Health inequities

in the South-East Asia Region: selected country case studies

World Health Organization
Regional Office for South-East Asia

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The International Health Policy Programme (IHPP), Thailand; the Institute of Health Policy (IHP), Sri Lanka and Health Research Associates (HRA), Sri Lanka conducted health equity analyses in Bangladesh, India, Indonesia, Nepal and Sri Lanka using the Demographic Household Survey data. The first report on regional health inequities was compiled by the Institute of Health Policy (IHP), Sri Lanka. Technical support for the final report was provided by ETH, WHO/HQ.

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Executive summary

People who are economically or socially disadvantaged suffer from worse health, on average, than their better-off counterparts. There is no great mystery as to why this happens. Poor people, especially in low-income countries, encounter high rates of illness, particularly infectious disease and malnutrition, because of lack of food, unclean water, low levels of sanitation and shelter, failure to deal with the environments that lead to high exposure to infectious agents and lack of appropriate medical care. An increasing share of the burden of noncommunicable diseases among the poor is an emerging concern.

The South-East Asia (SEA) Region consists of a number of countries who are not only poor but also shoulder a significant proportion of the global disease burden. For instance, countries in this Region account for two-thirds of the global burden of child malnutrition, and next to sub-Saharan Africa account for the highest number of maternal deaths. Additionally, it is the poor, the less educated and people living in rural areas within these countries who mostly suffer the brunt of this burden. Not only is this an issue of social justice, but countries in which high health inequities exist lose the opportunity to benefit from the skills, ideas and productive capacity of large sections of their populations.

This raises the question of what action can be taken at different levels –individual, community, government – to tackle these inequities. Operationally, the important question would be how and through what mechanisms can government, as a whole, and civil society work together to reduce health inequities. The Commission on Social Determinants of Health (CSDH) was established with a mandate to provide recommendations on strategies to tackle these inequities. Its final report is due in 2008.

The report will focus on the available evidence on inequities in health and inequalities in socioeconomic determinants that exist both within and across countries in the Region. Data from seven countries have been analysed – Bangladesh, India, Indonesia, Maldives, Nepal, Sri Lanka and Thailand.

The analysis reveals a strong association between a variety of social and economic inequalities and health inequities. It also shows how health inequities relate not only to immediate material or psychosocial circumstances of the individual, but also to structural factors, including a government's social welfare policies, quality of governance, and other issues like the power and prestige an individual possesses within society.

Three basic questions are addressed in this report:

1. What is the extent of health inequities within and across countries in the SEA Region?

A child born in Nepal is twelve times more likely not to live till his or her fifth birthday compared to a child born in Thailand. Within India, children born in the poorest 20% households are more than three times as likely to die before their fifth birthday compared to children in the richest 20% of households.

Within countries health inequities are dramatic, except in Sri Lanka and Thailand, even though in all countries economic growth has been generally strong and improvements in overall levels of health are visible. Maternal and child health are still major concerns. For example, skilled birth attendance, an important determinant of maternal mortality, is less than 5% among the poorest 40% of women in both Bangladesh (2004) and Nepal (2001).

Although the health status of poorer populations has improved in all countries, the gap between the poor and the rest of the population is getting wider. In Bangladesh, for example, the national average for the under-five mortality rate has dropped by 31% between 1997-2004, but among the poorest 20% population, it fell by only 14% in the same time period.

2. What are the major factors contributing to health inequities across socioeconomic groups within countries?

Two variables were considered for in-depth analysis: skilled birth attendance and child malnutrition. The contribution of underlying factors to inequities in these variables was analysed for four countries.

Four broad domains were identified based on the CSDH framework: socioeconomic and political context, socioeconomic position, intermediary determinants and health systems factors. Socioeconomic position was measured by wealth, education and occupation. Intermediary determinants included living and working conditions and behavioural and biological factors. Access to and quality of health services were included as health systems factors.

Results of the analysis indicate that inequities in health systems factors contribute to 19-25% of inequities in skilled birth attendance, while more than 50% of such inequities are accounted for by the socioeconomic position of women. Intermediary determinants contribute to only 6-10% of inequities in skilled birth attendance. Women face barriers mostly due to socio-cultural and political reasons. This factor therefore makes MDG No. 3 on gender equality and women empowerment important.

The story was slightly different for inequities in child malnutrition. Although socioeconomic position once again was the most significant contributor (36-68%), health systems factors contributed only marginally to such inequities (4-15%). Intermediary determinants, meanwhile, accounted for 30-40% of the observed inequities.

3. What are the major policy implications or actions that countries should consider given the results of the analysis?

Four main areas of action are identified. First, the contribution of factors outside the health sector to health inequities is clear. From the perspective of the ministries of health, this reinforces the need for effective intersectoral action if all sources of health inequities are to be tackled. This will involve engaging other parts of the government, including government at different levels (e.g. provincial, local), as well as civil society.

Second, the countries in the Region that have been successful in eliminating health inequities have almost universal coverage of basic health services. For example, skilled birth attendance coverage in both Sri Lanka and Thailand is above 95% and even the poorest populations have more than 90% coverage. However, in order to have universal access, gender equality and health-related human rights for all, gender sensitization and awareness, are needed (WHA resolution 60.25 and Global Health Agenda No. 3 2006-2011).

Third, the results reveal that poverty and food security are the most critical issues to address if child malnutrition is to be reduced. Recent debate in the Region has focused on the importance of feeding practices, which is partly correct, but household poverty appears to be more significant in determining the nutrition status of a child.

Fourth, much can be learned by increasing opportunities for exchange of information between countries. Sri Lanka and Thailand, and of late Maldives, have been successful in addressing a number of critical issues, especially with respect to maternal and child health. Bangladesh, India and other countries also have success stories to share about ways of improving health equity. Information exchange and dialogue would vastly improve the knowledge base available to policy-makers in the SEA countries given their similarities.

This report's analysis and recommendations have already been presented and discussed at the "Regional Consultation on Social Determinants of Health in South-East Asia" in Colombo, Sri Lanka, in October 2007. Policy-makers, ministry officials, academics and civil society representatives were present from nine of the 11 Member countries[1] of the South-East Asian Region. Participants at the consultation, among other things, expressed enthusiasm for:

(1) Increasing the visibility of health inequities by regularly monitoring health indicators by equity stratifiers, and by conducting health equity analysis.

(2) Building institutional mechanisms and frameworks for intersectoral action for health to tackle health inequities.

(3) Enhancing social participation by engaging civil society and documenting the knowledge from their experiences.

[1] The nine countries represented in this meeting were Bangladesh, Bhutan, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka and Thailand. Representatives from DPR Korea and Timor-Leste, the other two WHO-SEA countries, were not present.

Chapter 1

Introduction

Health inequities are found in all countries. The magnitude of these inequities, however, varies significantly between countries. South-East Asia is characterized by substantial health inequities both across and within countries. The Region also lags behind most other regions in its overall health attainments.

Reducing health inequities matters for various critical reasons. First, health equity is a central dimension of overall equity and justice. It conditions the capabilities of individuals and groups to participate in and benefit from social and economic development. Second, good health is instrumental to enable people to participate in society, with potentially positive consequences for economic performance. Health inequities most adversely impact vulnerable and impoverished populations, thereby further reducing their freedom to lead lives they have reason to value and their ability to contribute to social and economic development.

If health inequities are to be reduced systematically, then governments and policy-makers will find it useful to understand better what drives these inequities. It is also necessary to understand how important health sector interventions are, and also to be aware if interventions outside the health sector are necessary to reduce health inequities. The purpose of this report is to begin to do this, by examining some of these inequities and their determinants.

Subsequent sections of this report will clarify the concepts and methods used to develop the final messages, describe the magnitude and trends of health inequities in South-East Asian countries, identify the extent of contribution of determinants to health inequities and develop key messages based on the results of the analysis. Although the report briefly discusses the main policy implications from the results, it does not discuss the mechanisms or provide any tools for operationalizing the recommendations. This subsequent work is beyond the scope of this report but is being addressed by the Commission on Social Determinants of Health.

Country indicators and analyses are presented from most recent household survey data publicly available at the time the analysis was undertaken.

1.1 Objectives

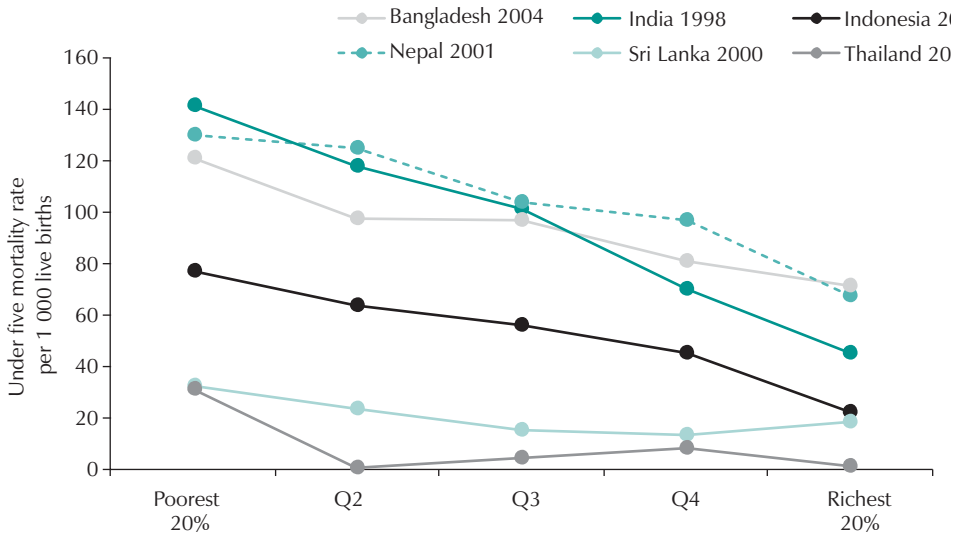
There are multiple approaches to understanding the magnitude of health inequities and what contributes to them. This report will primarily focus on analysing available quantitative data and applying new statistical methods to determine the magnitude of health inequities in South-East Asia, as well as unpacking the contribution of factors to such inequities. The latter will, in principle, assist policy-makers in identifying priority areas for action with respect to reducing health inequities.

1.1.1 Describing the magnitude of health inequities

National averages often mask substantially worse outcomes for many disadvantaged groups within the population. In Figure 1, we can see vast differences in the risk of mortality for children under five years between richer and poorer groups of population in each country. Patterns of inequities also differ across countries.

For example, the national average for under-five mortality rate in India for 1999 is 101 per 1 000 live births. However, children in the poorest 20% of households have a 40% higher risk of dying before their fifth birthday. They are also three times more likely to die before their fifth birthday than children in the richest 20% households. Similar inequities can be seen in other countries, though to a lesser extent in Sri Lanka and Thailand. These inequities can also be seen in other health indicators with differing magnitudes.

Fig. 1 Under five mortality rates per 1,000 live births across wealth quintiles in South-East Asian countries



Source: For all countries except Thailand, Demographic and Health Surveys (most recent data publicly available at time of analysis); Multiple Indicator Cluster Survey 2006, Thailand.

Therefore, in Section 3 of the report, we will focus on describing the extent of inequities that exist within countries across a number of health indicators, not only with respect to wealth or material status, but also considering differing levels of education, areas of residence and sex (where applicable).

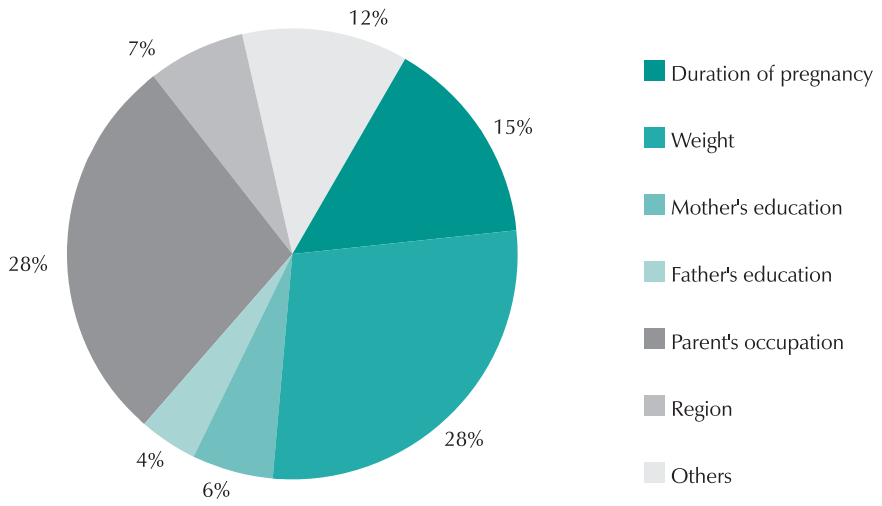
1.1.2 Identifying the determinants of health inequities

Evidence that has clear implications for policy and action makes a stronger statement to decision-makers than descriptive analyses. For instance, it may be useful to show that a particular district has higher rates of a disease, but when we can show who is affected, why, and what could be changed, the argument for action is strengthened.

This can often be accomplished through simple analyses using existing information and disaggregating them by socioeconomic groups. Decomposition analysis, for instance, demonstrates pathways of health determinants, showing the importance of non-health sectors in both generating and addressing health concerns. Decomposition analyses often suggest that collaborative, intersectoral strategies are needed.

In fact, strategies or policies designed to address the overall health status of a population may or may not adequately address health inequities. A recent analysis from Chile emphasizes this point. Figure 2 shows the contribution of various determinants of health to Chile's national (averaged) under-five mortality rate, and reveals that behavioural and biological factors (such as weight) account for the largest share of the country's under-five mortality.

Fig. 2 Contribution of factors to under-five mortality average in Chile, 2006

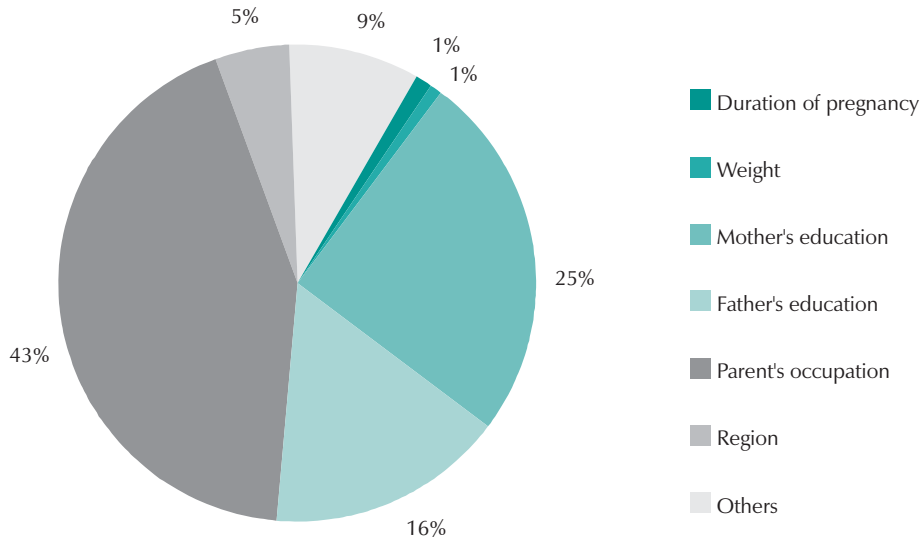


Source: CASEN 2006, Chile

However, Figure 3 indicates that factors related to socioeconomic position [such as mother's education (25%) and parents' occupation (43%)] contribute by far the most to the inequities in under-five mortality.

This implies that actions and interventions designed to impact health status may not necessarily alleviate health inequities. It is important to recognize that determinants of health can differ from the determinants of health inequity, with corresponding implications for related actions.

Fig. 3 Contribution of factors to under-five mortality inequities in Chile, 2006



Source: CASEN 2006, Chile

1.2 Country context

Of 177 countries ranked on the basis of their level of development in the Human Development Report 2006, the seven countries included in the analysis are categorized within 'medium human development'. The Human Development Index (HDI)[2] ranks range from 74 for Thailand to 138 for Nepal (Table 1). The two countries with the highest GDP per capita in this list – Sri Lanka and Thailand – also have considerably better indicators in terms of female literacy (89% and 91% respectively), low poverty rates (6%, 2%) and higher life expectancy at birth in years (75, 71).

At the other end, Nepal, with the lowest GDP per capita, has the highest income inequality as measured by the Gini index (47) and lowest female literacy (35%). Bangladesh, the second poorest country, has the highest poverty rate (41%) and lowest life expectancy (62 years), though income inequality in Bangladesh is the lowest among the countries with available data.

However, all the countries in the Region have experienced positive per capita income growth between 2000-2006, on average. GDP per capita growth in India (5.4%) has been highest, on average, for the period under consideration while Nepal's income growth has been slowest at just about 1% on average.

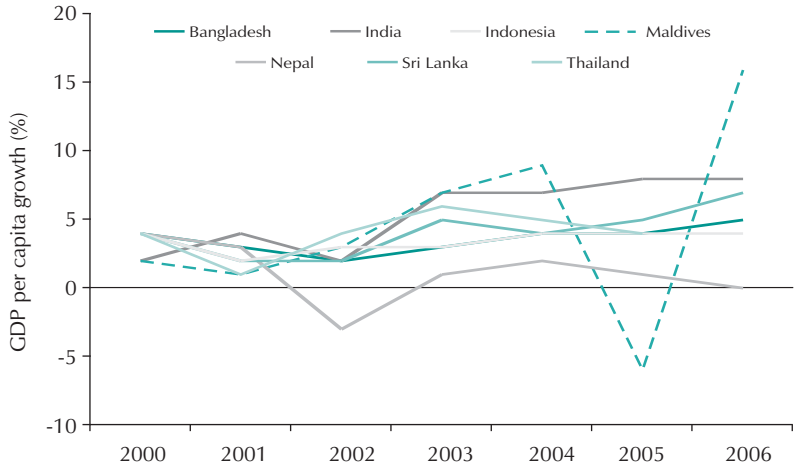
It is worth noting that Maldives' per capita income grew by 16% in 2006 although the previous year registered a negative growth of -6%. Maldives' economy is highly dependent on tourism, revenues from which are vulnerable to both natural disasters and other adverse events. For instance, the December 2004 tsunami in the Indian Ocean which also affected Maldives could have impacted economic growth the next year (2005). Also, political turmoil in Nepal may have resulted in lower growth rates than could be truly achievable. All other countries appear to have steadily growing economies in recent years.

[2] The Human Development Index (HDI) combines aspects of income, health and education to construct an index for each country. For details on HDI refer to the UNDP *Human Development Reports*.

Table 1: Socioeconomic context indicators for SEA Region countries included in this report								
	HDI rank, 2006*	GDP per capita, PPP (Int $)	Gini index	Average GDP per capita growth (2000-2006)	Life expectancy at birth in years	Poverty headcount ratio at $1 a day PPP (% of population)	Unemployment, total (% of labour force)	Adult female literacy rate (% of females age 15 and above)
Bangladesh	137	2 217	33	3.6	62	41	4	41
India	126	3 827		5.4	63	34	5	48
Indonesia	108	4 130	34	3.4	66	8	10	87
Maldives	98			4.6	68		2	96
Nepal	138	1 596	47	1.1	63	24	9	35
Sri Lanka	93	5 081	40	4.1	75	6	8	89
Thailand	74	9 331	42	4.0	71	2	2	91

Source: World Development Indicators 2000-2006, most recent data available, World Bank; blank cells represent unavailable data
***Source:** *Human Development Report 2006*, UNDP

Fig. 4 Trends in GDP per capita growth rates (%), 2000-2006



Source: World Development Indicators 2000-2006

1.3 Health situation in countries

With the exception of Sri Lanka and Thailand, the rest of the countries have poor health outcome indicators. Under-five mortality rates, for example, range between 9 per 1 000 live births for Thailand (2006) to 108 per 1 000 live births for Nepal (2001). Stunting (low height for age) prevalence rates among children under five years of age are some of the highest in the world with Nepal, India and Bangladesh having rates of 51%, 46% and 43%, respectively.

In terms of health systems coverage indicators, once again, the performance of Sri Lanka and Thailand is substantially better than other countries in the Region. For example, skilled birth attendance rates are 96% and 97% for Sri Lanka and Thailand, respectively, while skilled attendance during delivery is received by only 13% of women in both Bangladesh and Nepal. However, Bangladesh and Nepal have relatively higher rates for DPT3[3] vaccination coverage of 81% and 72%, respectively. Only Sri Lanka and Thailand have higher rates at 88% and 93%, respectively.

On a more encouraging note one can see from Table 2 that all countries, with trend data, seem to have improved their health indicator status over time. Bangladesh has reduced under-five mortality by 31% between 1997 and 2004, while Indonesia has reduced the same by 25% between 1997 and 2003. Nepal has increased DPT3 coverage rates by 18% between 1996 and 2001, although Indonesia has actually seen a drop of 6% in DPT3 coverage between 1997 and 2003.

In terms of health determinants, the proportion of people with access to safe drinking water sources ranges from 59% in Indonesia to 97% in Bangladesh. Access to safe water sources has reduced in Indonesia from 73% to 59% between 1997 and 2003. On the other hand a much smaller proportion of people have access to safe sanitation. Exposure to safe sanitation ranges from as low as 30% in Nepal to only up to 59% in Bangladesh. Data was not available on these indicators for Sri Lanka and Thailand.

[3] DPT3 vaccination refers to 3 doses of the vaccination against diptheria, pertussis and tetanus.

Table 2: Selected health outcomes, health systems and health determinant indicators for SEAR countries

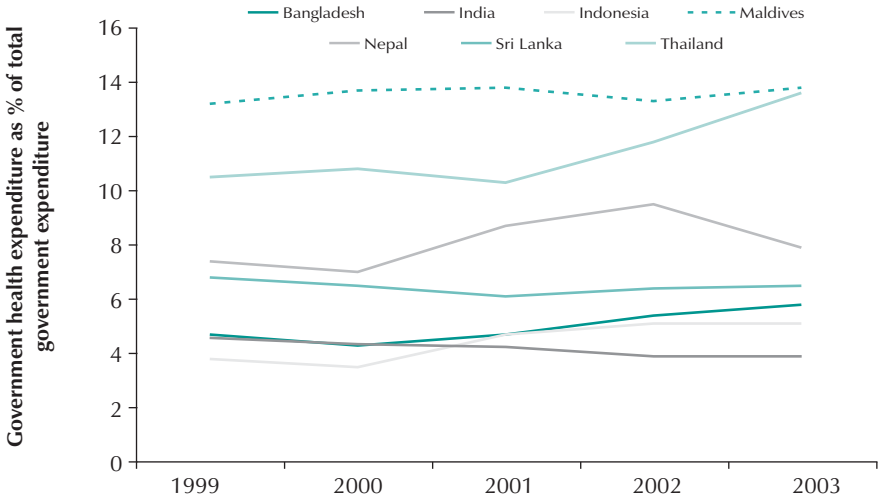
INDICATORS	SOUTH-EAST ASIA REGION COUNTRIES											
	BANGLADESH			INDIA	INDONESIA		MALDIVES	NEPAL		SRI LANKA		THAILAND
Health outcomes	2004	2000	1997	1999	2003	1997	2004	2001	1996	2000	1993	2006
Infant mortality rate per 1,000 live births	65	80	90	73	42	52		77	93	19	25	
Under-five mortality rate per 1,000 live births	88	110	128	101	53	71		108	139	21	32	9
Prevalence of stunting in children under five years (%)	43	45	55	46			22	51	48	14	24	12
Prevalence of underweight women (%)	34	45	52	36				27	28	22		
Prevalence of overweight women (%)	9			11				7		24		
Health systems												
Coverage of DPT3 vaccination (%)	81	72	69	55	58	64		72	54	88	87	93
Coverage of skilled birth attendance (%)	13	12	8	42	66	43	84	13	10	96	94	97
Current use of modern contraception (%)	47	43	42	43	57	55	34	35	26	50	44	73
Health determinants												
Exposure to safe water (%)	97	96	95	80	59	73		77	71			
Exposure to safe sanitation (%)	59	54	43	33	54	50		30	16			

Source: Demographic and Health Surveys (Bangladesh, India, Indonesia, Nepal, Sri Lanka); Multiple Indicator Cluster Survey (Thailand); Maldives Reproductive Health Survey (Maldives)

The data source for all countries except Maldives and Thailand are the Demographic and Health Surveys for the respective years. The Poverty and Vulnerability Assessment Survey 2004 was used for Maldives, while for Thailand, the data source was the Multiple Indicator Cluster Survey 2006.

From the most recent trend data available on health expenditure it can be seen that countries in the Region have accorded different levels of importance to health. Maldives has a steady level of government expenditure on health at 13%-14% (as a percentage of total government expenditure) while Thailand has, between 2001-2003, increased the proportion of health spending from 10% to 13%. Though there are other countries such as Nepal and India who have witnessed a slight drop in health expenditure (as a percentage of total government spending). In 2003, of the countries shown here, India had the lowest percentage share of health spending as a percentage of total government spending (3.9%).

Fig. 5 Trends in government expenditure on health as percentage of total government expenditure, 1999-2003



Source: World Health Report 2006, Statistical Annex

Chapter 2

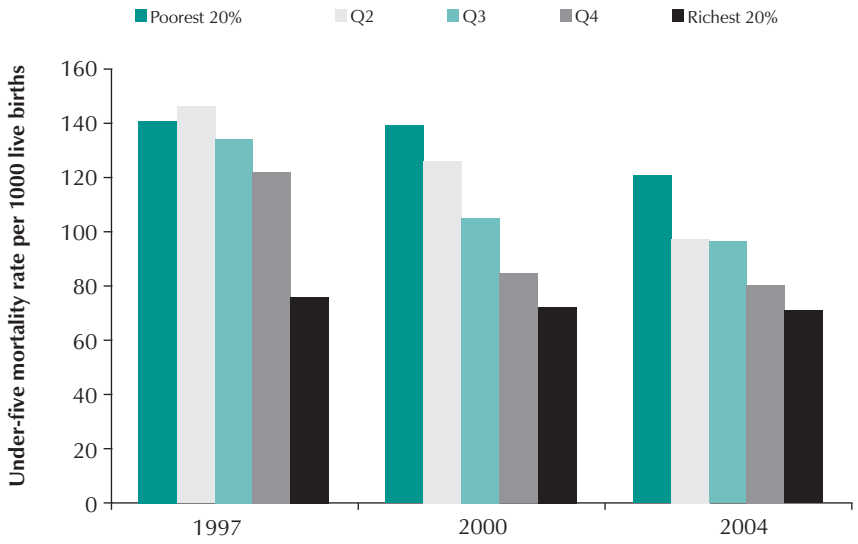
Health inequities: concepts and measurement

2.1 Health inequities, inequalities and social justice

There are dramatic differences in health attainment across population groups within countries. These differences occur because of several social stratification factors including socioeconomic, political, and cultural. Such inequalities are seen in both rich and poorer countries.

In general, evidence shows that the lower an individual's socioeconomic position the worse their health. There is a social gradient in health that runs from top to bottom of the socioeconomic spectrum. Figure 6 illustrates this point for trends in under-five mortality across wealth quintiles for Bangladesh. The figure shows that poorer groups have higher mortality rates for children under five across all three time periods, although, patterns of inequalities have changed over time.

Fig. 6 Trends in under-five mortality rates for Bangladesh across wealth quintiles



Source: Demographic and Health Surveys

Health inequities are unjust, unfair and avoidable inequalities in health achievement. Not all inequalities can, therefore, be considered to be inequitable. This can be illustrated by the difference between men's and women's health. Women, in general, live longer than men. This could be a consequence of biological sex differences in which case this inequality may not be classified as an 'inequity'. Conversely, though, if women's life expectancy is lower than men's it is likely that adverse social conditions act to reduce the natural longevity advantage of women. Such a scenario would be considered a gross inequity.

To make a fundamental improvement in health equity, technical and medical solutions such as disease control and medical care are critical and necessary though not sufficient. Given that inequities in health arise due to differential distribution of economic and social resources in society, addressing the social and economic determinants of health will yield greater, and sustainable, returns to existing efforts to improve health.

A first step in this process would be to draw attention to health inequities in society.

2.2 Measurement of health inequities

For several decades, studies have consistently shown inequalities in health among socioeconomic groups and by gender, race or ethnicity, geographical area and other social categories. Because health inequities generally reflect imbalances in power and wealth in society, addressing them requires strategic action. Better information alone is not sufficient to resolve the problems; political will, continuous monitoring of inequities, as well as country-level capacity to use this information for effective planning are also required for progress towards health equity and movement towards social justice in health to take place.

To document the existence or magnitude of health inequities, data are required on:

(1) a measure of health; and

(2) a measure of social position or advantage (an "equity stratifier") that defines strata in a social hierarchy.

2.2.1 Health measures

Ideally, core health indicators should cover a range of categories, including health status, health care and other determinants, and the social and economic consequences of ill health. Useful health status indicators for equity analyses include mortality, morbidity, nutritional status, functional status/disability, and suffering/quality of life.

Health care indicators include access to and utilization of public health care facilities and preventive and curative services, as well as quality of services, allocation of financial and human resources, and household financing and insurance. Access to safe water and sanitation traditionally falls within the public health realm in developed countries and is increasingly recognized as a core public health service in low- and middle-income countries.

Finally, acute and chronic ill health have different social and economic consequences for different social strata, e.g. catastrophic illness can cause or exacerbate household poverty among disadvantaged groups where there is no social protection.

2.2.2 Equity stratifiers

In most parts of the world, social advantage varies by four general equity stratifiers — socioeconomic status, gender, ethnicity and geographical area. These stratifiers interact in complex ways, and subgroups defined by several characteristics of these equity stratifiers are at a particular disadvantage, e.g. poor women in a marginalized ethnic group.

Socioeconomic position can be reflected by economic resources, education, and/or occupation. Household wealth or assets is a particularly meaningful measure of economic resources because accumulated assets can be used (e.g. when income is temporarily low) to cover health care expenses and maintain a standard of living that promotes health. Schooling (educational attainment) and occupation are important indicators of social status in their own right, but should not be viewed as proxies for wealth or income. Sex or gender are meaningful equity stratifiers for many, but not all, health measures.

Discrimination against ethnic or racial groups can have serious health and social effects (4, 6). Indicators for characterizing ethnicity include self-identification, social perception of race or ethnicity, religion, language spoken at home, tribal affiliation, or status as an immigrant or native-born citizen.

Finally, groups can be advantaged according to the geographical area (e.g. urban versus rural, or better- and worse-off provinces or districts) where they live or work. Resources are often allocated on a geographical basis, reflecting both logistic issues such as distance, topography and transport as well as the tendency for political power to be concentrated in urban areas or particular regions. Comparing allocations of health measures across different provinces and districts is useful, and such comparisons are easily understood by non-specialists.

2.2.3 Measures of inequity / inequality

There are six commonly used measures for measuring health inequality. It is only when we add a value judgement to a measure of inequality that it can be considered to measure inequity. The six measures of health inequality include:

(1) The range

(2) Gini coefficient (and associated Lorenz curve)

(3) Index of dissimilarity

(4) Population attributable risk

(5) Slope and relative index of inequality

(6) Concentration index

Simple range measures including ratio and difference are the most frequently used in literature to describe inequalities between groups. These measures compare occurrence of a health measure like child mortality within each equity stratifier like between female and male, between the lowest and the highest socioeconomic groups, between urban and rural areas.

In contrast, there are measures that express the inequality in health across the full spectrum of a socioeconomic stratifier like income or education where there is a social hierarchy.

In general, simple measures are the most relevant to drive policy because they are readily accessible to policy makers. More complex measures are primarily used in research settings, to confirm conclusions about comparisons which are made based on simpler measures.

One of the most well known is concentration index which explains where and to what extent a health variable is concentrated among the socioeconomic distribution; in other words, it shows whether the health variable is concentrated among the poor or among the rich and what the degree of concentration is. Annex I (b) contains detailed notes on all health measures.

Chapter 3

Methods

This section briefly describes the specific methods used within this report to document health inequities and their contributing factors in seven South-East Asia countries using publicly available household surveys: Demographic and Health Surveys and Multiple Indicator Cluster Surveys. This section covers the conceptual framework used to guide and interpret the analysis, the data sources, the indicators and their definitions, and the analytical approach used to estimate descriptive statistics and the approach to decompose the factors contributing to health inequities.

3.1 Conceptual framework

The conceptual framework used largely synthesizes models proposed by Dahlegren, Whitehead, Diederichsen, Hallqvist, etc., and were proposed for use by the Commission on Social Determinants of Health. This conceptual model illustrates the pathways by which social determinants of health affect health outcomes, makes explicit the linkages among different types of health determinants, and makes visible the ways social determinants contribute to health inequities among groups in society, given the increasing evidence of significant social stratification in health status (Figure 4). This conceptual framework served as the departure point on how to "operationalize" or make concrete monitoring and assessment, with the initial purpose of describing levels and potentially linkages across components within national settings. The key components of the model are summarized here:

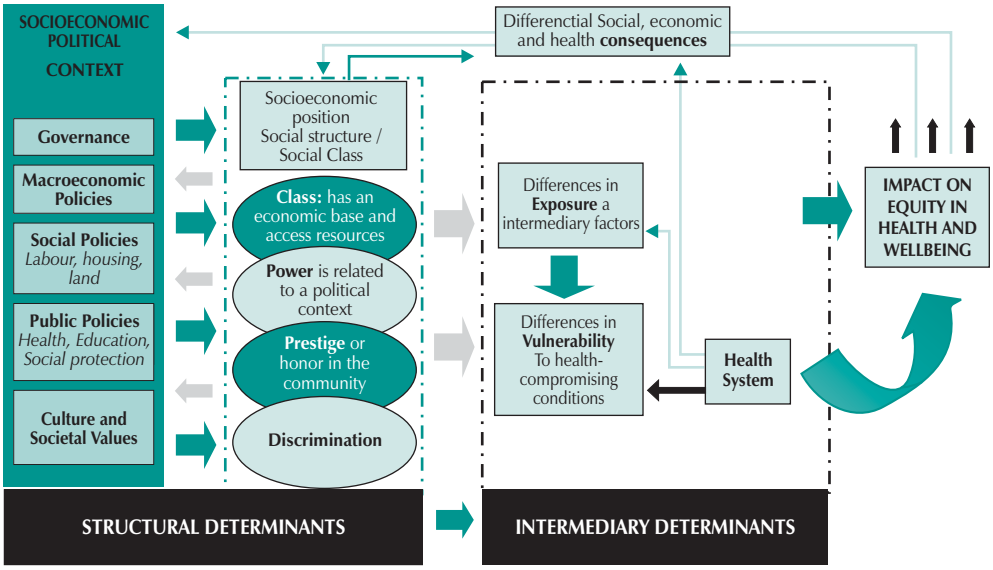
(1) *Socioeconomic-political context*: this encompasses a broad set of structural, cultural and functional aspects of a social system whose impact on individuals tends to elude quantification but which exerts a powerful formative influence on patterns of social stratification and thus on people's health opportunities

(2) *Socioeconomic position*: within each society, material and other resources are unequally distributed. This inequity can be portrayed as a system of social stratification or social hierarchy. People attain different positions in the social hierarchy according, mainly, to their social class, occupational status, educational achievement and income level. Their position in the social stratification system can be summarized as their socioeconomic position.

(3) *Intermediary determinants*: intermediary factors flow from the configuration of underlying social stratification and, in turn, determine differences in exposure and vulnerability to health-compromising conditions. The main categories of intermediary determinants of health are: material circumstances; psychosocial circumstances; behavioural and/or biological factors; and the health system itself as a social determinant.

This framework was utilized to develop the analysis of the pathways to health inequities and its determinants.

Fig. 7 Framework for identifying pathways leading to health inequities



Source: Irwin A., Solar O. "A Conceptual Framework for Action on the Social Determinants of Health" Discussion paper for the Commission on Social Determinants of Health

3.2 Data

Data from household surveys, in particular Demographic and Health Surveys (DHS), was used for analysis. The DHS collect data on relevant health and demographic outcomes, as well as data relevant for characterizing socioeconomic differences. The typical DHS samples adult women of reproductive age, and collects information on their household situation, their birth and reproductive history, and information about the health of their children.

In the case of Maldives, no recent suitable survey was available. The closest equivalent to a demographic and health survey was the Maldives Reproductive Health Survey 2004, which collected information on several health outcomes. Unfortunately, this survey did not include any questions on household socioeconomic characteristics, and therefore it was not suitable for analysis of health inequities. The other relevant survey for the purposes of this study was the Maldives Vulnerability and Poverty Assessment Survey 2004, which collected data on anthropometric indicators of children as well as general healthcare use. Although Maldives presents an important case within South-East Asia, since it has been the most successful of the SEAR countries in reducing child malnutrition as well as inequities in child malnutrition, it was not possible to analyse these patterns, as the relevant module from this survey was not obtainable.

In the case of India, the only dataset available for analysis was the 1999 National Family Health Survey. For Nepal, data from the 1996 and 2001 Demographic and Health Surveys was analyzed.

