEF Lebanon Lebanon

Abstract Background: The Second Arab Multidimensional Poverty Report was a collaboration between the League of Arab States, the UN and OPHI. Building on a 2017 report, the report utilizes a regional framework for both household and child multidimensional poverty. UNICEF contributed a chapter on child poverty using Multiple Overlapping Deprivation Analysis (MODA). Objectives: We updated the regional MODA analysis to include recent surveys and low-income countries, examined inequalities between population groups and identified approaches to integrating disability and gender in the regional framework. Methods: The regional MODA framework was applied for all middle-income countries with two surveys between 2010 and 2019 (n=7). We updated the regional analysis to include low- and middle-income countries including recent surveys for Egypt (EFHS 2021), Jordan (DHS 2022), Tunisia (MICS 2023) and Yemen (MICS 2022-23) and explore ways to better reflect gender and disability in child poverty measurement. Logistic regression and marginal effects were used to examine the strength of associations with socioeconomic characteristics. Findings: Overall levels of child multidimensional poverty and its constituent dimensions have declined gradually over the last decade in most Arab States with data. However, trends do not reflect the multiple recent crises in the region. Poverty headcounts remain high with over a quarter of children living in poverty and substantial inequalities by wealth and residence. Children with disabilities are more likely to be multidimensionally poor. Conclusion: Addressing multidimensional poverty in the Arab States requires a renewed focus on equity and on making essential infrastructure, services and income generation opportunities available to all. We propose options for strengthening the disability and gender focus of future Arab Multidimensional reports.

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## S12      **Geographic and Spatial Analysis II (B1)**

Paper No. 9

Title ***Enhancing MICS surveys with satellite images and ethnographic evidence: A case study for Vietnam***

Author(s) Rolando Gonzales Martinez                      University of Groningen                      The Netherlands  
Hinke Haisma                      University of Groningen                      The Netherlands

Abstract Leave no one behind is a fundamental principle within the framework of the United Nations' SDGs. The combination of satellite imagery and ethnographic evidence with MICS offers a promising approach to identifying vulnerable population groups that may otherwise be overlooked during the developmental trajectory towards the SDGs. In this project, supported by the Marie Skłodowska-Curie Actions of the European Horizon, a methodology based on Bayesian inference and artificial intelligence (machine learning, deep learning, and Large Language Models, LLMs) is proposed to combine survey information with the information of satellite images and ethnographic evidence obtained from the perceptions of women and children living in developing countries. Survey data and satellite images of luminosity, natural disasters, and agriculture were used in spatial machine-learning (ML) and deep learning (DL) with the aim of identifying the characteristics that are relevant to anticipate health problems and malnourishment in children. Ethnographic evidence was analyzed with LLMs and was combined in a Bayesian framework with the ML/DL evidence to identify environmental, household, and child-level characteristics of specific population groups that could be left behind by development programs. Results for Peru and Vietnam indicate that leveraging artificial intelligence alongside ethnographic insights can be an aid to augment survey data, facilitating the targeted identification of vulnerable children and women at heightened risk of being excluded from the development process towards the achievement of the SDGs.

Paper No. 47

Title ***Spatial Heterogeneity and Determinants of Diarrhoea among Under-Five in Pakistan***

Author(s) Ömer Ünsal                      Istanbul University                      Türkiye  
Munazza Fatima                      The Islamia University of Bahawalpur                      Pakistan

Abstract Background: Diarrhoea is the second leading cause of death in children under five globally, with approximately 1.7 billion cases and 525,000 deaths annually. Around 90% of these cases occur in South Asia and sub-Saharan Africa. In Pakistan, an estimated 53,000 children under five die each year due to diarrhoeal diseases. This study aims to spotlight geographical differences in the determinants of under-five diarrhoea cases across districts in Pakistan using a cross-sectional approach. Data & Methods: A wide spectrum of district-level data from different sources (MICS, Census 2017 report and WordClim) and 38 different datasets (including demography and education, water and sanitation, hygiene and nutrition, maternal characteristics, housing and poverty, bioclimate and health) were used to investigate the spatial determinants of under-five diarrhoea cases using Generalized Linear Regression (GLR), Multiscale Geographically Weighted Regression (MGWR) and Similarity Geographically Weighted Regression (SGWR) and bivariate mapping methods. Results: The MGWR model with 10 independent variables outperforms the GLR model ( $R^2=0.72$ ) with an adjusted  $R^2$  of 0.86. In addition, the MGWR method produced a higher  $R^2$  value than the SGWR method (0.84). The local accuracy of the MGWR model increases from southwest to northeast. According to MGWR findings, a significant positive correlation was observed in the northeastern region of Pakistan between under-five diarrhoea cases and factors such as rural population and breastfeeding. Conversely, a significant negative correlation was found in the southwestern region, particularly regarding open stool. Additionally, there was a significant negative correlation between salt iodization and cases in the northeastern part of Pakistan. Conclusions: The study illustrates the complex nature of diarrhoea, influenced by various factors including nutrition, environment, socioeconomics, and demographics. Geographic differences were significant, with factors such as altitude, temperature, fever, ARI, and sanitation practices playing key roles. This highlights the necessity for targeted public health interventions like vaccination campaigns, improved sanitation, and access to clean water, especially in rural and high-risk areas. Future research should focus on longitudinal studies and advanced spatial modeling to inform evidence-based policies aimed at reducing childhood diarrhoea burden in Pakistan.

Paper No. 136  
 Title **Using machine learning to understand the effectiveness of cash transfers in conflict settings**  
 Author(s) Hernando Grueso Hurtado University of Oxford United Kingdom  
 Oliver Fiala Save the Children UK United Kingdom  
 Julius Baruwa University of Cape Town South Africa  
 William E. Rudgard University of Oxford United Kingdom  
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 Lucie Cluver University of Oxford United Kingdom

Abstract Armed conflict in Sub-Saharan Africa severely impacts the wellbeing of vulnerable children and hinders economic development. This study investigates the impact of cash transfers in mitigating the negative effects of conflict on children's education. By combining cross-sectional household survey data with geo-coded conflict records from Nigeria, we use causal forests as a machine learning approach to assess the effectiveness of cash transfers in alleviating the negative effects of violence on educational attendance and learning outcomes. Our findings reveal a significant mitigating effect. Specifically, children living within a 5km radius of a recent violent attack are 21% less likely to attend school compared to those in safer areas. However, recipients of cash transfers in these conflict zones are 28% more likely to attend school compared to non-recipients. We applied a similar approach to study the effectiveness of cash transfers on learning outcomes such as reading comprehension. These results highlight the effectiveness of cash transfers as a strategic social protection measure to bolster resilience among vulnerable children in conflict zones. This research also provides new evidence of cash transfers as effective mechanisms towards the achievement of the Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) by demonstrating how cash transfers can enhance educational attendance in conflict-affected areas, and SDG 10 (Reduced Inequalities) by illustrating the role of cash transfers in reducing disparities in access to education.

Paper No. 198  
 Title **From provincial to national: unlock the value of MICS in Pakistan: A meta-analysis of MICS 2014-2022**  
 Author(s) Achraf Mrabet UNICEF Pakistan Pakistan  
 Manar E. Abdel-Rahman Qatar University Qatar  
 Faateh ud Din Ahmad UNICEF Pakistan Pakistan

Abstract Background: Despite the implementation of MICS surveys on a regular basis across all provinces in Pakistan, the MICS data remains underutilized. The potential of provincial MICS surveys to address data gaps in the child indicators received little attention. Even less evident is the availability of national estimates for the 44 SDG child-related indicators generated through the MICS data. Objective: The aim of this study is to generate pooled estimates for selected SDG child indicators related to nutrition, health, and protection using the provincial MICS data. Methods: SDG indicators will be calculated for each survey along with their 95% confidence interval. A meta-analysis will be performed using random effects restricted maximum likelihood method to account for potential heterogeneity among surveys. The Freeman–Tukey double arcsine transformation will be applied to stabilize the variances of the proportions. Forest plots will be generated to visualize the individual and pooled proportions. Heterogeneity will be assessed using the  $I^2$  statistic and the Q-test. Funnel plots and Egger's test will be used to assess the presence of publication bias. Subgroup and sensitivity analyses will be conducted. Confidence intervals overlap, and meta-regression will be used to compare the pooled proportion and national estimates derived from national surveys in Pakistan. Conclusion: The findings of this study will highlight the potential of the use of provincial MICS surveys to bridge the gap in child-related indicators and generate national estimates. This will enhance the utility of child health and well-being at the national level and contribute to reporting progress of SDG indicators. Furthermore, this will enhance the use of data by the government, enabling more informed policy decisions and targeted interventions.

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**S13 Child Labour I (O1)**

Paper No. 7  
Title ***Compulsory Schooling and Child Labor: The Role of Structural Factors***  
Author(s) M. Utku Özmen World Bank Türkiye  
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Abstract Compulsory schooling policy helps keeping children in formal education longer and potentially away from work. The effectiveness of such policies is especially crucial for low- and middle-income countries (LIMCs) where the prevalence of child labor is very high, reaching more than 50% in some countries. The recent theoretical contributions hint at the potential role of structural factors as mediating factors for compulsory schooling and child labor interplay. However, the empirical literature linking compulsory schooling and child labor does not offer a clear-cut answer in less developed countries, and there is a lack of causal investigations at the cross-country level. Our study aims to fill the gap in the literature by providing a causal investigation at the cross-country level and incorporating the role of structural factors, by using micro level Multi Indicator Cluster Surveys (MICS) data, with surveys covering the 2000-2019 period and 14 LIMCs. The results first point to a significant policy effect: the higher years of compulsory schooling reduces the probability of 11-17-year-old children working by 7-to-13%, on average. Second, among the structural factors considered, this policy effect is weaker, for instance, if the old dependency ratio increases, the level of income inequality is higher, the size of the informal sector is larger, or the share of services in employment is more elevated. Meanwhile, the policy effect is stronger, for instance, if the share of government education spending in GDP is higher; when the status and participation of the women in decision making in the household or the macro-level improves; in more dynamic economies with higher investment, merchandise trade and exports as a percentage of GDP; in countries with higher human capital quality; and with greater political stability. The results suggest that the success of compulsory schooling policy in reducing child labor depends on structural factors.

