

The contribution of poor and rural populations to national trends in reproductive, maternal, newborn, and child health coverage: analyses of cross-sectional surveys from 64 countries



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Summary

Background Coverage levels for essential interventions aimed at reducing deaths of mothers and children are increasing steadily in most low-income and middle-income countries. We assessed how much poor and rural populations in these countries are benefiting from national-level progress.

Methods We analysed trends in a composite coverage indicator (CCI) based on eight reproductive, maternal, newborn, and child health interventions in 209 national surveys in 64 countries, from Jan 1, 1994, to Dec 31, 2014. Trends by wealth quintile and urban or rural residence were fitted with multilevel modelling. We used an approach akin to the calculation of population attributable risk to quantify the contribution of poor and rural populations to national trends.

Findings From 1994 to 2014, the CCI increased by 0·82 percent points a year across all countries; households in the two poorest quintiles had an increase of 0·99 percent points a year, which was faster than that for the three wealthiest quintiles (0·68 percent points). Gains among poor populations were faster in lower-middle-income and upper-middle-income countries than in low-income countries. Globally, national level increases in CCI were 17·5% faster than they would have been without the contribution of the two poorest quintiles. Coverage increased more rapidly annually in rural (0·93 percent points) than urban (0·52 percent points) areas.

Interpretation National coverage gains were accelerated by important increases among poor and rural mothers and children. Despite progress, important inequalities persist, and need to be addressed to achieve the Sustainable Development Goals.

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Introduction

Since 2000, coverage levels for several reproductive, maternal, newborn, and child health interventions increased in many low-income and middle-income countries.¹⁻³ However, there is growing recognition that national levels and trends could hide important inequalities that need to be tackled to achieve universal coverage.⁴⁻⁶ Whereas some countries managed to increase national-level coverage at the same time as reducing disparities among different socioeconomic groups, in other countries the magnitude of inequalities remained unchanged.^{1,4}

We present a comprehensive set of analyses on trends in the composite coverage index (CCI), which summarises eight interventions along the reproductive, maternal, newborn, and child health continuum of care. We focus on inequalities in terms of socioeconomic position and place of residence (urban or rural). Specifically, we estimate the proportion of the measured progress at national level that can be attributed to improvements among poor and rural inhabitants.

Methods

Data sources

We analysed nationally representative, cross-sectional surveys from low-income and middle-income countries. The International Center for Equity in Health's database includes 235 national surveys with reproductive, maternal, newborn, and child health indicators stratified by wealth quintile and place of residence (urban or rural). The datasets include the Demographic and Health Surveys (DHS),⁷ funded by the US Agency for International Development, and the UNICEF-supported Multiple Indicator Cluster Surveys (MICS). We used DHS data from 1994 onwards, and MICS data from 2005 onwards. These two survey programmes gather data regularly from national probability samples of households, women of reproductive age (generally aged 15-49 years), and children younger than 5 years. The random samples, generally in the thousands, are drawn with multistage cluster sampling (usually two-stage), with households drawn at the last stage. The questionnaires used in the two surveys are highly standardised.

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For the International Center for Equity in Health's database see <http://equidade.org>

For the Multiple Indicator Cluster Surveys see <http://mics.unicef.org/>

Research in context

Evidence before this study

We searched PubMed with the search terms “intervention coverage” and “developing country” for articles published in English between Jan 1, 2005, and July 31, 2016 (the date of our final search). We identified no multicountry studies in which trends for reproductive, maternal, newborn, or child health interventions were reported according to family socioeconomic position. Studies of trends in the general population, without stratification by socioeconomic position, showed that coverage increased slowly in most countries since 2000, although some interventions showed faster gains than others. An analysis of 35 countries with two or more national surveys up to 2010 showed that countries making faster progress in coverage did so by achieving steeper increases among poor people. No investigators attempted to quantify the contribution of rural and poor families to national coverage trends.

Added value of this study

By pooling trends for health-intervention coverage in 64 countries from 1994 to 2014, we estimated coverage gains for different subgroups of the population, including the poorest 20%, the poorest 40%, and rural populations. We also developed methods for quantification of the contribution of these subgroups to national trends. We showed that women and children living in rural areas and those from poor families showed faster progress than the rest of the population, and thus contributed to substantial accelerations of national trends.

Implications of all the available evidence

Investments in reaching the poorest and rural women and children, probably driven by the incorporation of equity concerns into national programmes, seem to have paid off in terms of reducing disparities and accelerating progress at country level.

We reviewed each survey dataset rigorously to ensure that indicator numerators and denominators, and missing values, complied with the Countdown to 2015 indicator definitions. 64 low-income and middle-income countries had available data for the period Jan 1, 1994, and Dec 31, 2014, from 209 national surveys for our temporal trend analyses (appendix pp 3–4). All analyses were based on publicly available data from national surveys. Ethical clearance was the responsibility of the institutions that administered the surveys.

Outcome variable

The CCI is a summary measure of intervention coverage along the reproductive, maternal, newborn, and child health continuum, which was developed by the Countdown to 2015 team.^{2,8,9} The CCI is calculated for groups of children and mothers—eg, those living in the rural area of a country, or those belonging to a specific wealth quintile. It is a weighted mean of the coverage for interventions from four domains: reproductive services (family planning coverage), maternal and newborn care (antenatal care and skilled birth attendant), immunisation (BCG; three doses of diphtheria, pertussis, and tetanus [DPT3]; and measles vaccines) and management of illness (oral rehydration therapy and care seeking for pneumonia). The four domains are equally weighted, and within each domain all indicators have the same weight, except for DPT3, which has a higher weight because three doses are needed.

The CCI is calculated by the following formula:

$$\text{(FPC + } \frac{\text{SBA + ANC1}}{2} + \frac{2 \times \text{DPT3} + \text{BCG + MSL}}{4} + \frac{\text{ORT + CAREP}}{2} \text{)}$$

FPC stands for family planning coverage (also referred to as demand for family planning satisfied), SBA for skilled birth attendant, ANC1 for at least one antenatal care visit with a skilled provider, MSL for measles vaccine, ORT for oral rehydration therapy for children with diarrhoea, and CAREP for care seeking for pneumonia. Because information on care seeking for pneumonia was not collected by surveyors until the mid-1990s, the CCI time series starts in 1994.

The CCI was stratified by wealth quintiles and residence (urban vs rural). Wealth quintiles are derived from asset indices,^{10,11} which are based on household assets (eg, radio, television, refrigerator) and characteristics of the house (eg, building materials, toilet, electricity). These variables, which are included in surveys such as the DHS and MICS, are included in a principal components analysis, a data reduction technique that produces linear combinations of the variables—so-called components, with the first component usually explaining a high proportion of data variability.¹² This component, a continuous variable, is referred to as the wealth score. Principal component analyses are run separately for urban and rural households, and then the resulting indices are scaled so that a given score on each index means the same level of wealth.¹³ This approach is used for both the DHS and MICS.

Households are then broken into five quintiles according to the wealth score, with the lowest quintile representing the poorest 20%, and the highest quintile the richest 20%. Children are then classified into these quintiles on the basis of the wealth status of the household to which they belong. Because fertility is usually higher in the poorest households, the actual number of children for analyses tends to be higher in the poorer than in the richer quintiles. In DHS datasets, typically about 25% of the children belong to the lowest quintile and 15% to the highest (appendix p 5).

For the Countdown to 2015 indicator definitions see <http://www.countdown2015mnch.org>

See Online for appendix

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