For India, a more recent version of the National Family Health Survey exists (2005-06), but the data was not publicly available at the time the analysis was undertaken. Data from the 2006 Nepal Demographic and Health Survey was also not publicly available at the time of analysis and, thus, has not been included.

Thailand does not conduct a demographic and health survey so the Multiple Indicator Cluster Survey 2006 was used instead since it contains variables similar to those in the DHS.

Countries that have demographic and health surveys collect similar information. However, some collect more data than others. For example, the number of factors used to determine the quality of antenatal care varies from one country to another. Hence, this particular variable may not be directly comparable across countries. In addition, there are some important data limitations that should be noted. First, the most recent Sri Lankan survey does not sample people from the North-East region which comprises two of the country's nine zones. Second, except for India, data on antenatal care are only collected for the mother's last birth whereas much of the other information on child health and maternal care is collected for all births within the last five years. This limitation reduced the sample size for the in-depth decomposition analysis of stunting and skilled birth attendance.

The household surveys analysed in the study are listed in Table 3.

Table 3: Surveys used as data sources in study

Country	Name of Survey	Year of Survey
Bangladesh	Bangladesh Demographic and Health Survey	1997-1998 1999-2000 2004
India	India National Family Health Survey	1999
Indonesia	Indonesia Demographic and Health Survey	1997 2003
Nepal	Nepal Family Health Survey	1996 2001
Sri Lanka	Sri Lanka Demographic and Health Survey	1993 2000
Thailand	Thailand Multiple Indicator Cluster Survey	2006

Note: Maldives was not included in the analysis of health inequities because the datasets provided were incomplete.

3.3 Indicators

Inequities in the following indicators were analyzed across all countries where data on the indicator was available.

Table 4: Definitions of indicators analyzed in the study

No.	Indicator	Definition
1	Infant mortality	Probability of dying before first birthday (1q0)
2	Under-five mortality	Probability of dying between birth and fifth birthday (5q0)
3	Stunting in children	Percentage of children with chronic malnutrition
4	Prevalence of women underweight	Percentage of women with BMI below 18.5
5	Prevalence of women overweight	Percentage of women with BMI above 25
6	Coverage of DPT3 vaccination	Percentage of children vaccinated with DPT vaccine
7	Coverage of skilled birth attendance	Percentage of births attended by skilled health personnel
8	Current use of modern contraception (all women)	Percentage of women currently using modern contraception
9	Current use of modern contraception (all women with expressed need)	Percentage of women currently using modern contraception
10	Exposure to safe water	Percentage of households with access to safe water
11	Exposure to safe sanitation	Percentage of households with access to improved sanitation

3.4 Analytical Approach

3.4.1 Descriptive

The rates or proportions of all indicators are reported for each country at national level and by the following equity stratifiers, wherever possible:

(a) household wealth (5 categories-quintiles),

(b) education (categorized according to country classifications),

(c) area of residence (urban/rural areas), and

(d) sex (male and female).

As a proxy for household wealth an index was constructed considering asset ownership and service (electricity, etc.) provision. This index, estimated using a non-parametric method can rank households accordingly, and, differences in its values may provide an indication of socioeconomic inequalities.

It should be noted that only point estimates for all indicators have been reported here, though, confidence intervals have been calculated for selected indicators and are available in tables for each country.

3.4.2 Time trends

The descriptive analysis was repeated for previous surveys in four of the countries to assess the change of inequalities in the indicators over the time.

3.4.3 Decomposition of socioeconomic inequality

For policy purposes it is especially relevant to understand why unfair and avoidable inequalities (inequities) exist and what actions may be taken to improve equity. Decomposition analysis is one approach used to quantify the contribution made by different factors to inequities in health. It takes into account the socioeconomic distribution of determinants of health and health indicators. Therefore, it allows to establish which health determinants contribute to greater inequity in health. In other words, this method enables us to quantify the pure contribution of each determinant of a health indicator - controlled for the other determinants - to inequity in that health indicator. Such analysis can serve as one input to aid in the development of evidence-based policies, relevant to a particular context or country, to reduce inequities.

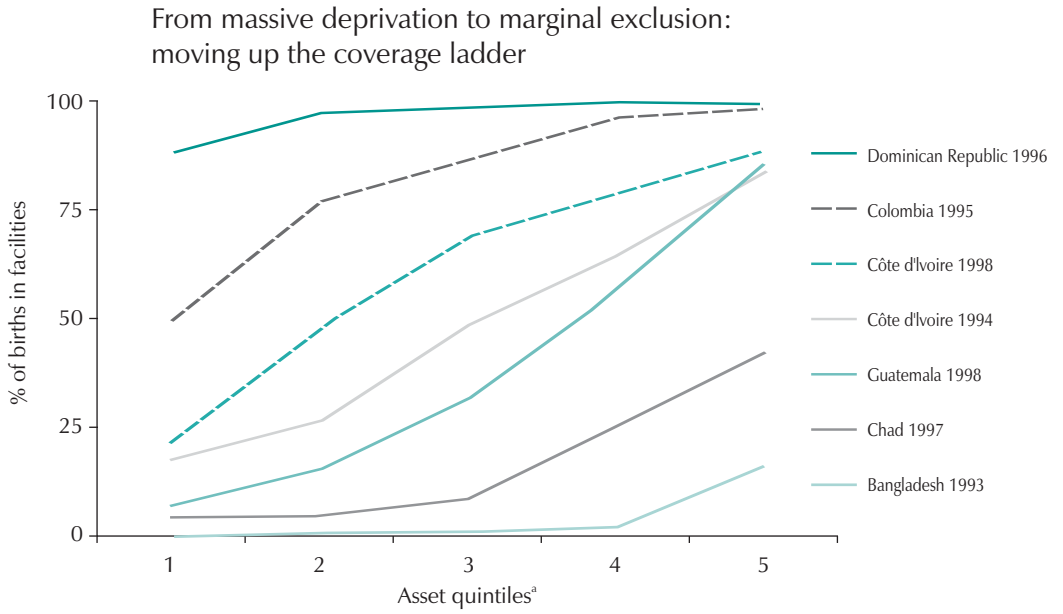
The contributions of determinants to socioeconomic inequality in “skilled birth attendance” (in four selected countries) and in “stunting in children” (in four countries) were determined using most recent household survey data. Relevant determinants were identified based on the conceptual framework described in section 3.1.

3.5 Interpretation approach

The extent of inequality varies both within countries and across countries. At one extreme are the poorest countries where large parts of the population are deprived of care, even among the better off: only a small minority enjoys reasonable access to a reasonable range of health benefits, creating a pattern of mass deprivation. At the other extreme are countries where a large part of the population enjoys a wide range of benefits but a minority is excluded: a pattern of marginal exclusion.

Looking at health care coverage by wealth group provides a crude illustration of these different patterns (see Figure 8). Between the extremes of mass deprivation (typical for countries with major constraints in supply of services and low-density health care networks) and marginal exclusion (typical for rich or middle-income countries with dense health care networks) are countries where poor populations have to queue behind the better off, waiting to get access to health services and hoping that benefits will eventually trickle down.

Fig. 8 Patterns of coverage across socioeconomic groups



Source: World Health Report 2005

Unless specific measures are taken to extend coverage and promote uptake in all population groups simultaneously, improvement of aggregate population coverage will go through a phase of increasing inequality. These complex dynamics also affect the distribution of health outcomes. For a long time policy-makers used aggregate health indicators to monitor health policies. As a result, national averages that show progress may conceal persisting or widening inequalities.

The manner in which systems based on primary health care develop will vary across these differing contexts. In the case of exclusion, programmes targeted at specific population groups, i.e. the poorest, are urgently needed to achieve pro-equity outcomes while in other instances, such as mass deprivation, broad strengthening of the whole system or a combination of the two approaches is required.

In this respect, the distribution of health outcomes and health opportunities across socioeconomic groups can provide a useful tool for health policy makers as it can easily be used to classify countries according to the above-mentioned patterns.

Chapter 4

Health inequities: magnitude and trends

Substantial health-related inequities exist both within and across countries in South-East Asia. For this study, selected health outcome indicators were analysed including infant mortality rate, under-five mortality rate, prevalence of stunting in children under five years of age, prevalence of underweight women and prevalence of overweight women. The health systems indicators studied were coverage of DPT3 vaccination, coverage of skilled birth attendance and current use of modern contraception. Differences in health outcomes and health systems indicators by urban/rural location, mother's educational attainment, household wealth and child's sex (where applicable) were analysed using data from the DHS and DHS-type surveys and reports.

4.1 Inequities in health outcomes within and across countries

4.1.1 Infant mortality

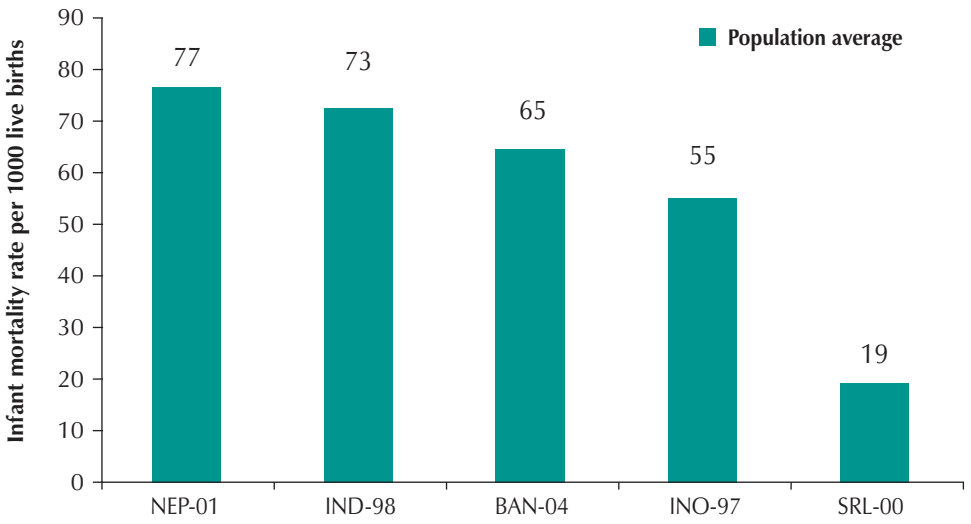
Reducing infant mortality is a key MDG. Infant mortality is defined as the probability of dying between birth and one year of age; the infant mortality rate is expressed as the number of infant deaths per 1,000 live births. In most of the studied countries, the infant mortality rate is estimated from the survey data for the five year period prior to the date of the relevant survey. Consequently, in countries with relatively good vital statistics (Maldives, Sri Lanka), the survey estimate may be lower than officially reported data.

In Bangladesh, Nepal and India, infant mortality rates exceed 65 deaths per 1,000 live births (Figure 9). However, the rate for Sri Lanka was significantly lower at 19 deaths per 1,000 live births, while the available data indicate that the infant mortality rate in Maldives is similar to that of Sri Lanka. In both Sri Lanka and Maldives there is greater access to maternal and child health services as evinced, for example, by their high rates of skilled birth attendance.

The difference in infant mortality rates between children in the poorest quintile and those in the richest quintile are large for Bangladesh and Nepal, but even more substantial for India and Indonesia (Figure 10). The gap in infant mortality between the rich and the poor has narrowed marginally for Bangladesh and Indonesia, but to a larger extent for Sri Lanka. It should be noted, though, that in both Bangladesh and Sri Lanka the richest quintile has experienced a slight

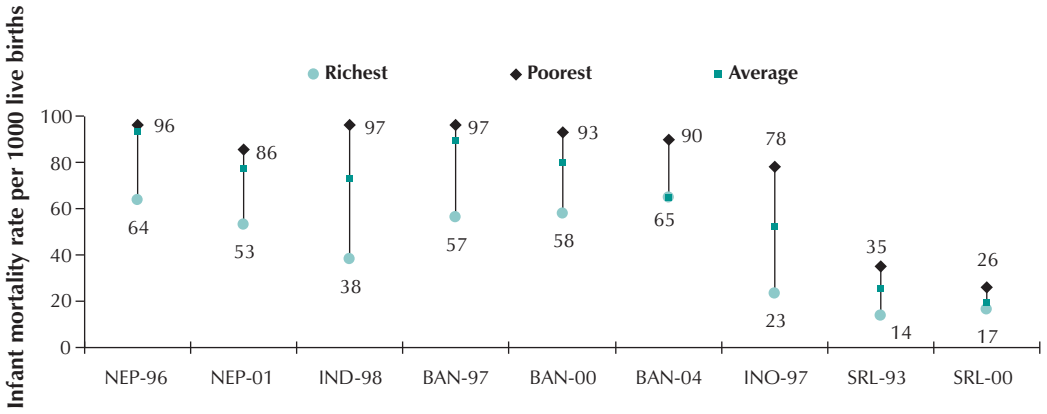
increase in infant mortality between the last two survey years. No assessment of inequities in infant mortality rates by income level could be made for Maldives and Thailand due to unavailability of appropriate data. Differences in infant mortality rates by educational attainment and by urban/rural residence are high in India, Indonesia and Nepal but not as large for Bangladesh (Figure SA 7 and Figure SA 8).

Fig. 9 Infant mortality rates in SEAR countries (most recent data available)



Source: Demographic and Health Surveys

Fig. 10 Inequities in infant mortality rates between the poorest and richest wealth quintiles by country and survey year



Source: Demographic and Health Surveys

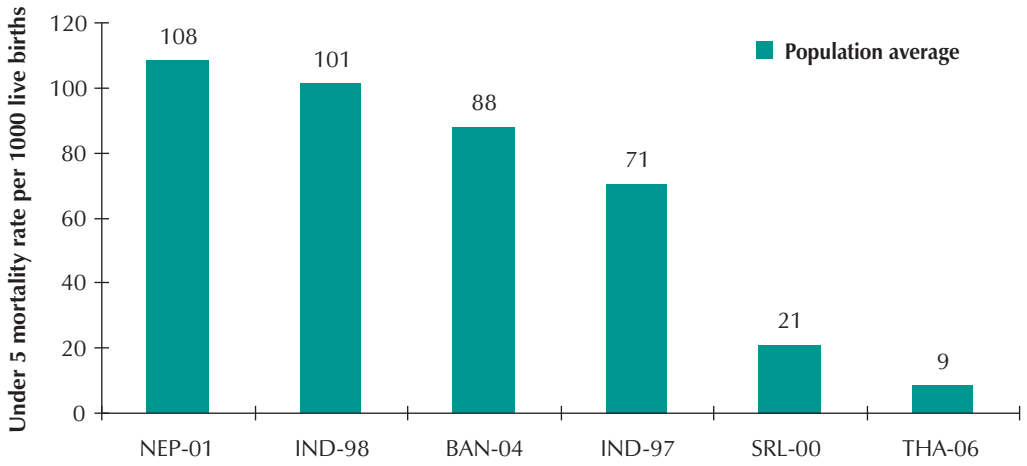
4.1.2 Under-five mortality

There is a wide range in under-five mortality rates across countries in South-East Asia, from less than 20 in Sri Lanka and Thailand to more than 100 in Nepal and India (Figure 11). Variations in under-five mortality rates are more likely to reflect differences in access to child health services than in the case for infant mortality. Infant mortality is also influenced by access to adequate maternal care.

In general, under-five mortality rates are two to three times higher in the poorest quintile than in the richest quintile in almost all the countries. Inequities are higher in countries where average under-five mortality rates are also higher (Figure 12). Inequities are greatest in India and Indonesia, where mortality in the poorest groups are more than three times than that in the richest group, while this ratio is less than two in Sri Lanka and Bangladesh.

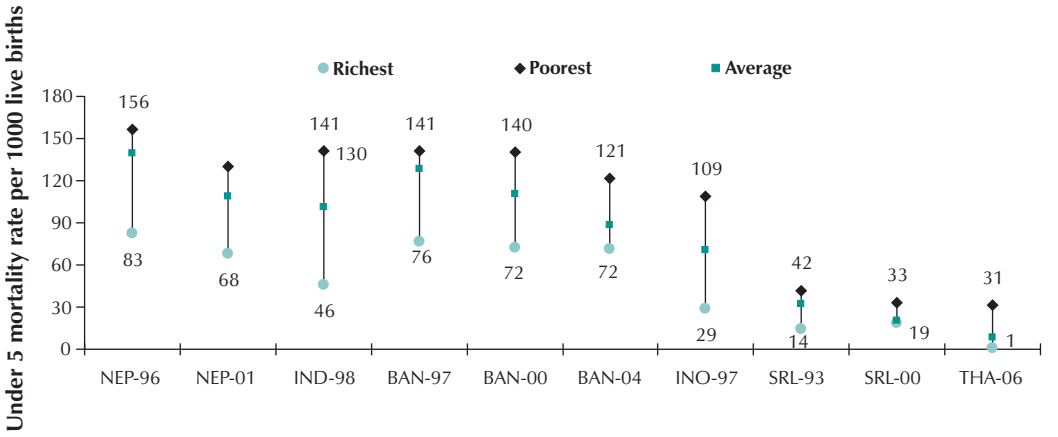
Similar patterns are observed when viewing differences in under-five mortality rates by education (Figure SA 9). In India, Indonesia and Nepal, rural children are much more likely to die before their fifth birthday than their urban counterparts (Figure SA 10).

Fig. 11 Under-five mortality rates in SEAR countries (most recent data available)



Source: Demographic and Health Surveys (Bangladesh, India, Indonesia, Nepal, Sri Lanka); Multiple Indicator Cluster Survey (Thailand)

Fig. 12 Inequities in under-five mortality rates between the poorest and richest wealth quintiles by country and survey year



Source: Demographic and Health Surveys (Bangladesh, India, Indonesia, Nepal, Sri Lanka); Multiple Indicator Cluster Survey (Thailand)

4.1.3 Prevalence of stunting in children under five

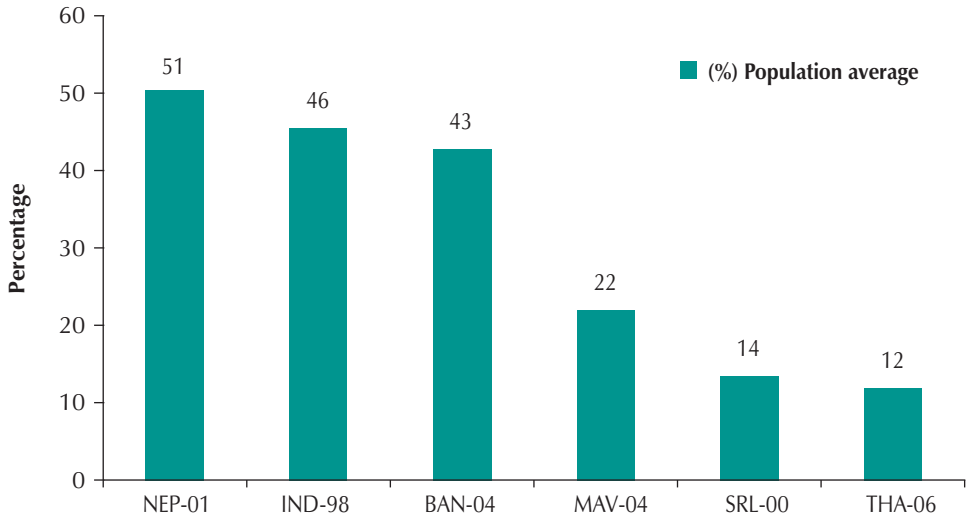
Stunting in children, defined by low height for age, is a marker of chronic under-nutrition, and its reduction is a key MDG objective. Some of the highest levels of stunting in the world are found in the South-East Asia Region, particularly in India, Bangladesh and Nepal.

Again, there is substantial variation in the Region in the levels of overall stunting, with countries falling into two groups: (1) where stunting is between 40%-50% such as in Bangladesh, Nepal and India, and (2) where stunting ranges between 10%-25% such as in Sri Lanka, Maldives and Thailand (Figure 13). In general, overall national stunting rates appear to be correlated to national income levels, with stunting being lowest in the richer countries of the Region.

Within countries, stunting varies considerably between the richest and poorest households, with stunting levels being on average twice as high in the poorest 20% compared to the richest 20% in Bangladesh, Nepal, India and Indonesia (Figure 14). However, the inequity between the poorest and richest quintiles is much greater in Sri Lanka and Thailand, where it is as much as three to six times. Children in India, Nepal and Thailand exhibit large differences in stunting by educational attainment of their mothers (Figure SA 11). Urban/rural differences are also apparent in India, Nepal and Sri Lanka (Figure SA 12).

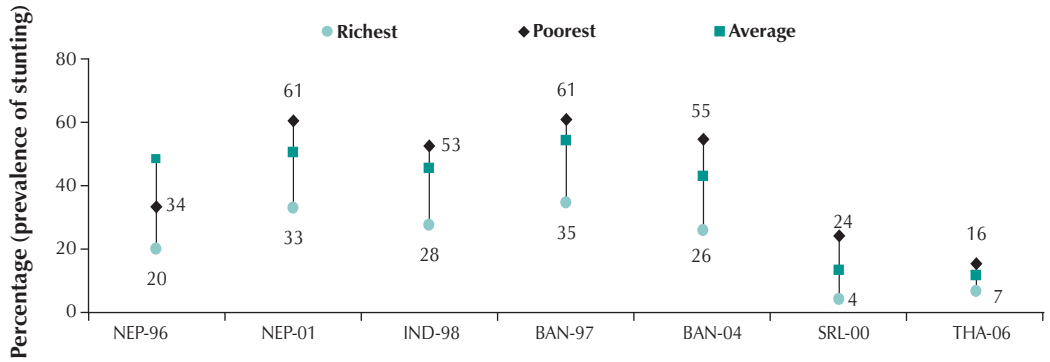
It is worth noting that, for Maldives, the most recent 2004 survey data indicate that not only has stunting decreased considerably, but there are also no major inequities by income level. The rapid improvement of stunting in children in Maldives in the past decade may be explained by rapid economic growth and low poverty levels (1.5% in 2004), which has provided an environment for improved food security. Maldives can, therefore, provide a successful example in the Region for reducing stunting as well as inequities in stunting.

Fig. 13 Prevalence of stunting in SEAR countries (most recent data available)



Source: Demographic and Health Surveys (Bangladesh, India, Indonesia, Nepal, Sri Lanka); Multiple Indicator Cluster Survey (Thailand)

Fig. 14 Inequities in prevalence of childhood stunting between the poorest and richest wealth quintiles by country and survey year



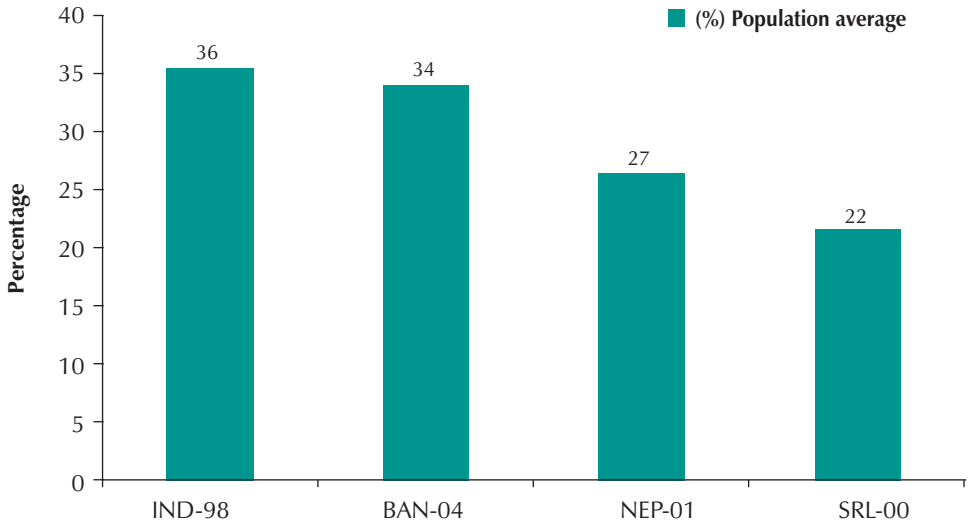
Source: Demographic and Health Surveys (Bangladesh, India, Indonesia, Nepal, Sri Lanka); Multiple Indicator Cluster Survey (Thailand)

4.1.4 Prevalence of underweight women

Inadequate food security manifests itself not only in child malnutrition, but also in maternal undernutrition and maternal underweight. Underweight mothers may suffer worse maternal health outcomes, as well as undernutrition in children. Prevalence of underweight women is high in South-East Asia, though there is a declining trend. For example, the prevalence of underweight mothers was over 50% in Bangladesh in 1997, but decreased to less than 40% in 2004.

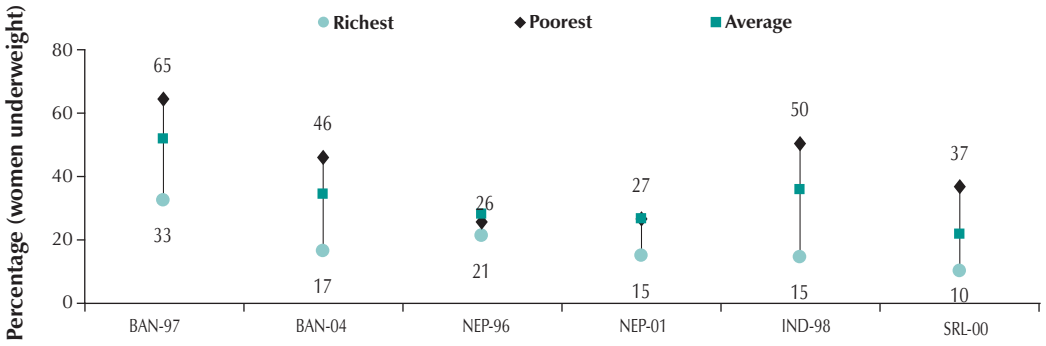
In most countries of the Region, levels remain between 20% to 40% (Figure 15). The differences in national levels closely mirrors those in child stunting rates, and overall rates are lowest in Sri Lanka (22%). Similarly, there is considerable inequity by wealth levels and education in all the countries (Figure 16 and Figure SA 13). The prevalence of underweight women is higher in poorer households than in richer households with poor women being two to three times more likely to be underweight than their wealthier counterparts. Similarly, women with no education are two to three times more likely to be underweight than those with more than a secondary education.

Fig. 15 Prevalence of women underweight in SEAR countries (most recent data available)



Source: Demographic and Health Surveys

Fig. 16 Inequities in prevalence of maternal underweight between the poorest and richest wealth quintiles by country and survey year



Source: Demographic and Health Surveys

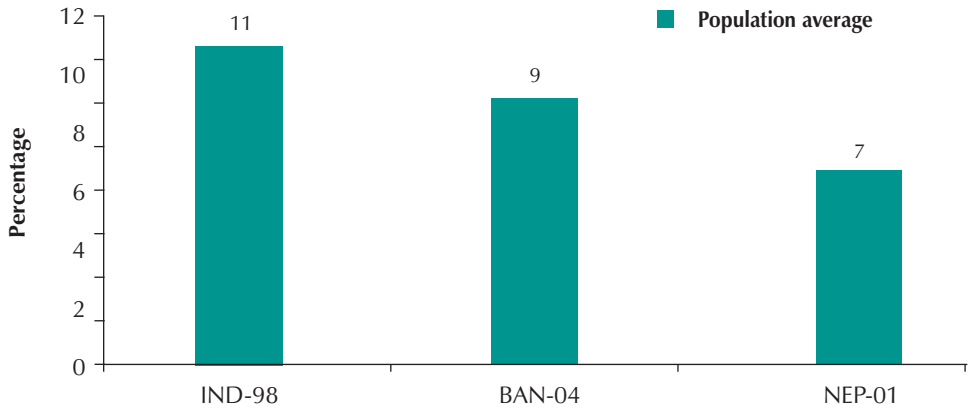
4.1.5 Prevalence of overweight women

As income levels and food security improve in the Region, obesity in adults and, specifically, in women is an emerging problem. Obesity is a significant risk factor for many types of noncommunicable disease, which now account for a growing share, and in some countries (Maldives, Sri Lanka, Thailand), the largest share of overall mortality.

The pattern of obesity in the Region is the opposite for that of underweight and stunting, with obesity levels increasing at higher national per capita GDP. Levels are highest in Sri Lanka and Thailand, and lowest in Nepal, Bangladesh and India (Figure 17). Similarly, inequities are in the opposite direction, with obesity being significantly higher in richer, more educated, urban households than in poorer, less educated, rural households in all the countries studied (Figure 18, Figure SA 15, Figure SA 16).

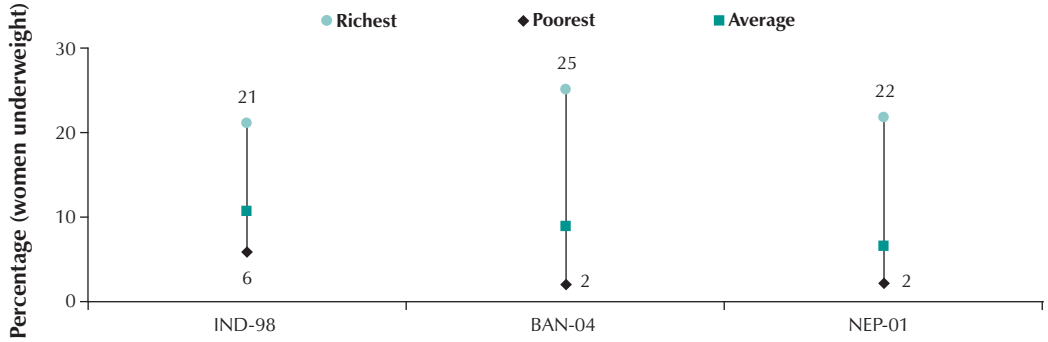
Interestingly, the inequities between the poorest and richest households are greater than for the previous two indicators discussed, with obesity concentrated in the richest quintile, typically being four to six times higher than in the poorest quintile. Inequities by education mirror those by income: obesity is concentrated among women with more than a secondary education.

Fig. 17 Prevalence of women overweight in SEAR countries (most recent data available)



Source: Demographic and Health Surveys

Fig. 18 Inequities in prevalence of maternal overweight between the poorest and richest wealth quintiles by country and survey year



Source: Demographic and Health Surveys

4.2 Inequities in health systems variables within and across countries

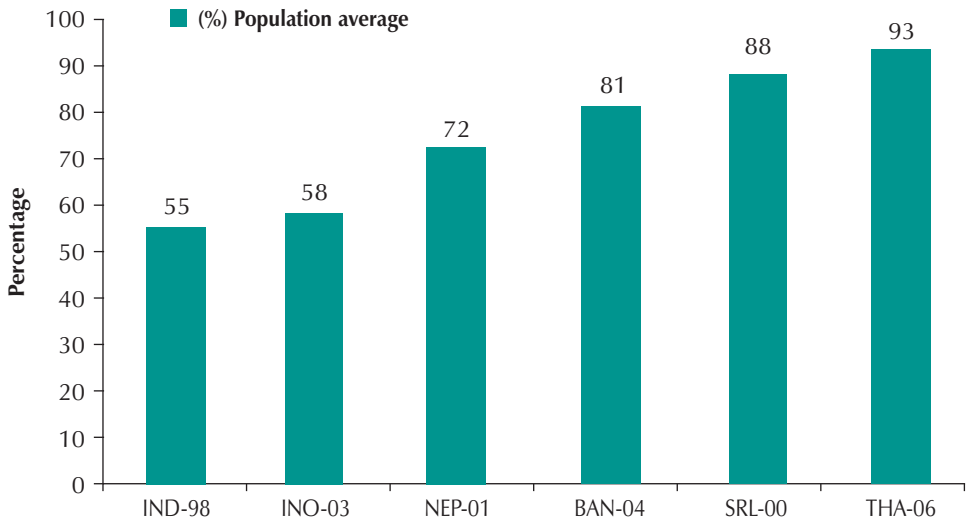
4.2.1 Coverage of DPT3 vaccination

The World Health Organization recommends that all children receive three doses of the DPT (Diphtheria, Pertussis and Tetanus) vaccine to obtain immunity against three of the six major preventable childhood diseases. These diseases can be substantially prevented and eventually eradicated through vaccination. In South-East Asia, coverage of the relevant populations by immunization is far from universal. DPT3 coverage rates range between 55%-94% among South-East Asian countries (Figure 19).

India has the lowest coverage rate while Sri Lanka and Thailand have the highest rates. In India, there is a large gap between the receipt of all three DPT doses among children in the poorest quintile (36%) and children in the least poor quintile (85%) (Figure 20). Significant differences across income groups are also seen in Indonesia, Bangladesh and Nepal although the gap between rich and poor has narrowed in the latter two countries between the 1990s and post-2000 (trend data was not available for Indonesia and India). On the other hand, coverage rates among the rich and poor in Sri Lanka and Thailand are similar, suggesting that attaining near universal coverage may be critical to reducing socioeconomic inequities in this indicator.

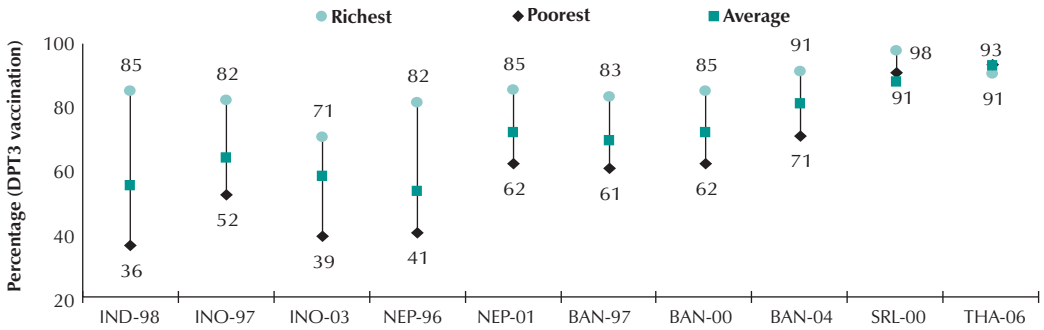
Differences are seen in DPT3 vaccination coverage by mother's educational attainment in countries with low coverage (Figure SA 1). In Bangladesh and Indonesia, the more education a mother has, the more likely her child is to be fully vaccinated. However, in India and Nepal, a large gap exists between children of mothers with no education and those with mothers with some education. Location in an urban area does not seem to have an impact on DPT3 vaccination coverage except in India (Figure SA 2).

Fig. 19 DPT3 coverage in SEAR countries (most recent data available)



Source: Demographic and Health Surveys (Bangladesh, India, Indonesia, Nepal, Sri Lanka); Multiple Indicator Cluster Survey (Thailand)

Fig. 20 Inequities in DPT3 vaccination between the poorest and richest wealth quintiles by country and survey year



Source: Demographic and Health Surveys (Bangladesh, India, Indonesia, Nepal, Sri Lanka); Multiple Indicator Cluster Survey (Thailand)

4.2.2 Coverage of skilled birth attendance

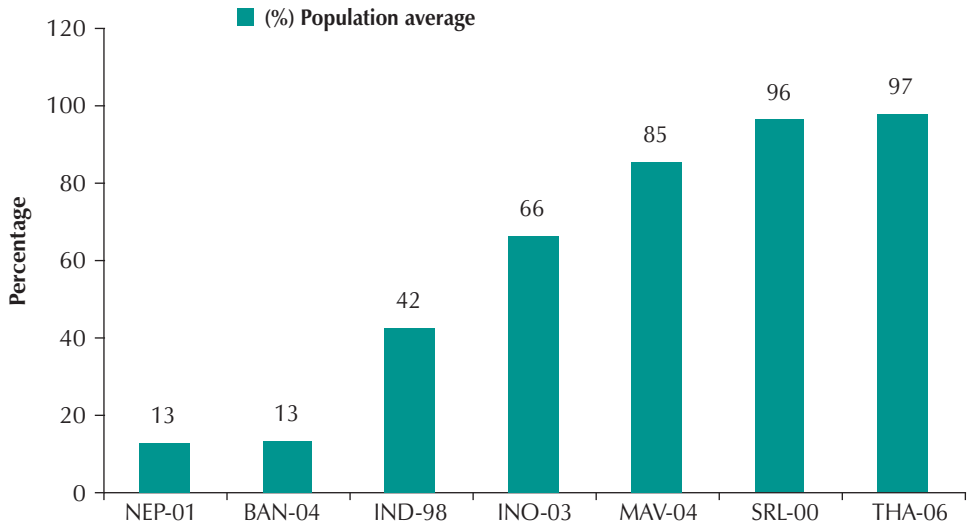
Having a skilled birth attendant present during the birth of a child improves the likelihood of a safe delivery. A skilled birth attendant is either a medical doctor, midwife or nurse who has been given appropriate training to care for mothers giving birth. The global experience and scientific evidence is very clear that skilled birth attendance and access to emergency obstetric care from adequately equipped hospitals are essential and critical to substantially reducing maternal mortality, which is one of the key health MDGs.