Paper No. 153  
Title ***Child work in developing countries: Revisiting the differences and similarities between income-generating and care and domestic work***  
Author(s) Elena Camilletti UNU-MERIT and Maastricht University The Netherlands  
Franziska Gassman UNU-MERIT and Maastricht University The Netherlands  
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Bruno Martorano UNU-MERIT and Maastricht University The Netherlands  
Abstract Child work is still widely prevalent in many countries: it includes both income-generating activities and unpaid care and domestic activities. Existing literature either aggregates these two forms of work or focuses exclusively on income-generating work. In this paper, we explore the differences and similarities in the prevalence and determinants of paid and unpaid child work using data from nationally representative household surveys from the Multiple Cluster Indicator Surveys (MICS) for 34 developing countries, representing over 900 million people. Contrary to previous studies, we explicitly include both types of child work. We find that across countries, care and domestic work is more prevalent but less intensive than income-generating work. The age and sex of the child matters. Gender is diametrically associated to the two forms of work, while the likelihood of both increases with age. We observe variation in the sign and magnitude of caregiver and household-level coefficients between countries, however in most countries household composition factors proxying care supply have opposite effects on the two forms of child work, while household infrastructure affects both forms of work in the same direction. There is a need for normative frameworks, evidence and policies that account for differences in these two forms of child work.

Paper No. 244

Title ***Children as caregivers in low- & middle-income countries***

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	Samaneh Mansouri	Université Laval	Canada
	Ruo Ying Feng	University of Ottawa	Canada
	Negin Zamani	Toronto Metropolitan University	Canada
	René Iwo	University of North Carolina at Chapel Hill	USA
	Magdalena Janus	McMaster University	Canada
	Afua Twum-Danso Imoh	University of Bristol	United Kingdom
	José Ignacio Nazif-Muñoz	Université de Sherbrooke	Canada

Abstract Introduction: Effective child supervision is essential for fostering physical and emotional development and preventing unintentional childhood injuries. Formal education enhances mothers' ability to support children's well-being. While sibling caretaking, a common practice worldwide, can strengthen child development and sibling bonds, it can also result in negative outcomes for children and families. However, population-based estimates on this care arrangement and information on mothers' traits that can improve child supervision in contexts with scarce childcare facilities are lacking in low- and middle-income countries (LMIC). Objective: To estimate the prevalence of children under five years old being supervised by another child younger than 10 years of age and how maternal education influences this type of childcare arrangement. Methods: Using the most recent wave of 67 Multiple Indicator Cluster Surveys (MICS) that included the outcome of interest, we built weighted Poisson regression models with robust variance to estimate the prevalence of child-to-child supervision and to examine the role of maternal education in this care arrangement. Results: Worldwide, the prevalence of children supervising another young child ranged between 0% and 56%, with West and Central Africa showing the highest rates. In all regions, it was observed that as the level of a mother's education increased, the rate of child-to-child supervision consistently decreased. Yet, in eight countries where the trend was reversed, no distinct pattern could be identified. Conclusion and Future Directions: The significant disparity in children supervising other children underscores the importance of investigating political, socio-economic, cultural, and environmental factors that may either promote or hinder appropriate supervision of children. Such context-specific research is needed to inform targeted interventions to support maternal education and child supervision in diverse socio-cultural contexts. It can also provide valuable evidence on what is considered 'adequate' supervision across different cultures, and how to accurately assess it.

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**S14 Nutrition II (O2)**

Paper No. 23

Title ***Food Insecurity and Early Childhood Development among Children 24-59 months in Nigeria: A Multilevel Mixed Effects Modelling of the Social Determinants of Health Inequities***

Author(s)	Otobo I. Ujah	Federal University of Health Sciences, Otukpo	Nigeria
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	Russell S. Kirby	University of South Florida	USA

Abstract Prior studies have demonstrated the consequent impact of household food insecurity (HFI) for child development. Yet, there is a paucity of evidence quantifying this association based on the recently designed Early Development Index 2030 (ECDI2030). Herein, we provide national estimates of early childhood development (ECD) risks using the ECDI2030 and examined to what extent HFI was associated with ECD among children aged 24-59 months in Nigeria. This population based cross-sectional analyses used data from the UNICEF-supported 2021 MICS in Nigeria. The analytical sample comprised children aged 24-59 months (Unweighted N = 11494). We measured early childhood development for each child using the ECDI2030, measured across three domains: learning, psychosocial well-being and health. HFI was assessed using the Food Insecurity Experience Scale (FIES), categorized as none/mild, moderate and severe HFI. To investigate the relationship between HFI status and ECD, we used mixed-effects multilevel logistic regression models, with random intercepts. A total of 11494 (weighted N = 12112) children aged 24-59 months (mean [SE] age, 43.1 [0.1] months), including 5797 boys (50.2%) and 5697 girls (49.9%), were included in the study. Approximately 46.4% of children were developmentally off track and about 76% of children lived in food-insecure households. The intercept-only model demonstrated statistically significant variation in the prevalence of ECD ( $\tau_{00} = 0.94$ , intraclass correlation = 0.21,  $p < 0.0001$ ), suggesting nonignorable variability in ECD across communities. Adjusting for confounders, we observed no significant association between HFI and ECD. However, increasing child's age and disability status appeared as significant risk factors for higher odds of children being developmentally off track. While the findings from this study suggest that the association between HFI and ECD in children aged 24-59 months in Nigeria remains inconclusive, they indicate that ECD in Nigeria is influenced by a combination of individual, compositional, and contextual factors.

Paper No. 81

Title ***Levels, Severity and Determinants of Stunting in Children (0-59 months) in Afghanistan: Secondary Analysis of Multiple Indicator Cluster Survey (MICS), 2022-23***

Author(s)	Atma Prakash	Institute of Economic Growth	India
	Vani Sethi	UNICEF ROSA	Nepal
	Said M Yaqoob Azimi	UNICEF Afghanistan	Afghanistan
	Melanie Galvin	UNICEF Afghanistan	Afghanistan
	Zivai Murira	UNICEF ROSA	Nepal
	Gustavo Nicolas Paez Salamanca	UNICEF ROSA	Nepal
	William Joe	Institute of Economic Growth	India



**Abstract** Background: Childhood stunting is a critical nutritional concern for Afghanistan. Prioritizing development assistance toward child nutrition requires recent estimates on child stunting and timely insights on determinants at national and sub-national levels. This study addresses this gap by estimating the prevalence and determinants of stunting and severe stunting in children under-five using the latest publicly available data. Methods: The recent wave of Afghanistan Multiple Indicator Cluster Survey (MICS 2022-23) was analyzed to estimate the prevalence of stunting (height-for-age Z-score <-2SD) and severe stunting (<-3SD) by demographic and socioeconomic characteristics. The predictors of stunting and severe stunting outcomes were examined using multivariate logistic regression analyses with four domains of independent variables - child, maternal, and household characteristics and complementary feeding practices. Findings: In Afghanistan, 44.5% of children were stunted and 21.6% were severely stunted. The southern region has the highest burden of stunting (55%). Under-five girls were less likely to be stunted than boys [OR 0.89, 95% CI (0.84, 0.95)]. The likelihood of stunting increased with age of the child and birth order. Maternal education, household wealth quintile, exposure to mass media [OR 0.86, 95% CI (0.79; 0.94)], and dietary diversity [OR 0.66, 95% CI (0.51; 0.86)] were the key predictors of stunting. Determinants of severe stunting mirrored those of stunting, with the additional risk for 24-59 months age group and higher birth order. Interpretation: Socioeconomic status, maternal education, child age, birth order, dietary practices, and geographical location were key determinants of stunting. Targeted interventions addressing poverty, education for women, family planning, and improved nutrition are crucial to reducing childhood stunting in Afghanistan.

Paper No. 196

Title ***Prevalence and socio-demographic determinants in early initiation of breastfeeding in Eastern Europe and Central Asia countries: A multi-country analysis of Multiple Indicator Cluster Surveys***

Author(s) Mohammad Nahid Mia UNICEF South Sudan South Sudan  
Deepak Kumar Dey UNICEF ECARO Türkiye

**Abstract** Background: Early initiation of breastfeeding (EIBF) is a ray of hope in a world that aspires to a better start for infants. This study examines the prevalence and socio-demographic factors of EIBF in nine European and Central Asian countries. Design: This analysis used secondary analysis from nine nationally representative cross-sectional surveys. EIBF prevalence was estimated, and logistic regression was used to explore associations between EIBF and predictors. The STATA 'SVY' command was controlled for survey design. Setting and subjects: The study utilizes the most recent MICS data from six Eastern European countries namely, Belarus, Georgia, Kosovo (UNSCR 1244), Macedonia, Montenegro, and Serbia whereas three Central Asian countries, namely, Kyrgyzstan, Turkmenistan, and Uzbekistan. The subjects were women aged 15-49 who had given birth in the last two years preceding the survey (n=6,603). Results: EIBF prevalence was 47.4 per cent overall, with statistically significant country differences: 24.9% in Eastern Europe and 65.5% in Central Asia were breastfed within the first hour after birth. EIBF prevalence varied widely, ranging from 7.8% in Serbia and 9.5% in Macedonia to 81.0% in Kyrgyzstan and 68.4% in Turkmenistan. Central Asian neonates were 6.3 times more likely to experience EIBF compared to European. Key factors associated with higher EIBF rates included higher education (AOR=1.9), younger age (AOR=1.5), and richest (AOR=1.4). Additionally, women who delivered at health facilities (AOR=1.7), wanted their last child (AOR=1.8), and had a normal delivery (AOR=8.4) also had higher odds of initiate breastfeeding early. Conclusions: The study reveals significant differences in the prevalence of EIBF in the studied countries. Increased EIBF rates are positively associated with key variables such as higher education, younger mother age, greater wealth, planned pregnancies, and normal deliveries. Based on the results, it is important to rollout targeted programmes to boost early breastfeeding practices to improve newborn health outcomes.

Paper No. 254

Title ***Estimating the rates and predictors of exclusive breastfeeding among infants 0 to 5 months across the 261 districts in Ghana: the small area estimation approach***

Author(s)	Gloria Adobea Odei Obeng-Amoako	University of Ghana	Ghana
	Justina Serwaah Owusu	University of Ghana	Ghana
	Simon Onilimor	Ghana Statistical Service	Ghana

Abstract Breastmilk is an important source of nourishment for young children especially when breastmilk is exclusively fed to children less than 6 months. The World Health Organization (WHO) recommends exclusive breastfeeding (EBF) for the first 6 months of life given its effect on childhood morbidity and mortality risk reduction. However, few children benefit from the natural yet nutrient dense and appropriate food for the right start of life. The latest MICS 2017/18 indicates that only 42.9% Ghanaian children less than 6 months were fed exclusively on breastmilk the day preceding the survey. The report also show that EBF rates vary across regions; the Western Region had the lowest rate of 22.2% while the Upper West had the highest rate of 77.6%. Children residing in rural areas (45.8%) were more exclusively breastfed than those in the urban areas (38.7%). Currently, data on EBF are aggregate-national and regional level. Evidence gap exist on disaggregated EBF data in smaller geographical areas where the needs for context-specific interventions and resources allocation are greatest. To address this gap, this paper will report on the rates and predictors of exclusive breastfeeding among infants 0 to 5 months across the 261 districts in Ghana using the small area estimation approach. We will combine nationally representative datasets; the MICS 2017/18, the Population and Housing Census 2010 and 2020 to estimate prevalence of EBF in districts. Common variables associated with EBF in the datasets will be identified and harmonized. In a multivariate analysis, prevalence and predictors of EBF will be determined. We will examined the accuracy of regression models in predicting EBF with the area under curve (AUC) of the Receiver Operator Characteristic (ROC). The study findings will provide local-level evidence useful for targeting EBF interventions and decision-making for child survival in Ghana.