Unfortunately, skilled attendance at child birth is relatively uncommon in most countries of South-East Asia, except Sri Lanka, Maldives and Thailand, where skilled birth attendance is almost universal (Figure 21). This seems to be in part because a large percentage of the population in the other countries live in rural areas, where access to medically-trained individuals is in practice limited. This is the case in Nepal and Bangladesh, where only 13% of children were delivered with a skilled birth attendant present. Rural areas accounted for 84% and 74% of the total population in Nepal and Bangladesh, respectively, in 2006.

The gap in coverage of skilled birth attendance is high between the rich and poor, and has remained the same or increased between the 1990s and post-2000 (Figure 22). Urban/rural differences are particularly high (Figure SA 3). In India and Indonesia, coverage rates are higher: 42% and 66%, respectively. However, in India the richest 20% women are five times more likely to receive skilled attendance and, in Indonesia, they are four times more likely to do so than the poorest 20%.

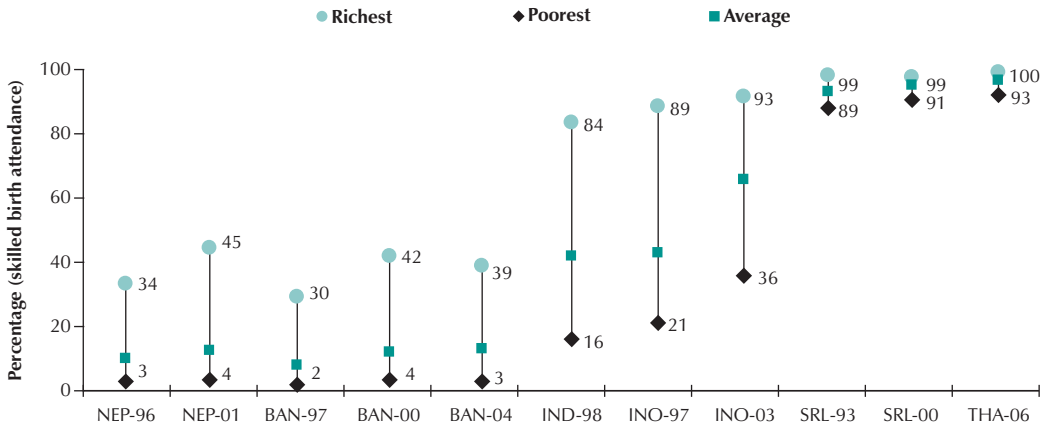
Similar patterns of coverage are seen with respect to educational attainment of the mother (Figure SA 4). Mothers with higher levels of education are more likely to have a skilled birth attendant present at their births than those with lower educational levels. In contrast, almost all babies in Sri Lanka (96%), Maldives (84%) and Thailand (97%) are born with a skilled birth attendant present (Figure 21). In these latter countries, coverage rates are high regardless of socioeconomic, educational and geographical differences.

Fig. 21 Skilled birth attendance coverage in SEAR countries (most recent data available)



Source: Demographic and Health Surveys (Bangladesh, India, Indonesia, Nepal, Sri Lanka); Multiple Indicator Cluster Survey (Thailand)

Fig. 22 Inequities in skilled birth attendance between the poorest and richest wealth quintiles by country and survey year



Source: Demographic and Health Surveys (Bangladesh, India, Indonesia, Nepal, Sri Lanka); Multiple Indicator Cluster Survey (Thailand)

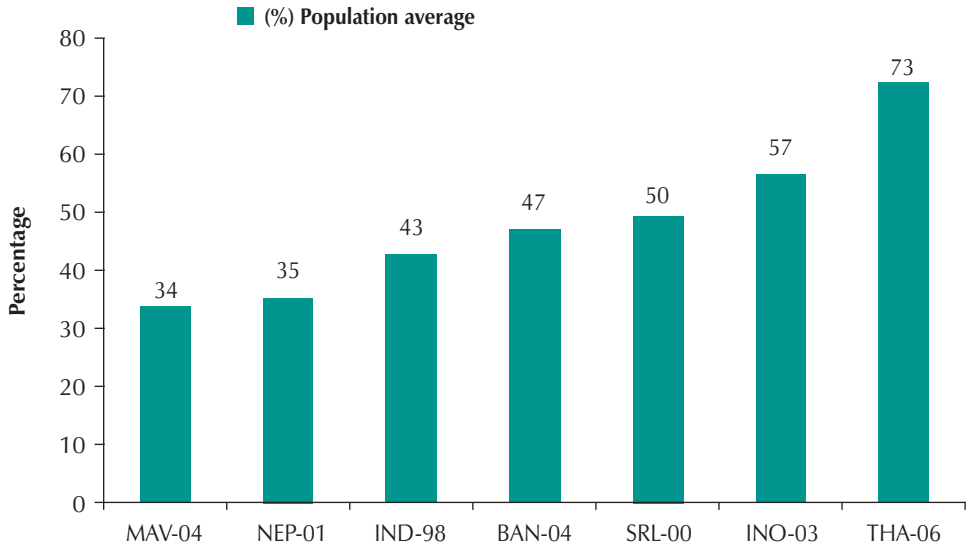
4.2.3 Use of modern contraception

No more than half of married women in almost all of the countries under study use modern methods of contraception, including sterilization, with the exception of women in Indonesia and Thailand (Figure 23). In all countries, actual use of modern contraception is significantly below the percentage of women that indicate a current need for contraception. Nepalese and Maldivian women report the lowest coverage rates (35% and 34% respectively).

Inequities in coverage by income, education and urban/rural residence are seen in Nepal and India with the poor, less educated and those living in rural areas much less likely to use contraception than those with higher incomes, higher educational levels or living in urban areas (Figure 24, Figure SA 5, Figure SA 6). On the other hand, Bangladesh, Indonesia and Thailand have similar coverage rates across income quintiles and educational levels. Sri Lanka exhibits an unusual pattern, in that, the poor and less educated have *higher* usage rates for modern contraceptive methods than the rich and more educated. This distinctive profile stems from the fact that in Sri Lanka, poor, less educated, rural women are more likely to be sterilized (*i.e.*, use permanent methods of contraception) than their wealthier, more educated, urban counterparts. The pattern is the opposite with respect to use of temporary methods of contraception.

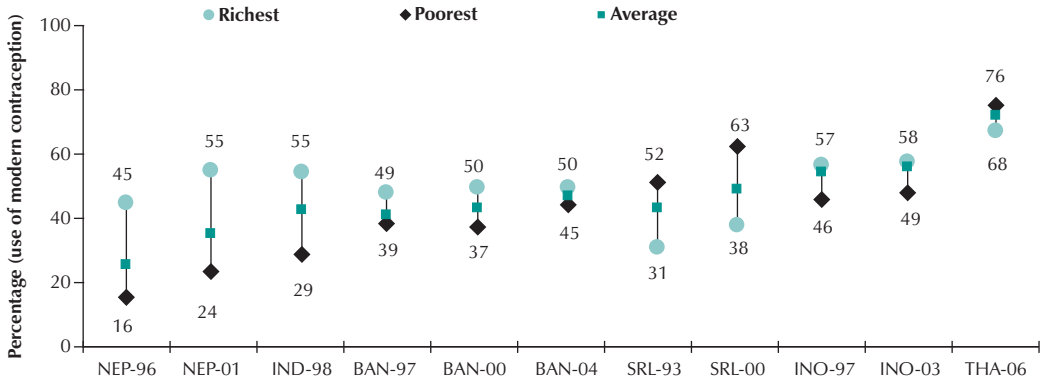
Changing the behaviour of women to encourage the use of modern contraception appears to provide substantial room for improvement, because few changes are seen in coverage rates for countries with data from more than one year.

Fig. 23 Use of modern contraception in SEAR countries (most recent data available)



Source: Demographic and Health Surveys (Bangladesh, India, Indonesia, Nepal, Sri Lanka); Multiple Indicator Cluster Survey (Thailand); Maldives Reproductive Health Survey (Maldives)

Fig. 24 Inequities in use of modern contraception between the poorest and richest wealth quintiles by country



Source: Demographic and Health Surveys (Bangladesh, India, Indonesia, Nepal, Sri Lanka); Multiple Indicator Cluster Survey (Thailand)

4.3 Inequities in key health determinants within and across countries

Inequities in key health determinants mirror the inequities in health outcomes that are found within countries of the South-East Asia Region. Two indicators illustrate this and can be analyzed using the available survey data: (1) exposure to safe water, and (2) exposure to safe sanitation. Both are important environmental factors that affect levels of illness and health in the population, and both are related to MDG 7 of ensuring environmental sustainability.

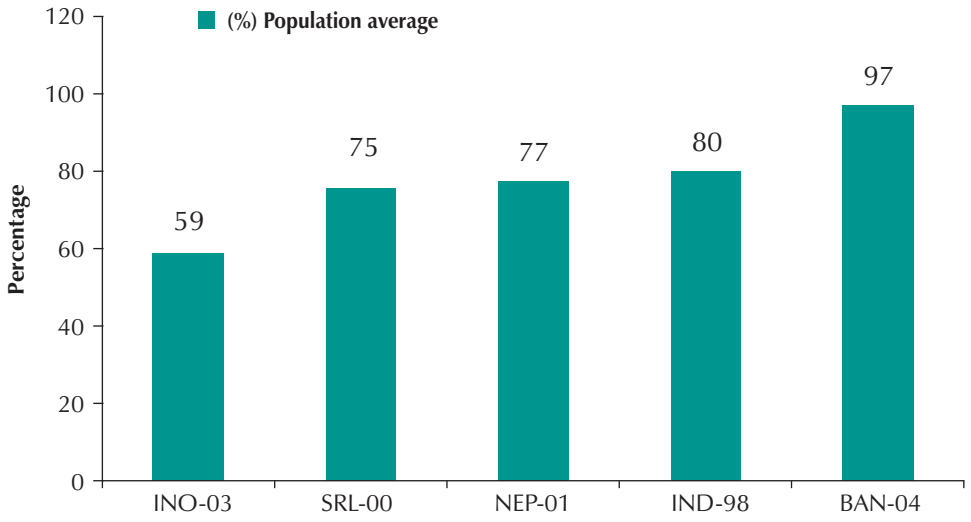
4.3.1 Exposure to safe water

Many serious diseases, including typhoid, cholera and dysentery, are caused by contaminated water. In an effort to decrease the number of illnesses due to diarrhoeal diseases, the United Nations has set as a goal the provision of safe drinking water to all.

In Bangladesh, this goal appears to have been met (Figure 25). However, in Indonesia, less than 60% of the population have access to safe drinking water. This finding is particularly troubling because survey data indicate that usage of safe water has *decreased* from 72% in 1997. In India, Nepal and Sri Lanka, the percentage of households that use safe drinking water is just over 75%.

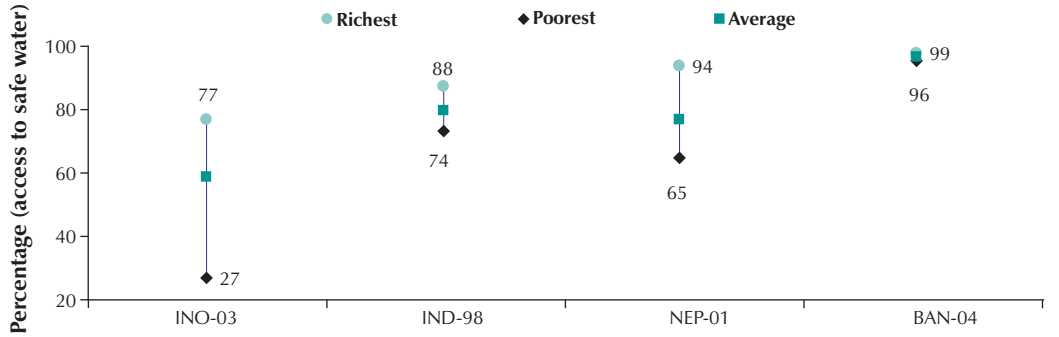
Inequities are apparent by income and urban/rural residence. Households in the richest wealth quintile in Indonesia are three times more likely to have access to safe drinking water as those in the poorest quintile (Figure 26). The difference between the richest and poorest 20% households in Nepal is less than in Indonesia but is still large. In all countries, except Bangladesh, urban residents are 1.5 times more likely to have access to safe drinking water than their rural counterparts (Figure SA 17).

Fig. 25 Exposure to safe drinking water in SEAR countries (most recent data available)



Source: Demographic and Health Surveys

Fig. 26 Inequities in access to safe water between the poorest and richest quintiles by country and survey year



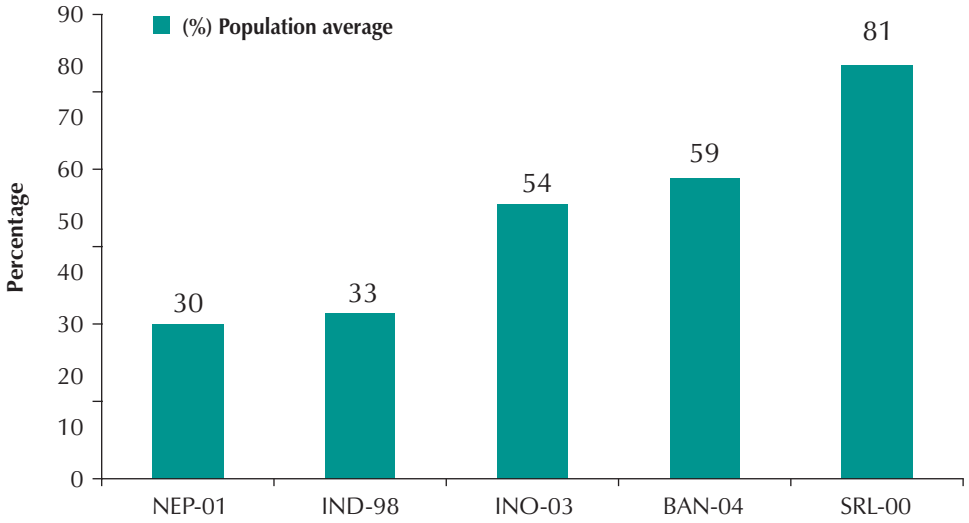
Source: Demographic and Health Surveys

4.3.2 Exposure to safe sanitation

Like access to safe drinking water, use of safe sanitation facilities helps to reduce the incidence of diarrhoeal diseases. Unfortunately, access to such facilities is limited throughout South-East Asia. Less than one-third of households in India and Nepal, and a little more than half of those in Bangladesh and Indonesia use safe sanitation facilities (Figure 27). Access is substantially higher in Sri Lanka (80%). It is encouraging to note, though, that access has improved for all countries for which more than one year of survey data were available (Figure 28). In Nepal, the number of households with access to safe sanitation facilities has doubled.

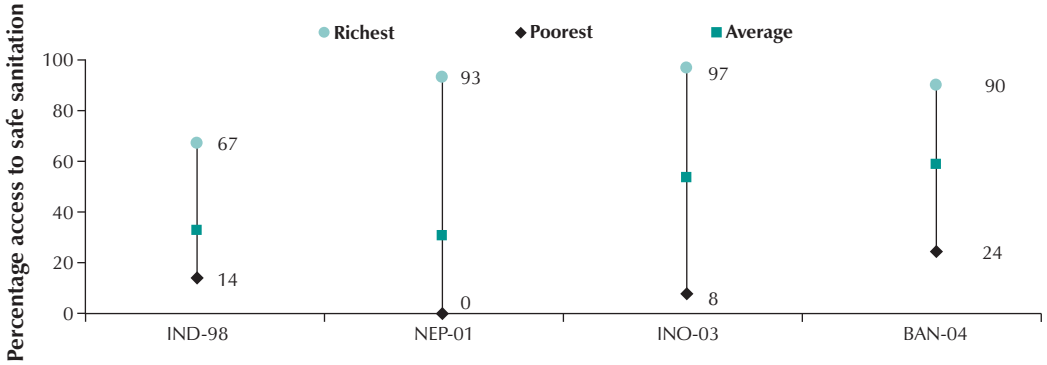
The gap between access for the wealthiest and the poorest households is significant. In Nepal and Indonesia, 0-10% of the poorest households use safe sanitation methods whereas more than 90% of the richest households do so. The income gap is smallest for India but is still substantial. Urban/rural differences also exist (Figure SA 18). In India, Indonesia and Nepal, urban residents are twice as likely to have access to safe sanitation as rural residents.

Fig. 27 Exposure to safe sanitation facilities in SEAR countries (most recent data available)



Source: Demographic and Health Surveys

Fig. 28 Inequities in access to safe sanitation between the poorest and richest quintiles by country and survey year



Source: Demographic and Health Surveys

Chapter 5

Identifying determinants of health inequities

The objective of this section is to identify factors and their contribution to the observed inequities in maternal and child health in the Region. Maternal mortality is still high in some countries in the region. Of an estimated half a million maternal deaths worldwide, almost half occur in South and South-East Asia. In addition, the Region shoulders almost two-thirds of the global burden of malnutrition. Therefore, this analysis will primarily focus on determinants of maternal mortality and child malnutrition (under five years of age). Similar analyses can be conducted for a variety of other health outcomes.

Substantial constraints exist on the availability and quality of information to confidently describe the problems associated with maternal mortality, although we do know that most maternal deaths occur between the third trimester and the first week after the end of pregnancy indicating the importance of prenatal, perinatal and postnatal care. In this study, the percentage of skilled birth attendance has been used as a proxy for maternal mortality, as available information is more reliable. However, it should be also noted that access to skilled birth attendance is an important goal in its own right, and inequities in its achievement also matter directly.

Child malnutrition was analysed using 'stunting' - low height-for-age - as it is considered to be a good long-term indicator of the nutritional status of a population, since it represents a chronic and sustained lack of food.

The framework described in section 3.1 was used to identify the pathways and determinants to inequities in these variables in the Region. Four broad domains encapsulating the pathways to health inequities were identified in the framework:

Socioeconomic, political context

Socioeconomic position

Intermediary determinants

Health systems factors

Table 5 highlights the major determinants that comprise the framework's broad categories.

Table 5: Major determinants identified under broad categories of the framework				
	Socioeconomic, political context	**Socioeconomic position**	**Intermediary determinants**	**Health systems factors**
Major factors	• Area of residence (urban/rural) • Region (district, zone) • Religion	• Wealth • Education (mother's and partner's) • Occupation (mother's and partner's) • Other social characteristics (sex of household head, relationship of mother to household head)	• Water and sanitation • Exposure to media • Mother's biological characteristics (age, birth interval, parity, height, body mass index) • Child's biological characteristics (age, sex, birth weight, morbidity) • Child care practices (method of stool disposal, length of time breastfed, types of food fed to child, vaccinations received by child) • Competition for resources (mother currently pregnant, child is twin/ triplet, number of children under 5 in household)	• Antenatal care (number of visits, quality of care, place of care) • Barriers to accessing care

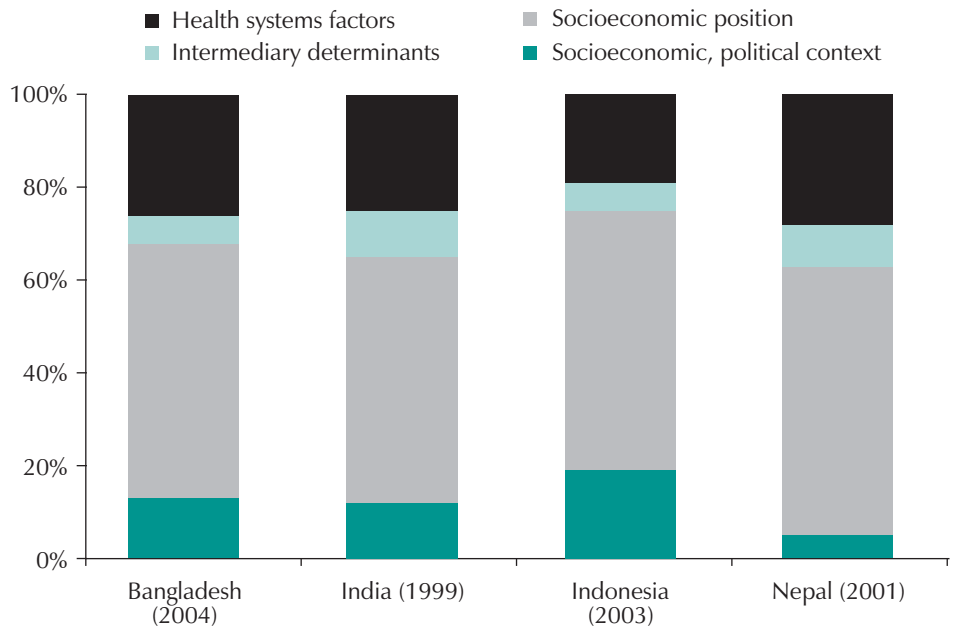
Note: Determinants in italics were only used for analyzing determinants of child malnutrition.

The analytical approach described in section 3 was used to conduct a decomposition analysis of determinants of inequities.

5.1 Main contributors to inequities in skilled birth attendance

Data from four countries in the Region - Bangladesh, India, Indonesia and Nepal - were used to analyze determinants of inequities in skilled birth attendance. The choice of countries was based on availability of recent data and poor maternal health indicators in the country. Inequities in Sri Lanka and Thailand were not analysed, as inequities in access to skilled birth attendance in these two countries are too low to be decomposed reliably, while there was insufficient information for analysing the Maldives dataset.

Fig. 29 Contribution of broad factors to inequities in skilled birth attendance



Source: Demographic and Health Surveys (based on analysis conducted for this report)

Figure 29 shows an overview of the major factors that contribute to inequities in skilled birth attendance. It can be seen that in all four countries socioeconomic position and health systems factors accounted for between 75%-86% of inequities in skilled birth attendance. The contribution of socioeconomic position ranged between 53% Bangladesh to 58% in Nepal while the contribution of health systems factors ranged from 19% in Indonesia to 28% in Nepal. The socioeconomic, political context in which women live in was also a significant contributor in Indonesia (19%).

Among the individual factors, household wealth was the single biggest contributor to these inequities, whereas other important factors included quality of antenatal care, mother's education and valid antenatal care. From table 6, we can see that in all four countries inequities in wealth accounted for more than a quarter of the inequities, while differences in quality of antenatal care contributed to nearly a fifth of inequities in skilled birth attendance in three countries.

However, it should be noted that inequities in wealth do not always result in inequities in skilled birth attendance. Inequities in wealth are as high in Thailand and Sri Lanka and yet inequities in skilled birth attendance are low. This indicates that policies that serve to increase overall access to maternal services to the whole population, especially in rural areas, can substantially or completely mitigate inequities in access that are linked to income. In addition, it is worth noting that in both Sri Lanka and Thailand (and the Maldives), this high level of access to skilled birth attendance is achieved through mostly public provision.

Table 6: Percentage contribution to inequities in skilled birth attendance of six of the most common determinants (that contribute positively to inequities) across the four countries						
	Wealth	**Mother's education**	**Valid antenatal care**	**Quality of antenatal care**	**Partner's education**	**Urban (residence)**
Bangladesh	27	14	8	18	8	12
India	31	12	7	18		10
Indonesia	27	12	6		9	
Nepal	35	10	9	19	6	6

Source: Demographic and Health Surveys (based on analysis conducted for this report)

5.2 Main contributors to inequities in childhood stunting

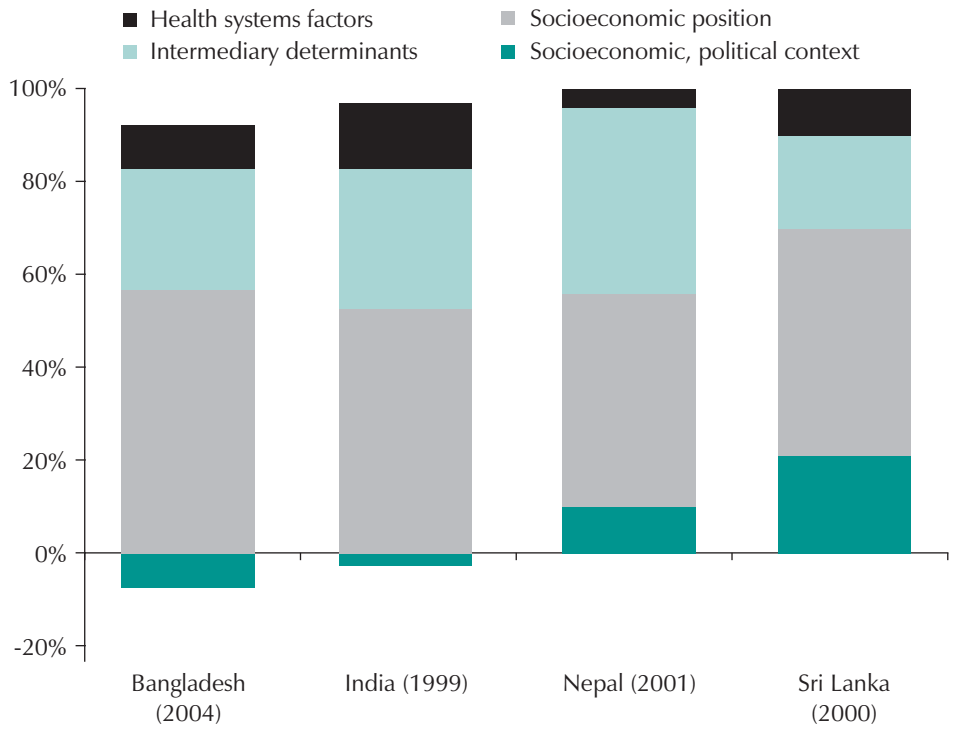
For the analysis of determinants of inequities in stunting, data from four countries in the Region - Bangladesh, India, Nepal and Sri Lanka - were used. The choice of countries was based on availability of recent data, and high malnutrition rates and inequities across socioeconomic groups in the country.

Figure 30 shows that socioeconomic position and intermediary factors together contribute to 68%-98% of inequities in stunting of children under five years of age. Socioeconomic position, as a whole, accounts for 46% of inequities in Nepal and up to 67% of inequities in Bangladesh in childhood stunting. Intermediary factors are most significant as contributors to inequities in stunting in Nepal (40%) and the least in Sri Lanka (20%). Health system factors account for a relatively small proportion of inequities in stunting in all the countries. Given that inequities in access to health services are probably less significant in Sri Lanka than in the other countries, it also indicates that improving health services and health service access in the other countries is unlikely to be a major pathway to reducing inequities in child stunting.

From Table 7 it can be seen that inequities in household wealth is the most important determinant in Bangladesh where it accounts for 68% of inequities but less important in Nepal where it contributes to 15% of inequities in stunting. Wealth inequities here are probably a proxy for overall household food security, and these results suggest that the single most important factor contributing to differences in stunting between households within most countries of the Region are likely to be related to the overall economic situation and food security of households.

Other important factors related to childhood stunting are mother's biological characteristics (12%-20% across the four countries), sanitation facilities (11%-19%) and mother's education (16%-19%).

Fig. 30 Contribution of broad factors to inequities in child malnutrition (stunting) rates in the Region



Source: Demographic and Health Surveys (based on analysis conducted for this report)

Table 7: Percentage contribution to inequities in childhood stunting of six of the most common determinants (that contribute positively to inequities) across the four countries

	Wealth	Mother's biological characteristics	Sanitation facilities	Mother's education	Exposure to media	Partner's education
Bangladesh	68*	20			10	8
India	28	13	11	19		7
Nepal	15	12	19	16	8	
Sri Lanka	40	20	19	19		

* The contribution of wealth here is 68%, although the total contribution of socioeconomic position is 67%. This discrepancy occurs because some factors within socioeconomic position act as a buffer for health inequities. Such factors have a *negative* contribution. Only factors that had a positive contribution to inequities are reported here.

Source: Demographic and Health Surveys (based on analysis conducted for this report)

Chapter 6

Discussion

6.1 Overall magnitude and trends in health inequities

Inequities in health outcomes and in health services access are substantial both across and within countries in South-East Asia. For instance, the national average for skilled birth attendance in Bangladesh is 13% compared to 97% in Thailand. Inequities are even more acute for coverage of skilled birth attendance among the poorest 20% populations across these two countries. In Bangladesh only 3% of women in the poorest quintile are likely to receive skilled assistance during delivery, while in Thailand 93% are. In general, where levels of health services access are high, particularly in Sri Lanka and Thailand, socioeconomic inequities in health are reduced.

Inequities are lower across countries for certain health indicators. For example, prevalence of underweight women ranges from 22% in Sri Lanka to 36% in India. Though, within India, women in the poorest quintile are more than three times likely to be underweight compared to women in the richest quintile. Similar patterns of inequities can be seen across various other stratifiers such as level of education and area of residence.

Importantly, gender inequities are more subtle but persist in the countries of the Region. Both infant and under five mortality rates are higher for male children than for females. This is an expected result, and seen globally, given biological differences between the two. However, the rates of child malnutrition (stunting) is higher for females than males in all the countries. This may be indicative of a preference for the male child over a female child.

Participants at the Regional Consultation on Social Determinants of Health in South-East Asia in Colombo (October 2007) stressed the importance of a second level of stratification. That is, health inequities should also be estimated by, for example, gender and wealth levels - for poor women as opposed to richer women - or for the rural poor compared to urban poor or urban rich. This would help in identifying more accurately the most vulnerable subgroups of population. Although this type of analysis was not conducted for the current report it will be a useful exercise in the future.

6.2 Key discussion points from the skilled birth attendance analysis

Levels of skilled birth attendance are low in four of the seven countries of the Region (13%, 13%, 42%, 66%) when compared to the Millennium Development Goal of 80% to be achieved by 2015. Inequities in access to skilled birth attendance are also high both across and within countries as indicated in the previous section. Where improvements have occurred in the past decade, they have tended to benefit richer households more than the poorer ones. Addressing these inequities is critical if countries are committed to reducing inequities in maternal mortality as well as overall maternal mortality rates.

In countries where inequities were analysed, *socioeconomic position* was by far the most dominant determinant of whether mothers received skilled birth attendance, followed by health system factors. It may not be enough for governments to provide maternal care services, even though it is a necessary condition. Socioeconomic factors act as significant barriers preventing many or most mothers to make use of provided services. Such barriers can include the financial cost of accessing services, which will tend to affect poorer women more than richer women; as well as physical barriers in the form of distance and availability of transport. Poor rural health infrastructure, both in terms of quantity and quality, may adversely affect the perception of health services in rural areas, thereby reducing demand. Improving maternal education will also be key in developing demand for appropriate maternal health services.

6.3 Key discussion points from the child malnutrition analysis

In the case of child malnutrition, the analyses suggest that the key determinants of inequities across groups are related to socioeconomic position, particularly wealth, in all the countries studied, and have less to do with health system factors. Unlike the case of skilled birth attendance, the impact of socioeconomic position, probably, does not work through its impact on access to services. Instead, the likely explanation is that socioeconomic position is an indicator of the overall income and food security of a household. Economic inequity in child malnutrition is thus strongly related to factors outside the health sector. In fact, the health-system-related factors like access to, utilization of and quality of health services do not make significant contributions to inequity in malnutrition. Access to adequate sanitation facilities and mother's biological characteristics are important intermediate determinants. However, some intermediary factors such as healthcare behaviours and child care practices, were found to have little impact on inequities. Reducing child malnutrition is thus likely to be achieved mostly by improving overall food security. That such a strategy is likely to be effective is illustrated by Maldives, the only country in the Region to have very low socioeconomic inequities in child malnutrition.

6.4 Limitations of the analysis

Some key limitations of the analysis are noted below:

(1) The analysis is based on (a) cross-sectional data, and (b) time series data that are not linked at the individual level, which means that attribution cannot be specific.

(2) The decomposition analysis is limited in the number of determinants on account of the kind of information collected in surveys. Another limitation is that it is difficult to identify many variables that would adequately represent the socioeconomic, political context in which people live in.

(3) In addition, for a highly populated and diverse country like India, it may be more meaningful to conduct analysis at the state level (for which survey data is available). Although, this was not done here, national health authorities could consider the possibility of doing so.

6.5 Key implications for policy and actions

Health inequities have many determinants, and these vary by type of inequity and by country. Nevertheless, some general conclusions can be drawn and proposals for actions identified.

6.5.1 The role of the health sector

The health sector, as expected, has critical and multiple roles to play in reducing health inequities across key health outcomes. As stated in the Health Systems Knowledge Network Report of the CSDH, the health system can act as an important buffer on other social determinants of health inequities. The analysis from this report reaffirms that assertion and highlights the following aspects to consider:

(1) In general, improving overall access to health services, through financing arrangements and provision of services, and moving towards universal coverage is likely to reduce socioeconomic inequities for most indicators of health system use and access. Doing so will involve multiple actions at different levels:

  (a) secure political commitment to social and economic policies that support equity

  (b) secure increases in government expenditure on the health sector

(2) reallocate government resources to geographical regions, populations, levels of the system and forms of health care in response to needs.

(3) Monitoring and analysing health indicators and inequities across key stratifiers regularly will be essential to enhancing the visibility of health inequities.

(4) The Ministry of Health could take a leadership role in leveraging action through intersectoral approaches both within the health sector across departments, as well as across different government sectors. It will also be important to recognize the role of and involve civil society in improving population health and reducing inequities.

6.5.2 Intersectoral action for health

The analysis clearly illustrates the importance of socioeconomic position in determining health inequities in maternal and child health. Therefore, policies designed to address health inequities are likely to succeed only if they tackle the underlying causes such as wealth, education, occupation and other structural factors determining the socioeconomic position of an individual in a country. Intersectoral action for health spearheaded by the ministries of health with other key sectors such

as finance, education, planning, public works, and labour will be key in effectively tackling health inequities. The critical question is how? Some ideas for the way forward could be to:

(1) Develop strategies that allow other government sectors to recognize health equity as a social indicator and to develop actions and policies to improve this social indicator, not as a function of their contribution to health, but in their own sectoral interest, as they improve the impact of their policies. This is what is referred to as *policy integration*.

(2) Build institutional mechanisms and frameworks for intersectoral action for health. There is no "one model" or a "best" model for intersectoral action; the model depends on the country's historical and social context, and epidemiological priorities. It will be important to revisit and analyse major factors behind the successes and failures of intersectoral action across the world, and at different points in time.

(3) Introduce or build on organizational arrangements and practices that involve population groups and civil society organizations, particularly those working with socially disadvantaged and marginalized groups, in decisions and actions that identify, address and allocate resources to health needs.

6.5.3 Improving food security and reducing poverty

Reducing poverty and improving food security for the poorest households will be the key to reducing overall child malnutrition and inequities by income level. As mentioned earlier, child malnutrition rates in the Region are among the highest in the world, with the lowest socioeconomic groups having stunting rates that are two to five times higher than in the highest groups.

However, debate in countries of the Region has often focussed on the influence of feeding and child care practices only. Although these are important determinants of inequities in child malnutrition, the current analysis makes it clear that it is indeed poverty and food insecurity that are resulting in high child malnutrition rates in poor households.

6.5.4 Knowledge exchange and sharing between countries

Participants at the Regional Consultation on Social Determinants of Health in Colombo (October 2007) expressed enthusiasm in increasing forums for exchange of information between countries in the Region. Events during the consultation clearly indicated that there was much that each country could learn from another on strategies to tackle issues related to health and health inequities.

For example, provision of public sector maternal care services are not adequate in some countries, and have failed in reducing inequities in key maternal health indicators. In Bangladesh and India more than 50% of all skilled birth attendance is provided in the private sector or at home. But others, in particular Maldives, Sri Lanka and Thailand, have been successful in using public provision to reduce inequities in access. It could, therefore, be useful for other countries to not only focus on identifying and mitigating the factors that prevent poor mothers accessing public services, but also to see what lessons can be learnt from the experience of countries such as Maldives, Sri Lanka and Thailand.

Annex 1

Technical notes and definitions

(A) Household wealth index

Given that the Demographic and Health Surveys do not collect data on self-reported income and expenditure, but provide information on ownership of asset indicator variables, this study focused on creating a non-monetary economic index. Principal components analysis (PCA) and dichotomous hierarchical ordered probit (DIHOPIT) model are two statistical methods that may be employed to develop an index of long-run economic status of a household.

Principal components analysis

Principal components analysis is a technique for extracting from a large number of variables those few orthogonal linear combinations of the variables that best capture the common information. Intuitively, the first principal component is the linear index of all the variables that captures the largest amount of information that is common to all of the variables.

The result of principal components is an asset index for each household (A_j) based on the formula:

$$A_j = \sum_{i=1}^{N} f_i * (a_{ji} - a_i)/s_i$$

where f_i is the "scoring factor" for i_{th} asset as determined by the procedure, a_{ji} is the j_{th} household's value for the i_{th} asset and a_i and s_i are the mean and standard deviation of i_{th} asset variable over all households.

The crucial assumption - and it is just an assumption - is that household long-run wealth is what causes the most common variation in asset variables. The scoring factor is the "weight' assigned to each variable (normalized by its mean and standard deviation) in the linear combination of the variables that constitute the first principal component.