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**S15      Inequality, Children in Poverty and Social Protection II (B1)**

Paper No.	86		
Title	<b><i>Social protection, child poverty and resilience</i></b>		
Author(s)	Oliver Fiala	Save the Children UK	United Kingdom
Abstract	<p>Social protection is a universal right and a powerful tool in reducing poverty. It is also a crucial foundation to help children to fulfil their potential, especially for children living in communities struggling with simultaneous vulnerabilities. The social protection module in rounds 6 and 7 of the Multi-Indicator Cluster Surveys (MICS) allows more granular population-level analyses of the link between social protection, child outcomes, and its ability to build resilience against climate change and other shocks. We bring together microdata representing almost 1 million children across 35 MICS surveys (6 low-income, 14 lower-middle-income and 15 upper-middle-income countries), allowing for trans-national comparisons of social assistance systems and its impact on children. Across our sample, 40% of children live in households receiving any social assistance in the last three months, with coverage varying between 32% in low-income countries to 56% in upper-middle-income countries. A distributive analysis shows that social protection is overall somewhat progressive, i.e. poorer households (as measured by the asset-based wealth index) are more likely to receive social assistance (however, the largest coverage is found in the second quintile, not among the poorest families). We further compare social protection coverage with multidimensional child poverty for a subsample of 16 countries. Overall, we find a slight positive correlation between poverty and receipt of social assistance. However, this correlation is stronger in higher-income countries compared to low-income countries. In fact, in low-income countries, we find that social protection coverage is higher among non-poor children (77%) than children severely deprived (65%). Finally, adaptive social protection systems can play an essential role in building resilience and minimising the negative impacts shocks. However, when combining our sample with geospatial information on climate risks, we find that families living in high-risk communities are not more likely to receive social assistance than those living in lower-risk communities.</p>		
Paper No.	95		
Title	<b><i>Cluster analyses of multidimensional poverty in Africa</i></b>		
Author(s)	Mary Zhang	Birmingham University	United Kingdom
	Hans Ekbrand	University of Gothenburg	Sweden
	Björn Halleröd	University of Gothenburg	Sweden
	David Gordon	University of Bristol	United Kingdom
Abstract	<p>Poverty is a multidimensional phenomenon reflected by inadequate living conditions, such as overcrowding and deprivation of food, shelter, drinking water, sanitation facilities, etc. To eradicate poverty in all forms and all places by 2030 is the first Sustainable Development Goal agreed upon by all governments worldwide. Nevertheless, given the vast diversities of developing countries and their relatively restricted financial and other resources, implementing poverty eradication policies and practices, assuming “one works for all”, is impractical. Instead, a more pragmatic approach is to understand the similarities and differences of the local contexts and, therefore, to perform interventions and policies more effectively in places where assistance is most needed. Our work proposes a set of cluster analyses to compare the commonalities and divergences in multidimensional poverty across 47 African countries (covering 303,081 households), combining each country’s most recent MICS and DHS data wherever the data is available. Ward’s method, with a squared Euclidean distance, suggests four distinctive country profiles, predominantly driven by their geographic location, economic development and quality of governance. We discuss the theoretical and practical implications of this work.</p>		

Paper No. 115  
 Title ***Estimating monetary poverty among the Roma community in Serbia: Relating the Household Budget Survey and MICS***  
 Author(s) Alexander Hunns UNU-MERIT, United Nations University The Netherlands  
 Franziska Gassmann UNU-MERIT, United Nations University The Netherlands  
 Francesco Iacoella UNICEF Office of Evaluation USA  
 Julieta Morais UNU-MERIT, United Nations University The Netherlands

Abstract Sustained economic growth, and a pre-2022 period of relative regional stability provided Serbia an opportunity to make strides in reducing poverty, and particularly child poverty. However, multiple sequential shocks including COVID-19, the destabilisation caused by war in Ukraine, and a cost-of-living crisis present a challenge to the sustained improvement in household living standards. There are concerns among national and international policymakers about whether the burden of these crises is borne more heavily by commonly marginalised groups, such as the large Roma population in Serbia, and whether this burden is visible in data available to policymakers. The data landscape in Serbia is marked by national household surveys fielded by the national statistical office – used for estimating poverty rates - and the Multiple Indicator Cluster Survey (MICS) fielded by UNICEF, the values in which do not enable the estimation of income-based poverty, but do provide robust and extensive information on the lives and livelihoods of the Roma community. In order to understand the extent to which contemporaneous crises affected poverty and well-being among the Roma community, we developed and tested a methodology to transpose results between the surveys using a matching method based on assets index scores calculated in the two databases. This paper presents a summary of the method proposed and applies it to the Serbian Household Budget Survey (HBS) and MICS surveys, enabling an estimation of the poverty rate among the Roma population, along with commentary on the robustness of the results. This method could be used to expand the utility of MICS surveys which collect robust information on marginalised or minority groups but do not enable poverty estimates, providing essential insights for policymakers.

Paper No. 121  
 Title ***Improving the measurement in the MICS of social & material deprivation for children and their families***  
 Author(s) David Gordon University of Bristol United Kingdom

Abstract In 2015, the governments of all UN Member States agreed to attempt to eradicate child and adult poverty during the 21st Century. If they are successful, this will represent one of humanity's greatest achievements – arguably its greatest achievement. In order to eradicate poverty, policy makers will need both political will and adequate resources but they will also need high quality information about the extent and nature of poverty in order to develop effective and efficiently anti-poverty policies. Good anti-poverty policy requires good measurement to help target resources where they are most needed and to monitor progress. It is unlikely that poverty will be eradicated if it cannot be measured. Unfortunately, there are currently no poverty measures which can be used in all countries. There are international poverty measures used in Low Income countries (e.g., World Bank's 'dollar a day' and 'basic needs') and different measures used in High Income countries (e.g., OECD's relative low income). However, there are no real comparable measures for Middle Income countries (where most of the world's poor people live). In addition, most countries have no adequate child poverty measures. This talk will discuss the development of a consensual deprivation question module for use in the MICS (and similar surveys) to supplement and complement existing child and family poverty indicators and the prospects of producing valid, reliable and truly comparable global poverty measurements in all countries – i.e., all High, Middle and Low income countries. The talk will draw upon recommendation 28 of the UN Economic Commission for Europe (UNECE) report on Poverty Measurement: Guide to Data Disaggregation[1], which has been endorsed by the Conference of European Statisticians and included an important recommendation about deprivation indicator development.

Paper No. 215

Title ***Health insurance among children with disabilities: Evidence from 34 Multiple Indicator Cluster Surveys***

Author(s) Sara Rotenberg London School of Hygiene and Tropical Medicine United Kingdom

Lena Morgon Banks London School of Hygiene and Tropical Medicine United Kingdom

Shanquan Chen London School of Hygiene and Tropical Medicine United Kingdom

Hannah Kuper London School of Hygiene and Tropical Medicine United Kingdom

Abstract Background: Children with disabilities have general health needs, and often additional health needs related to their impairment, such as specialist care or assistive technology. However, financial protection and lack of health insurance are notable barriers to accessing health care for this population. Methods: We examined data from 38 UNICEF-supported Multiple Indicator Cluster Surveys conducted between 2017-2021. Children with disabilities were identified using the Child Functioning Module (CFM) and household disability status was determined by presence of a family member who had functional difficulties in the CFM or adult functioning module. We used modified-Poisson models to examine the relationship between individual and household disability status and health insurance. All analysis were adjusted for age and gender, and pooled analyses were adjusted for country. Results: 347,255 children aged 2-17 were eligible for inclusion, including 73,784 children with disabilities (21%). Health insurance coverage varied by country—from 96% in Georgia to 0.49% in Sao Tome et Principe. There was evidence children with disabilities had less access to health insurance than children without disabilities, particularly in lower-middle income countries (adjusted Risk Ratio (aRR): 0.95 [0.91, 0.99]). Children with disabilities from the poorest 40% of households (aRR: 0.89 [0.86, 0.93]) were significantly less likely to have health insurance compared to children with disabilities from wealthier households. Conclusion: Our study suggests children with disabilities are less likely to be covered by health insurance across 38 low- and middle-income countries, despite greater need for health services. Health insurance reforms must focus on improving access to health insurance for this population.

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**S16 Water and Sanitation II (B2)**

Paper No. 100

Title ***The role of environmental hygiene in understanding drinking water quality: sampling practices for MICS water quality surveys***

Author(s)	Katrina J Charles	University of Oxford	United Kingdom
	Saskia Nowicki	University of Oxford	United Kingdom
	Li Ann Ong	University of Oxford	United Kingdom
	Dara Johnston	UNICEF South Sudan	South Sudan
	Zahid Hayat Mahmud	Laboratory of Environmental Health	Bangladesh

Abstract Two billion people lack access to safely managed drinking water, with microbial water quality the major barrier to achievement of SDG target 6.1. Microbiological contamination of drinking water in improved drinking water systems originates from poor environmental hygiene – ranging from catchment protection to household hygiene. Understanding environmental hygiene and the pathways it impacts on drinking water quality is key to informing appropriate methodologies for water quality sample collection. We analyse secondary databases from MICS household surveys and multiple studies in Bangladesh, focusing on contamination at two points in the water supply: the point of collection and point of use. At the point of use, MICS data from 17 countries demonstrates contamination associated with household hygiene causing poor water quality in 9% to 70% of samples nationally, indicating the significant role of household hygiene separately from other forms of water safety management. At the point of collection, data from eight studies in Bangladesh (n=5,092) demonstrates that cleaning of taps and handpump spouts reduces the number of water points with faecal contamination by half. We estimate an additional 35 million people in Bangladesh alone would have access to safe drinking water if water outlet cleaning were implemented. Sampling methods need to ensure cleaning of taps before sampling to ensure results can differentiate between failing infrastructure and poor hygiene.