Dichotomous hierarchical ordered probit model

The method assumes that long-run wealth is not directly observed; i.e. it's a latent variable. What is observed are so-called indicator variables including a series of assets, housing dwellings and services for each household. This method is based on the premise that wealthier households are more likely to own any given set of indicator variables. However, the level of economic status at which a household becomes more likely to own a given indicator variable is assumed to vary by the indicator variable. As long as the assets are normal goods - in that higher levels of economic status lead to higher proportions of observed ownership - the method can use the information content in a set of indicator variables owned by a given household to estimate an economic status index for that household. This method also allows for using socio-demographic predictors of economic status - such as the household head's education, age and sex; and rural/urban residence - to be incorporated in the estimation process.

(B) Measures of inequality in health

The range

Range measures including rate ratios (RR) and rate differences (RD) are the most frequently used in the literature on health inequality.

These measures compare the range in rates of illness/mortality between the least healthy and the healthiest groups or between the lowest and the highest socioeconomic groups. While the RR is unitless, independent of average level and scale, the RD depends on both average level and scale.

A conceptually similar approach is apparent in some measures of socioeconomic inequalities in health distribution. If individuals are ranked according to their income, then for each decile or quintile of individuals, their health status can be estimated. The ratio of the health status of the lowest income quintile to the highest income quintile, a variation on the RR is called low to high ratio.

The defects of range measures are obvious. First, they don't address the entire social gradient in health, that is, they fail to measure the extent of inequality across the entire socioeconomic spectrum. The gap between the top and the bottom groups may, for example, remain unchanged, but the extent of inequality between the intermediate groups may be reducing (or increasing). Second, they overlook the sizes of the groups being compared. This problem can cause misleading results when comparisons are performed over time or across countries. Yet, they have the merit of being a readily interpretable and usable measure of the relative gap in health between the poor and the rich.

Gini coefficient (and associated Lorenz curve)

The Lorenz curve plots the cumulative percentage of a health variable against the cumulative percentage of the sample, ranked by their health, starting with the most sick person and ending with the healthiest. If health is equally distributed, the Lorenz curve coincides with the diagonal. Otherwise it lies under the diagonal. *The further the curve is from the diagonal, the greater the degree of inequality*.

The Gini coefficient is defined with reference to the Lorenz curve. The Gini coefficient, denoted by G, is defined as twice the area between the Lorenz curve and the diagonal. It ranges from 0 (when there is no inequality) to 1 (when all the population's health is concentrated in the hands of one person).

The Lorenz curve has the merit of reflecting the experiences of all people and not just those in the top and bottom groups. In addition, since it does not involve stratifying the population by social class, it allows one to side-step all the problems associated with classifying people by social class including the problem of changing class sizes.

But there is still a big problem. This measure doesn't address "To what extent are there health inequalities that are systematically related to socioeconomic status?" Any change in the distribution of health which keeps the mean level of health the same but involves a sick person getting healthier and a healthy person getting sicker reduces health inequality irrespective of the socioeconomic status of the persons concerned. Whether this insensitivity of the Lorenz curve to the socioeconomic dimension of health inequalities is a defect depends clearly on the question one is looking for. It clearly is a defect if one takes the view that what is interesting and indeed worrying about health inequalities is not that they exist, but that they mirror inequalities in socioeconomic status.

Index of dissimilarity

Suppose there are j=1,…,J socioeconomic groups. Then the index of dissimilarity (ID) is:

$$ID = \frac{1}{2}\sum_j \left| S_{jh} - S_{jp} \right|$$

where Sjh is the jth group's share of the population's health and Sjp is the jth group's population share.

It can be interpreted as follows: the percentage of all cases (e.g. ill individuals or deaths) that has to be redistributed to obtain the morbidity or mortality rate for all socioeconomic groups. The ID is larger if the groups with the highest and the lowest rates are larger.

The index of dissimilarity suffers from the same shortcoming as the pseudo-Lorenz curve. It is insensitive to the socioeconomic dimension of inequalities in health. What matters in the ID is simply how each socioeconomic group's share of the population's health compares with its population share, not how this disparity compares with the socioeconomic group's socioeconomic status.

Population attributable risk

Although population attributable risk (PAR) is part of the repertoire of epidemiology, its application to the study of health inequalities is fairly recent. *This measure can be interpreted as the proportional reduction in overall morbidity or mortality rates that would occur in the hypothetical case that everyone experiences the rates of the highest socioeconomic group, expressed as the percentage of the overall rate*. The PAR not only reflects the morbidity or mortality rates of lower socioeconomic groups (as compared to the highest socioeconomic group) but also their population size: the larger the groups with the high rates, the larger the potential reduction in overall rate is.

Slope and relative index of inequality

Unlike the Lorenz curve, and the ID, the slope index of inequality (SII) and its relative version - the relative index of inequality (RII) - do reflect the socioeconomic dimension to health inequalities. The approach involves calculating the mean health status of each socioeconomic group and then ranking groups by their socioeconomic status (not by their health).

The slope index of inequality is calculated as the slope of the weighted least squares (WLS) regression line showing the relationship between health status and the rank ordering, Rj, of the groups in the socioeconomic hierarchy. *It can be interpreted as the absolute effect on health of moving from the lowest socioeconomic group through to the highest*.

The SII avoids the defect of the range measures: it reflects the experiences of the entire population and it is sensitive to the distribution of the population across socioeconomic groups. Moreover, because it ranks socioeconomic groups by socioeconomic status rather than by health, the SII reflects the socioeconomic dimension to inequalities in health.

One additional noteworthy feature of the SII is its sensitivity to the mean health status of the population. Suppose that everyone's health doubled, the SII would double. Whether inequity has doubled is a moot point: relative differences have remained the same, but absolute differences have widened. If it is the former that are regarded as important, the SII might be divided by the mean level of health, in which case a doubling of everyone's health would leave the resultant index unaffected. This is referred to as relative index of inequality.

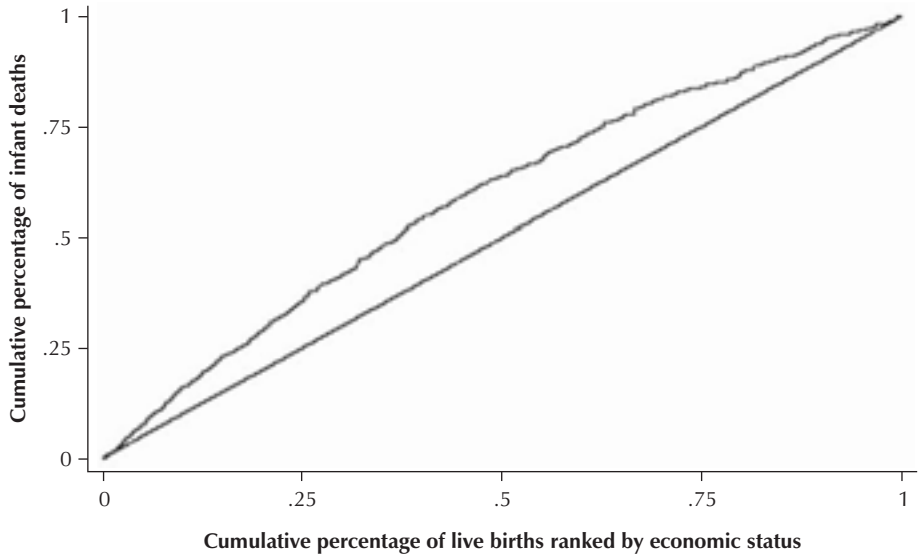
Concentration index and the concentration curve

The concentration curve plots the cumulative percentage of the health variable against the cumulative percentage of the sample, ranked by their socioeconomic status, beginning with the most disadvantaged, and ending with the least disadvantaged.

The concentration index is defined with reference to the concentration curve. The health concentration index, denoted by C, is defined as twice the area between the concentration curve and the line of equality. So, in the case where there is no socioeconomic inequality, the concentration index is zero. The value of the concentration index can vary between –1 and +1. Its negative values imply that a variable is concentrated among disadvantaged people while the opposite is true for its positive values. When there is no equality, the concentration index will be zero. If the health variable is "bad", such as infant death, a negative value of the concentration index means it is higher among the most disadvantaged.

The concentration index is a measure of relative inequality, so that a doubling of everyone's health leaves the concentration index unchanged. If the health variable is equally distributed among socioeconomic status, the concentration curve will be a 45° line. This is known as the line of equality. If, by contrast, the health variable takes higher (lower) values among people with lower socioeconomic status, the concentration curve will lie above (below) the line of equality. The further the curve lies from the line of equality, the greater the degree of inequality in health.

Fig. 31 The concentration curve



Source: Figure for illustrative purposes only

The concentration index can be computed as twice the (weighted) covariance of the health variable and a person's relative rank in terms of economic status, divided by the variable mean, according to equation (1).

$$C = \frac{2}{\mu}\mathrm{cov}_w(y_i, R_i) \quad \text{..... (1)}$$

where y_i and R_i are the health status of the ith individual and the fractional rank of the ith individual (for weighted data) in terms of household economic status, respectively, μ is the (weighted) mean of the health of the sample and cov_w denotes the weighted covariance.

Decomposition analysis

The method proposed by Wagstaff, Van Doorslaer, and Watanabe was used to decompose socioeconomic inequality in infant mortality into its determinants. A decomposition analysis allows one to estimate how determinants proportionally contribute to inequality (e.g., the gap between poor and rich) in a health variable. They showed that for any linear regression model linking the health variable of interest, y; to a set of K health determinants, x_k:

$$y_i = \alpha + \sum_k \beta_k x_{ki} + \varepsilon_i \quad \text{..... (2)}$$

where ε is an error term. Given the relationship between y_i and x_{ki} in equation (2), the concentration index for y (C) can be written as:

$$C = \sum_k \left(\frac{\beta_k \bar{x}_k}{\mu} \right) C_k + \frac{GC_\varepsilon}{\mu} = C_{\hat{y}} + \frac{GC_\varepsilon}{\mu} \quad \text{..... (3)}$$

where μ is the mean of y, $\overline{x}_k$ is the mean of x_k, C_k is the concentration index for x_k (defined analogously to C). In the last term (which can be computed as a residual), $GC\varepsilon$ is the generalized concentration index for ε_i.

Equation (3) shows that C can be thought of as being made up of two components. The first is the deterministic, or "explained", component. This is equal to a weighted sum of the concentration indices of the regressors, where the weights are simply the elasticities $(\beta_k \overline{x}_k / \mu)$ of y with respect to each x_k. The second is a residual, or "unexplained", component. This reflects the inequality in health that cannot be explained by systematic variation in the x_k across socioeconomic groups.

The method allows to establish which factors contribute to greater inequality and how, i.e. through the more unequal distribution of the determinant or through the greater effect on mortality. In other words, this method enables us to quantify the pure contribution of each determinant of a health variable - controlled for the other determinants - to socioeconomic inequality in that health variable. However, as the concentration index of a health variable can only be decomposed into the concentration indices of its determinants additively, the usefulness of the method is limited to linear models.

Annex 2

Country reports

Bangladesh

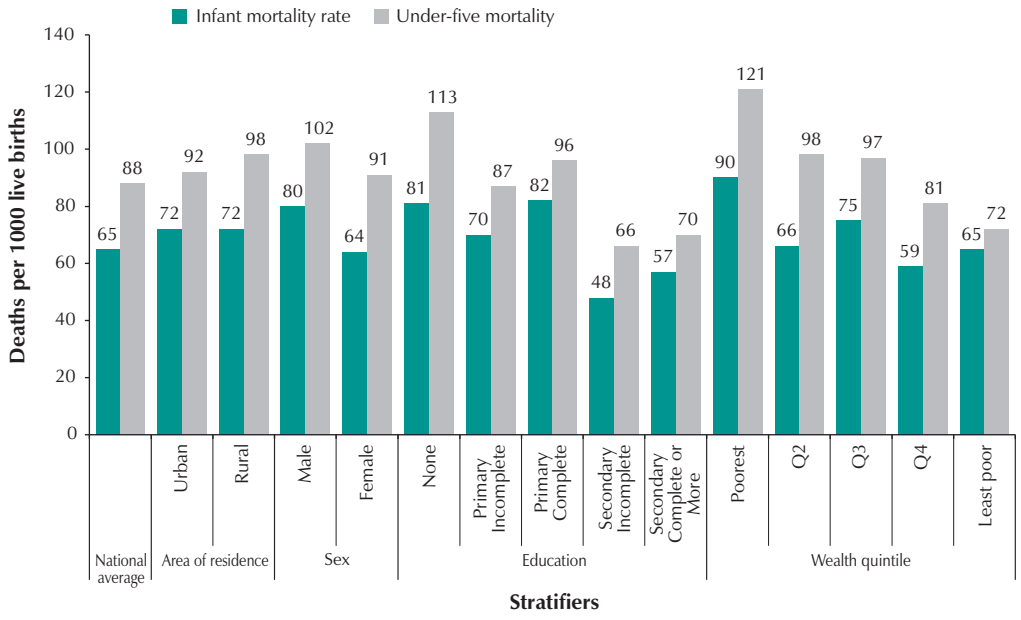
Indicators analysed

The data source used to assess inequities in health and access to health services is Bangladesh's Demographic and Health Survey, 2004. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of women underweight and overweight. Health system indicators include coverage of DPT vaccination, coverage of skilled birth attendance and current use of modern contraception.

Results

The results of the analysis are depicted in the following charts. The figure below shows the national average of infant and under-five mortality, as well as the gradient by wealth quintile, place of residence, and education achievement.

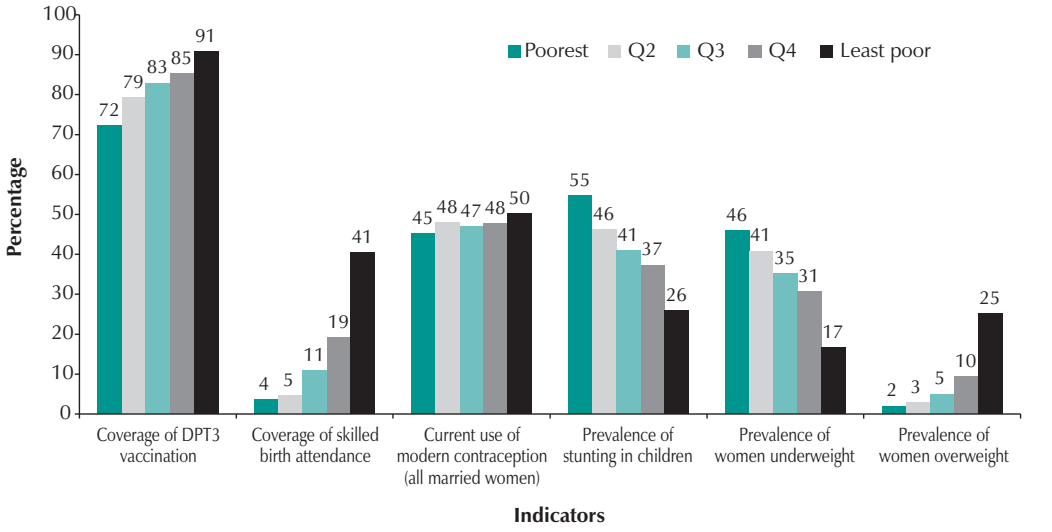
Fig. 1 Infant and under-five mortality by stratifiers, Bangladesh, 2004



The data from 2004 show that the poorest quintile experienced 1.7 times the under-five mortality and 1.4 times the infant mortality experienced by the richest quintile. The under-five mortality gradient by wealth quintile reflects a steady decline across wealth quintiles but the pattern for infant mortality shows substantially higher rates for households in the poorest quintile than for those in the 80% richer households. By mother's education level, there is no clear pattern for either infant or under-five mortality across the gradient. However, it is clear that mortality rates are substantially lower for children of mothers with secondary education. For instance, children born to mothers who completed their primary education only were 1.7 times more likely to die before their first birthday and 1.5 times more likely to die before their fifth birthday than those born to mothers with secondary education. The mortality rates are similar for urban and rural area residents. Both infant and under-five mortality rates are higher for boys than for girls.

The figure below shows six indicators stratified by wealth quintiles.

Fig. 2 Selected indicators by wealth quintile, Bangladesh, 2004

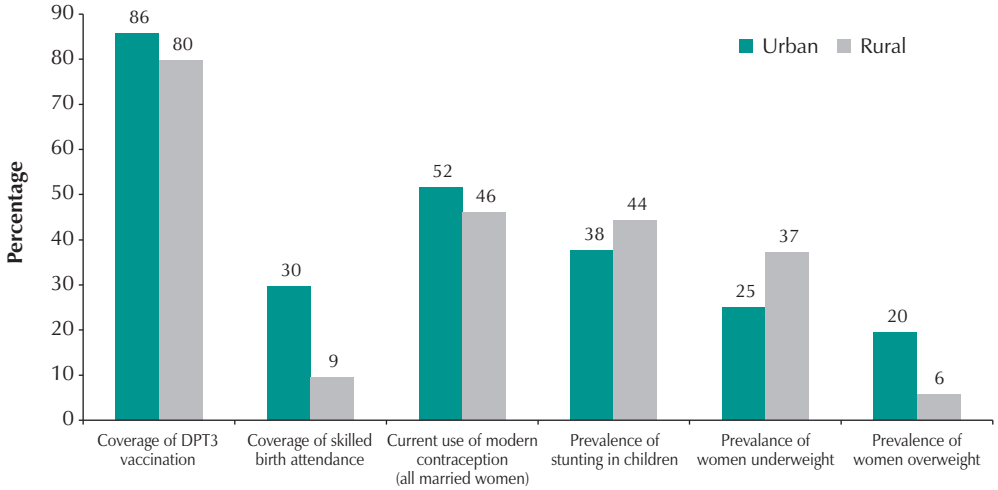


In terms of access to health services, the data shows income-related inequities for skilled birth attendance and coverage of DPT3 vaccination. For the former, coverage increases gradually across wealth quintiles but for the latter, a sharp increase is seen between the fourth and the richest quintile, revealing the pattern of 'mass deprivation'. Mothers in the richest quintile are 12 times more likely to be assisted by skilled health personnel during delivery than mothers in the poorest quintile. Coverage of current use of modern contraception among married women is similar across wealth quintiles, hovering around 50%.

Among all health indicators, the change in prevalence across the first four wealth quintiles is gradual but the change is pronounced between the fourth and richest quintile (again, a pattern of mass deprivation). The proportion of women who are underweight is 46% in the poorest quintile compared to 17% in the richest. The most prominent distinction among wealth quintiles manifests itself with the prevalence of overweight indicator: women in the richest quintile are 12.6 times more likely than women in the poorest quintile to be overweight.

The following figure depicts the rural-urban patterns for six indicators.

Fig. 3 Selected indicators by area, Bangladesh, 2004

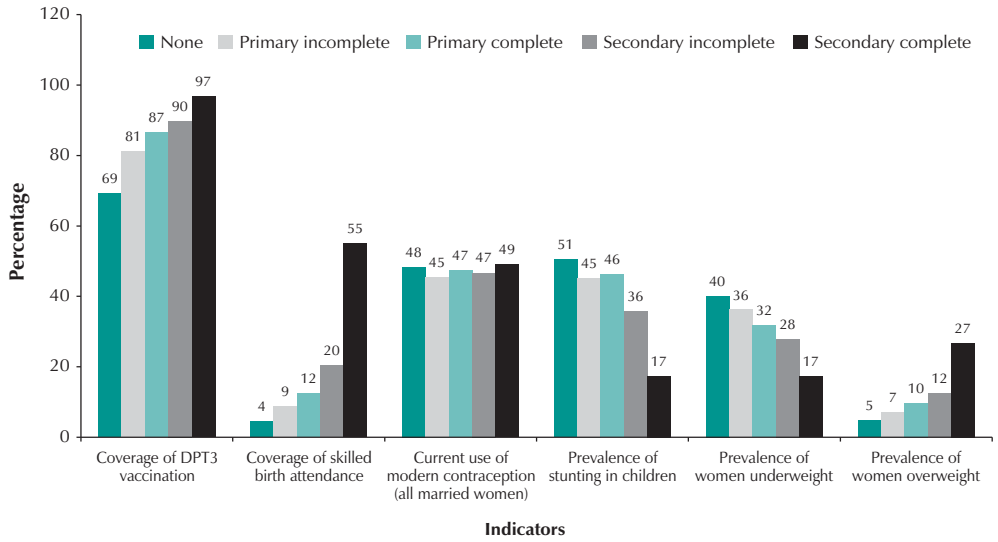


The figure shows that there are inequities between rural and urban areas, especially with respect to skilled birth attendance. For all indicators, rural residents are worse off. For example, coverage of skilled birth attendance is 3.3 times higher in urban areas than in rural areas. Inequities in coverage of DPT3 vaccination and use of modern contraception between urban and rural areas are small.

Differences in stunting among children by area of residence are relatively small. However, women in rural areas are 1.5 times more likely to be underweight than women in urban areas. Urban dwellers are 3.3 times more likely to be overweight than rural residents.

The following figure shows the six selected indicators by education achievement of the mother.

Fig. 4 Selected indicators by education, Bangladesh, 2004



Educational achievement is an important factor associated with inequities in health. For most indicators, increased education levels are associated with better outcomes. The exceptions are current use of modern contraception which is roughly the same across educational levels and prevalence of women who are overweight which increases significantly with more education. For example, 55% of women who have completed their secondary education are assisted by skilled personnel during the births of their children, compared to only 4% of women with no education. Similarly, the proportion of children who are stunted is three times as high for those with mothers with no education compared to those with mothers who have at least a secondary education. Forty percent of women without education are underweight, compared to 17% in the most educated group. Women with at least a secondary education are five times as likely to be overweight than uneducated women.

Trends in population averages and wealth inequities

Table 1 summarizes the trends of health status and health systems indicators.

The findings indicate the improvement between 1996 and 2004 of population averages for all indicators. Infant mortality and under-five mortality rates and the prevalence of women underweight show a substantial decrease. The survey data also show improvement in the national averages across all health systems indicators.

Table 1: Trends in population averages and household wealth inequities for selected health and health care indicators

Indicator	Population average			Ratio*		
	1996-1997	1999-2000	2004	1996-1997	1999-2000	2004
Health indicators						
Infant mortality rate	89.6	79.6	65.0	1.7	1.6	1.4
Under-five mortality rate	127.8	110.0	88.0	1.9	1.9	1.7
Stunting in under-five children	54.6	44.7	43.0	1.8		2.1
Prevalence of underweight in women	52.0	45.4	34.3	2.0		2.8
Health systems						
DPT3 coverage	69.3	72.1	81.0	1.4	1.4	1.3
Delivery by skilled birth attendants	8.0	12.1	13.4	16.6	12.0	11.9
Contraceptive prevalence rate (all married women)	41.6	43.4	47.3	1.3	1.3	1.1

* Poorest to richest ratio is used for infant mortality rate, under-five mortality rate, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate. This provides a consistent way to interpret ratios, as health outcomes indicators are expressed in negative terms (e.g., lower infant mortality is better), whereas health system process indicators are expressed in positive terms (e.g., higher DPT3 coverage is better).

However, the different indicators present different patterns in terms of inequity trends over eight-year time period. The relative gap in stunting in under-five children shows a slight increase in inequity, whereas prevalence of women underweight shows a marked increase. All health systems indicators exhibit a reduction in inequity.

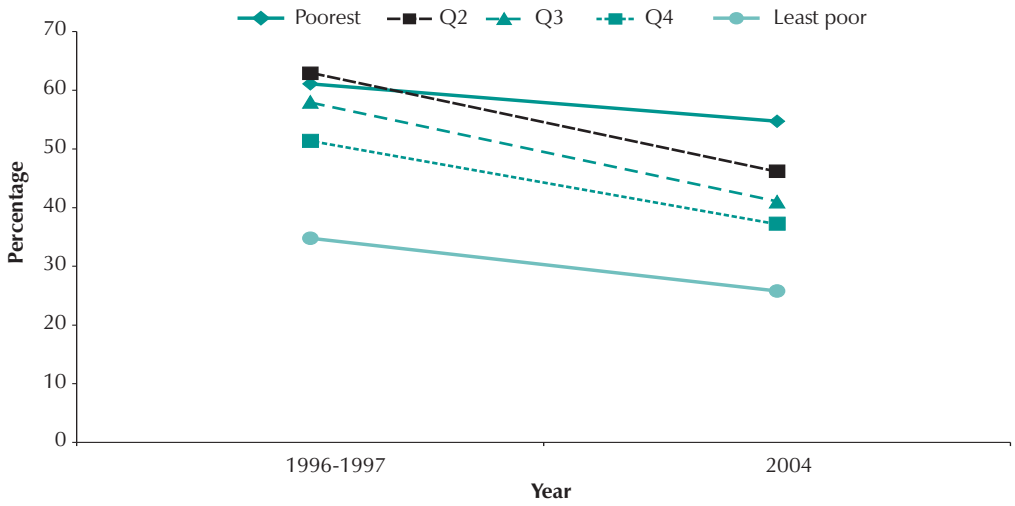
Table 2 summarizes trends in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework to interpret the results over time, as inputs to health policies.

Table 2: Changes in inequities and population averages

		Relative gap	
		Narrowing	**Widening/status quo**
Population average	Improving	**A. Best outcome** – DPT3 coverage – Use of modern contraception – Delivery by skilled attendants – Infant mortality rate – Under-five mortality rate	**B.** – Stunting – Prevalence of underweight among women
	Worsening	**C.**	**D. Worst outcome**

The best outcome cell (cell A) shows that the relative gap -- ratio between richest and poorest wealth quintiles -- narrows and the population average improves over time. All but two indicators under study fall into this category. It is possible to see a widening of the relative gap with improving population average (cell B). One reason why this pattern could result is when the richest group improves faster than the poorest group. This is the case for stunted children and underweight women: in spite of improving national averages, the relative gap between the poorest and richest quintiles has actually widened a little bit. Figure 5 illustrates this pattern in stunting among children under five years. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C). No indicators exhibit this pattern. The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average. Fortunately, no indicators fall into this category.

Fig. 5 Trend in stunting by wealth quintile, Bangladesh



Main determinants of inequities in skilled birth attendance

In this section the decomposition technique is used to unpack the contribution of factors to *inequities* in coverage of skilled birth attendance (rather than the national average). This exercise provides a useful lens to consider areas for potential improvement that would specifically reduce inequities. In this case, decomposition analysis shows that socioeconomic position is the most important contributor, accounting for more than half of the inequities in skilled birth attendance in Bangladesh (Figure 6). Health systems factors also contribute significantly. The primary determinant of socioeconomic position that contributes to inequities is household wealth, accounting for 27% of the differences (Figure 7). Factors related to antenatal care—namely four or more visits to medical professionals and the quality of care received—account for almost one-third of inequities in the use of skilled birth attendants in Bangladesh.

Fig. 6 Contribution of broad factors to inequities in skilled birth attendance, Bangladesh, 2004

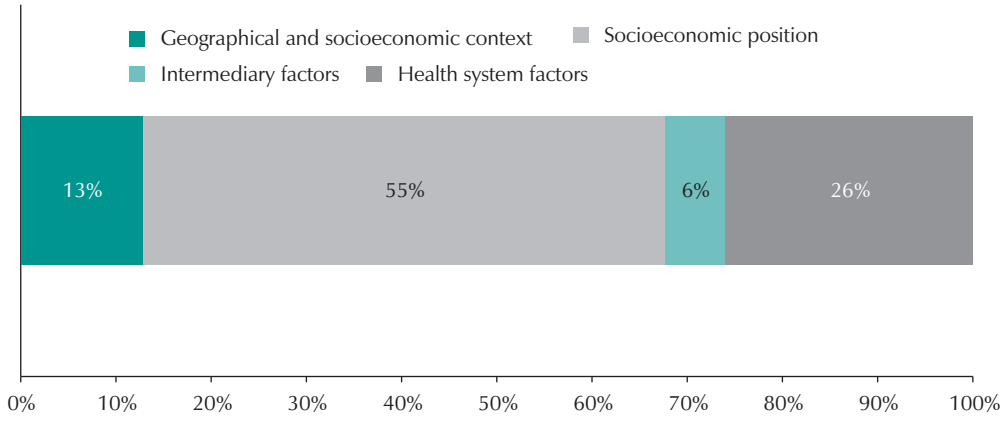
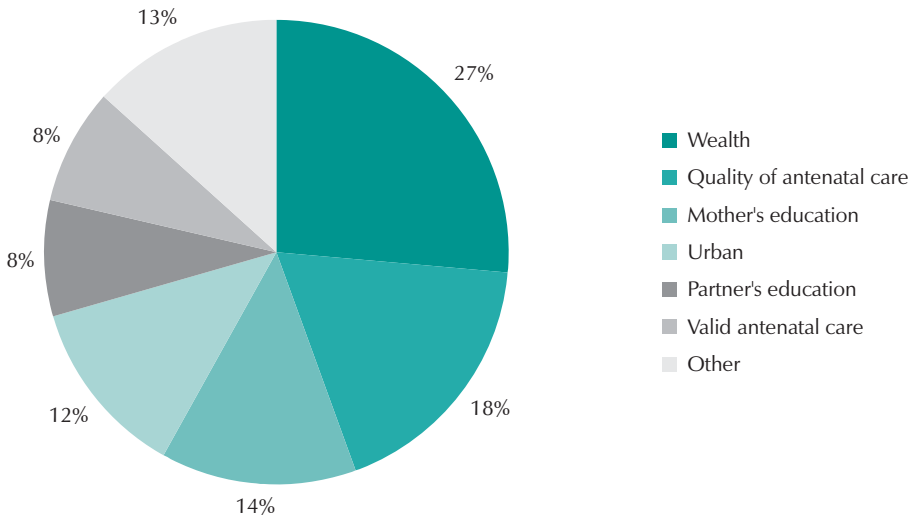


Fig. 7 Major determinants of inequities in skilled birth attendance, Bangladesh, 2004



Main determinants of inequities in stunting

Decomposition analysis of inequities in stunting among children under five years shows that socioeconomic position is by far the most important contributor to increasing inequities, followed by intermediary factors (Figure 8). However, geographical and socioeconomic context factors contribute to *reducing* inequities. The negative contribution of these variables suggests that the effect of religion and location of residence is independent of socioeconomic status and is pro-poor. Only those individual factors that contribute positively to inequities were included in the analysis to determine the magnitude of their contribution. The primary determinants of inequities within the socioeconomic position category are household wealth and partner's education, which together account for 60% of differences (Figure 9). The most important intermediary factors are mother's biological characteristics (including mother's age, number of births, mother's height and body mass index), exposure to mass media and child care practices (including breastfeeding for at least six months, giving babies colostrum soon after birth, feeding solid foods to babies after six months).

Fig. 8 Contribution of broad factors to inequities in childhood stunting, Bangladesh, 2004

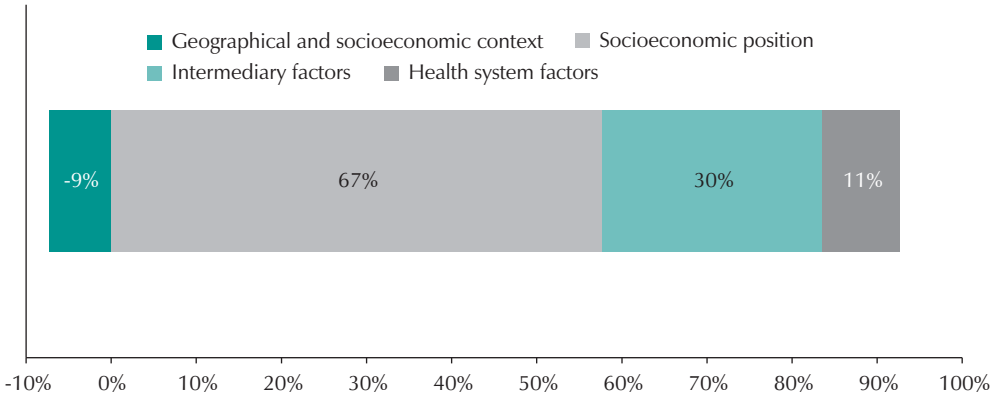
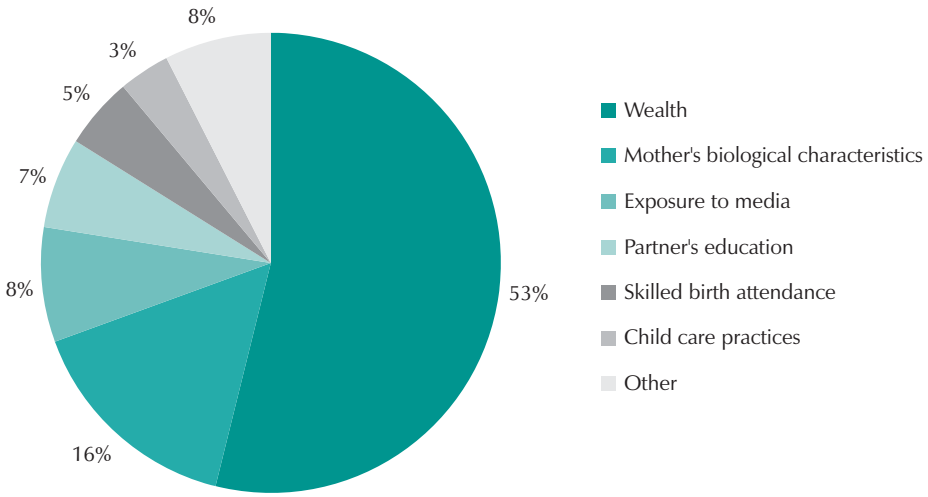


Fig. 9 Major determinants of inequities in childhood stunting, Bangladesh, 2004



India

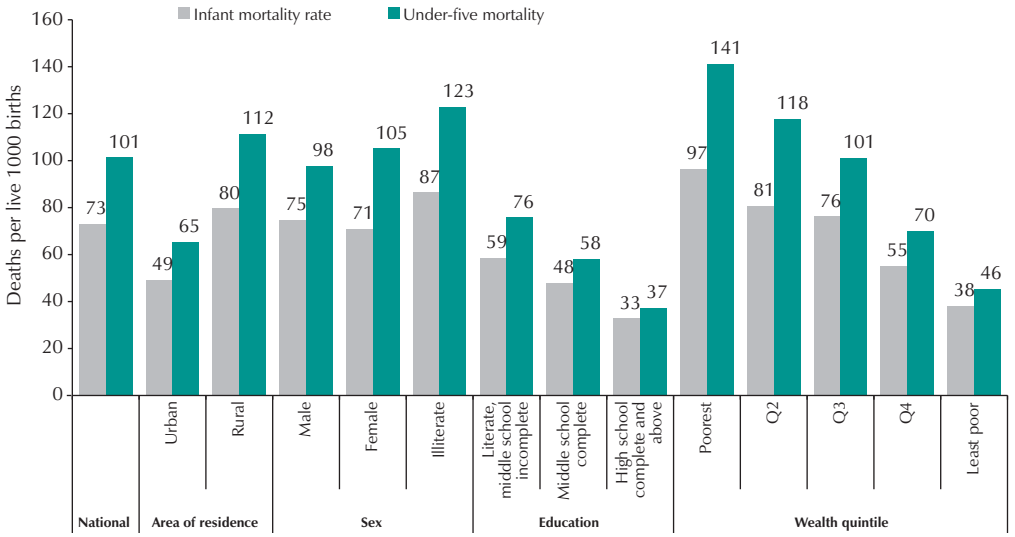
Indicators analysed

The data source used to assess inequities in health and access to health services is India's National Family Health Survey 1998-1999. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of women underweight and overweight. Health system indicators include coverage of DPT vaccination, coverage of skilled birth attendance and current use of modern contraception.

Results

The results of the analysis are depicted in the following charts. The figure below shows the national average of infant and under-five mortality, differences between boys and girls as well as the gradient by wealth quintile, place of residence, and education achievement.

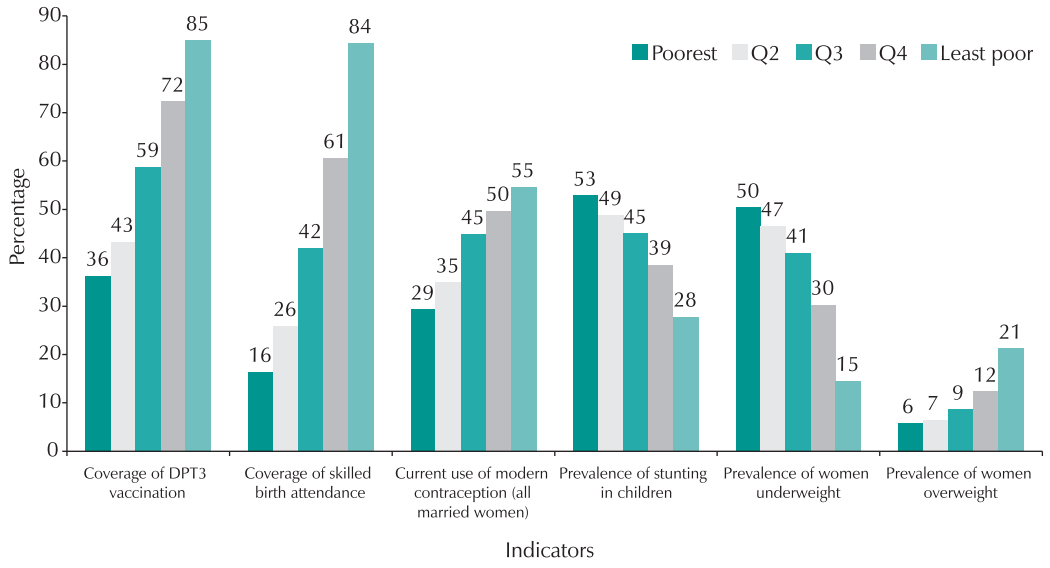
Fig. 1 Infant and under-five mortality by stratifiers, India, 1998-1999



The data from 1998-1999 shows that the poorest quintile experienced 3.1 times the under-five mortality experienced by the richest quintile. The under-five and infant mortality gradients by wealth quintile reflect a steady decline. However, by mother's education level, a sharp drop in both mortality rates can be seen between children born to illiterate mothers and those born to literate mothers with some schooling. For instance, children born to illiterate mothers were 3.3 times more likely to die before their fifth birthday than those born to mothers who completed high school, and 1.6 times more likely to die than those born to literate mothers who received an incomplete middle school education. Rural area residents experienced 1.6 times higher infant mortality and 1.7 times higher under-five mortality compared to the urban dwellers. Both infant and under-five mortality rates are nearly equal for boys and girls.