Paper No. 253

Title ***MICS water quality module: Current work and future perspectives***

Author(s)	Caetano Dorea	University of Victoria	Canada
	Robert Bain	UNICEF MENARO	Jordan
	Rick Johnston	WHO	Switzerland
	Tom Slaymaker	UNICEF HQ	UK

Abstract The integration of water quality testing in household surveys such as MICS was first piloted in 2012. Since then it has been included in the fifth global round of surveys (2013-2017) onwards and scaled to over 40 countries with nationally-representative data on safely managed drinking water services (i.e. accessible on premises, available when needed and free from faecal and priority chemical contamination). International water quality trainers work in tandem with national experts to train field times via hands-on training prior to the fieldwork. Alongside data from administrative sources, these surveys play a critical role in the monitoring of SDG progress. Here, we highlight how the training module has evolved, summarise efforts towards contextually-appropriate microbial water quality testing, and present an overview of some of the different survey format results. The standard module (~5 days of practical training) has had to adapt to a variety of factors such as: different water quality equipment (DPRK 2017), decentralised training due to geographical dispersion (Pacific Islands 2019), pandemic travel restrictions (Mozambique 2021), format/duration (Ecuador 2022), etc. This has also led to the adaptation of the module for a WASH in Schools survey planned for Panama (2024). Furthermore, discussions are underway on how to adapt the technical support model used for water quality module training to other MICS modules. Water quality testing equipment can be a costly part of the module with some parts such as the membrane filtration manifold costing up to \$1500. Work is underway to validate a lower cost version of approximately \$2.00. Additionally, alternatives to single use items (e.g. sterilised funnels) are being validated to further reduce costs and waste generation. A review of data quality and identification of potential refinements to the module will also be discussed.

Paper No. 264  
 Title **Who hauls the water? An analysis of water carriage from MICS datasets**  
 Author(s) Rick Johnston WHO Switzerland  
 Tom Slaymaker UNICEF HQ UK  
 Abstract In 2022, 1.8 billion people lived in households where people must collect drinking water from water supplies located off premises. The SDG framework recognizes the burden of water carriage: for water to be considered as 'safely managed' (SDG 6.1) the supply must be located on premises, and to count as a 'basic service' (SDG 1.4) it should not take more than 30 minutes to collect drinking water. Often women and girls bear the primary responsibility for water carriage, putting them at risk of injury or violence. However, the magnitude of this burden has not been systematically quantified, in part because of insufficient information about the amount of time spent in water collection. Many household surveys collect information on responsibility for water carriage, and some collect information on the amount of time per trip required. MICS has collected these two variables since round 3. In round 6, a third variable was added: the number of trips per week. With these three variables, it is possible to calculate the amount of time spent collecting water. This paper analyzes data from over 50 MICS datasets, and explores inequalities in water carriage by sex, age, socioeconomic status, and geographic location (urban, rural, and subnational areas). Aggregates are produced for regions with sufficient data coverage, including sub-Saharan Africa.

Paper No. 268  
 Title **What do we know about menstrual health in LMICS?: Analysis of data from MICS6 and lessons for MICS7**  
 Author(s) Tom Slaymaker UNICEF HQ United Kingdom  
 Rick Johnston WHO Switzerland  
 Christie Chatterley WHO/UNICEF JMP & Fort Lewis College USA  
 Ayca Donmez UNICEF HQ USA  
 Abstract A large proportion of the global population experience menstruation and, since the start of the SDG period, there has been a concerted effort to develop definitions and indicators for monitoring menstrual health (MH). Questions on access to materials and facilities for MH and participation in school, work and social activities during menstruation were included for the first time in the unmet needs section of MICS6 household survey questionnaire for adolescent girls and women age 15-49. The WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation and Hygiene (WASH) has incorporated the resulting data into its global databases and included analysis of menstrual health in its progress updates on WASH in households. A new global definition of menstrual health was agreed in 2021 and the JMP subsequently convened global experts to develop an updated module on menstrual health and hygiene for inclusion in MICS7. This paper analyzes data from over 50 MICS6 datasets and explores subnational inequalities by age, wealth, residence and disability. It discusses the lessons learned from MICS6 and how these have been addressed in the new complementary module for MICS7.

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## S17 Early Childhood Development (O1)

- Paper No. 105  
Title **Examining the dimensionality of ECDI2030 across countries: Findings from Multiple Indicator Cluster Surveys round 6**  
Author(s) Zeyi Li The University of Hong Kong China  
Nirmala Rao The University of Hong Kong China  
Dana Charles McCoy Harvard University USA
- Abstract SDG Target 4.2 aims to ensure that all girls and boys have access to quality early childhood development, care and pre-primary education by 2030. Target Indicators 4.2.1 and 4.2.2 track progress towards this goal. This study focuses on Target Indicator 4.2.1, which measures the proportions of children who are “developmentally on track” between 24 and 59 months, using the ECDI2030. The ECDI2030 is a caregiver survey integrated into the MICS questionnaire from Round 6, and was designed to cover the three domains referenced in Target Indicator 4.2.1: Health, Learning, and Psychosocial Well-being. Nevertheless, its dimensionality remains unclear. Furthermore, although the ECDI2030 was validated using data from two countries (Halpin et al., 2024), questions remain regarding its structural validity across cultural contexts. This study examines the dimensionality of the ECDI2030 using data from the latest round of MICS survey from nine countries (N = 46,660, Mage = 43.21 months, SD = 9.71, range = 24-59). All items were scored using a binary response scale, and the “Don’t know” responses were treated as missing. Confirmatory Factor Analyses (CFAs) were conducted to compare a one-factor model (i.e., one latent variable), and a three-factor model (i.e., three latent variables representing different domains respectively). Results showed acceptable fit indices for both the one-factor model ( $\chi^2(170) = 52614.26$ ,  $p < .001$ , RMSEA = .08, CFI = .90, TLI = .89, SRMR = .10) and the three-factor model ( $\chi^2(167) = 35969.97$ ,  $p < .001$ , RMSEA = .07, CFI = .93, TLI = .92, SRMR = .09), with the three-factor structure significantly improving model fit over the one-factor structure ( $\chi^2(3) = 9923.90$ ,  $p < .001$ ). These findings indicate that the ECDI2030 data could be used at the domain level, and further analyses will examine whether this factor structure is consistently viable across countries.
- Paper No. 147  
Title **Using MICS Data extracted from IPUMS-MICS to Assess Multi-Country Effects in children’s Learning**  
Author(s) Alvaro Fortin UNICEF Ukraine Ukraine
- We propose a paper that assesses measurement and substantive issues related to SDG4, “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”. We are interested in (a) identifying moderating factors associated to target 4.2.1, children 24-59 months who are developmentally on track in health, learning and psychosocial wellbeing; and (b) reviewing whether the moderating model is consistent across groups (countries, genders, socio-economic conditions, urban-rural dwelling). We will test the moderating factors pooling the data sets for various countries relying on the IPUMS MICS extractions and based on moderating effects detected in MICS single country studies; e.g., the role of family in education (Sosu, M.E. & Pimenta, S.M., 2023), development associated to ethnicity identified by language as proxy (Miller, A. C., Flood, D., Tschida, S., Douglas, K., Rohloff, P., 2023), child labour moderating psychosocial wellbeing and dropout (Thi, A.M., Zimmerman, C., Ranganathan, M., 2023). To test whether the mediation effects are consistent across countries, we propose fitting a multi-group Multiple Indicators Multiple Causes model (MIMIC). MIMIC is a special case of Structural Equation Modelling (SEM) that tests the impact of covariates on a single-factor measurement model. We propose estimating Modification Indexes (MI), indicators of misspecification that represent an expected drop overall in Chi-Square value if parameters are freely estimated (Byrne, 2002). Our conclusions will provide evidence of moderators that need to be addressed to support early childhood education and of a methodological approach to test for comparability of findings across populations using MICS data.



Paper No. 165

Title ***Child's functional difficulties and early childhood development in 11 sub-Saharan African countries: moderating effect of parental stimulation***

Author(s) Hyejun Chi  
Rockli Kim

Korea University  
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Abstract Background: Despite the growing literature on ECD, there has been relatively little ECD-related progress for children with functional difficulties. The current study aimed to identify the extent of functional difficulties of children in sub-Saharan Africa (SSA) and explore its association with ECD in this region. Methods: Using the MICS from 11 SSA countries conducted between 2017-2020, we included 44,762 children aged 36-59 months in the analysis. For the ECD score ranging 0 to 5 (covering cognitive and socioemotional domains), we estimated three-level linear regressions to assess its association with the child's functional difficulties. Functional difficulties were measured through caregivers' report on whether the child has a lot of difficulty in or is incapable of seeing, hearing, walking, fine motor, communicating, learning, playing, and social behaviors. Interaction analyses were conducted to examine whether the association was moderated by learning- and stimulation-related characteristics. Results: Overall, 7.1% of children had any functional difficulties (ranging from difficulty in seeing [0.5%] to social behaviors [2.7%]). The mean ECD score was 3.3 (SD=1.2). Having any functional difficulties was associated with significantly lower ECD score after adjusting for sociodemographic characteristics of child, parents, and household ( $b=-0.59$ , 95% CI=-0.63, -0.54). Statistically significant interaction by parental stimulation was found (interaction  $p$ -value=0.021) – if both parents engaged in high stimulation, the child showed the equally highest ECD score independently of functional difficulties. Conclusion: Children with functional difficulties are prevented from reaching their full developmental potentials, which can be partly moderated by adequate parental stimulation. To improve wellbeing of all children both in their childhood and later adulthood, global and national initiatives are needed, particularly focusing on the role of early stimulation.

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**S18 Health Seeking Behavior, Curative Care, Respiratory Health and Malaria I (O2)**

Paper No. 3  
Title ***Inequalities in women healthcare seeking behaviour for under-five children illness in Afghanistan: Evidence from 2022 Afghanistan Multiple Indicator Cluster Survey***  
Author(s) Conrad Murendo Save the Children Afghanistan  
Abstract Objective: The main aim of this article was to identify and quantify the inequality in health seeking behaviour for children in Afghanistan and investigate the contribution of various factors to the observed inequality. Study design: This study utilizes secondary data from the Afghanistan MICS 2022–23. The analysis is based on a nationally representative sample of 33, 398 consisting of merged household and children under five datasets. Methods: Concentration curve and Erreygers concentration index were used to identify and quantify the wealth-related inequality in health seeking behaviour for children under five. In addition, the contributions of different factors to the observed inequality were estimated using the Erreygers decomposition analysis. Results: The concentration index of health care seeking behaviour for children under five in Afghanistan was 0.040 ( $p < 0.000$ ) and significant indicating presence of wealth-related inequalities in health seeking behaviour for children under five. This confirms that good healthcare seeking behavior for children under five is heavily concentrated among richer households. The decomposition analysis findings revealed that wealth (38%), rural residency (36%), household size (12%), and child underweight (8%) made the largest contribution to the pro-rich inequalities in health care seeking. On the other hand, number of under five children in family (25%) made the largest contribution to the pro-poor inequalities in health care seeking. Conclusion: This article provides empirical evidence of wealth-related inequalities in health care seeking for children under five in Afghanistan, disfavoring poorer households. The study findings suggest that the greater part of pro-rich inequalities in health care seeking behaviour is driven by household wealth, rural residency, and household size. These results show that policies and interventions to reduce the root causes of inequalities in health care seeking for children under five should focus on improving household wealth among poor sections of the society and decentralizing health facilities in rural areas to reduce travel distances.