The figure below shows six indicators stratified by wealth quintiles.

Fig. 2 Selected indicators by wealth quintile, India, 1998-1999

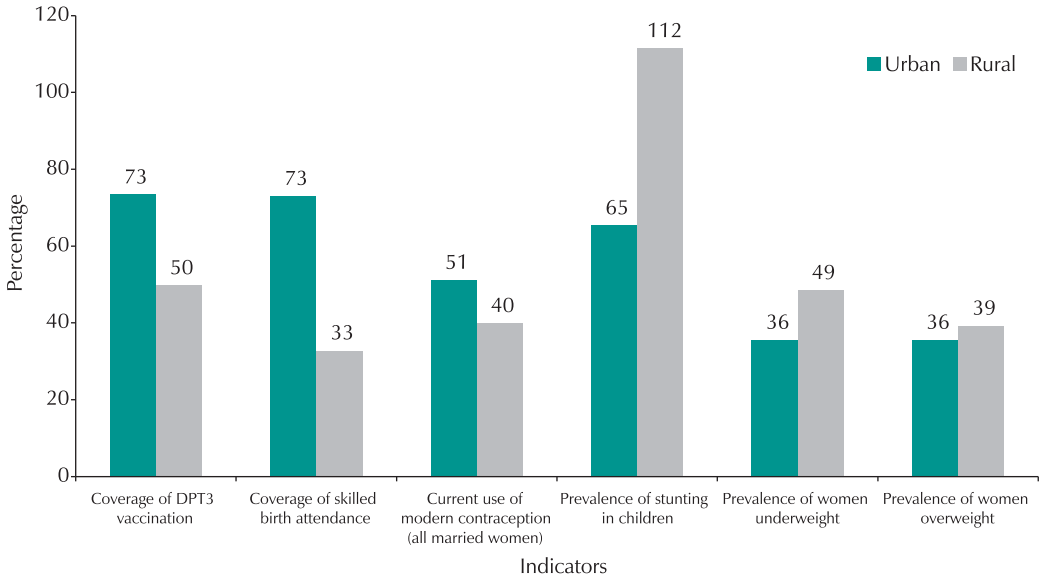


In terms of access to health services, the data shows income-related inequities for all indicators. Inadequate health care access and poor health outcomes are more prevalent among the poor. There is a gradual increase in coverage rates across wealth quintiles for DPT3 vaccinations and for use of modern contraception. However, for skilled birth attendance, the richest quintile has significantly higher coverage rates than the rest of the population. Mothers in the richest quintile are 5.1 times more likely to be assisted by skilled health personnel during delivery than mothers in the poorest quintile.

Among health indicators, there is a gradual improvement in the proportion of women who are underweight across the first four wealth quintiles. However, marked improvements are seen among women in the richest quintile compared to women in lower wealth quintiles. Thirty percent of women in the fourth quintile are underweight compared to 15% of those in the richest quintile. The opposite pattern is seen for overweight women. As women move from a poorer quintile to a wealthier quintile, they are more likely to be overweight, particularly if they are in the richest quintile. The percentage of women who are overweight in the richest quintile is almost double that of those in the fourth quintile.

The following figure depicts the rural-urban patterns for six indicators.

Fig. 3 Selected indicators by area, India, 1998-1999

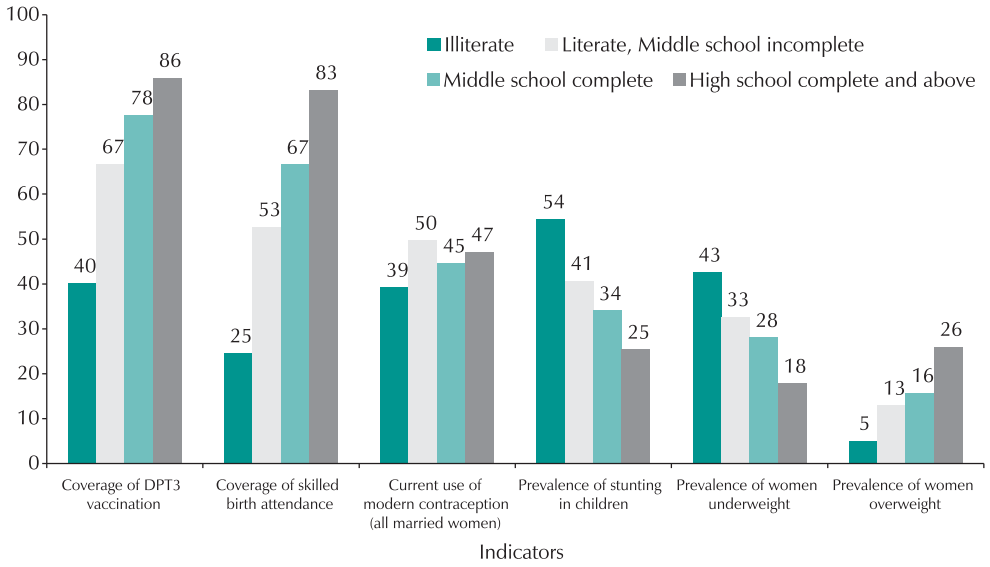


The figure shows that there are inequities between rural and urban areas, especially with respect to skilled birth attendance and coverage of DPT3 vaccination. For all indicators, rural residents are worse off. For example, coverage of skilled birth attendance is 2.2 times higher in urban areas than in rural areas.

Stunting among children is 1.4 times higher in rural areas than in urban areas. Women in rural areas are only 1.1 times more likely to be underweight than women in urban areas. However, the percentage of women who are overweight is about the same in urban and rural areas.

The following figure shows the six selected indicators by education achievement of the mother.

Fig. 4 Selected indicators by education, India, 1998-1999



Educational achievement is an important factor associated with inequities in health. All indicators exhibit inequities across educational levels, except for current use of modern contraception for which usage rates are similar across educational categories. For example, 83% of women who have completed high school are assisted by skilled personnel during the births of their children, compared to only 25% of women with no education. Similarly, the proportion of children who are stunted is twice as high for those with mothers with no education compared to children with mothers who have a high school degree. Forty-three percent of women without education are underweight, compared to 18% in the most educated group. Women who have completed high school are five times more likely to be overweight than uneducated women.

Main determinants of inequities in skilled birth attendance

In this section the decomposition technique is used to unpack the contribution of factors to inequities in coverage of skilled birth attendance (rather than the national average). This exercise provides a useful lens to consider areas for potential improvement that would specifically reduce inequities. In this case, decomposition analysis shows that socioeconomic position and health systems factors together account for 78% of inequities in skilled birth attendance in India (Figure 5). The major determinants of socioeconomic position that contribute to inequities are household wealth (31%) and mother's education (12%) (Figure 6). The major health systems factors that contribute to inequities are receipt of valid antenatal care (7%) and quality of antenatal care received (18%).

Fig. 5 Contribution of broad factors to inequities in skilled birth attendance, India, 1998-1999

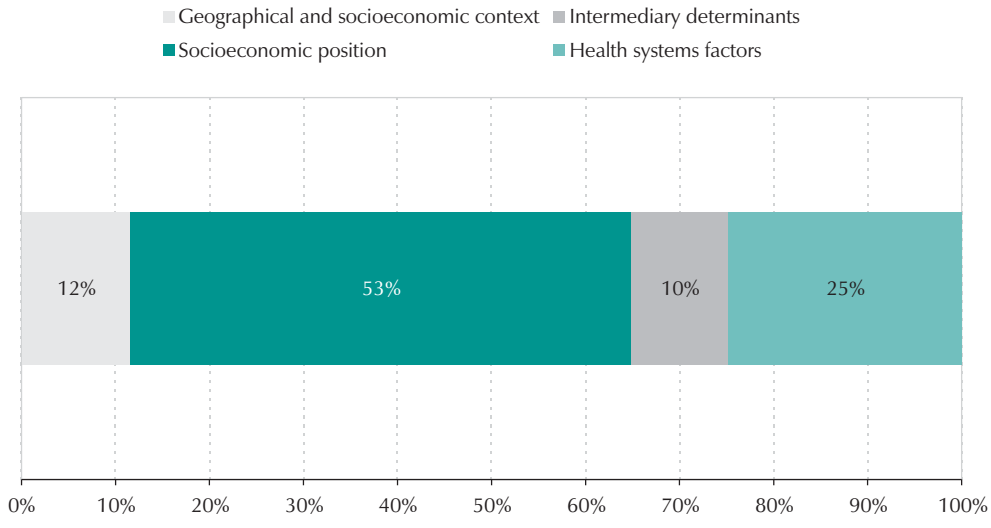
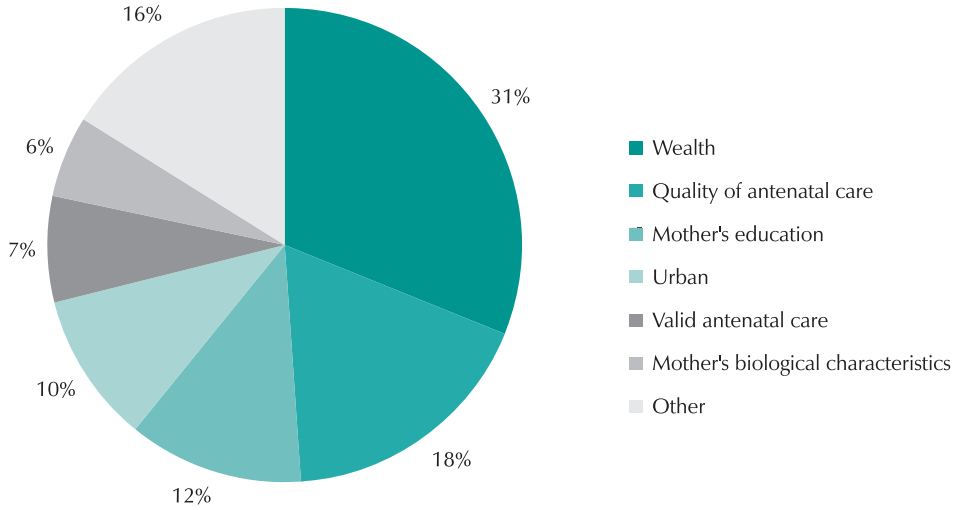


Fig. 6 Major determinants of inequities in skilled birth attendance, India, 1998-1999



Main determinants of inequities in stunting

Decomposition analysis of inequities in stunting among children under five years shows that socioeconomic position is by far the most important contributor to increasing inequities followed by intermediary determinants (Figure 7). However, geographical and socioeconomic context factors contribute to reducing inequities. The negative contribution of these determinants suggests that the effect of religion and location of residence is independent of socioeconomic status and is pro-poor. Only those individual factors that contribute positively to inequities were included in the analysis to determine the magnitude of their contribution. Within the socioeconomic position category, household wealth, mother's education and father's education together account for 50% of the inequities in childhood stunting (Figure 8). The intermediary determinants with the greatest impact are mother's biological characteristics (including age, parity, height and body mass index) and sanitation facilities.

Fig. 7 Contribution of broad factors to inequities in childhood stunting, India, 1998-1999

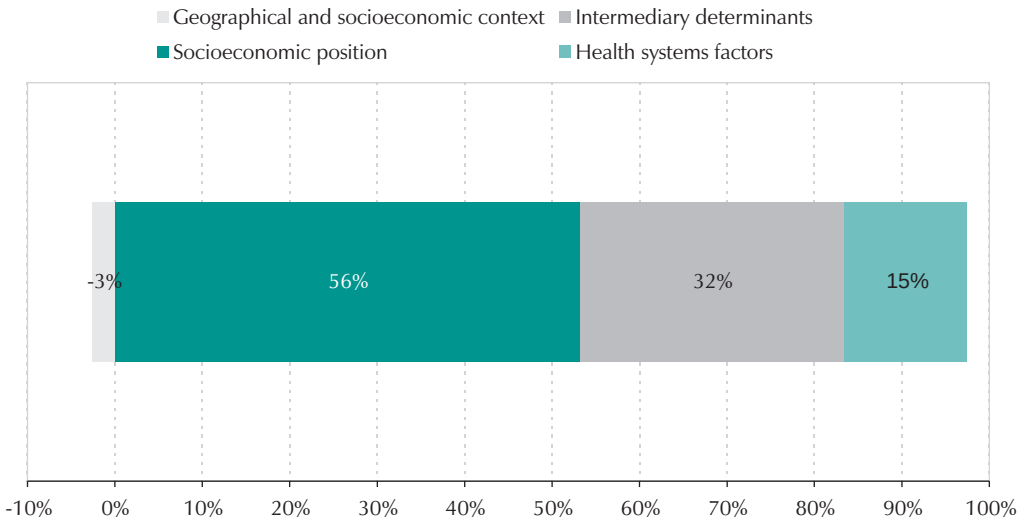
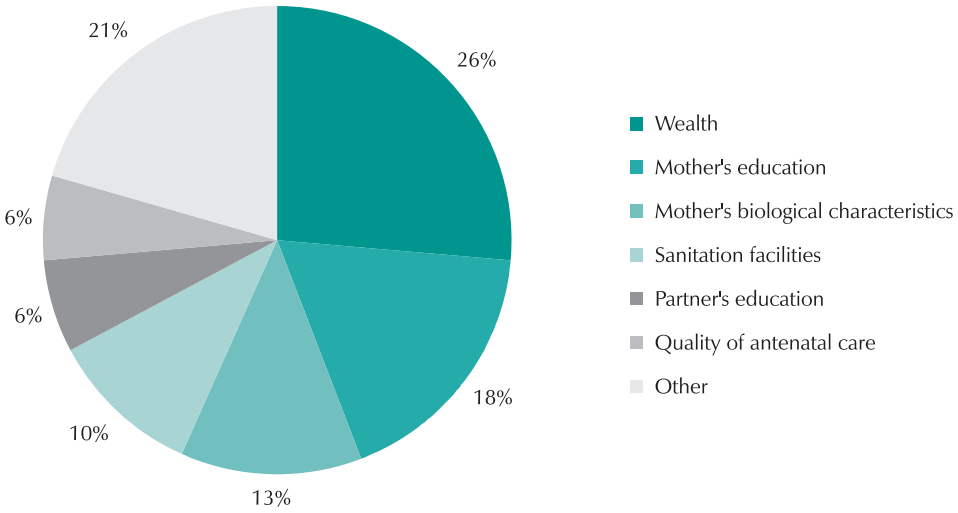


Fig. 8 Major determinants to inequities in childhood stunting, India, 1998-1999



Indonesia

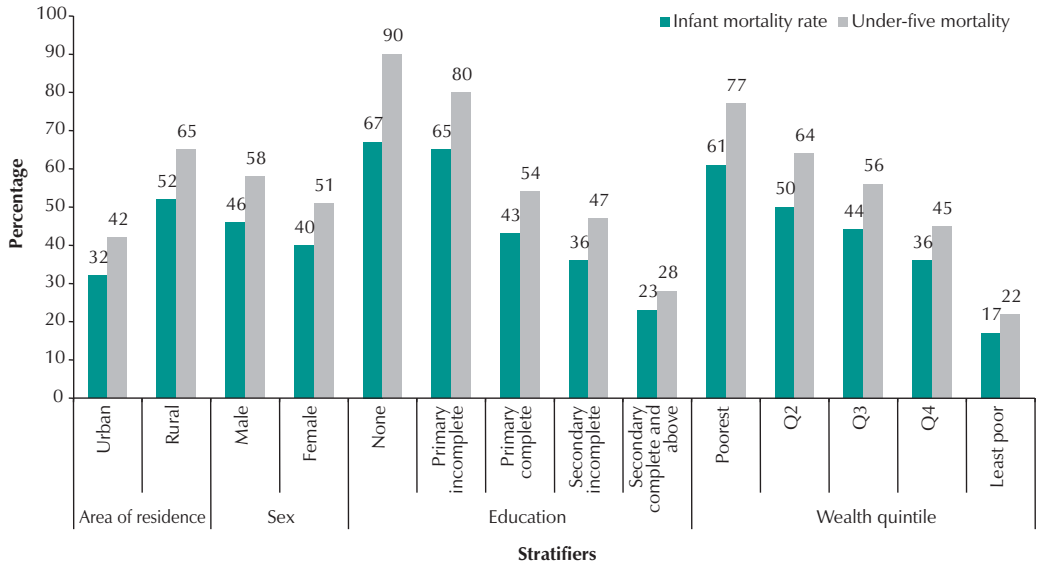
Indicators analysed

The data source used to assess inequities in health and access to health services is Indonesia's Demographic and Health Survey 2002-2003. Health indicators assessed are infant mortality and under-five mortality. Health system indicators include coverage of DPT vaccination, coverage of skilled birth attendance and current use of modern contraception.

Results

The results of the analysis are depicted in the following charts. The figure below shows the national average of infant and under-five mortality, differences between boys and girls as well as the gradient by wealth quintile, place of residence and education achievement.

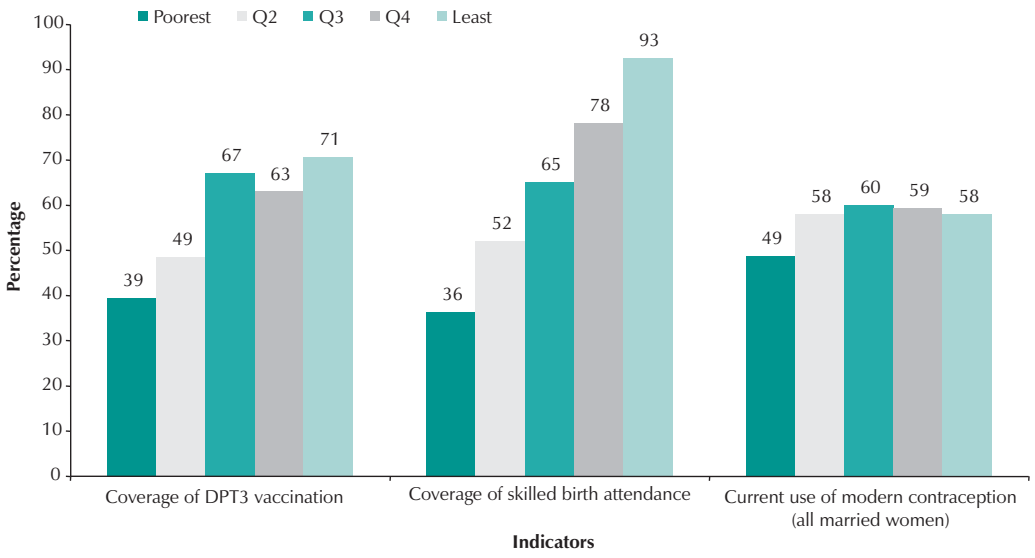
Fig. 1 Infant and under-five mortality by stratifiers, Indonesia, 2002-2003



The data from 2002-2003 show that the poorest quintile has 3.6 times higher under-five and infant mortality rates compared to the richest quintile. The mortality gradients by wealth quintile reflect a steady decline across the four poorest quintiles but a sharp drop between the fourth quintile and the richest one. However, by mother's education level, a sharp drop in both infant and under-five mortality can be seen between children born to mothers with some primary education and those who have completed their primary education. Another sharp decrease in mortality levels occurs between children with mothers with some secondary education and those who have completed this stage of their education. For instance, children born to mothers with no education were 3.2 times more likely to die before their fifth birthday than those born to mothers who completed their secondary education, and 1.9 times more likely to die than those born to mothers with some secondary education. Residents in rural areas experienced 1.6 times higher infant mortality and 1.5 times higher under-five mortality compared to the urban dwellers. Both infant and under-five mortality rates are higher for boys than for girls.

The figure below shows three indicators stratified by wealth quintiles.

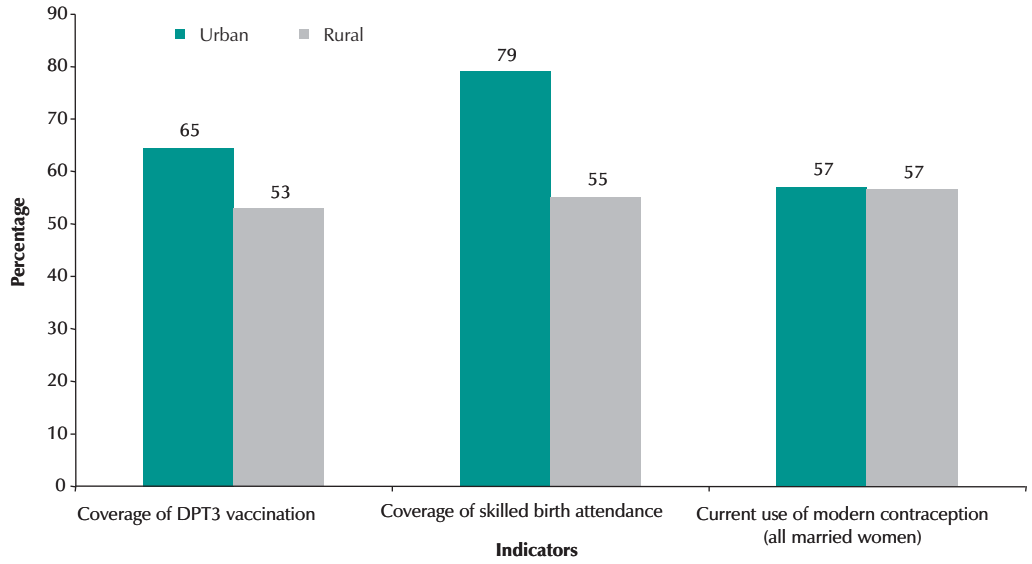
Fig. 2 Selected indicators by wealth quintile, Indonesia, 2002-2003



The indicators selected to analyse inequities in terms of access to health services do not exhibit consistent patterns with respect to income-related inequities. For use of skilled birth attendants, coverage rates increase gradually from poorer quintiles to wealthier ones. Women in the richest quintile are 2.6 times more likely to have their birth attended by a skilled health professional than those in the poorest quintile. Coverage of DPT3 vaccination ranges from 63% to 71% among the three wealthier quintiles. However, coverage for the poorer quintiles is significantly less. Coverage rates for modern contraception across wealth quintiles do not vary much.

The following figure depicts the rural-urban patterns for three indicators.

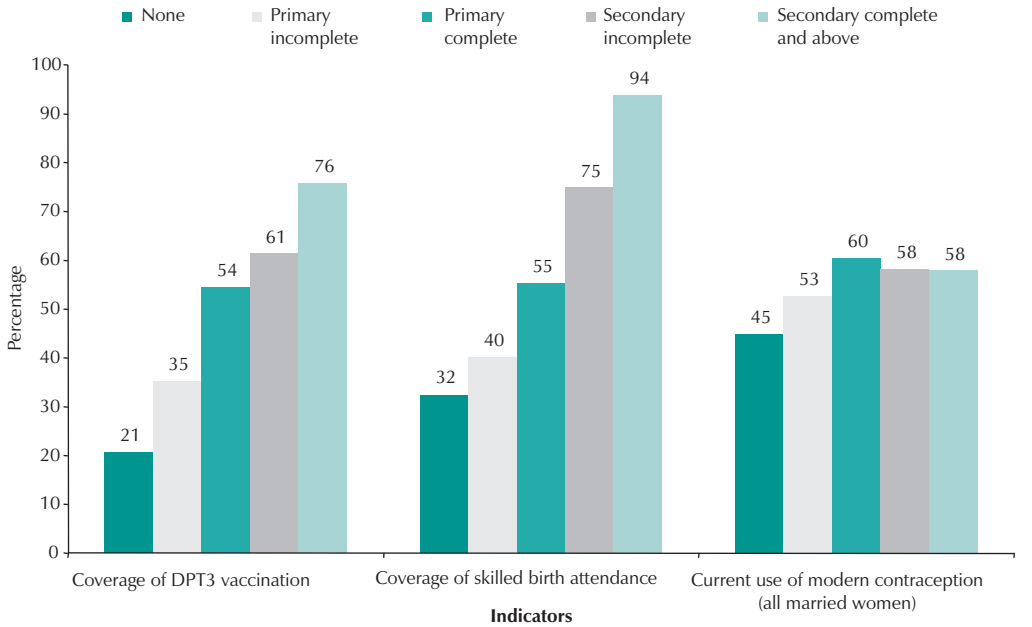
Fig. 3 Selected indicators by area, Indonesia, 2002-2003



The figure shows that there are inequities between rural and urban areas with respect to DPT3 vaccination coverage and use of skilled birth attendants. For example, coverage of skilled birth attendance is 1.4 times higher in urban areas than in rural areas. Current use of modern contraception is the same for women in rural areas and in urban areas.

The following figure shows the three selected indicators by education achievement of the mother.

Fig. 4 Selected indicators by education, Indonesia, 2002-2003



Educational achievement is an important factor associated with inequities in health. For example, 94% of women who completed their secondary education are assisted by skilled personnel during the births of their children, compared to only 32% of women with no education. Children of women who have completed their secondary education are 3.7 times more likely to have received the DPT3 vaccination than children of uneducated women. Women with no education are less likely to use modern methods of contraception compared to women with some education. No further differences are seen across educational levels.

Trends in population averages and wealth inequities

Table 1 summarizes the trends of health status and health systems indicators.

The findings indicate improvement between 1997 and 2002-2003 of population averages for infant and under-five mortality rates. Among health systems indicators, delivery by skilled birth attendants and contraceptive prevalence rate exhibit improvements. The increase in use of skilled birth attendants is substantial. However, there is a decrease in the proportion of children who have received the DPT3 vaccination.

Table 1: Trends in population averages and household wealth inequities for selected health and health care indicators

Indicator	Population average		Ratio*	
	1997	2002-2003	1997	2002-2003
Health status				
Infant mortality rate	52.2	43.0	3.4	3.6
Under-five mortality rate	70.6	54.5	3.7	3.5
Health systems				
DPT3 coverage	64.1	58.3	1.6	1.8
Delivery by skilled birth attendants	10.1	66.0	4.2	2.6
Contraceptive prevalence rate (all married women)	54.7	56.7	1.2	1.2

* Poorest to richest ratio is used for infant mortality rate, under-five mortality rate, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for DPT3 coverage, delivery by skilled birth attendants, contraceptive prevalence rate. This provides a consistent way to interpret ratios, as health outcomes indicators are expressed in negative terms (e.g., lower infant mortality is better), whereas health system process indicators are expressed in positive terms (e.g., higher DPT3 coverage is better).

The different indicators present different patterns in terms of inequity trends over the 5-year time period. The relative gap in infant mortality and DPT3 coverage shows a slight increase in inequity, whereas a slight decrease in inequity is exhibited for under-five mortality. The contraceptive prevalence rate shows no change in inequity between the two time periods. However, a significant reduction in inequity is seen in the use of a skilled birth attendant between the two time periods.

Table 2 summarizes trends in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework to interpret the results over time, as inputs to health policies.

Table 2: Changes in inequities and population averages

		Relative gap	
		Narrowing	**Widening/status quo**
Population average	Improving	**A. Best outcome** – Coverage of skilled birth attendance – Under-five mortality	**B.** – Use of modern contraception – Infant mortality
	Worsening	**C.**	**D. Worst outcome** – DPT3 coverage

The best outcome cell (cell A) shows that the relative gap - ratio - between the richest and poorest wealth quintiles narrows and the population average improves over time. Coverage of skilled birth attendance and under-five mortality exhibit this pattern. Figure 5 illustrates this pattern for delivery by a skilled birth attendant. It is possible to see a widening of the relative gap with improving population average (cell B). One reason why this pattern could result is when the richest group improves faster than the poorest group. This is the case for use of modern contraception and infant mortality: in spite of improving national averages, the relative gap between the poorest and richest quintiles has actually widened a little bit. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C). No indicators exhibit this pattern. The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average: DPT3 vaccination coverage falls into this category. This pattern is exhibited in Figure 6.

Fig. 5 Trend in skilled birth attendance coverage by wealth quintile, Indonesia

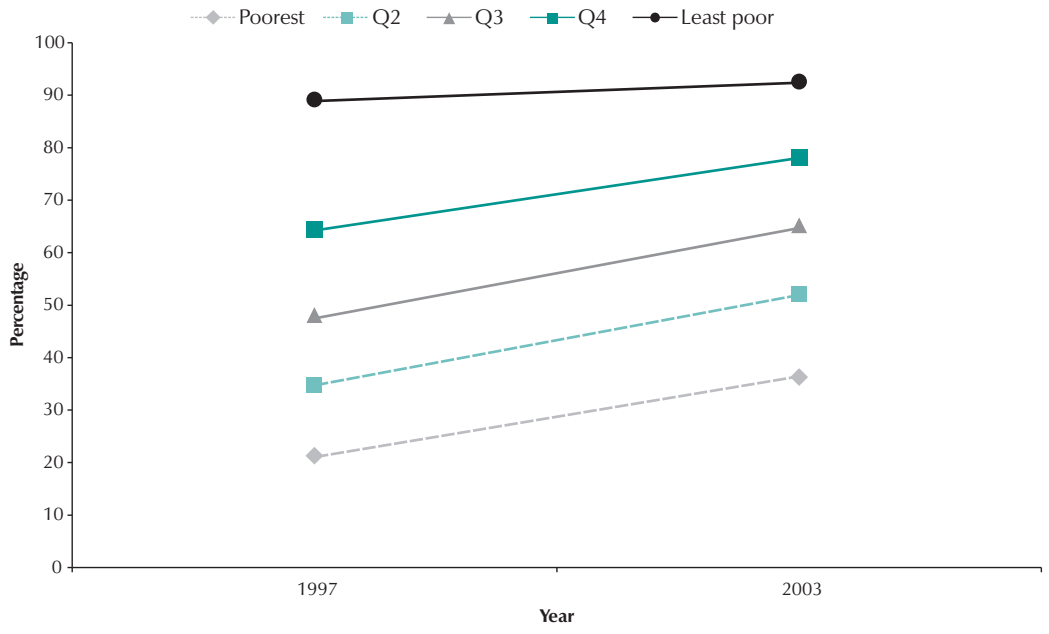
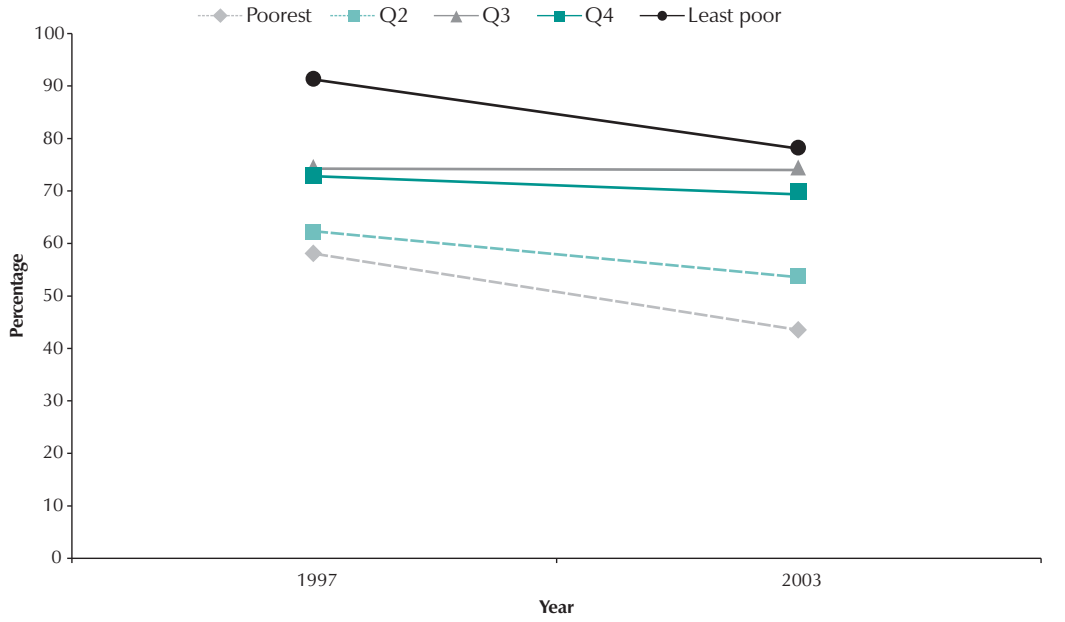


Fig. 6 Trend in DPT3 coverage by wealth quintile, Indonesia



Main determinants of inequities in skilled birth attendance

In this section the decomposition technique is used to unpack the contribution of factors to inequities in coverage of skilled birth attendance (rather than the national average). This exercise provides a useful lens to consider areas for potential improvement that would specifically reduce inequities. In this case, decomposition analysis shows that socioeconomic position accounts for 56% of inequities in skilled birth attendance in Indonesia (Figure 7). Health systems factors and geographic and socioeconomic context each contribute just under 20%. The determinants in the socioeconomic position category that contribute most to inequities are household wealth, mother's education and partner's education (Figure 8). Antenatal care factors and the region in which the household is located also contribute significantly to inequities in use of skilled birth attendants in Indonesia.

Fig. 7 Contribution of broad factors to inequities in skilled birth attendance, Indonesia, 2003

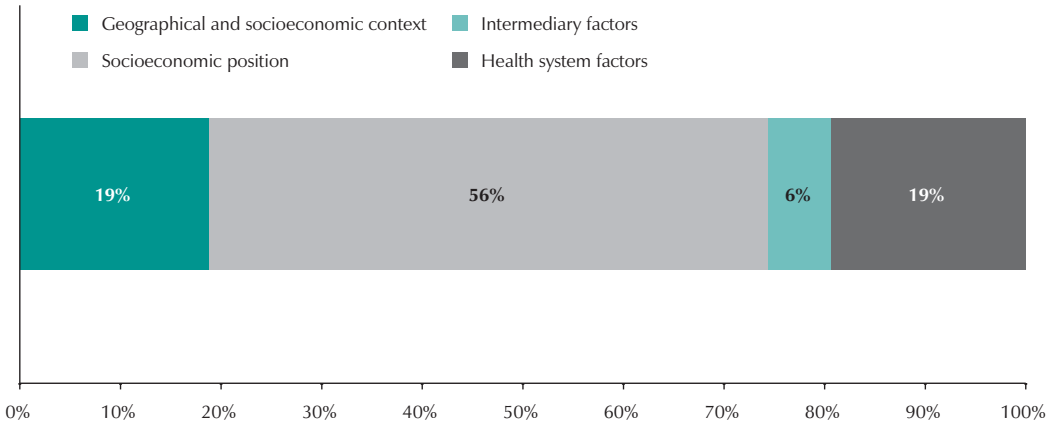
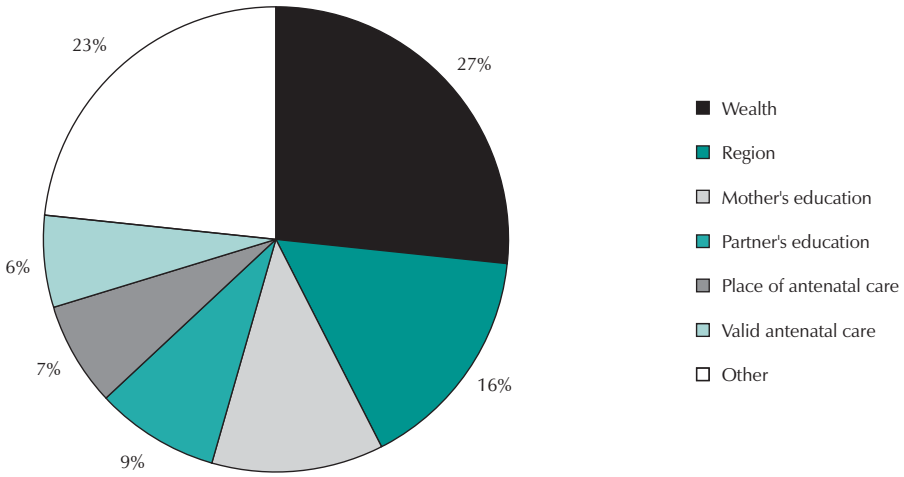


Fig. 8 Major determinants of inequities in skilled birth attendance, Indonesia, 2003



Nepal

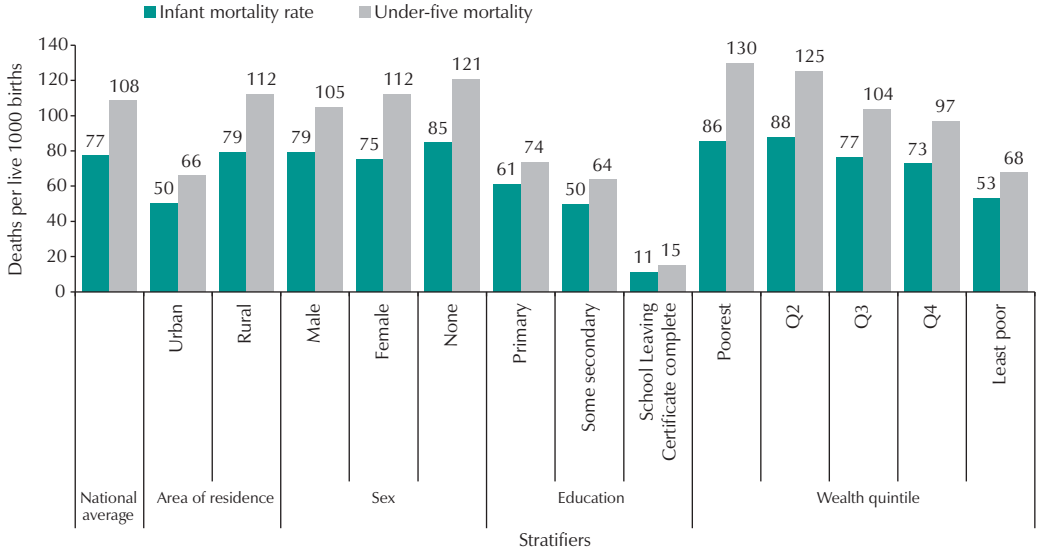
Indicators analysed

The data source used to assess inequities in health and access to health services is Nepal's Demographic and Health Survey, 2001. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of women underweight and overweight. Health system indicators include coverage of DPT3 vaccination, coverage of skilled birth attendance and current use of modern contraception.