Paper No. 69  
Title ***Multidimensional Energy Poverty and Respiratory Health in Young Children: An Empirical Evidence From 26 Energy Poor Countries***  
Author(s) Maryam Sadiq The University of Azad Jammu and Kashmir Pakistan  
Sidra Younas The University of Azad Jammu and Kashmir Pakistan  
Abstract Background: Energy facilities have been extensively considered in the literature as a significant foundation to address global development challenges including poverty, health, inequality, and education. The unidimensional and multidimensional energy poverty (MEP) is critically associated with the occurrence of acute respiratory infections (ARIs) in young children. This study aimed to examine the effect of an extended MEP index (MEPI) on the perspective of ARI among children under five years belonging to 27 energy-poor countries. Methods and Materials: The data from MICS conducted between 2017 and 2023, encompassing 340703 children under 5 years of age is used for analysis. The MEPI consists of five main dimensions with 12 indicator factors. The ARIs comprised of 3 variables with corresponding weights. The Partial Least Squares (PLS) along with a variable selection method is executed to determine the association of ARI with MEPI, income level of family, area of residence, and global region among young children. Results: The present analysis reported that the MEP, area of residence, income level of family, and geographical region are significantly associated with the risk of ARI among children. Specifically, the risk of ARI increases by 34% due to a unit change in energy poverty among children under five years. Additionally, geographical regional inequalities substantially affect respiratory health. Conclusions: The findings greatly contribute to establishing a remarkable policy for achieving SDG goals regarding good health and clean energy by addressing the well-being of young children in low and lower-middle income countries.

Paper No. 137

Title **Coverage and inequality trends on ownership and usage of mosquito nets in 34 sub-Saharan African countries (2010-2023)**

Author(s)	Tingkai Zhang	Tsinghua University	China
	Shijiao Zhang	Tsinghua University	China
	Shushu Wang	Tsinghua University	China
	Maximilian Harnoth	University of Göttingen	Germany
	Zhicheng Wang	China Development Research Foundation	China
	Sol Richardson	Tsinghua University	China

Abstract Background: Malaria remains a significant public health issue in Sub-Saharan Africa. Insecticide-treated mosquito nets (ITNs) are a crucial preventive measure. However, there is limited understanding of recent trends in ITN coverage and associated socio-economic inequalities. This study focuses on households, pregnant women, and children under five due to their unique vulnerabilities. Limited net availability can lead to unequal protection and disparities within households. Pregnant women are particularly vulnerable due to the impact on their health and their unborn child. Children under five are at high risk due to undeveloped immunity and inability to protect themselves. Hence, ensuring they have access to and use ITNs is of vital importance. Methods: We analyzed data from several rounds of DHS and MICS between 2010 and 2021. We compiled data from 601,003 households, 59,162 currently pregnant women, and 385,485 children aged 0-59 months across 28 Sub-Saharan African countries. Trends in ITN ownership and usage were examined. Inequality in ITN ownership and utilization by wealth groups was assessed using the Slope Index of Inequality (SII) and the Relative Index of Inequality (RII). Results: ITN coverage increased across all wealth groups from 2010 to 2021 in 28 Sub-Saharan African countries, with an average household ownership increase of 8.94%. Utilization among pregnant women and children under five grew by 10.09% and 8.87%, respectively. Socio-economic disparities were reduced, as indicated by decreasing SII and RII for ITN coverage. The increase in ITN ownership in poorer wealth quintiles contributed to reduced social inequalities. However, the poorest groups still have lower absolute coverage levels compared to wealthier counterparts. Subgroup analysis showed that ITN usage among children, particularly in poorer groups, remains the least covered compared to households and pregnant women. Partial correlations and linear regression indicate that increases in ITN coverage correlate with decreases in SII and RII, suggesting that expanded ITN delivery helps to reduce socio-economic inequalities. Conclusions: ITN coverage and utilization have improved across Sub-Saharan Africa, yet significant inequalities persist. Targeted interventions are necessary to increase ITN coverage among the most disadvantaged populations. Sustained efforts to overcome socio-economic barriers and emphasize ITN use among key populations, especially children, are crucial to achieving equitable health outcomes.

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**S19 Child Labour II (B1)**

Paper No.	101
Title	<b><i>Child labor statistics using MICS: Work &amp; hazardous work estimates for 40 low- and middle-income countries</i></b>
Author(s)	Anna Bolgrien IPUMS at the University of Minnesota USA Deborah Levison University of Minnesota - Twin Cities USA Deborah S. DeGraff Bowdoin College USA
Abstract	SDG 8.7 aims to eliminate the worst forms of child labor and, by 2025, end child labor in all its forms. Despite the SDG inclusion, addressing harmful child labor has largely fallen off global policy budgets in recent decades. Data on work hazards in MICS6 can help target children most likely to be in highly problematic work. Furthermore, the Covid-19 pandemic was a reminder of the critical role that young people play in family survival and how child labor can have short and long term benefits and consequences for young people. In the short term, children's work reduces household poverty (SDG1) and hunger (SDG2) and can teach skills for productive employment (SDG8) in the longer term, while harms that ensue can reduce children's health (SDG3), reduce participation in education (SDG4), and increase inequality (SDG10). Chores can affect SDG 8.6 by keeping young people (especially girls) out of employment, education, and training. This paper presents estimates of child labor force participation from pooled IPUMS MICS round 6 data from 40 low- and middle-income countries with a focus on exposure to work hazards for 5-17 year-olds. Participation in chores in a child's own home is also estimated. Completed estimates by gender, age group, and urban/rural show that some kinds of hazards are very common, and that many children experience either hazardous working conditions or are engaged in work with some level of risk of harm. Reducing hazards with higher probabilities of harm would contribute to the wellbeing of young workers. Additional estimates in progress include interactions between work, work hazards and school attendance. We expect to be able to answer questions such as "are more hazards reported for non-enrolled children?" As a side product, a dataset of estimates can be made publicly available.
Paper No.	126
Title	<b><i>The effects of farming and livestock rearing on child labour in rural Bangladesh</i></b>
Author(s)	Saki Nakamura Kobe University Japan Akira Ishida Kobe University Japan
Abstract	The human rights problem of child labour is still pervasive around the world, and even in rapidly developing Bangladesh, approximately 1.7 million children are engaged in child labour. Many previous researchers have highlighted the factors determining households' decision to send their children to work, mainly as a strategy to cope with poverty. However, whether there is a 'wealth paradox' in the relationship between household wealth and child labour is controversial. For example, whereas some have concluded that an inverted U-shaped curve can represent the relationship between farm size and children's working hours, others have stated that the relationship can be represented by an S-shaped curve that is turned sideways. Additionally, while the influence of parental education on children's working hours has been studied, that of maternal empowerment has not been examined in detail. Therefore, this research aims to clarify the effects of farm size and maternal empowerment on children's working hours, using raw data from the Bangladesh Multiple Indicator Cluster Survey (MICS) Round 6. The estimation results by simultaneous estimation methods of the Tobit and Probit models show a U-shaped relationship between farm size and children's working hours, suggesting that the investment in education, which is the income effect, outweighs the demand for child labour, which is the substitution effect. Furthermore, the results show that maternal empowerment and children's working hours are inversely related, indicating that maternal autonomy may help prevent children from working.

Paper No. 191

Title ***Mother's age at marriage and offspring's involvement in child labour: A multi-country analysis across sub-Saharan Africa***

Author(s)	Sopuruchukwu Obiesie	University of Oxford	United Kingdom
	William E. Rudgard	University of Oxford	United Kingdom
	Ritapriya Bandyopadhyay	University of Oxford	United Kingdom
	Julius Baruwa	University of Cape Town	South Africa
	Lucie Cluver	University of Oxford	United Kingdom

Abstract Introduction: Girl-child marriage has severe impacts on girls' health and well-being, but there is limited understanding of the impacts on their children. Such evidence can highlight the urgency of addressing this issue for future generations. This study investigates the association between maternal experience of child marriage and her children's exposure to harmful work. Methodology: Using data from UNICEF MICS6, we analyzed 40,995 mother-child pairs for children aged 5-17 years and women aged 20-49 years from 13 Sub-Saharan African countries. The dependent variables were child labour, measured as a binary variable, and hours of child work in the preceding week. The independent variable was a binary measure of the mother's experience of child marriage. To inform the progressive realisation of child rights, we also evaluate girl-child marriage as a continuous variable using age at first union. Univariate and multivariate binomial and negative-binomial regressions were conducted, accounting for data clustering. Results: Mother's experience of child marriage was associated with increased offspring's odds of child labour (Crude Odds Ratio [SE]=1.45 [0.06]; adjusted OR=1.18 [0.04]). This association did not vary by the type of child labour experienced. The impact of maternal child marriage on offspring's child labour was more pronounced for female children (adjusted OR= 1.17 [0.07]). Increasing mother's age at first union significantly reduced the incidence rate of child working hours. Girls tended to work longer hours, but there were no gender differences in impact. Significant heterogeneity existed across countries. Although the association between child marriage and increased odds of child labour was consistent in 12 of 13 countries, it was not always statistically significant. Maternal literacy, household wealth, and community prevalence of child marriage explained most of the observed effects. Conclusion: A woman's experience of child marriage is likely to be linked to her children's exposure to child labour, highlighting the urgency to address child marriage for future generations.

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**S20 Adolescents, Living Arrangements, Interventions, and Strategies (B2)**

Paper No. 103  
Title **Equity analysis on the acceleration strategy for adolescent girls in Latin America and the Caribbean using MICS data: A multi-country analysis**  
Author(s) Liliana Carvajal Velez UNICEF LACRO Panama  
Shane Khan Independent consultant USA  
Rada Noeva UNICEF LACRO Panama  
Abstract This study aims to examine the key socioeconomic determinants of disparities across regional areas of acceleration for adolescent girls in Latin America and the Caribbean (LAC) using data from the most recent MICS conducted in the region. The analysis will focus on the prioritized areas for Adolescent Girls by UNICEF, including gender norms, girl empowerment and participation, health, nutrition, sexual and reproductive health and rights (SRHR), menstrual health and hygiene (MHH), learning and transition to work, freedom from violence and harmful practices, and economic security. Utilizing MICS surveys conducted in LAC countries since 2015, the study will present findings on the socioeconomic determinants of disparities in the identified areas of acceleration. Particular emphasis will be placed on compounding effects model, which examines the intersectional impact of multiple disadvantages on adolescent girls' well-being. Furthermore, the study will offer recommendations for targeted interventions and policies aimed at addressing these inequalities and promoting the well-being of adolescent girls in the LAC region. By shedding light on the socioeconomic drivers of disparities, this research aims to inform evidence-based strategies to support adolescent girls' empowerment and achieve equitable outcomes across the identified areas of acceleration.

Paper No. 132  
Title **Social assistance and child/adolescent rights in Eastern and Southern Africa**  
Author(s) Ritapriya Bandyopadhyay University of Oxford United Kingdom  
William E. Rudgard University of Oxford United Kingdom  
Silinganisiwe Dzumbunu University of Cape Town South Africa  
Shan Ni UNICEF Eswatini Eswatini  
Priscilla Idele UNFPA HQ USA  
Hernando Grueso Hurtado University of Oxford United Kingdom  
Rachel Yates University of Oxford United Kingdom  
Lucie Cluver University of Oxford United Kingdom  
Elona Toska University of Oxford United Kingdom

**Abstract** Background. Poverty and social vulnerability undermine children's futures, often with lifelong consequences. Social assistance, a form of social protection, supports child and adolescent wellbeing by reducing poverty and social exclusion, and promoting healthy development. We aimed to fill a critical evidence gap around the coverage of existing social assistance programmes among vulnerable children and adolescents in Eastern and Southern Africa. Methods. We analysed nationally representative Multiple Indicator Cluster Survey data from children and adolescents (0-17 years) in Comoros, Eswatini, Madagascar, Malawi, and Zimbabwe (N=84,659). We describe the coverage of social transfers, and school support based on three vulnerability indicators: 1) Multidimensional deprivation; 2) Not living with parents/ orphanhood; and 3) Disability. We then estimate the association between these vulnerabilities and seven Sustainable Development Goal indicators using multivariable mixed-effect regression models. Results. Across the study countries, coverage of social transfers and school support varied widely, ranging from 1%-46% and 3%-32%, respectively. In Madagascar and Zimbabwe, the coverage of social transfers, and school support was higher among children experiencing at least one deprivation. Similarly, children not living with parents/ orphaned children in Eswatini, Malawi, and Zimbabwe had increased access to social transfers and school support. Notably, child disability was only associated with higher coverage of school support in Malawi. Multivariable analysis highlighted the higher levels of risk faced by vulnerable children. Child deprivation was associated with higher odds of child domestic work, lower literacy, lower numeracy, and higher early sexual debut. Not living with parents/ orphanhood was associated with lower numeracy, and higher early sexual debut. Child disability was associated with higher severe child discipline, lower numeracy, and higher early sexual debut. Conclusion. To achieve the sustainable development goals, efforts must be intensified to increase social assistance coverage for children and adolescents facing economic and social vulnerabilities associated with adverse development outcomes.

Paper No. 204

Title ***Living Arrangements and Development Outcomes of Children in East Asia – An Analysis and Policy Implications***

Author(s)	Jayachandran Vasudevan	UNICEF EAPRO	Thailand
	Muhammad Rafiq Khan	UNICEF Thailand	Thailand
	Nataliya Borodchuk	UNICEF Thailand	Thailand

**Abstract** The living conditions of children during early years is critical to their growth and development as a responsible adult in the community. Especially, living with both parents is very important. Results from Multiple Indicator Cluster Survey (MICS) conducted in various countries in East Asia namely Lao PDR, Thailand, and Viet Nam show that the proportion of children living apart from their biological parents has increased substantially during the last decade. For example, in Thailand the proportion of children (0-17 years) living with both parents declined by about seven percentage points (57% to 50%) during 2015 to 2022 and more or less similar trends were observed in Lao PDR (85% in 2012 to 78% in 2023) and Viet Nam (84% in 2014 to 78% in 2021). The differentials by wealth index quintile also reveals that a much higher proportion of children from poor households are not living with both parents compared with children living in wealthy households. This study aims to look at the differentials in the various child related development outcomes such as ECDI, learning, child discipline etc. among children living with both parents and not living with parents. The bivariate analysis show that, the ECDI score is better for children living with both parents in Thailand in 2022 (79%) compared to those not living with both parents (76%), and the score is low for children living with neither biological parent (74%) vs living with at least one biological parent (79%). Similarly, differentials were also noticed for other development outcomes of children by living conditions. The study will use multivariate analysis techniques to understand the relationship between various child development outcomes and living conditions of children. Also collaborate with data from admin and children in institutional care studies, to derive policy implications and recommendations.

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## S21 Climate Change (O1)

Paper No. 2  
Title ***The Impact of Excessive Heat on Early Childhood Development***  
Author(s) Jorge Cuartas New York University & Universidad de los Andes USA  
Andrés Camacho Universidad de los Andes Colombia  
Lenin H. Balza The Interamerican Development Bank USA  
Nicolás Gómez The International Monetary Fund USA

Abstract Objective. The growing climate crisis is causing profound impacts on societies, communities, and individuals (Romanello et al., 2022). However, little is known about the consequences of climate change on the early development of foundational skills and learning (Cuartas et al., 2024). The purpose of this study is to assess the potential consequences of experiencing climate change-related risks during early childhood on early learning opportunities and developmental outcomes across the globe, as well as understand ecological factors that may promote resilience. Data. To do so, we geocode the spatial location (when available) or region of households surveyed in all available MICS from round 4. We spatially merge this information with satellite data on climate change-related risks (e.g., NOAA Global Surface Temperature Dataset v4.0, NASA's Observations from Space). Through the spatial join of the raster datasets, we develop measures of climate change-hazard exposure at the household level. Analysis. We use a quasi-experimental approach that leverages spatial and temporal variation in households' surveys relative to climate change hazards to explore the effects of both climate shocks (i.e., acute risks) and long-term exposure (i.e., protracted impacts) on young children's development (as measured by the ECDI) and learning opportunities (including caregivers' stimulation, discipline, and attendance to early childhood care and education programs). We conduct sensitivity and falsification tests to assess the internal validity and robustness of estimates. Finally, we employ moderation analyses using interaction terms to assess variability in effects across settings and according to community, family, and individual characteristics. Implications. Current findings inform policy and programmatic efforts aimed at promoting positive adaptation, early learning opportunities, and healthy child development amid the growing climate crisis, contributing to meeting key policy goals established in the SDGs (e.g., Goals 3, 4, 10, 13, and 16) and ensuring a sustainable future for all.

Paper No. 226  
Title ***Examining the nexus between child food poverty, nutrition and climate shocks using MICS and geospatial data in Zimbabwe***  
Author(s) Tawanda Chingozha UNICEF Zimbabwe Consultant Zimbabwe  
Mara Nyawo UNICEF Zimbabwe Zimbabwe  
Rumbidza Tizora UNICEF Zimbabwe Zimbabwe  
Richard Kumapley WHO Switzerland

Abstract Zimbabwe has an unfinished agenda of reducing undernutrition, high micronutrient deficiencies and a prevalence of overweight that increases rapidly with age. Many children are eating too little of what they need early in life to grow and develop, while adolescents and adults are increasingly eating too much of what they do not need. Severe child food poverty is high at 41%, with total child food poverty (severe plus moderate) at 86% (MICS 2019). The country is on-track to meet the SDG nutrition targets to maintain child wasting and overweight to less than 3 per cent, but it remains off-track to meet the remaining 4 nutrition targets of a 50% reduction in stunting and anemia, 30% reduction in low birthweight and increasing exclusive breastfeeding to 70%. Increasing climate shocks (such as drought) impose additional constraints. The study takes stock of progress by analyzing nutrition trends from the 3 MICS rounds conducted in Zimbabwe (2009, 2014 and 2019), finding a sharp decrease in the share of children overweight between 2009 and 2014, with stunting and wasting increasing modestly. Child food poverty, stunting, wasting, and overweight prevalence declined over the period 2014 to 2019. Linear and non-linear multivariate estimates show that urban areas, proximity to economic activity (proxied by night lights) and livestock abundance are inversely associated with child food poverty while a positive correlation is observed for solid fuels for cooking reliance, low mother or household head educational attainment and drought. The average annual rate of reduction (AARR) for stunting and the compound annual growth rate (CAGR) for overweight are also calculated. The work informs reprioritization of existing key nutrition interventions to accelerate progress towards achieving SDG nutrition targets by 2030.



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**S22 Reproductive Health (O2)**

Paper No.	151		
Title	<b><i>Analysis of antenatal care, intrapartum care, and postnatal care utilization: Findings from the 2018 Iraqi Multiple Indicator Cluster Survey</i></b>		
Author(s)	Sami Najmaddin Saeed	University of Debrecen	Hungary
	Sándor János	University of Debrecen	Hungary
	Shayma Abd Ezat	Hawler Medical University	Iraq
Abstract	<p>Background: A positive pregnancy experience can be achieved through having a continuum of maternal care that involves prenatal, intrapartum, and postnatal care. The overall objective was to analyze data on antenatal, intrapartum, and postnatal care utilization focusing on women aged 15–49 in Iraq using multiple indicator cluster survey data. Method: This study used secondary data analysis from the 2018 multiple indicator cluster survey. The participants were women 15–49 years old who had had a live birth two years before the survey. Univariate and multivariable logistic regression analyses were used to identify associated factors. Result: The prevalence of women who received antenatal care was 66.1%, intrapartum care was 86.9%, and the prevalence of post-natal health checks for mother and baby was 82.8% and 79.4%, respectively. Poor maternal health care was significantly associated with factors living in a rural area, low and no education level of women, households from the poorest to the fourth wealth index, having no access to mass media, having a husband or partner with more wife, being unhappy, having more children, and, inadequate antenatal care visits, whereas, women living in Kurdistan, being a group age 18–20 years at first marriage, and delivery by cesarean section were more likely to have better maternal health care service and utilization. Conclusion: The outcome of this study can be a useful resource for relevant health decision-makers, policies, and skilled health professionals to improve healthcare services for mothers by focusing on those significant related factors.</p>		
Paper No.	225		
Title	<b><i>Trends and factors associated with contraception among married palestinian women: A cross-sectional study from MICS 2010, 2014 and 2019/2020</i></b>		
Author(s)	Rie Fuse	Keio University	Japan
	Mohammed B A Sarhan	Keio University	Japan
	Nao Wakabayashi	Keio University	Japan
	Raghda Khatab	Keio University	Japan
	Rika Fujiya	Keio University	Japan
Abstract	<p>Introduction: Contraception plays a crucial role in protecting the health of women and children. Limited studies compare multiple years of contraception based on national surveys, including in Gaza. Therefore, this study examined the trend of contraception and the factors associated with using contraception in 2010, 2014, and 2019/2020 in Palestine. Methods: This cross-sectional study used three Palestinian Multiple Indicator Cluster Surveys in 2010, 2014, and 2019/2020. The number of women was 7,620, 5306, and 4,622 aged 15-49 years respectively. We used a chi-square test and logistic regression analysis to identify factors associated with contraception. Results: The proportion of women using contraception in 2014 and 2019/2020 increased compared to 2010 (i.e., 75.1%, 85.4%, and 84.3% in 2010, 2014, and 2019/2020). The associated factors with using contraception were age, place of residence, economic status, and using the Internet. Conclusion: Using contraception was influenced by individual factors. Therefore, future implementation is needed to consider these factors.</p>		