Results

The results of the analysis are depicted in the following charts. The figure below shows the national average of infant and under-five mortality, the difference in mortality rates of boys and girls as well as the gradient by wealth quintile, place of residence, and education achievement.

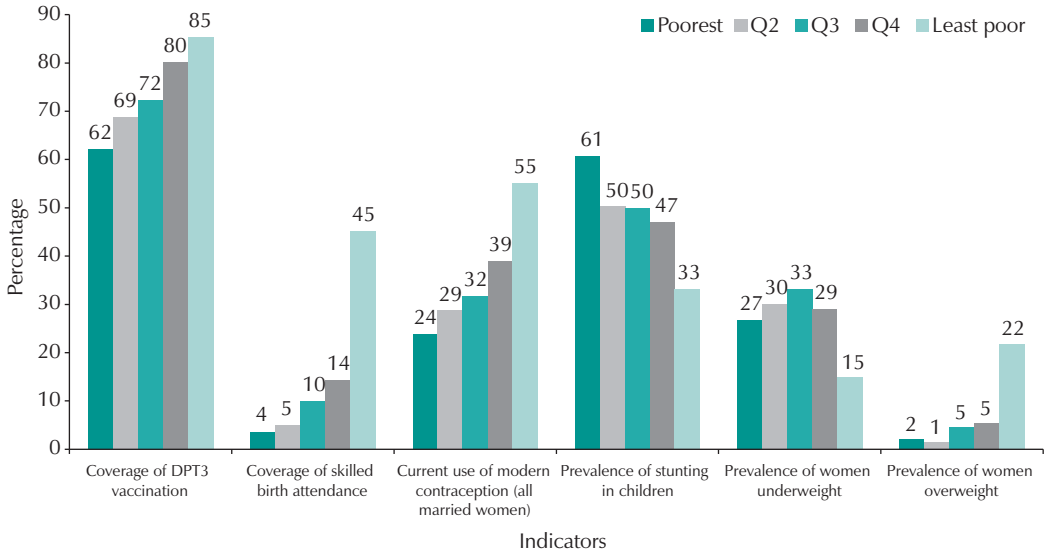
Fig. 1 Infant and under-five mortality by stratifiers, Nepal, 2001



The data from 2001 show that the poorest quintile experienced 1.9 times the under-five mortality experienced by the richest quintile. The under-five and infant mortality gradients by wealth quintile reflect a steady decline after the two poorest quintiles and a sharp drop between the fourth quintile and the richest one. By mother's education level, a sharp drop in both infant and under-five mortality can be seen between children born to mothers with no education and with only primary education, and between children born to mothers with some secondary education and those with a school leaving certificate (SLC). For instance, children born to mothers with no education were 7.6 times more likely to die before their first birthday than those born to mothers who have completed their secondary education, and 1.6 times more likely to die than those born to mothers with primary education. Residents in rural areas experienced 1.6 times higher infant mortality and 1.7 times higher under-five mortality compared to the urban dwellers. Both infant and under-five mortality rates are nearly equal for boys and girls.

The figure below shows six indicators stratified by wealth quintiles.

Fig. 2 Selected indicators by wealth quintile, Nepal, 2001



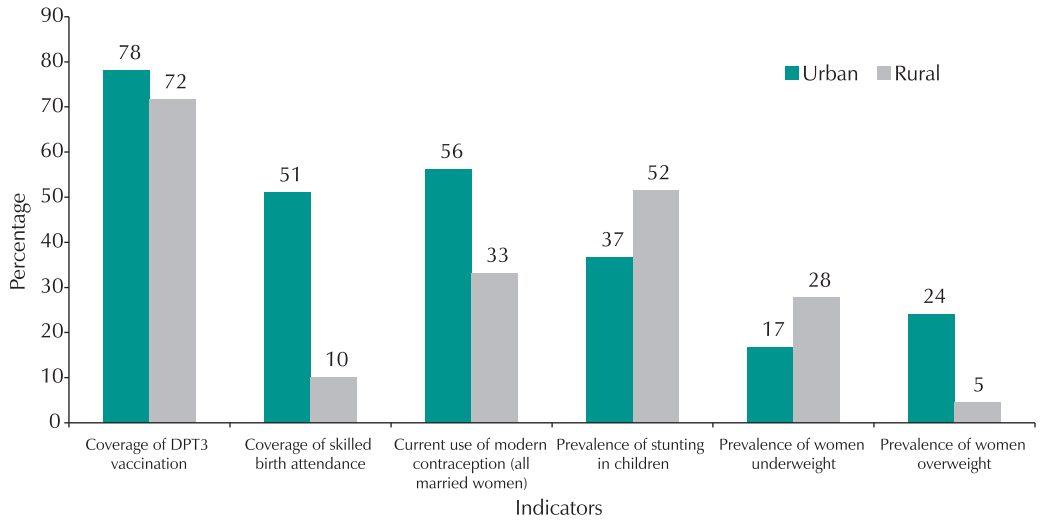
In terms of access to health services, the data show income-related inequities for all indicators. There is a gradual increase in coverage rates across wealth quintiles for DPT3 vaccinations. However, for skilled birth attendance and use of modern contraception, the richest quintile has significantly higher coverage rates than the rest of the population. Mothers in the richest quintile are 12.5 times more likely to be assisted by skilled health personnel during delivery than mothers in the poorest quintile. Similarly, coverage of current use of modern contraception among married women is 2.3 times higher in the richest quintile in comparison to the poorest quintile.

Among health indicators, the patterns of stunting in children across wealth quintiles reveal similar rates for children in households in the three middle quintiles. However, stunting is significantly higher among children in the poorest quintile than among children in the richest quintile. The patterns for percentage of women who are underweight or overweight are similar. Among the poorest 80% of households, the percentage of women who are underweight varies between 27%

and 33%, but drops sharply to 15% for the richest quintile. Similarly, the percentage of women who are overweight is less than five percent for those living in the poorest 80% of households but is 22% for those in the richest quintile.

The following figure depicts the rural-urban patterns for six indicators.

Fig. 3 Selected indicators by area, Nepal, 2001

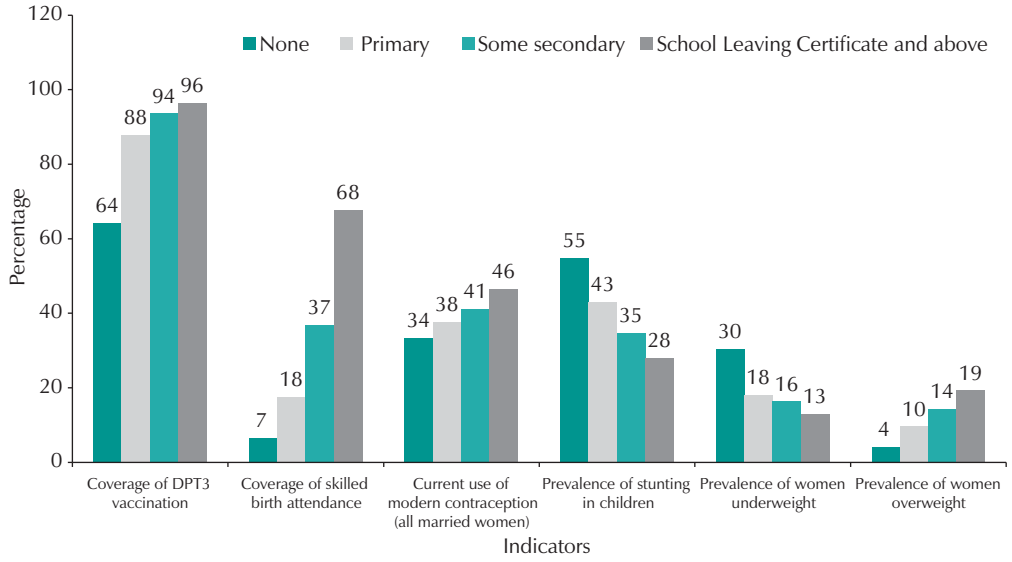


The figure shows that there are inequities between rural and urban areas in terms of access to health services, especially with respect to skilled birth attendance. For all indicators, rural residents are worse off. For example, coverage of skilled birth attendance is 5.1 times higher in urban areas than in rural areas. The inequity in coverage of DPT3 vaccination between urban and rural areas is small.

Stunting among children is 1.4 times higher in rural areas than in urban areas. Women in rural areas are 1.6 times more likely to be underweight than women in urban areas. However, the percentage of women who are overweight is 5.4 times higher in urban areas than in rural areas.

The following figure shows the six selected indicators by education achievement of the mother.

Fig. 4 Selected indicators by education, Nepal, 2001



Educational achievement is an important factor associated with inequities in health. For example, 68% of women with at least secondary education are assisted by skilled personnel during the births of their children, compared to only 7% of women with no education. Similarly, the proportion of children who are stunted is twice as high for those with mothers with no education compared to those with mothers who have at least a secondary education. Thirty percent of women without education are underweight, compared to 13% in the most educated group. Women with at least a secondary education are four times as likely to be overweight than uneducated women. The inequities are apparent but not as prominent with respect to the percentage of women who currently use modern contraceptive methods.

Trends in population averages and wealth inequities

Table 1 summarizes the trends of health status and health systems indicators.

The findings indicate an improvement between 1996 and 2001 of population averages for all the indicators except stunting in children. Infant mortality and under-five mortality rates show a substantial decrease. The survey data show improvement in the national averages for two health systems indicators but not for delivery by a skilled birth attendant.

However, the different indicators present different patterns in terms of inequity trends over the 7-year-period. The relative gap in infant mortality and stunting in under-five children shows a slight increase in inequity, whereas prevalence of women underweight shows a marked increase. Trends for DPT3 coverage and contraceptive prevalence rate show a substantial reduction in inequity but delivery by skilled birth attendant documents an increase.

Table 1: Trends in population averages and household wealth inequities for selected health and health care indicators				
Indicator	Population average		Ratio*	
	1996	2001	1996	2001
Health status				
Infant mortality rate	93	77.2	1.5	1.6
Under-five mortality rate	139.2	108.4	1.9	1.9
Stunting in under-five children	48.4	50.5	1.7	1.8
Prevalence of underweight in women	28.3	26.7	1.2	1.8
Health systems				
DPT3 coverage	53.5	64.3	2.1	1.4
Delivery by skilled birth attendants	10.1	6.6	11.6	12.5
Contraceptive prevalence rate (all married women)	26	33.5	2.9	2.3

* Poorest to richest ratio is used for infant mortality rate, under-five mortality rate, stunting in under-five children and prevalence of underweight in women, while richest to poorest ratio is used for DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate. This provides a consistent way to interpret ratios, as health outcomes indicators are expressed in negative terms (e.g., lower infant mortality is better), whereas health system process indicators are expressed in positive terms (e.g., higher DPT3 coverage is better).

Table 2 summarizes trends in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework to interpret the results over time, as inputs to health policies.

Table 2: Changes in inequities and population averages			
		Relative gap	
		Narrowing	Widening/status quo
Population average	Improving	**A. Best outcome** – DPT3 coverage – Use of modern contraception	**B.** – Infant mortality rate – Under-five mortality rate – Prevalence of underweight among women
	Worsening	**C.**	**D. Worst outcome** – Delivery by skilled attendants – Stunting

The best outcome cell (cell A) shows that the relative gap - ratio - between the richest and poorest wealth quintiles narrows and the population average improves over time. DPT3 coverage and the proportion of women using modern contraception represent this pattern. Figure 5 illustrates this pattern in DPT3 coverage. It is possible to see a widening of the relative gap with improving population average (cell B). One reason why this pattern could result is when the variable for the richest group improves faster than the poorest group. This is the case in infant mortality and underweight women: in spite of improving national averages, the relative gap between the poorest

and richest quintiles has actually widened a little bit. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C). No indicators exhibit this pattern. The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average: stunting in children and delivery by skilled birth attendant falls in this category. Figure 6 illustrates this pattern in childhood stunting.

Fig. 5 Trend in DPT3 vaccination coverage by wealth quintile, Nepal

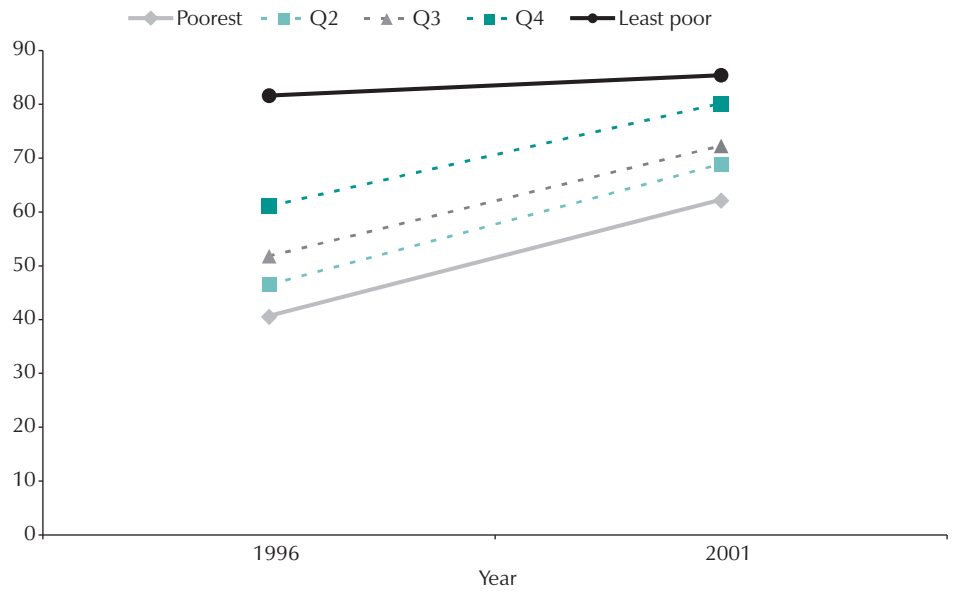
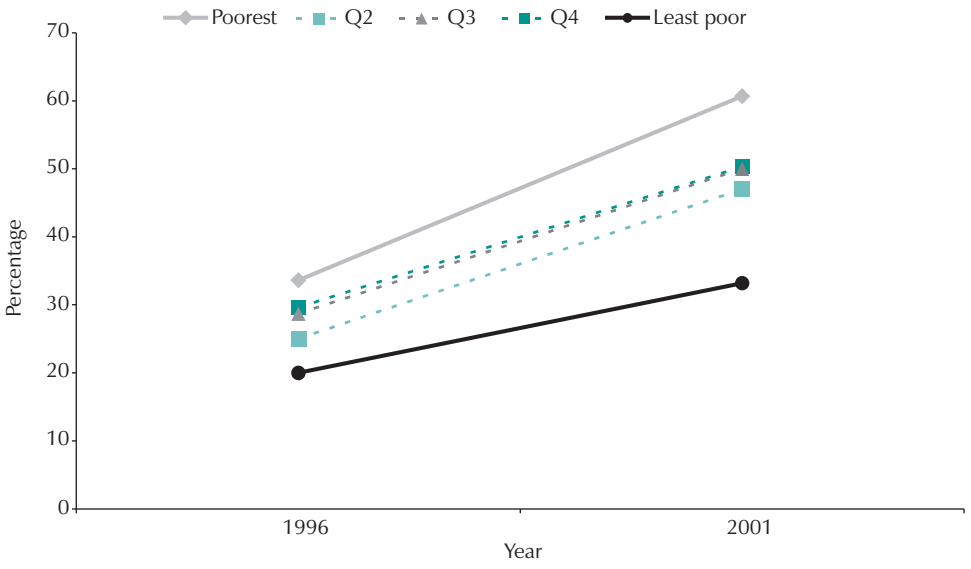


Fig. 6 Trend in Stunting by wealth quintile, Nepal



Main determinants of inequities in skilled birth attendance

In this section the decomposition technique is used to unpack the contribution of factors to inequities in coverage of skilled birth attendance (rather than the national average). This exercise provides a useful lens to consider areas for potential improvement that would specifically reduce inequities. In this case, decomposition analysis shows that socioeconomic position is by far the most important contributor, accounting for 58% of the inequities, followed by health systems factors (Figure 7). Some individual factors within the categories featured below contribute to reducing inequities. These factors have been excluded from the analysis conducted to determine the magnitude of individual determinants' contributions to inequities. Three socioeconomic determinants account for half of the inequities in skilled birth attendance in Nepal: household wealth, mother's education and father's education (Figure 8). The health systems factors that have the largest contributions are receipt of valid antenatal care during pregnancy (9%) and quality of antenatal care received (19%).

Fig. 7 Contribution of broad factors to inequities in skilled birth attendance, Nepal, 2001

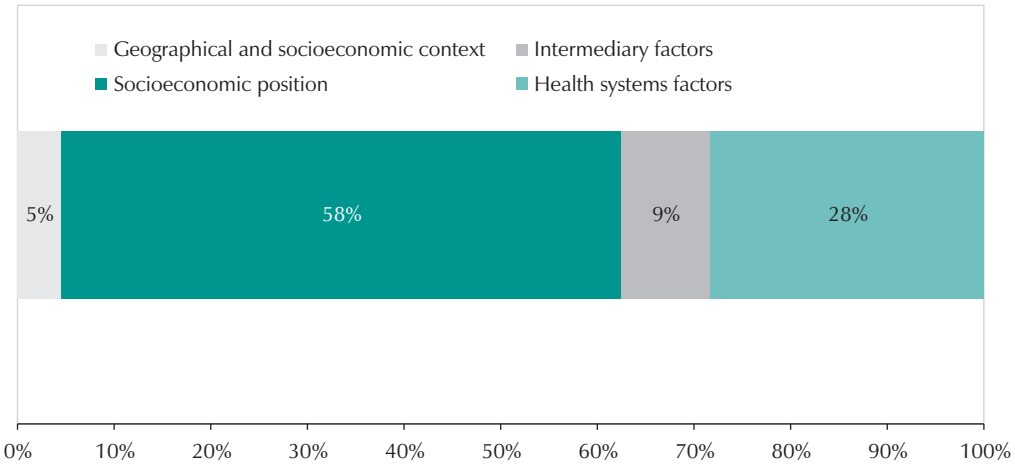
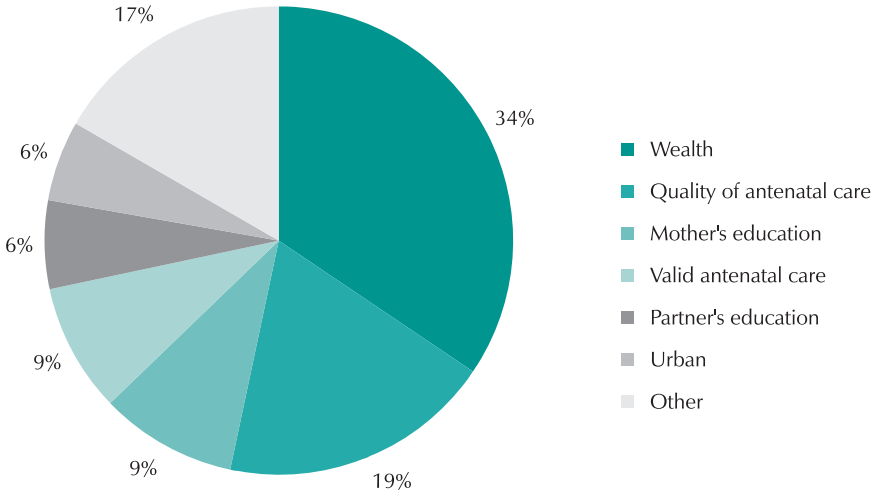


Fig. 8 Major determinants of inequities in skilled birth attendance, Nepal, 2001



Main determinants of inequities in stunting

Decomposition analysis shows that 85% of inequities in stunting among children under five years old in Nepal can be attributed to socioeconomic position and intermediary factors (Figure 9). Some individual factors that comprise the broad categories in the bar chart below contribute to reducing inequities. Since the effect of these factors appears to be independent of socioeconomic status, they are not included in the analysis to determine the magnitude of the contribution of individual factors to inequities. The major determinants of inequities within the socioeconomic position category are household wealth and mother's education (Figure 10). Three intermediary factors account for 36% of inequities in childhood stunting in Nepal: sanitation facilities, mother's biological characteristics (including age, parity, height and body mass index) and exposure to mass media.

Fig. 9 Contribution of broad factors to inequities in childhood stunting, Nepal, 2001

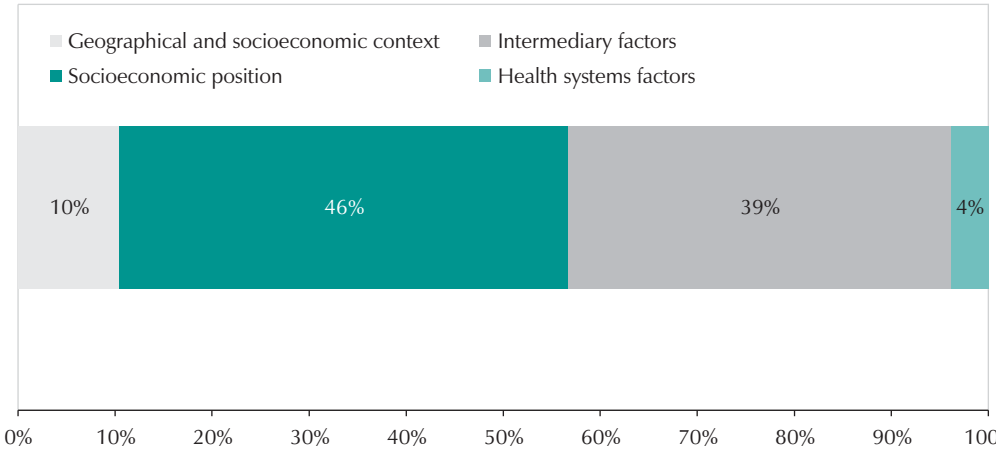
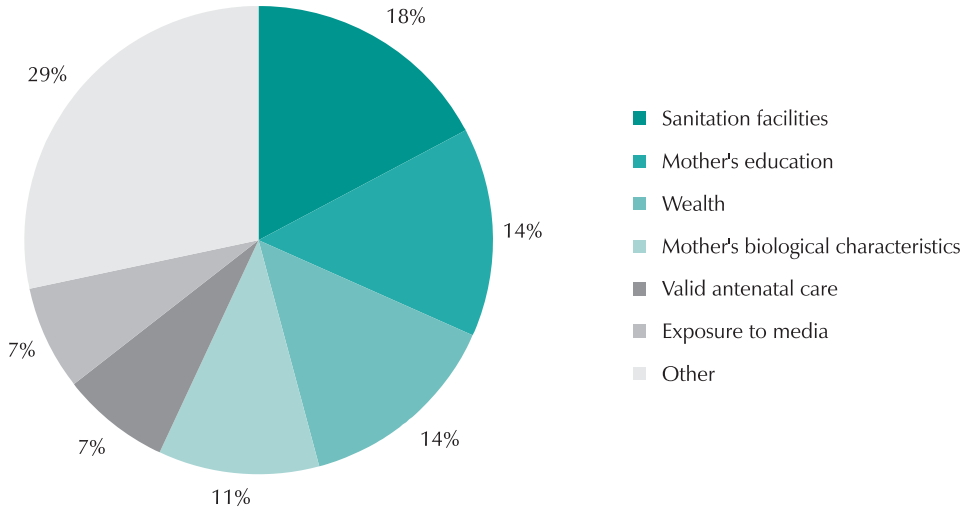


Fig. 10 Major determinants of inequities in childhood stunting, Nepal, 2001



Sri Lanka

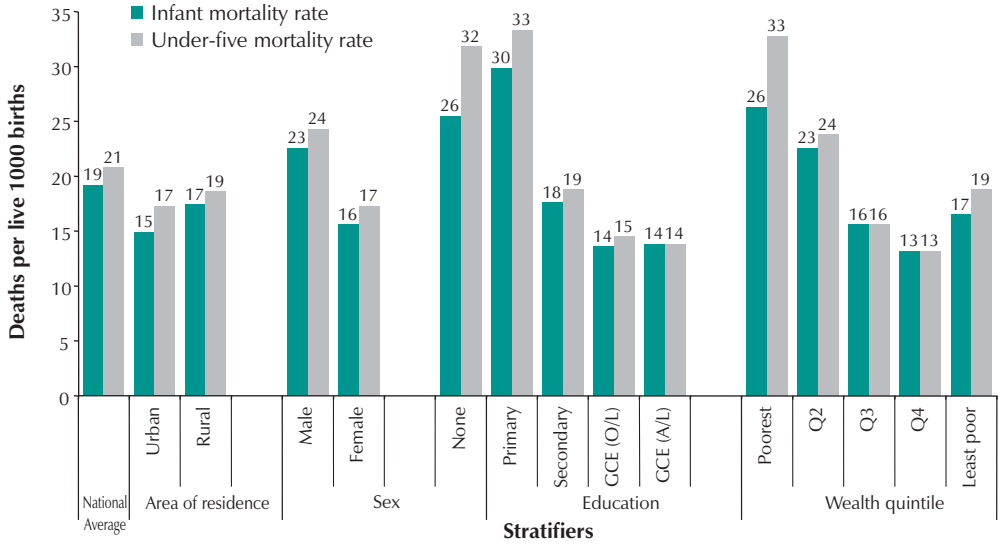
Indicators analysed

The data source used to assess inequities in health and access to health services is Sri Lanka's Demographic and Health Survey, 2000. Health indicators assessed include infant and under-five mortality, prevalence of stunting in children and prevalence of women underweight and overweight. Health system indicators include coverage of DPT vaccination, coverage of skilled birth attendance and current use of modern contraception.

Results

The results of the analysis are depicted in the following charts. The figure below shows the national average of infant and under-five mortality, as well as the gradient by wealth quintile, place of residence, and education achievement.

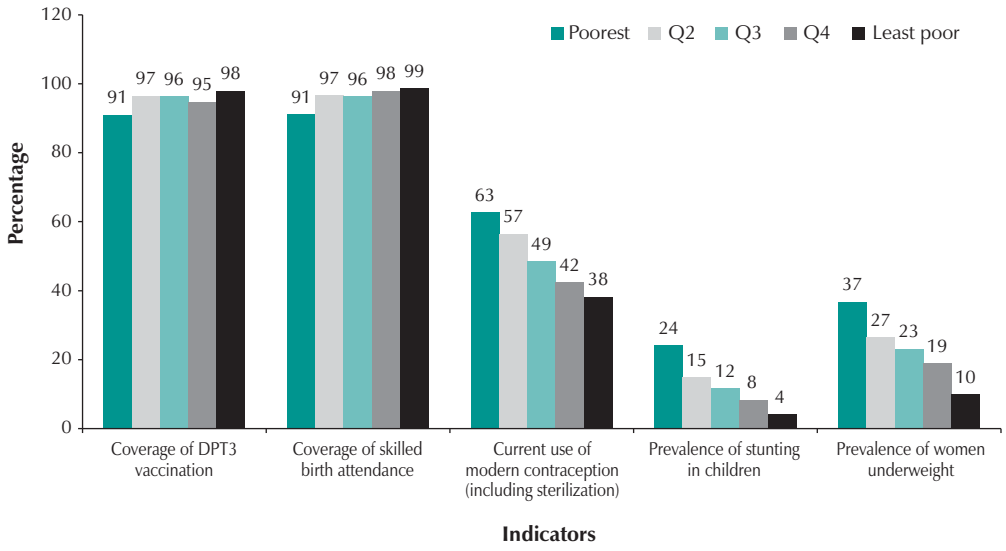
Fig. 1 Infant and under-five mortality by stratifiers, Sri Lanka, 2000



The data from 2000 show that the poorest quintile experienced 1.7 times the under-five mortality and 1.6 times the infant mortality experienced by the richest quintile. The mortality gradients by wealth quintile reflect an unusual pattern of declining across the first four quintiles and increasing again for the richest quintile. By mother's education level, it is clear that children born to mothers with little or no education are more than twice as likely to die than those born to mothers with at least a secondary education. The under-five mortality rates for children with mothers with less education are over 30 but the rates for children with more educated mothers are 19 and below. Mortality rates are similar for urban and rural area residents. Both infant and under-five mortality rates are 1.4 times higher for boys than for girls.

The figure below shows five indicators stratified by wealth quintiles.

Fig. 2 Selected indicators by wealth quintile, Sri Lanka, 2000

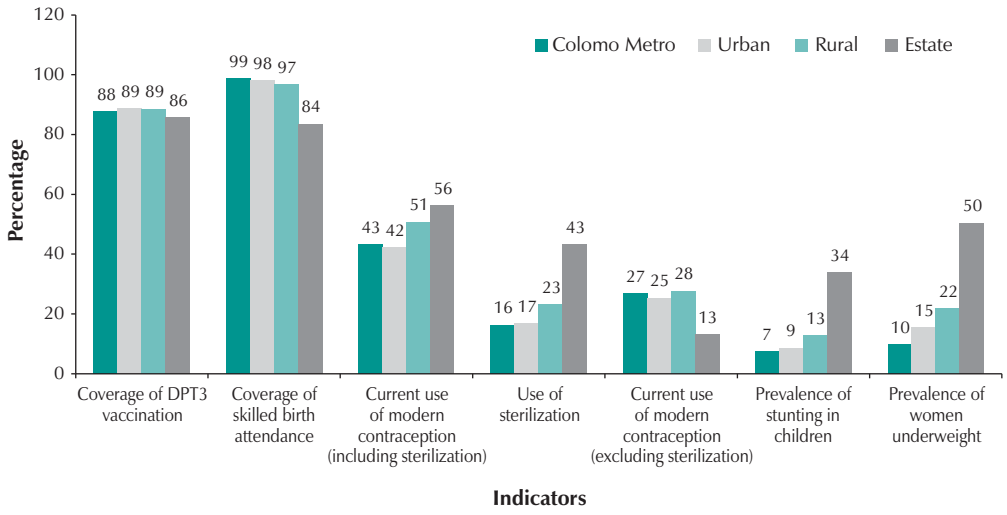


In terms of access to health services, there is almost full coverage across wealth quintiles for DPT3 vaccinations and for skilled birth attendance. The data show income-related inequities only for current use of modern contraception. Contrary to expectations, as income increases in Sri Lanka, use of modern contraception decreases. This unusual phenomenon can largely be attributed to the fact that mothers who have been sterilized are included in the group of women who currently use modern contraception. Poorer women have much higher sterilization rates but lower rates for contraceptive use than richer women in Sri Lanka.

Among health indicators, the change in prevalence of stunting in children and underweight in women is gradual but the difference between the poorest and richest quintiles is large. The percentage of children living in households in the poorest quintile who are stunted is six times that of those in the richest households. Similarly, the proportion of women who are underweight is 37% in the poorest quintile compared to 10% in the richest.

The following figure depicts the rural-urban patterns for seven indicators.

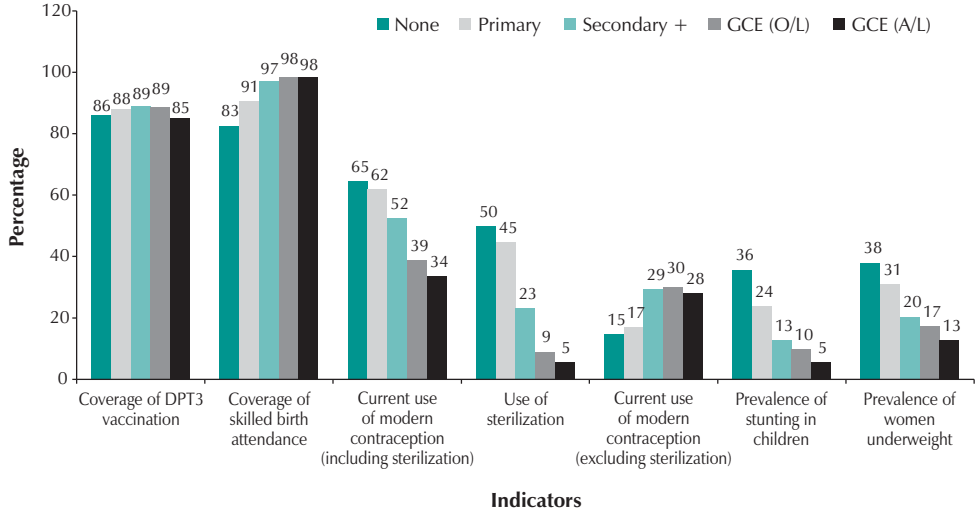
Fig. 3 Selected indicators by area, Sri Lanka, 2000



The figure shows that there are virtually no inequities between rural and urban areas, with respect to DPT3 vaccination coverage and use of skilled birth attendants. However, rural and estate residents are more likely to use modern methods of contraception, which includes sterilization, than urban residents. When use of contraception is separated into use of sterilization and use of other modern methods, it becomes clear that estate residents are much more likely to use sterilization but less likely to use other modern methods of contraception compared to those living in other sectors. The prevalence of stunting in children and underweight in women is higher for rural residents compared to urban residents but is substantially higher for those living in estate areas compared to all other areas. For example, children living in estate areas are almost three times more likely to be stunted than those living in rural areas and five times more likely than those living in the Colombo metropolitan area.

The following figure shows the seven selected indicators by education achievement of the mother.

Fig. 4 Selected indicators by education, Sri Lanka, 2000



Educational achievement is generally an important factor associated with inequities in health outcomes. However, for use of health systems in Sri Lanka, it is not as great a determinant. There are few differences across education categories with respect to DPT3 vaccination coverage and use of skilled birth attendants. However, there is a gradual decrease in use of modern contraception as the level of education attained increases. Women with no education are 1.9 times more likely to use modern contraception than women who have completed their G.C.E. (A/L). Again, this counterintuitive finding is due to the fact that less educated women are more likely to be sterilized. Women with a secondary education are half as likely to be sterilized but twice as likely to use other modern methods of contraception as less educated women. Although the poor are actually less likely to use short-term contraceptive methods, the sterilization gap dominates the calculations of percentage of women who use modern contraception.

Inequities in health outcomes are strongly related to educational attainment. Children of mothers with no education are 7 times more likely to be stunted than those whose mothers have completed their G.C.E. (A/L). Similarly, 38% of uneducated women are underweight compared to 13% of the most educated women.

Trends in population averages and wealth inequities

Table 1 summarizes the trends of health status and health systems indicators.

The findings indicate the improvement between 1993 and 2000 of population averages for all indicators. The health indicators--infant mortality, under-five mortality and stunting-- show a substantial decrease. The survey data also show improvement in the national averages across all health systems indicators.

Table 1: Trends in population averages and household wealth inequities for selected health and health care indicators

Indicator	Population average		Ratio*	
	1993	2000	1993	2000
Health status				
Infant mortality rate	25.9	19.2	2.5	1.6
Under-five mortality rate	30.5	20.8	3.0	1.7
Stunting in under-five children	23.8	13.5		5.7
Health systems				
DPT3 coverage	86.6	87.9		1.1
Delivery by skilled birth attendants	94.1	96.0	1.1	1.1
Contraceptive prevalence rate (all married women)	43.7	49.5	1.7	1.6

* Poorest to richest ratio is used for infant mortality rate, under-five mortality rate and stunting in under-five children, while richest to poorest ratio is used for DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate. This provides a consistent way to interpret ratios, as health outcomes indicators are expressed in negative terms (e.g., lower infant mortality is better), whereas health system process indicators are expressed in positive terms (e.g., higher DPT3 coverage is better).

The different indicators exhibit similar patterns in terms of inequity trends over the 7-year time period. For all indicators, the relative gap between rich and poor has decreased. Both infant and under-five mortality rates show marked improvement in reducing inequity whereas the improvement in health care indicators is more subtle.

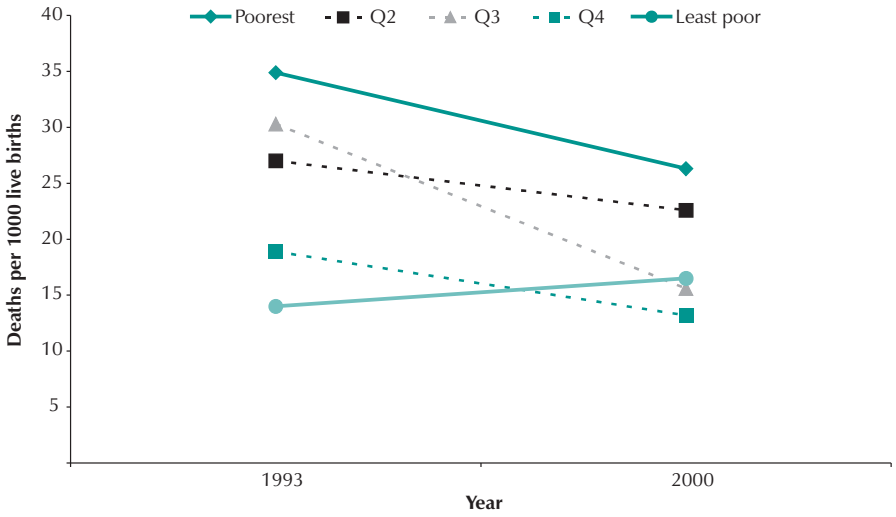
Table 2 summarizes trends in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A-D, provide a framework to interpret the results over time, as inputs to health policies.

Table 2: Changes in inequities and population averages

		Relative gap	
		Narrowing	**Widening/status quo**
Population average	Improving	**A. Best outcome** – Use of modern contraception – Infant mortality rate – Under-five mortality rate – Delivery by skilled attendants	**B.**
	Worsening	**C.**	**D. Worst outcome**

The best outcome cell (cell A) shows that the relative gap - ratio - between richest and poorest wealth quintiles narrows and the population average improves over time. Three indicators under study fall into this category. Figure 5 illustrates this pattern in infant mortality rates. It is possible to see a widening of the relative gap with improving population average (cell B). One reason why this pattern could result is when the richest group improves faster than the poorest group. No indicators exhibit this pattern. Also possible is a worsening in the population average coupled with a narrowing of the relative gap (cell C). No indicators exhibit this pattern. The worst outcome (cell D) is when there is a widening of both the relative gap and a worsening of the population average. Fortunately, no indicators fall into this category.

Fig. 5 Trend in infant mortality by wealth quintile, Sri Lanka



Main determinants of inequities in stunting

In this section the decomposition technique is used to unpack the contribution of factors to inequities in stunting in children under the age of five (rather than the national average). This exercise provides a useful lens to consider areas for potential improvement that would specifically reduce inequities. In this case, decomposition analysis shows that socioeconomic position is by far the most important contributor, followed by geographic and socioeconomic context factors (Figure 6). A number of individual factors that comprise the broad categories in the bar chart below contribute to reducing inequities. The negative contribution of these determinants suggests that their effects are independent of socioeconomic status. Only those individual factors that contribute positively to inequities were included in the analysis to determine the magnitude of their contribution. Within the socioeconomic position category, household wealth and partner's education together account for 38% of inequities (Figure 7). The district in which a household is located is also important in describing inequities in childhood stunting that exist in Sri Lanka.

Fig. 6 Contribution of broad factors to inequities in childhood stunting, Sri Lanka, 2000

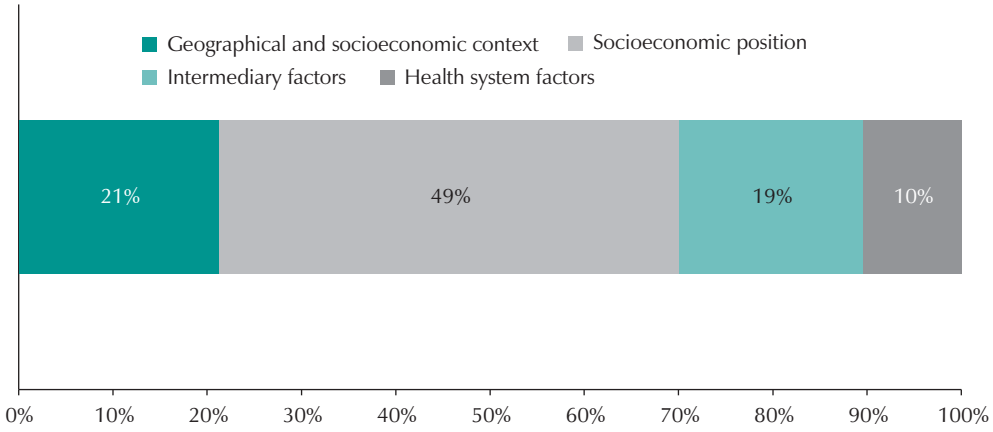
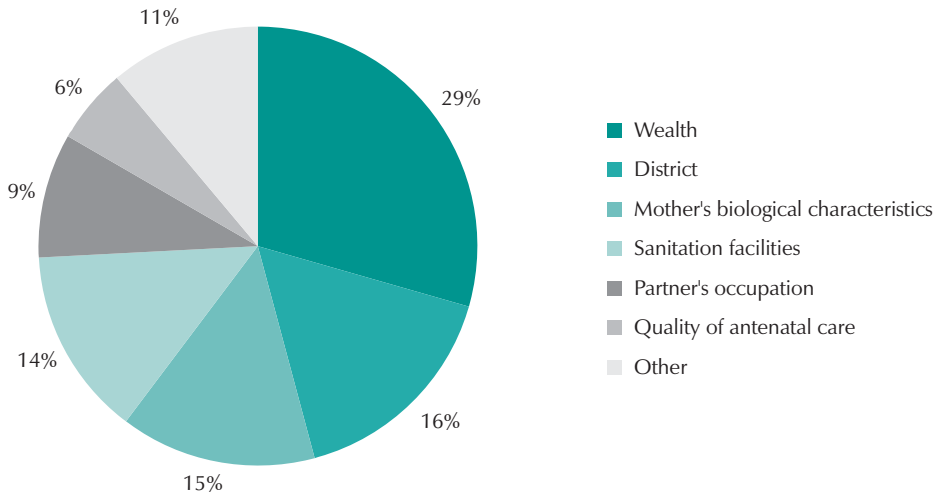


Fig. 7 Major determinants of inequities in childhood stunting, Sri Lanka, 2000



Thailand

1. Introduction

Thailand is quite self-sufficient in producing national representative household dataset to reflect health and healthcare utilization in the population for policy use, mostly prepared by the National Statistical Office (NSO). Thailand is therefore not the priority country for Demographic and Health Survey (DHS) sponsored by USAID. Only one DHS was conducted in the early 1980s and is quite outdated. UNICEF is very keen to involve Thailand in the global efforts to improve the health of the population especially of mothers and children through the Multi-Indicator Cluster Survey (MICS). The first MICS was conducted by NSO in 2005-06 with support from UNICEF. It is the only dataset which reflects health differentials among the population.

1.1 Survey samples- MICS

The health equity analyses in this report were generated from the UNICEF-sponsored MICS conducted in Thailand by the NSO during December 2005 – February 2006.

This survey data set was based on the structured, face-to-face interviews of key informants from households in Bangkok and all other 75 provinces in four regions of Thailand. An original sample of 43,440 nationally representative households was obtained using a two-stage, stratified sampling technique. Out of this, 42,302 households had people living in and 40,511 contributed to the survey response (Table 1).

Three separate sets of the questionnaires, for households and their members, women in reproductive ages (15-49 years), and children under five years, could be linked to each other by a unique household identifier and ID number of the individual household members.

1.2 Measures of population health

In this report, health status and outcomes of the Thai population were captured by some selected domains of children's and women's health. Children's health was reflected through the measures of mortality, common illnesses, and nutritional status in children below five years of age as well as the immunization coverage of children aged 12-23 months.

In the area of women's health, the focus was on mothers whose children were born two years before the survey and on family planning among married, non-pregnant women (see the operational definition of these measures in Table 2).

1.3 Equity stratifiers

Socio-demographic characteristics of the population subgroups were used as the health equity stratifiers. In this report, they were measured at various levels, including the individual gender, age, and education; the household income per capita, and wealth index; and the contextual characteristics of residence location (administrative areas and geographic regions).

For an analysis of child health, education of the children' mothers or care givers was classified into four levels (no education, primary school, secondary school, and higher education). Economic status (i.e., average income and wealth index) of the households was divided equally by quintiles, each containing 20% of all households from the original sample. Hence, the income quintiles or wealth index quintiles might not distribute equally (each by 20%) when the analysis was performed for the children or female population subgroups.

1.4 Objective

As part of the equity in health study in South-East Asia, the objectives of the Thai case study are to assess the health differential by different socioeconomic stratifiers using the latest MICS 2006. Note that using MICS, most indicators reflect mother and child health, and not of the general population as such.

We re-analyze using the MICS national dataset with a special focus on the equity perspective and perform extremely analysis.

2. Results

2.1 Child health

Under-five mortality

Equity in child health as reflected by under-five mortality is presented in Tables 3A and 3B. The mortality prevalence was enumerated from the mothers whose children were born five years before the survey period. Two types of denominators were used: women who had at least one of their children below five years (Table 3A) and women whose children were under five years (Table 3B). Women whose children had died below 5 years of age were counted as the numerator.

On average, women with under-five mortality children accounted for 0.5% of the women who had at least one under-five child (Table 3A) and for 0.9% of the women all of whose children were aged less than 5 years (Table 3B).

Above-average mortality occurred in mothers who had relatively lower education. Households with high economic status (as indicated by the upper quintiles of average income and wealth index) had a lower prevalence of under-five mortality. Mothers living in the northeast region tended to have higher under-five mortality.

Low birth weight

Mothers whose babies were born during the last two years with a weight of less than 2.5 kg were found mostly in the two extreme age groups (i.e., those younger than 20 years or older than 39 years) (Table 4). Mothers who had more than school education and had low birth weight babies were in a lower proportion than those finishing secondary school. The effect of differential household economic status on low birth weight showed no concrete pattern. The number of mothers with low-birth weight children in the South is greater than those living in other regions.

Breast-feeding

There are some gradients on the number of children under six months who were still breast fed without any other kind of food. Boys were a little more likely to have breast feeding as the sole source of nutrition than girls (Table 5). Less than 2% of the babies born to uneducated mothers were breastfed until they were six months. The breastfeeding proportion increased in those born to mothers who passed the primary and secondary schools, then declined slightly in the post-school educated mothers. Disparity in breastfeeding was not monotonous with respect to economic levels of the households. The breastfeeding prevalence at the extreme (lowest and highest) categories was comparable and higher than that at the middle economic status. Those living in non-municipal or provincial areas (except in the central region) tended to breastfeed more frequently than those living in the urban areas and in Bangkok.

Childhood illnesses

Two common illnesses in children under five years, diarrhoea and suspected pneumonia were found unequally distributed across the population subgroups (Table 6). Both diarrhoea and pneumonia occurring two weeks before the survey were found more frequently in boys than in girls. Mothers or care givers who were educated above the secondary school level, households in the richest quintile, and those living in municipal areas and in Bangkok reported a lower prevalence of these two common illnesses.

Childhood malnutrition

The nutritional status of the population was captured by the prevalence of under-five year children who suffered from moderate-to-severe malnourishment. Inequity in childhood malnutrition was observed in three measures of weight and height shortfalls.

The prevalence of underweight children (body weight below two standard deviations of the average for the same age) was 9.3% on average (Table 7). Children living outside the municipal area and in the northeast or southern regions had more prevalence of underweight. This observation also applies to the prevalence of stunting, an indication of chronic malnutrition. For the prevalence of wasting, an indication of acute malnutrition, a lesser differential was noticed across these residence locations. Notably, the prevalence of all three malnutrition measures declined monotonically as the education of the children's mothers or care givers and the household economic status increased.

Childhood immunization

As recommended by UNICEF and WHO, all children should receive one dose of BCG, three doses of OPV and DPT, and one dose of measles or MMR vaccine before 12 months of age. Based on the information from children's health diaries or mothers/care givers' recalls, the children aged 12-23 months who were given all necessary vaccines before they were two years and 1 year old accounted for 86.8% and 73.2%, respectively (Tables 8A and 8B).

Coverage of childhood immunization in Thailand has not seen much variation across the equity stratifiers. Ironically, children whose mothers or care givers were highly educated, living in the economically better-off households, in the municipal area or in Bangkok even showed a lower coverage, compared with their worse-off counterparts.

Another indication of child health was measured through the mothers whose babies were protected against neonatal tetanus. The recommended schedule is at least two doses of tetanus toxoid (TT) during pregnancy; otherwise, before the pregnancy, the woman should receive at least two doses of TT with the last dose within three years, at least three doses with the last dose within five years, at least four doses and the last dose within 10 years, or at least five doses in a lifetime.

Similar to the pattern of childhood vaccination, not much variation across the equity stratifiers was observed on the coverage of TT (Table 9). Women highly educated or living in the economically better-off households and in the more urban residence locations did not report a greater coverage, compared with their counterparts.

2.2 *Women's health*

This report analysed the health status of the female population through the measures of maternal care and family planning engagement. Maternal care was indicated by the types of providers of antenatal care and delivery.

Teenage pregnancy

The striking socioeconomic differential in women's health is found in the prevalence of teenage pregnancy. This problem tends to prevail among the worse-off groups: mothers who had no education, living in the 20% poorest households, in the non-municipal areas and in provincial areas (Table 10).

Antenatal care

Nearly all pregnant women (98%) were taken care of by medical doctors, nurses, midwives, or auxiliary midwives (Table 11). There was a slightly increasing trend in the prevalence of antenatal care (ANC) that was provided by these skilled health personnel with respect to an increase in the education level and economic status of the surveyed women. However, the ANC differential across residence locations was not noticeable, except for those living in the southern region of Thailand.

Delivery care

Following a similar pattern with antenatal care distribution, the proportion of women whose babies were delivered by skilled health personnel tended to increase with respect to an increase in education and economic levels (Table 12). In addition, more women living in the urban area tended to have their babies delivered by health professionals. The southern part of Thailand was still the region where deliveries were relatively less covered by skilled health personnel, probably due to religious reason.

In terms of the facility for giving birth, the pattern of socioeconomic differential follows a similar pattern with the providers of care. Women who delivered at health care facilities, including sub-district health centres, district hospitals, provincial hospitals, and any other public or private health care facilities tended to be more from the better-off groups (Table 13).

Family planning

Almost three quarters of women of reproductive age, who were married or lived with men and were not known to be pregnant during the survey chose modern methods of contraception, including sterilization, pill, injection, implantation, IUD, and condom (Table 14). Interestingly, the relatively higher educated and economically well-off women chose natural contraception methods more frequently than their counterparts.

2.3 Extreme scenario analysis

To determine if the magnitude of inequity in population health is worse or better than the inequality in the economic status in the country, disparity in the health status measures between the highest and lowest levels with respect to the equity stratifiers is determined. Specifically, the prevalence or population coverage for an indicator of health outcomes (in %, as previously described in Section 2) for the highest socioeconomic levels (i.e., higher education, the richest quintile, urban residence) is divided by that in their lowest counterparts (i.e., no education, the poorest quintile, rural residence). This disparity ratio signals the largest gap possible in each health outcome.

In Thailand, economic inequality was reflected by the share of total expenditure between the rich and the poor. The gap between the richest 20% to the poorest 20% was 7.7 times in 2002 (UNDP 2006).

HDI rank 2006		Share of income or expenditure				Richest 10% to poorest 10%	Richest 20% to poorest 20%	Gini Index
	Survey year	Poorest 10%	Poorest 20%	Richest 20%	Richest 10%			
74	2002	2.7	6.3	49.0	33.4	12.6	7.7	42.0

Source: UNDP Human Development Report 2006

The disparity ratios for most measures of child health (Table 15) and women's health (Table 16) are close to 1.0, which are much less than the economic gap in the population. All women's health measures, except for teenage pregnancy apparently perform better in health equity than child health. Education tends to play an important role in improving the health outcomes for the female population since the gaps between women with higher education and uneducated women are largest in all measures. The urban-rural disparity in women's health is minimal (disparity ratio close to 1.0) for all indicators.

In the area of child health, children born to the mothers or in households with the highest socio-economic status are less prone to impaired health outcomes, as compared with those in the lowest status. Large gaps appear in the under-five mortality and childhood malnutrition. Again, education of mothers or care givers and household economic status influences the child health inequity whereby the urban-rural difference plays a minor role. Immunization coverage is the area in which the magnitude of child health inequity is the least and the lowest socio-economic subgroup does not perform worse than the highest subgroup.

2.4 Conclusion

There is a small health inequity based on various stratifiers, whereas the richest to poor quintile consumption distribution was far greater than health, with a magnitude of almost 8, with a Gini index of 0.42. Women's health performs better than child health as the gap is smaller. It was found that education plays an important role in improving the health outcomes for the female population since the gaps between women with higher education and the uneducated women are the largest in all measures. The urban-rural gap in women's health is very small.

In the area of child health, large gaps in under-five mortality and childhood malnutrition were observed. Again, education of mothers or care givers and household economic status influences the child health inequity whereby the urban-rural difference plays a minor role. Immunization coverage performs very well as there is the least gap.

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Appendix

Table 1 Number of households, women, and children sampled and responding by regions			
Questionnaire set	**Sampled or eligible**	**Interviewed**	**Response rate**
Households	**43,440**	**40,511**	**93.3%**
Bangkok	2,340	2,129	91.0%
Central	14,730	13,372	90.8%
North	9,270	9,000	97.1%
Northeast	9,720	9,332	96.0%
South	7,380	6,678	90.5%
Women (15-49 years)	**37,187**	**36,960**	**99.4%**
Bangkok	2,394	2,350	98.2%
Central	12,658	12,575	99.3%
North	7,358	7,353	99.9%
Northeast	8,337	8,313	99.7%
South	6,440	6,369	98.9%
Children (0-4 years)	**9,444***	**9,409***	**99.6%**
Bangkok	374	372	99.5%
Central	2,858	2,851	99.8%
North	1,667	1,664	99.8%
Northeast	2,479	2,470	99.6%
South	2,066	2,052	99.3%

* Number of the children's mothers or care givers

Table 2: Operational definition of population health measures		
Domain and measure	**Numerator**	**Denominator**
Child health		
Under-five mortality	Number of women who had children during the last five years but who died later	Number of women aged 15-49 years who had ever given birth within five years before the interview
Low birth weight	Number of women aged 15-49 years whose babies born in the last two years born with weight less than 2.5 Kg	Number of women aged 15-49 years whose the last birth was within 2 years before the interview
Breastfeeding	Number of children 0-5 months still being breastfed without any other food	Number of children 0-5 months whose mothers/care givers were interviewed
Diarrhoea prevalence	Number of children 0-59 months with mother/care giver-reported diarrhoea two weeks prior to the interview	Number of children 0-59 months whose mothers/care givers were interviewed
Suspected pneumonia prevalence	Number of children 0-59 months reported cough with difficulty in breathing and tightness in the chest during two weeks prior to the interview	Number of children 0-59 months whose mothers/care givers were interviewed
Underweight prevalence	Number of children 0-59 months whose weight was lower than 2 SD of the weight for age	Number of children 0-59 months who were measured for weight
Stunting prevalence	Number of children 0-59 months whose height was lower than 2 SD of the height for age	Number of children 0-59 months who were measured for height
Wasting prevalence	Number of children 0-59 months whose weight was lower than 2 SD of the weight for height	Number of children 0-59 months who were measured for weight and height
BCG coverage	Number of children 12-23 months who received BCG vaccine before their first birthdays	Number of children 12-23 months whose mothers/care givers were interviewed
OPV coverage	Number of children 12-23 months who received the first three doses of OPV before their first birthday	Number of children 12-23 months whose mothers/care givers were interviewed
DPT coverage	Number of children 12-23 months who received the first three doses of DPT vaccine before their first birthdays	Number of children 12-23 months whose mothers/care givers were interviewed
Measles or MMR coverage	Number of children 12-23 months who received measles or MMR vaccine before their first birthday	Number of children 12-23 months whose mothers/care givers were interviewed
Hepatitis B coverage	Number of children 12-23 months who received the first three doses of hepatitis B vaccine before their first birthday	Number of children 12-23 months whose mothers/care givers were interviewed

Domain and measure	Numerator	Denominator
Tetanus toxoid coverage	Number of women aged 15-49 years who gave birth in the last 12 months before the interview and received at least two doses of TT during pregnancy or before pregnancy at the appropriate schedules	Number of women aged 15-49 years who gave birth within 12 months before the interview
Women's health		
Teenage pregnancy	Number of women aged 15-49 years whose first pregnancy was below 20 years	Number of women aged 15-49 years who have ever given birth
Antenatal care	Number of women aged 15-49 years whose latest pregnancy in the last two years was taken care of by skilled health personnel including physicians, nurses, midwives, or auxiliary midwives	Number of women aged 15-49 years gave birth within two years before the interview
Delivery care by skilled health personnel	Number of women aged 15-49 years whose babies in the last two years were delivered by skilled health personnel including physicians, nurses, midwives, or auxiliary midwives	Number of women aged 15-49 years who gave birth within two years before the interview
Delivery care at health facilities	Number of women aged 15-49 years whose babies in the last two years were delivered at public or private health facilities	Number of women aged 15-49 years who gave birth within two years before the interview
Family planning	Number of women aged 15-49 years, married or living with men, and not pregnant or unknown who reported using either modern or natural contraceptive methods	Number of women aged 15-49 years who have been married or lived with men and are not currently pregnant or unknown

Table 3A: Women with at least one child younger than five years and those whose children were dead		
	Mothers who had at least one of their children born in the last 5 years (N)	**Mothers who had under-five year children death (%)**
Total	**3,983,004**	**0.47%**
Age of mother		
15-19 years	182,992	0.82%
20-24 years	913,746	0.88%
25-29 years	1,088,352	0.50%
30-34 years	972,598	0.10%
35-39 years	572,637	0.42%
40-44 years	218,976	0.14%
45-49 years	33,703	0.16%
Education of mother		
None	103,264	0.64%
Primary	1,716,030	0.87%
Secondary	1,644,277	0.16%
Higher	512,969	0.15%
Income per capita		
Quintile 1 (lowest)	1,796,249	0.28%
Quintile 2	432,796	1.58%
Quintile 3	486,443	1.03%
Quintile 4	714,524	0.25%
Quintile 5 (highest)	549,453	0.03%
Wealth index quintiles		
Poorest	814,539	1.47%
Second poorest	790,667	0.02%
Middle	847,646	0.26%
Second richest	831,491	0.50%
Richest	698,661	0.07%
Residence		
Municipal area	1,046,162	0.40%
Non-municipal area	2,936,842	0.50%
Region		
Bangkok	371,304	0.29%
Central	945,809	0.12%
North	587,285	0.25%
Northeast	1,417,994	0.87%
South	660,612	0.43%

Table 3B: Women with all children younger than five years and those whose children were dead		
	Mothers who had all children born in the last 5 years (N)	**Mothers who had under-five year children death (%)**
Total	**2,130,085**	**0.86%**
Age of mother		
15-19 years	182,566	0.82%
20-24 years	813,364	0.99%
25-29 years	640,782	0.82%
30-34 years	331,063	0.29%
35-39 years	125,171	1.84%
40-44 years	30,874	0.92%
45-49 years	6,265	0.77%
Education of mother		
None	35,258	1.66%
Primary	564,200	2.57%
Secondary	1143455	0.22%
Higher	383,818	0.20%
Income per capita		
Quintile 1 (lowest)	758,634	0.65%
Quintile 2	295,912	2.27%
Quintile 3	337,095	1.43%
Quintile 4	396,930	0.44%
Quintile 5 (highest)	340,241	0.06%
Wealth index quintiles		
Poorest	375,668	3.11%
Second poorest	394,446	0.04%
Middle	446,775	0.47%
Second richest	493,285	0.80%
Richest	419,911	0.12%
Residence		
Municipal area	596,918	0.69%
Non-municipal area	1533167	0.93%
Region		
Bangkok	204,750	0.51%
Central	573,329	0.17%
North	325,409	0.43%
Northeast	698,402	1.74%
South	328,195	0.84%

Table 4: Mothers whose latest babies were less than 2.5 kg at birth		
	Mothers with a birth in the last 2 years (N)	**Low birth weight (%)**
Total	**1,848,734**	**8.3%**
Age of mother		
15-19 years	145,640	11.2%
20-24 years	527,034	9.3%
25-29 years	523,683	6.4%
30-34 years	393,584	8.1%
35-39 years	195,489	7.9%
40-44 years	57,410	11.4%
45-49 years	5,894	17.7%
Education of mother		
None	55,525	6.6%
Primary	679,602	6.8%
Secondary	854,903	10.5%
Higher	257,188	5.3%
Income per capita		
Quintile 1 (lowest)	873,716	8.7%
Quintile 2	181,392	7.1%
Quintile 3	255,898	7.0%
Quintile 4	315,512	9.5%
Quintile 5 (highest)	221,126	7.7%
Wealth index quintiles		
Poorest	382,916	9.9%
Second poorest	391,818	4.2%
Middle	389,364	8.1%
Second richest	369,364	11.2%
Richest	315,272	8.3%
Residence		
Municipal area	485,311	9.1%
Non-municipal area	1363423	8.0%
Region		
Bangkok	168,751	8.8%
Central	432,249	8.8%
North	261,653	8.6%
Northeast	657,526	6.8%
South	328,555	10.1%

Table 5: Children under six months currently being breastfed			
	0-5 month children (N)	Breastfeeding only (%)	Breastfeeding with other foods (%)
Total	**452,887**	**5.3%**	**70.3%**
Gender			
Male	233,841	5.6%	69.7%
Female	219,046	5.0%	71.0%
Education of mother			
None	14,300	1.7%	73.2%
Primary	177,790	3.7%	68.3%
Secondary	203,529	7.2%	71.3%
Higher	56,654	4.7%	72.3%
Income per capita			
Quintile 1 (lowest)	228,212	5.0%	73.3%
Quintile 2	53,035	10.1%	51.3%
Quintile 3	61,756	3.2%	68.1%
Quintile 4	70,860	3.5%	73.8%
Quintile 5 (highest)	37,672	4.5%	79.9%
Wealth index quintiles			
Poorest	83,517	7.6%	71.4%
Second poorest	100,312	4.7%	73.3%
Middle	104,369	4.8%	71.2%
Second richest	87,958	2.7%	66.8%
Richest	76,731	7.5%	68.4%
Residence			
Municipal area	135,750	3.6%	70.8%
Non-municipal area	317,137	6.0%	70.2%
Region			
Bangkok	44,459	2.8%	72.2%
Central	101,753	2.4%	66.0%
North	59,779	11.1%	60.8%
Northeast	164,652	5.6%	73.5%
South	82,244	5.4%	75.5%

Table 6: Children under five years reported diarrhoea and suspected pneumonia during the last two weeks			
	0-59 month children (N)	**Diarrhoea (%)**	**Suspected pneumonia (%)**
Total	**4,837,701**	**8.7%**	**4.6%**
Gender			
Male	2,462,874	9.3%	5.2%
Female	2,374,827	8.1%	4.0%
Age			
0-5 months	452,887	6.9%	1.1%
6-11 months	504,409	14.2%	3.4%
12-23 months	974,880	15.0%	6.2%
24-35 months	961,120	7.6%	5.2%
36-47 months	975,467	6.7%	4.4%
48-59 months	968,938	3.4%	4.6%
Education of mother/care giver			
None	204,352	9.6%	4.0%
Primary	2,506,119	8.5%	5.0%
Secondary	1,537,336	9.9%	4.3%
Higher	582,504	5.9%	3.7%
Income per capita			
Quintile 1 (lowest)	2,296,360	9.5%	5.6%
Quintile 2	604,680	10.3%	4.6%
Quintile 3	575,917	8.7%	4.0%
Quintile 4	852,890	8.0%	3.0%
Quintile 5 (highest)	499,038	4.5%	3.6%
Wealth index quintiles			
Poorest	1,066,086	10.2%	6.7%
Second poorest	1,033,603	7.3%	4.5%
Middle	1,027,619	10.3%	4.7%
Second richest	903,769	9.1%	3.3%
Richest	806,624	5.9%	3.1%
Residence			
Municipal area	1,368,090	8.0%	3.2%
Non-municipal area	3,469,611	8.9%	5.2%
Region			
Bangkok	430,857	6.6%	2.4%
Central	1,055,165	8.5%	3.1%
North	761,466	8.9%	6.6%
Northeast	1,799,858	9.2%	5.7%
South	790,355	8.5%	3.3%

Table 7: Children under five years with moderate-to-high malnourishment				
	0-59 month children* (N)	Underweight prevalence (%)	Stunting prevalence (%)	Wasting prevalence (%)
Total	**4,632,238**	**9.3%**	**11.9%**	**4.1%**
Gender				
Male	2,348,869	9.1%	11.8%	3.9%
Female	2,283,369	9.6%	12.0%	4.3%
Age				
0-5 months	427,668	1.7%	7.0%	3.0%
6-11 months	489,200	6.1%	10.2%	5.6%
12-23 months	932,747	10.9%	18.2%	6.2%
24-35 months	922,953	9.1%	8.6%	2.4%
36-47 months	927,141	10.7%	11.6%	3.1%
48-59 months	932,529	11.8%	12.5%	4.4%
Education of mother/care giver				
None	197,752	13.1%	17.6%	8.0%
Primary	2,419,111	11.3%	13.3%	3.6%
Secondary	1,465,857	7.4%	10.7%	4.2%
Higher	542,128	3.8%	6.9%	4.2%
Income per capita				
Quintile 1 (lowest)	2,209,908	13.1%	14.9%	5.0%
Quintile 2	587,615	8.7%	11.3%	2.9%
Quintile 3	551,108	6.5%	10.2%	3.8%
Quintile 4	811,524	4.6%	8.9%	3.2%
Quintile 5 (highest)	463,267	3.6%	6.0%	3.0%
Wealth index quintiles				
Poorest	1,029,216	15.2%	15.7%	4.6%
Second poorest	989,386	9.7%	13.3%	3.6%
Middle	995,305	9.7%	12.9%	4.5%
Second richest	869,205	6.0%	9.3%	3.7%
Richest	749,126	4.1%	6.7%	3.9%
Residence				
Municipal area	1,282,891	5.6%	8.7%	3.9%
Non-municipal area	3,349,347	10.8%	13.2%	4.2%
Region				
Bangkok	400,902	4.2%	4.3%	2.6%
Central	991,445	6.9%	10.8%	4.5%
North	751,926	7.1%	10.4%	3.9%
Northeast	1,737,005	11.5%	12.3%	3.8%
South	750,960	12.5%	18.3%	5.4%

* Only the children who had undergone complete anthropometry

Table 8A: Immunization coverage before two years of age								
	12-23 month children (N)	BCG, OPV, DPT, and measles or MMR						Hepatitis B (%)
		BCG (%)	OPV (%)	DPT (%)	Measles or MMR (%)	All (%)	None (%)	
Total	**974,880**	**98.1%**	**95.5%**	**93.1%**	**92.1%**	**86.8%**	**1.4%**	**85.9%**
Gender								
Male	494,100	97.9%	95.8%	92.9%	92.2%	87.4%	1.8%	87.7%
Female	480,780	98.3%	95.3%	93.2%	92.0%	86.2%	1.1%	84.1%
Education of mother/care giver								
None	45,171	96.1%	90.6%	92.3%	82.6%	79.9%	3.9%	85.6%
Primary	483,524	98.1%	95.7%	93.3%	92.3%	87.3%	1.3%	87.0%
Secondary	330,224	98.5%	96.3%	94.5%	92.9%	88.6%	1.2%	86.8%
Higher	115,447	97.4%	94.7%	88.8%	92.6%	82.7%	1.8%	79.2%
Income per capita								
Quintile 1 (lowest)	456,269	98.0%	96.7%	94.4%	92.7%	89.0%	1.5%	88.1%
Quintile 2	120,396	98.6%	92.4%	94.1%	92.1%	87.2%	1.4%	85.0%
Quintile 3	126,769	98.3%	96.4%	90.8%	92.1%	85.0%	1.0%	85.0%
Quintile 4	175,358	98.5%	94.8%	92.8%	91.4%	85.5%	1.2%	84.3%
Quintile 5 (highest)	95,978	96.6%	94.2%	88.7%	90.4%	80.8%	1.9%	81.2%
Wealth index quintiles								
Poorest	228,509	96.5%	94.7%	93.4%	91.1%	87.3%	2.6%	87.4%
Second poorest	194,164	99.1%	95.7%	95.4%	94.5%	91.0%	0.9%	90.1%
Middle	204,294	99.2%	96.5%	92.0%	90.9%	85.2%	0.6%	85.1%
Second richest	186,049	97.5%	94.5%	93.5%	91.1%	86.2%	2.1%	87.5%
Richest	161,864	98.3%	96.5%	90.5%	93.3%	84.0%	0.6%	78.1%
Residence								
Municipal area	278,669	97.5%	94.6%	91.3%	90.9%	84.1%	1.7%	82.5%
Non-municipal area	696,211	98.3%	95.9%	93.7%	92.6%	87.9%	1.3%	87.3%
Region								
Bangkok	94,026	96.7%	92.6%	89.3%	84.8%	77.5%	2.5%	73.8%
Central	220,417	98.0%	94.4%	91.0%	90.5%	82.7%	1.4%	82.2%
North	167,956	98.8%	97.9%	96.9%	88.3%	87.3%	1.1%	92.3%
Northeast	330,936	98.6%	96.6%	96.7%	96.2%	93.7%	1.1%	89.9%
South	161,545	97.1%	94.1%	86.7%	94.1%	83.4%	1.9%	83.3%

Table 8B: Immunization coverage before one year of age							
	12-23 month children (N)	BCG, OPV, DPT, and measles or MMR					Hepatitis B (%)
		BCG (%)	OPV (%)	DPT (%)	Measles or MMR (%)	All (%)	
Total	**974,880**	**87.5%**	**84.9%**	**84.9%**	**75.2%**	**73.2%**	**80.4%**
Gender							
Male	494,100	88.6%	86.3%	86.3%	75.6%	74.0%	81.3%
Female	480,780	86.5%	83.4%	83.4%	74.9%	72.3%	79.5%
Education of mother/care giver							
None	45,171	87.7%	82.3%	82.3%	70.6%	68.6%	79.9%
Primary	483,524	89.0%	85.6%	85.6%	76.9%	75.3%	80.9%
Secondary	330,224	87.9%	86.6%	86.6%	75.3%	72.9%	82.7%
Higher	115,447	80.4%	78.5%	78.5%	70.3%	67.0%	72.8%
Income per capita							
Quintile 1 (lowest)	456,269	89.4%	86.0%	86.0%	78.3%	76.0%	81.6%
Quintile 2	120,396	88.2%	85.6%	85.6%	80.3%	78.2%	81.3%
Quintile 3	126,769	86.3%	84.2%	84.2%	72.8%	71.7%	79.2%
Quintile 4	175,358	85.9%	83.9%	83.9%	70.7%	68.0%	79.1%
Quintile 5 (highest)	95,978	82.7%	81.6%	81.6%	66.0%	64.3%	77.9%
Wealth index quintiles							
Poorest	228,509	89.4%	85.2%	85.2%	77.3%	75.7%	79.1%
Second poorest	194,164	92.0%	90.4%	90.4%	81.4%	79.5%	85.0%
Middle	204,294	84.2%	81.5%	81.5%	72.3%	70.2%	80.0%
Second richest	186,049	89.3%	86.1%	86.1%	74.3%	71.4%	84.4%
Richest	161,864	81.8%	80.8%	80.8%	69.6%	67.6%	72.9%
Residence							
Municipal area	278,669	83.8%	81.5%	81.5%	69.8%	67.4%	78.7%
Non-municipal area	696,211	89.0%	86.3%	86.3%	77.4%	75.5%	81.1%
Region							
Bangkok	94,026	75.6%	75.0%	75.0%	62.7%	60.2%	68.0%
Central	220,417	83.8%	81.1%	81.1%	66.8%	65.2%	79.7%
North	167,956	95.5%	93.1%	93.1%	79.8%	78.7%	87.9%
Northeast	330,936	91.0%	89.0%	89.0%	83.0%	80.7%	82.0%
South	161,545	84.1%	78.9%	78.9%	73.5%	70.4%	77.7%