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**S23 Education and Learning II (B1)**

Paper No. 59

Title ***Learning Poverty in Sub-Saharan Africa***Author(s) Ray Langsten American University in Cairo Egypt  
Fatma Abdelkhalek Assiut University Egypt

Abstract Target 4.1 of the Sustainable Development Goals states that by 2030 “all girls and boys [will] complete free, equitable and quality primary and secondary education”. Quality education implies that children will be able to read. However, a recent UNESCO report states that in 2019, before the COVID-19 pandemic, 86% of children in sub-Saharan Africa (SSA) suffered from learning poverty (LP) – the inability to read well. LP consists of two broad components: participation and learning. Participation is measured by the rate of out-of-school children of primary school age. Learning is defined as “the percentage of 10-year-old children who cannot read and understand a simple story”. In SSA, both of these components present complexities. In terms of participation, many children start school late and/or fail to advance year-by-year. Therefore, even in countries where most children are in school, many are behind the expected grade for their age. For example, a 10-year-old child should be in the 4th or 5th year of primary school. In Ghana, where almost all children begin school (>97%), 41% of 10-year-olds are still in 1st through 3rd grade. In other countries many children never enroll in school. Chad suffers both participation problems. Less than 60% of children start school; 71% of 10-year-olds who started have not yet reached 4th grade. In SSA, learning often depends on the language of instruction – which may be the language spoken in the home, or may be a language used by the former colonial regime. This research focuses on the foundational learning module of Round 6 of the Multiple Indicator Cluster Surveys to examine the locus of LP of children in 16 SSA countries. We will consider both participation (do children enroll – are they delayed) and learning (what role does language of instruction play in reading ability).

Paper No. 163

Title ***Girls outperforming boys: Pre-school gender gap in literacy and numeracy skills in sub-Saharan Africa***Author(s) Irina Valenzuela IFAD (University of Illinois Urbana-Champaign) USA  
Julie Buhl-Wiggers Copenhagen Business School Denmark  
Rebecca Thornton Baylor University USA

Abstract A growing body of research shows that girls of recent generations outperform boys in learning outcomes across the world. This literature focuses mainly on school-age children, with limited evidence on gender disparities at preschool ages. We use data from the Demographic and Health Surveys and Multiple Indicator Cluster Surveys across 25 Sub-Saharan African countries from 2011 to 2019 and compare mothers' reports of preschool readiness skills of boys and girls ages 3–4. We find that girls are 2 percentage points more likely than boys to identify ten letters of the alphabet and to identify the first ten numbers, while we find no difference across genders in reading four words. Approximately 70% of the countries in our sample exhibit a female advantage in skills. We also find that girls are more likely to attend early childhood education programs and be engaged in parent-child interactions at home. We explore mechanisms and find that preschool attendance is more important for the formation of skills for girls and that mothers' literacy is more important for their daughters' skill formation than for their sons.

Paper No. 236

Title ***A case for harmonizing parental education attainment variables in Multiple Indicator Cluster Surveys (MICS)***

Author(s)	René Iwo	University of North Carolina at Chapel Hill	USA
	Ruo Ying Feng	University of Ottawa	Canada
	José Ignacio Nazif-Muñoz	Université de Sherbrooke	Canada
	Magdalena Janus	McMaster University	Canada
	Negin Zamani	Toronto Metropolitan University	Canada
	Mónica Ruiz-Casares	Toronto Metropolitan University	Canada

Abstract

Mother's and father's education (MFE) attainment has crucial implications on children's lives through parenting styles, resources, and the psychosocial environment in which children grow up. Given the absence of any variables about parental employment in Multiple Indicator Cluster Surveys (MICS), MFE often becomes the primary indicator of family socioeconomic status. However, education systems vary widely across countries (and within countries over time), and the global nature of MICS presents challenges for including these two variables in cross-national comparisons. This paper outlines four shortcomings with the current approach to the MFE variable in MICS. Firstly, while there is an attempt to harmonize the different levels into 3 or 4 categories, discrepancies remain (e.g., some surveys contain "secondary and above", whereas others differentiate between "secondary" and "postsecondary"). Second, boundaries between primary and (lower/upper) secondary schools vary widely across countries (e.g., primary school includes grades up to 8 in Macedonia MICS4, while in Kyrgyzstan MICS5 it only includes grades up to 4). Third, distribution of participants in countries often is unequal across the harmonized categories, which might cause problems in some statistical analyses (e.g., almost all parents in Eastern European countries are high-school graduates). Fourth, vocational education treated differently in each survey (i.e., this information, if collected, is often unclear if it is at secondary or postsecondary level). We suggest three potential approaches for cross-national comparisons involving MFE and discuss the pros and cons of each: 1) high-vs-low dichotomized variable, 2) categorical variable with 3 or 4 categories (e.g., no formal education, primary, secondary, post-secondary), and 3) continuous variable with years of education. This last approach is available in similar surveys like the Demographic and Health Surveys (DHS). We discuss the harmonization needed to ensure that MFE can be properly extracted across future iterations of MICS.

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## S24 Sampling, Representation, and Small Area Estimation (B2)

Paper No.	42		
Title	<b>Endogenous Sample Selection</b>		
Author(s)	Torsten Figueiredo Walter	New York University	Abu Dhabi
	Niclas Moneke	University of Oxford	United Kingdom
Abstract	This paper examines the production of household survey data, a crucial input to social science research and evidence-based policy. In theory, household surveys generate data from a randomly selected, representative sample of the population. We provide causal evidence that in practice, enumerators respond to the design of surveys by excluding household members that require a disproportionate amount of effort on their end. Leveraging 146 Demographic and Health Surveys and 52 MICS from 79 low- and middle-income countries, we show that household members eligible for large numbers of questions are frequently underrepresented in survey samples. Omitted members differ systematically from included members and as a result, survey samples are not representative of the population, thus leading to biased aggregate statistics.		
Paper No.	138		
Title	<b>Small area estimation using MICS data: A methodological approach</b>		
Author(s)	Jon Wakefield	University of Washington	USA
	Qianyu Dong	University of California Santa Cruz	USA
	Yunhan Wu	University of Washington	USA
	Andrea Boskovic	University of Washington	USA
	Zihang Yu	University of Washington	USA
	Liliana Carvajal Velez	UNICEF LACRO	Panama
	Nazim Gashi	UNICEF MICS Consultant	Kosovo
	Stephanie Kauv	UNICEF WCARO	Senegal
	Zehang Richard Li	University of California Santa Cruz	USA
	Joshua Yang	University of Washington	USA
Abstract	Characterizing within-country variation in key health and demographic indicators is an important public health endeavor. Knowledge of the variation can inform on interventions and aid in examining progress towards SDG targets. In low- and middle-income countries the most reliable source of information is often household survey data. In this paper, we present small area estimation (SAE) models that can be used with MICS data to produce subnational estimates for child health variables such as vaccination and neonatal mortality. We will describe data requirements for SAE and stress the importance of obtaining a reliable measure of uncertainty. Direct, area-level and unit-level models will be described and contrasted and the methods will be illustrated using MICS data from a variety of countries in different regions, using the software package surveyPrev and accompanying shinyApp. Specific issues we will discuss include stratification by urban/rural, combining survey and other data sources (such as from censuses), aggregation from smaller to larger areas, the use of covariates, and guidelines for fitting specific models.		

Paper No. 272  
Title **Ensuring representation of children not co-residing with biological mothers in MICS**  
Author(s) Ranto Ramananjato UNICEF ESARO Kenya  
Pierre Martel UNICEF MICS Consultant Lesotho  
Abstract "Leave No One Behind" stands as a key guiding principle of the 2030 Sustainable Development Agenda reflecting the global community's commitment to inclusive progress, especially for those furthest behind. Similarly, non-discrimination, equality and equity are the core guiding principles of the UN convention on the Rights of the Child. Despite these commitments, inclusive and quality data are still challenging to capture. Household surveys are one of the most important instruments used to collect inclusive data on household populations across the world. However, particular groups of children such as children not co-residing with biological mother may be excluded due to design choices in questionnaire structures and criteria used for respondent eligibility. This session explains how MICS ensures that children not co-residing with biological mother are represented and sheds light on such exclusion in other sociodemographic surveys as well as its implication on certain child-related indicators.

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## S25 Child Protection: Birth Registration and Child Discipline (O1)

Paper No. 44  
Title **Problems with the MICS module measuring child exposure to discipline and violence in the home**  
Author(s) John D. McLennan University of Calgary Canada  
Abstract A module on child exposure to discipline and violence in the home was introduced in the third round of the MICS and has become a standard component for most participating countries in subsequent rounds. Data derived from this module are used to generate SDG indicator 16.2.1. Although an attempt to index this domain is important, there are several problems with the current module and the resulting measures. The module is composed of a truncated version of a measure of intrafamilial conflict developed on US populations. Unfortunately, there is little published evidence that the necessary steps were undertaken to develop and then assess the extent to which this measure adequately indexes discipline and violence exposure in the home in multiple international settings. There are several outstanding questions particularly regarding its psychometric properties. These include concerns about (1) content validity (e.g., adequate coverage of common practices across multiple settings); (2) reliability (e.g., test-retest and inter-rater reliability); and (3) sensitivity to change. The latter may be of particular concern given the decision to collapse response options and a questionable lumping of items which may undermine its ability to assess change over time, a desirable quality for such a measure. This paper will review aspects of the source instrument, specifics related to the identified outstanding questions, and proposed steps for measurement improvement. Although there may be reluctance to change an existing MICS measure given the consequential loss of a consistent metric across time and space, it is proposed that there may be greater disadvantages to persisting with the use of a weak measure. Substantial evolution in measures of other complex constructs in MICS in response to identified weaknesses (e.g., dimensions captured in the water module) demonstrate that such changes can be made if there is sufficient concern about a measure's weaknesses.

Paper No. 55  
Title ***Inequality of Opportunity in Asia and the Pacific - Birth Registration***  
Author(s) Selahattin Selsah Pasali ESCAP Thailand  
Zilu Zhou ESCAP Thailand  
Abstract This paper aims to examine inequality in birth registration completeness rates among children under 5 years of age in Asia and the Pacific. It applies the classification and regression tree (CART) and Dissimilarity Index (D-Index) methodologies to household survey data in 27 countries, including 16 countries with MICS data between 2010 and 2022. After identifying factors that significantly impact birth registration completeness, such as child's age, household wealth, gender and maternal education, our CART algorithm identifies furthest behind and furthest ahead children within 27 countries and estimates the gaps at national and subnational levels. Countries with multiple years of data show uneven progress in reducing the gaps between the furthest behind children and the national averages. To leave no child behind, countries need to strengthen both supply and demand side policies and undertake inequality assessments. These findings contribute to empirical understanding of birth registration completeness in the region and provide policy implications in achieving birth registration for all children (related to Sustainable Development Goal Target 16.9).

Paper No. 176  
Title ***Do Child Disciplinary Practices Vary by Household Head Education in Middle Eastern and North African Countries?***  
Author(s) Manar E. Abdel-Rahman Qatar University Qatar  
Abeer H. Abuqaoud Qatar University Qatar  
Abstract Background: The choice of disciplinary methods significantly impacts child development. The education level of household heads may influence child disciplinary practices, especially within extended families. However, evidence from the Middle East and North Africa (MENA) region remains scarce and inconsistent. Objectives: This study aims to determine the overall prevalence of child disciplinary (CD) practices in selected MENA countries and assess their association with the household head's education level. It hypothesizes that lower education levels in household heads increase the risk of inappropriate CD. Participants & Settings: Data from the most recently available national surveys conducted between 2012 and 2023 in Algeria, Iraq, Palestine, Qatar, Tunisia, and Yemen will be used. The surveys collected information on CD practices from adult caregivers for all children in the household aged 1-4 and only one randomly selected child aged 5-17 (if age 5-14). Methods: The study will examine three outcome variables to capture the behavior of any of the household members toward children's nonviolent discipline, physical discipline, and psychological aggression within the preceding month of the survey. The primary exposure variable is the household head's education level, with covariates including child and household characteristics and beliefs about physical punishment. Weights will be adjusted to account for the random selection of children aged 5-14 years. To pool data from the six countries, while considering their complex survey design, the child weight will be denormalized using survey sampling fractions derived from United Nations population data. Univariate and multivariable logistic regression analyses will be employed, with models built through purposeful selection. Stata version 18 will be used for analysis. Conclusion: By identifying how household head education influences disciplinary methods, stakeholders can develop programs promoting nonviolent discipline and improving child welfare. This study also fills a gap in the literature in the MENA region and lays the groundwork for future research.

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**S26 Health Seeking Behavior, Curative Care, Respiratory Health and Malaria II (O2)**

Paper No. 112

Title ***How Multiple Indicator Cluster Surveys can be used to assess the uptake and use of long-lasting insecticidal nets over time in Togo***

Author(s)	Gountante Kombate	University Medical Centre Utrecht	The Netherlands
	M'belou Mazimna	Ministry of Health and Public Hygiene	Togo
	Kamba Andre-Marie Soubeiga	University Joseph Ki-Zerbo	Burkina Faso
	Diederick E Grobbee	University Medical Centre Utrecht	The Netherlands
	Marianne A.B. van der Sande	University Medical Centre Utrecht	The Netherlands

**Abstract** Background: Malaria continues to be a significant public health problem in Sub-Saharan Africa, particularly for children under 5 years. There have been numerous mass distribution campaigns for long-lasting insecticide-treated bed nets (LLINs). The aim of this study was to assess progress in terms of equity in ownership, access and use of LLINs, in Togo. Methods: Data from the Multiple Indicator Cluster Survey 2010 during wet season were used, together with data from the Demographic and Health Survey (2013-2014 during dry season), and the Malaria Indicator Survey (2017 during wet season). For each survey, three main LLIN indicators were calculated: ownership, access, and use. Trends from 2010 to 2017 were assessed by calculating the percentage point change between 2010 and 2017. A multivariate analysis was performed to identify factors associated with the use of LLINs in children under five. Results: Nationally, 2010 MCIS showed ownership of at least one LLIN at 56.0% [54.4-58.2] and use among children under five at 47% [46.1-58.0]. Between 2010 and 2017, LLIN ownership increased from 56.0% [54.4-58.2] to 85.0% [84.1-86.0]. LLIN access increased from 28.3% [27.0-29.2] to 71.0% [70.1-73.1], with little heterogeneity between regions. LLIN use increased from 37.1% [36.2-38.6] to 63.0% [62.5-64.7] in the whole population, with a similar trend observed among children under five. Region and type of housing showed a significant association with the use of LLINs in children under five. Conclusion: MICS data were a good starting point for assessing LLIN ownership, access and use. Between 2010 and 2017, Togo made significant progress in acquiring, accessing, and utilizing LLINs. The reduced inequality suggests that efforts were well targeted to those most in need. Future policy decisions and downstream analyses of malaria prevention can be informed by these results.

Paper No. 159

Title ***Effective coverage for child curative care using MICS data: A case study in the Democratic Republic of Congo***

Author(s)	Gouda Roland Mesmer Mady	Johns Hopkins Bloomberg School of Public Health	USA
	Abdoulaye Maiga	Johns Hopkins Bloomberg School of Public Health	USA
	Agbessi Amouzou	Johns Hopkins Bloomberg School of Public Health	USA

**Abstract** Background: The Democratic Republic of Congo (DRC) still experiences high child mortality due primarily to infectious diseases including malaria, diarrhea and acute respiratory infections. The country is unlikely to achieve the Sustainable Development Goals (SDG), despite recent improvements in coverage of health interventions. This situation highlights the need for further assessment of the quality of care while analyzing health intervention coverage. Our study examines the capacity of health facilities to provide Integrated Management of Childhood Illness (IMCI) services and evaluates whether sick children received healthcare according to quality standards. Methods: We used DRC 2017-18 Multiple Indicator Cluster Survey (MICS) and 2017 Service Provision Assessment (SPA) survey to conduct effective coverage cascade analyses of IMCI (diarrhea, fever/malaria, acute respiratory infections) accounting for service provision quality through an ecological linking of MICS and SPA data. We identified estimates and gaps in service availability, care-seeking, service readiness, missed opportunities, and inadequate service processes. We also examined inequalities in health service provision and coverage according to household and individual socioeconomic factors. Results: Approximately one-third of children experienced any IMCI diseases. Overall, health facility capacity score to deliver services to sick children (service readiness) was about 64.0% while service quality score was 56.8%. The coverage cascade revealed significant gaps in service readiness and processes, with crude coverage at 26.3% and quality-adjusted coverage at 10.3%. Key factors influencing care-seeking, service coverage, and quality of care included the education level of mothers/caretakers, wealth quintile, and place of residence. Conclusions: Our findings highlight that a substantial proportion of facilities do not meet the necessary capacity to provide IMCI services, and service provision often does not adhere to quality standards. To achieve universal coverage and meet SDGs for childhood health, it is crucial to ensure both the readiness and quality of IMCI services are met.

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## Plenary: Recent Initiatives of the MICS Programme (B1)

Paper No. 79

Title **Comparing MICS Indicators by Degree of Urbanisation and National Urban/Rural Definitions**

Author(s) Nazim Gashi UNICEF MICS Consultant Kosovo

Ahmet Sinan Türkyilmaz UNICEF MICS Consultant Türkiye

Abstract The conventional national definition of urban and rural areas in different countries varies considerably and thus limits international comparability. The Degree of Urbanisation (DEBURGA) method classifies local administrative units based on population density, contiguity, and population size in three area types: cities, towns and suburbs, and rural areas. This paper presents an innovative approach to integrating DEBURGA as a predefined survey variable into the Multiple Indicator Cluster Surveys (MICS) Programme, aiming to enhance and facilitate international statistical comparisons. The research will be conducted over some selected MICS surveys, comparing conventional urban/rural indicator estimates with those derived from the DEBURGA classification. Utilising the MICS sampled clusters, each cluster will be classified according to the DEBURGA methodology. Subsequently, basic background and some selected MICS indicators will be disaggregated to compare with the traditional urban/rural division. To align more closely with conventional classifications, an additional analysis will be conducted by combining the city and town categories. Furthermore, the study will examine the confidence intervals of MICS indicators to ascertain if they fall within the expected ranges when compared with the traditional urban/rural classification. The aim is to investigate the potential benefits and implications of integrating the DEBURGA classification into household survey sample frames as complements but not a replacement of national definition. This study would allow to make international comparisons among countries with standard urban/rural definition. Through the research process, an understanding of the importance of accurately capturing urban degree dynamics on a global scale will be sought.

Paper No. 269

Title **A novel method to monitor the performance of interviewers**

Author(s) Pierre Martel UNICEF MICS Consultant Lesotho

Abstract Along the years, MICS and other mainstream household survey programmes have developed approaches to monitor the quality of data while being collected in the field. These have mostly focused on pre-determined sets of key indicators. As the size and diversity of questionnaires have steadily increased in multi-topic surveys such as the MICS, a need has emerged to cast the net broader and to find a practical way to look at how interviewers perform on each and every question of such large questionnaires. We present a novel approach, developed in recent years and tested on numerous MICS surveys, to assess interviewers' performance on ALL survey questions while fieldwork is still in progress.

Paper No. 270

Title **Populating standard questionnaires and enabling design of manageable in the 7th round of MICS**

Author(s) Bo Robert Beshanski-Pedersen UNICEF MICS Consultant United Kingdom

Abstract Populating standard questionnaires and enabling design of manageable surveys in the 7th round of MICS

The growing demand for data puts pressure on household survey programmes and countries to deliver on higher precision, accuracy, speed, and frequency – on more diverse topics, leading to surveys that are bigger in every respect. The MICS Programme has developed an objective approach to determine what content to offer as part of its standard questionnaires and an objective measure of level of effort required to implement a topic successfully in a survey. The two measures are presented and discussed.