Table 9: Women with babies born 12 months before the survey who received TT at various schedules					
	Mothers with a birth in the last 12 months (N)	At least 2 doses during pregnancy (%)	Two doses within 3 years prior to delivery (%)	Three doses within 5 years prior to delivery (%)	At any required schedule (%)
Total	**1,001,636**	**79.9%**	**8.1%**	**0.5%**	**88.5%**
Age					
15-19 years	96,393	80.9%	5.4%	0.04%	86.3%
20-24 years	282,196	85.8%	4.9%	0.4%	91.1%
25-29 years	287,352	76.7%	11.4%	0.5%	88.6%
30-34 years	206,171	78.1%	7.5%	0.9%	86.5%
35-39 years	100,265	74.7%	9.6%	0%	84.3%
40-44 years	28,482	82.6%	14.7%	0.9%	98.2%
45-49 years	777	100%	0%	0%	100.0%
Education of mother/care giver					
None	28,798	83.8%	6.3%	0%	90.1%
Primary	336,396	80.4%	8.1%	0.8%	89.3%
Secondary	483,225	79.5%	8.1%	0.1%	87.7%
Higher	152,068	80.0%	8.5%	0.8%	89.3%
Income per capita					
Quintile 1 (lowest)	498,779	80.0%	7.8%	0.4%	88.2%
Quintile 2	86,359	81.4%	6.4%	2.2%	90.0%
Quintile 3	137,679	78.3%	10.3%	0.3%	88.9%
Quintile 4	163,207	82.4%	6.8%	0%	89.2%
Quintile 5 (highest)	114,596	77.5%	9.3%	0.2%	87.0%
Wealth index quintiles					
Poorest	193,542	79.0%	5.8%	0%	84.8%
Second poorest	235,579	81.6%	8.0%	0.4%	90.0%
Middle	207,288	82.5%	8.3%	1.6%	92.4%
Second richest	193,036	77.0%	11.3%	0.1%	88.4%
Richest	172,191	78.8%	7.0%	0.2%	86.0%
Residence					
Municipal area	257,262	79.3%	7.0%	0.6%	86.9%
Non-municipal area	744,374	80.1%	8.5%	0.5%	89.1%
Region					
Bangkok	85,450	76.7%	7.2%	0%	83.9%
Central	234,188	79.0%	6.4%	0.2%	85.6%
North	133,542	84.8%	8.7%	0.2%	93.7%
Northeast	374,084	77.3%	10.0%	0.7%	88.0%
South	174,372	84.6%	6.4%	0.8%	91.8%

Table 10: Women whose first pregnancy was at age below 20 years		
	Mothers who have given birth (N)	**Pregnancy at age < 20 years (%)**
Total	**11,950,095**	**37.3%**
Education		
None	377,821	49.9%
Primary	7,297,967	42.2%
Secondary	3,092,034	36.9%
Higher	1,173,148	4.6%
Income per capita		
Quintile 1 (lowest)	4,735,739	44.0%
Quintile 2	1,834,573	38.6%
Quintile 3	1,308,344	38.4%
Quintile 4	2,159,805	32.4%
Quintile 5 (highest)	1,899,178	24.2%
Wealth index quintiles		
Poorest	2,301,494	44.2%
Second poorest	2,368,887	42.8%
Middle	2,491,325	41.8%
Second richest	2,520,411	34.7%
Richest	2,267,978	22.7%
Residence		
Municipal area	3,318,969	30.4%
Non-municipal area	8,631,126	40.0%
Region		
Bangkok	1,186,771	28.7%
Central	2,871,532	33.6%
North	2,160,776	38.1%
Northeast	4,158,196	41.4%
South	1,572,820	38.8%

Table 11: Mothers receiving antenatal care by health care provider types			
	Mothers with a birth in the last 2 years (N)	Skilled health personnel (%)	Other persons (%)
Total	**1,848,734**	**97.8%**	**1.0%**
Age			
15-19 years	145,640	96.6%	0.9%
20-24 years	527,034	98.3%	1.0%
25-29 years	523,683	98.3%	0.6%
30-34 years	393,584	97.3%	1.5%
35-39 years	195,489	97.0%	0.7%
40-44 years	57,410	98.2%	1.8%
45-49 years	5,894	100%	0%
Education			
None	55,525	90.6%	2.4%
Primary	679,602	97.3%	1.4%
Secondary	854,903	98.3%	0.8%
Higher	257,188	99.5%	0.3%
Income per capita			
Quintile 1 (lowest)	873,716	97.0%	1.5%
Quintile 2	181,392	96.6%	0.7%
Quintile 3	255,898	98.1%	1.1%
Quintile 4	315,512	99.4%	0.1%
Quintile 5 (highest)	221,126	99.6%	0.4%
Wealth index quintiles			
Poorest	382,916	96.0%	1.2%
Second poorest	391,818	98.1%	0.9%
Middle	389,364	97.8%	1.3%
Second richest	369,364	97.9%	1.3%
Richest	315,272	99.5%	0.2%
Residence			
Municipal area	485,311	97.8%	0.3%
Non-municipal area	1363423	97.8%	1.2%
Region			
Bangkok	168,751	98.5%	0%
Central	432,249	97.5%	1.0%
North	261,653	98.2%	0.5%
Northeast	657,526	98.9%	0.2%
South	328,555	95.3%	3.4%

Table 12: Mothers receiving delivery care by health care provider types			
	Mothers with a birth in the last 2 years (N)	**Skilled health personnel (%)**	**Other persons (%)**
Total	**1,848,734**	**97.3%**	**2.6%**
Age			
15-19 years	145,640	98.1%	1.9%
20-24 years	527,034	97.9%	2.1%
25-29 years	523,683	97.7%	2.2%
30-34 years	393,584	97.6%	2.4%
35-39 years	195,489	94.4%	5.2%
40-44 years	57,410	92.4%	7.6%
45-49 years	5,894	88.5%	0%
Education			
None	55,525	81.1%	17.3%
Primary	679,602	95.3%	4.6%
Secondary	854,903	99.1%	0.9%
Higher	257,188	100%	0%
Income per capita			
Quintile 1 (lowest)	873,716	95.6%	4.2%
Quintile 2	181,392	96.3%	3.6%
Quintile 3	255,898	98.9%	1.1%
Quintile 4	315,512	99.0%	1.0%
Quintile 5 (highest)	221,126	100%	0%
Wealth index quintiles			
Poorest	382,916	92.7%	6.9%
Second poorest	391,818	97.8%	2.2%
Middle	389,364	97.5%	2.5%
Second richest	369,364	99.1%	0.9%
Richest	315,272	99.8%	0.2%
Residence			
Municipal area	485,311	99.4%	0.5%
Non-municipal area	1363423	96.5%	3.4%
Region			
Bangkok	168,751	99.4%	0.6%
Central	432,249	99.3%	0.6%
North	261,653	94.6%	4.9%
Northeast	657,526	98.6%	1.4%
South	328,555	92.8%	7.2%

Table 13: Mothers receiving delivery care at health care facilities		
	Mothers with a birth in the last 2 years (N)	**Delivery at health facilities (%)**
Total	**1,848,734**	**96.8%**
Age		
15-19 years	145,640	98.2%
20-24 years	527,034	97.4%
25-29 years	523,683	96.7%
30-34 years	393,584	97.6%
35-39 years	195,489	94.2%
40-44 years	57,410	92.4%
45-49 years	5,894	75.3%
Education		
None	55,525	78.2%
Primary	679,602	95.0%
Secondary	854,903	98.5%
Higher	257,188	100%
Income per capita		
Quintile 1 (lowest)	873,716	95.1%
Quintile 2	181,392	95.8%
Quintile 3	255,898	97.8%
Quintile 4	315,512	98.9%
Quintile 5 (highest)	221,126	100%
Wealth index quintiles		
Poorest	382,916	92.4%
Second poorest	391,818	96.8%
Middle	389,364	97.1%
Second richest	369,364	98.2%
Richest	315,272	99.8%
Residence		
Municipal area	485,311	99.3%
Non-municipal area	1363423	95.8%
Region		
Bangkok	168,751	99.4%
Central	432,249	99.3%
North	261,653	94.1%
Northeast	657,526	97.9%
South	328,555	92.0%

Table 14: Married women engaging in family planning by contraceptive methods			
	Married women aged 15-49 years* (N)	Modern contraceptive methods (%)	Natural contraceptive methods (%)
Total	**13,079,990**	**72.6%**	**1.5%**
Age			
15-19 years	327,602	76.8%	2.5%
20-24 years	1,358,621	76.1%	1.5%
25-29 years	1,869,196	76.1%	1.7%
30-34 years	2,286,255	75.5%	1.8%
35-39 years	2,504,264	77.3%	1.7%
40-44 years	2,476,730	69.6%	1.3%
45-49 years	2,257,322	61.9%	0.8%
Education			
None	400,662	59.1%	1.2%
Primary	7,524,835	74.8%	1.0%
Secondary	3,612,677	72.7%	1.6%
Higher	1,528,467	64.9%	3.7%
Income per capita			
Quintile 1 (lowest)	4,943,904	76.6%	1.0%
Quintile 2	2,038,947	70.6%	1.0%
Quintile 3	1,424,941	65.0%	1.4%
Quintile 4	2,292,044	77.8%	1.7%
Quintile 5 (highest)	2,367,142	65.7%	2.7%
Wealth index quintiles			
Poorest	2,378,430	76.0%	0.9%
Second poorest	2,522,776	76.5%	0.9%
Middle	2,668,706	72.8%	1.3%
Second richest	2,901,247	70.1%	1.6%
Richest	2,608,831	68.0%	2.7%
Residence			
Municipal area	3,835,886	68.1%	1.9%
Non-municipal area	9,244,104	74.4%	1.3%
Region			
Bangkok	1,374,956	65.8%	2.3%
Central	3,309,099	72.0%	1.2%
North	2,383,365	77.4%	0.8%
Northeast	4,352,438	77.4%	1.1%
South	1,660,132	59.8%	3.3%

* Included women who have ever lived with a man and excluded known pregnant women

Table 15 Disparity ratios of child health between the highest and lowest socioeconomic status

	Under-five mortality	Low birth weight	Breast feeding only	Illnesses		Malnutrition			Immunization					
				Diarrhoea	Suspected pneumonia	Under-weight	Stunting	Wasting	BCG	OPV	DPT	Measles/ MMR	Hepatitis B	TT
Prevalence or coverage	0.5%	8.3%	5.3%	8.7%	4.6%	9.3%	11.9%	4.1%	87.5%	84.9%	84.9%	75.2%	80.4%	88.5%
Disparity ratios														
Male: Female			1.12	1.15	1.30	0.95	0.98	0.91	1.00	1.01	1.00	1.00	1.04	0.95
Higher: No education	0.23	0.80	2.76	0.61	0.93	0.29	0.39	0.53	1.01	1.05	0.96	1.12	0.93	0.99
Q 5: Q 1 income per capita	0.11	0.89	0.90	0.47	0.64	0.27	0.40	0.60	0.99	0.97	0.94	0.98	0.92	0.99
Q 5: Q 1 wealth index	0.05	0.84	0.99	0.58	0.46	0.27	0.43	0.85	1.02	1.02	0.97	1.02	0.89	1.01
Municipal: Non-municipal	0.80	1.14	0.60	0.90	0.62	0.52	0.66	0.93	0.99	0.99	0.97	0.98	0.95	0.98

Table 16: Disparity ratios of women's health between the highest and lowest socioeconomic status					
	Teenage pregnancy	Ante natal care by skilled health provider	Delivery		Modern contraception
			Skilled health personnel	Health care facility	
Prevalence or coverage	37.3%	97.8%	97.3%	96.8%	72.6%
Disparity ratios					
Higher: No education	0.09	1.10	1.23	1.28	1.10
Q 5: Q 1 income per capita	0.55	1.03	1.05	1.05	0.86
Q 5: Q 1 wealth index	0.51	1.04	1.08	1.08	0.89
Municipal: Non-municipal	0.76	1.00	1.03	1.04	0.92

Statistical Annex 1

Inequities in health determinants and outcomes by equity stratifiers

Fig. SA 1 Inequities in DPT3 vaccination by mother's education by country

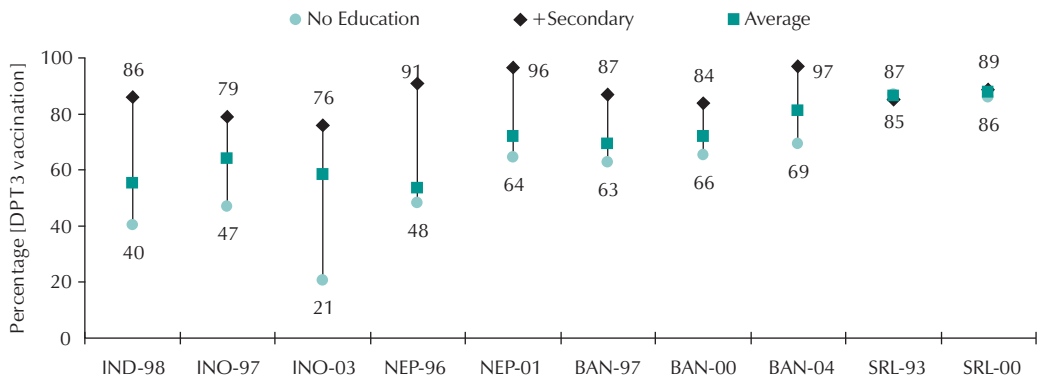


Fig. SA 2 Inequities in DPT3 vaccination by urban/rural residence by country

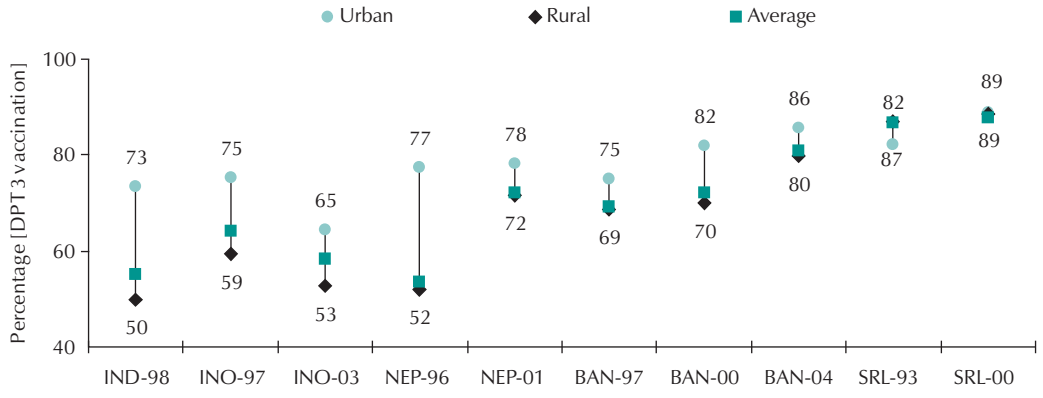


Fig. SA 3 Inequities in skilled birth attendance by mother's education by country

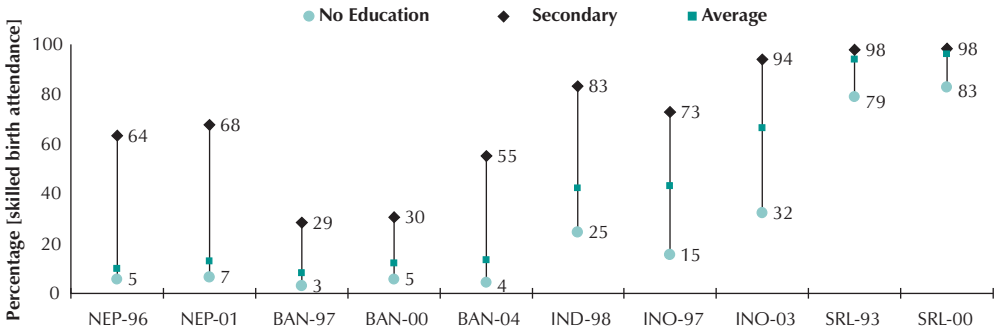


Fig. SA 4 Inequities in skilled birth attendance by urban/rural residence by country

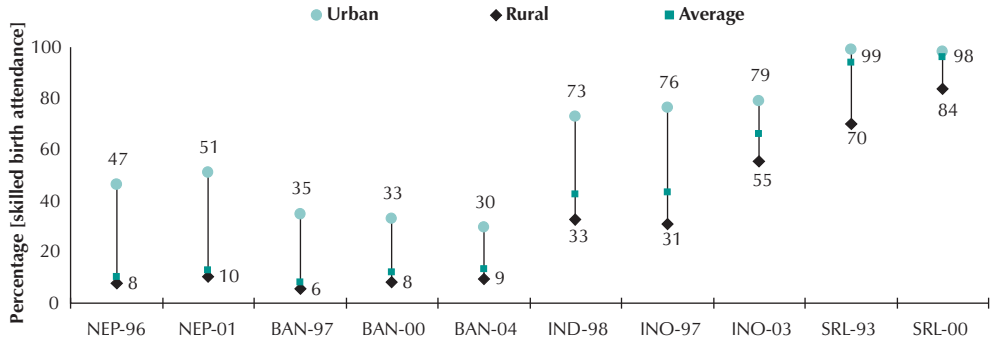


Fig. SA 5 Inequities in use of modern contraception by mother's education by country

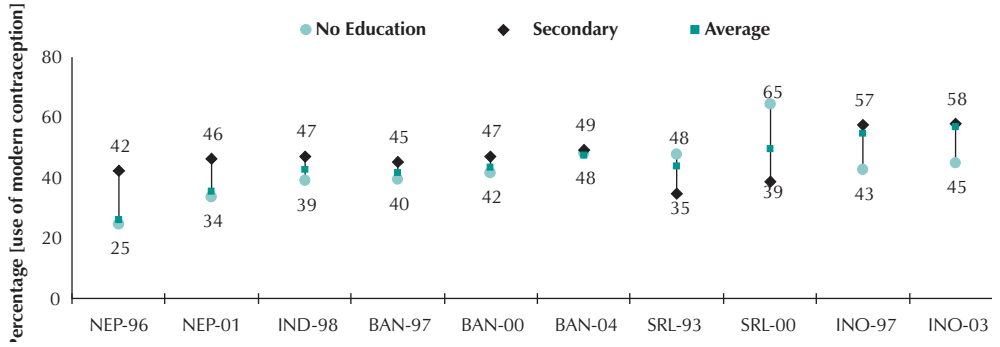


Fig. SA 6 Inequities in use of modern contraception by urban/rural residence by country

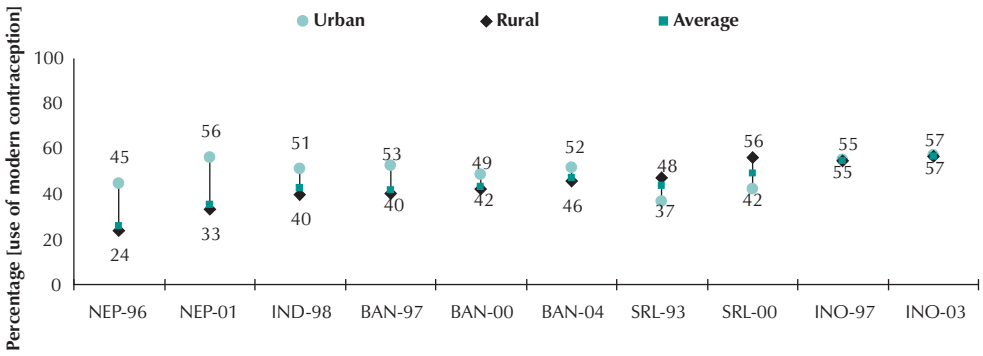


Fig. SA 7 Inequities in infant mortality rates by mother's education by country

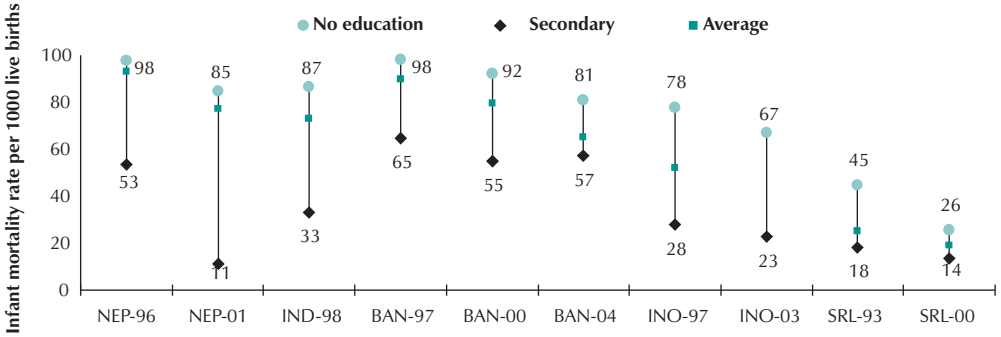


Fig. SA 8 Inequities in infant mortality rates by urban/rural residence by country

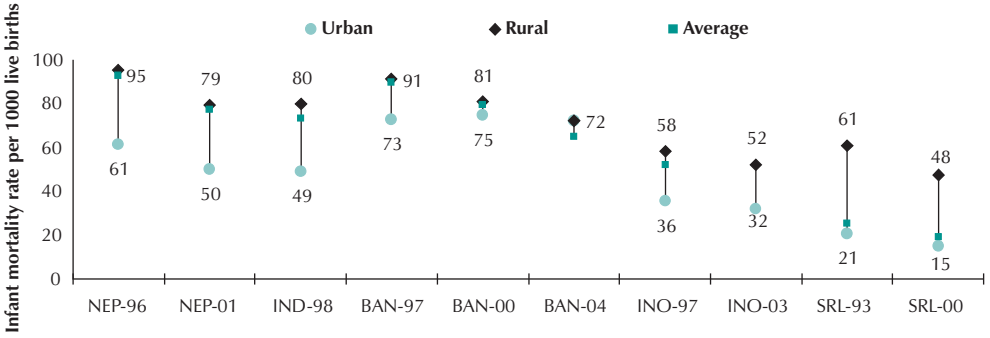


Fig. SA 9 Inequities in under-five mortality rates by mother's education by country

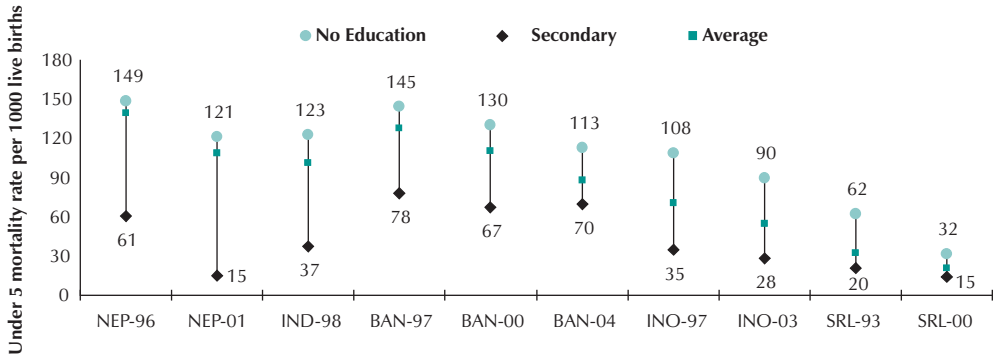


Fig. SA 10 Inequities in under-five mortality rates by urban/rural residence by country

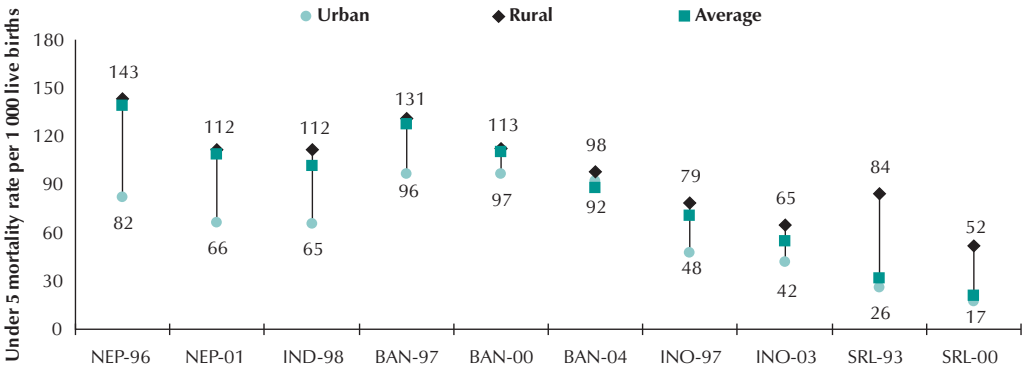


Fig. SA 11 Inequities in prevalence of childhood stunting by mother's education by country

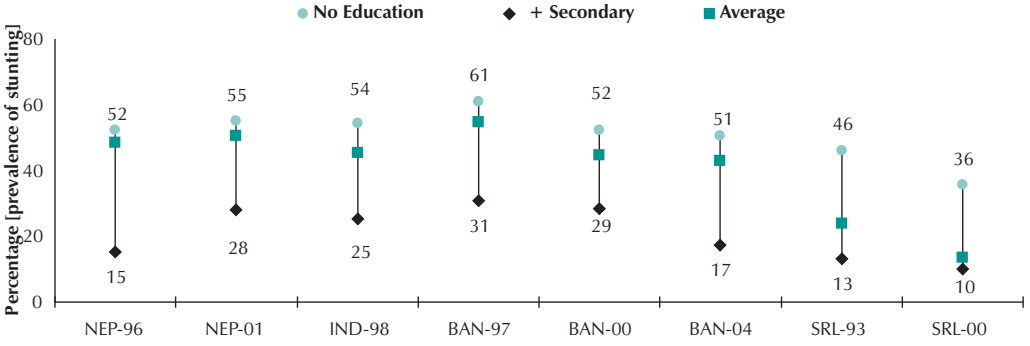


Fig. SA 12 Inequities in prevalence of childhood stunting by urban/rural residence by country

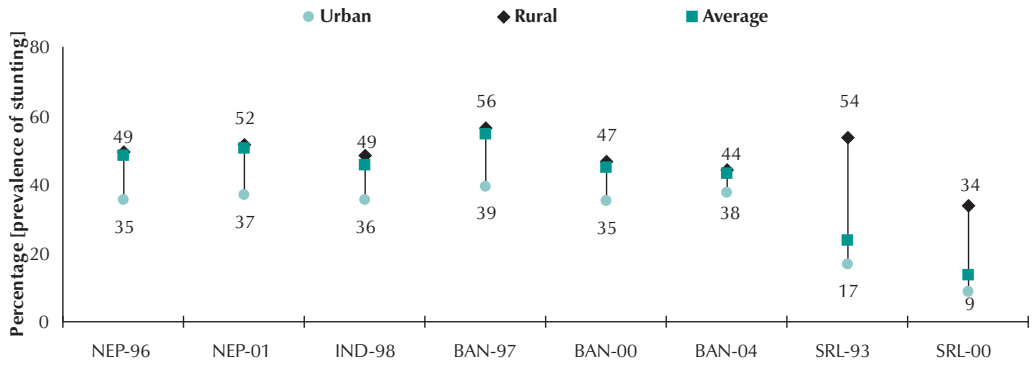


Fig. SA 13 Inequities in prevalence of maternal underweight by mother's education by country

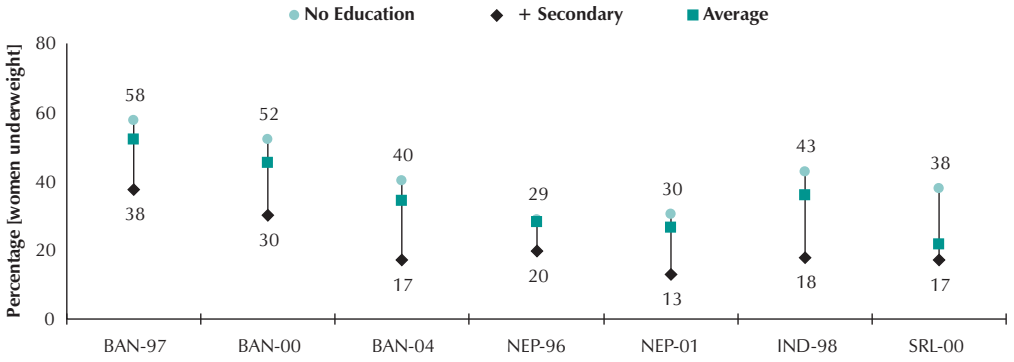


Fig. SA 14 Inequities in prevalence of maternal underweight by urban/rural residence by country

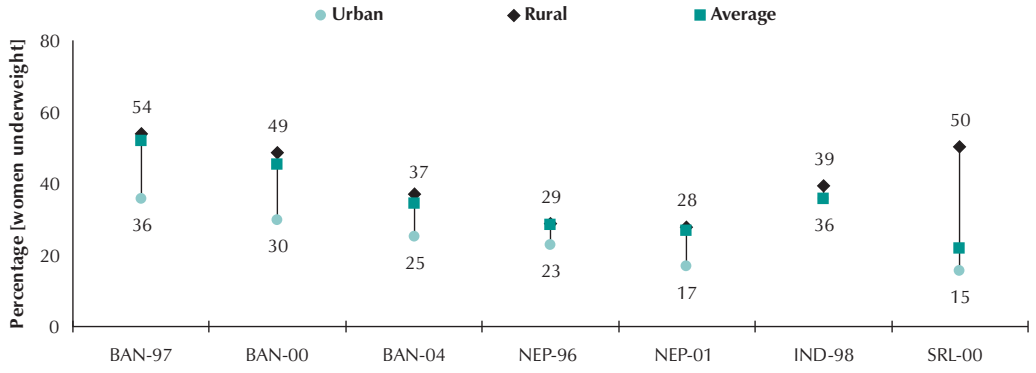


Fig. SA 15 Inequities in prevalence of maternal overweight by mother's education by country

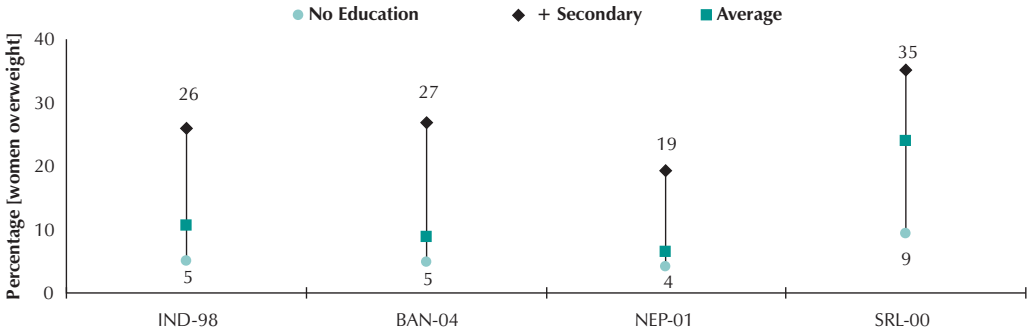


Fig. SA 16 Inequities in prevalence of maternal overweight by urban/rural residence by country

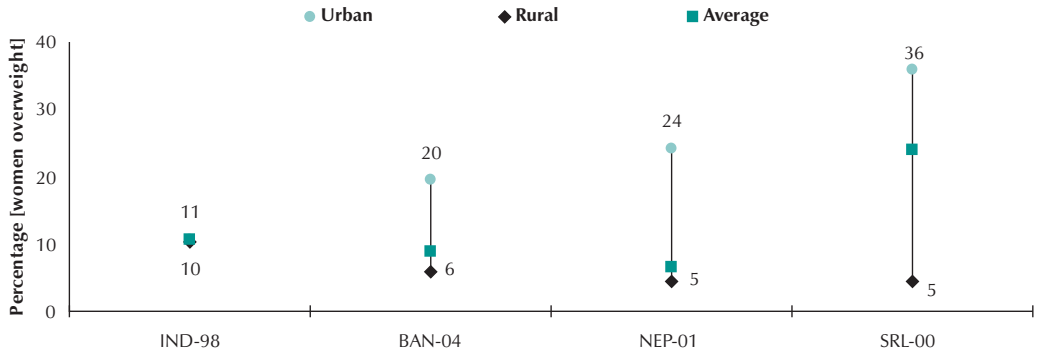


Fig. SA 17 Inequities in access to safe water by urban/rural residence by country

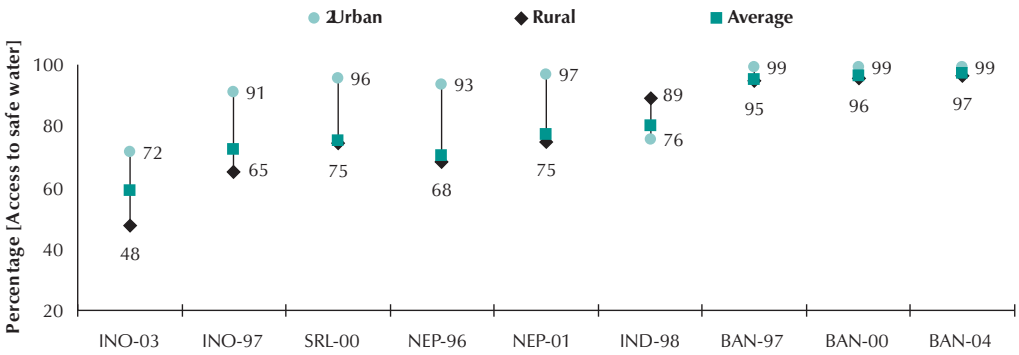
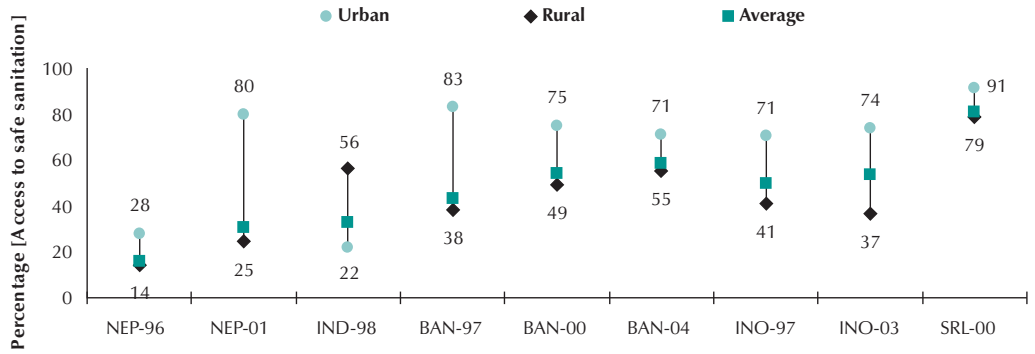


Fig. SA 18 Inequities in access to safe sanitation by urban/rural residence by country



	Health Outcome Indicators																									
	Infant mortality rate (per 1,000 live births)					Under-five mortality rate (per 1,000 live births)					Prevalence of stunting in children under five years (%)					Prevalence of underweight women (%)					Prevalence of overweight women (%)				
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Bangladesh (1)	90	66	75	59	65	121	98	97	81	72	55	46	41	37	26	46	39	34	30	17	2	3	5	10	25
India (2)	97	81	76	55	38	141	118	101	70	46	53	49	45	39	28	50	47	41	30	15	6	7	9	12	21
Indonesia (3)	61	50	44	36	17	77	64	56	45	22															
Maldives (4)																									
Nepal (5)	86	88	77	73	53	130	125	104	97	68	61	50	50	47	33	27	30	33	29	15	2	1	5	5	22
Sri Lanka (6)	35	27	30	19	14	42	34	32	25	14	30	26	19	12	6										
Thailand (7)						31	1	5	8	1	16	13	13	9	7										

	Health systems indicators															Health determinants									
	Coverage of DPT3 vaccination (%)					Coverage of skilled birth attendance (%)					Current use of modern contraception (%)					Exposure to safe water (%)					Exposure to safe sanitation (%)				
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Bangladesh (1)	71	82	82	85	91	3	4	10	17	39	45	48	47	47	50	96	97	97	97	99	24	46	63	79	90
India (2)	36	43	59	72	85	16	26	42	61	84	29	35	45	50	55	74	77	79	84	88	14	19	26	41	67
Indonesia (3)	39	49	67	63	71	36	52	65	78	93	49	58	60	59	58	27	45	60	72	77	8	22	45	77	97
Maldives (4)																									
Nepal (5)	62	69	72	80	85	4	5	10	14	45	24	29	32	39	55	65	62	93	74	94	0	0	6	63	93
Sri Lanka (6)	91	97	96	95	98	91	97	96	98	99	63	57	49	42	38										
Thailand (7)	93	95	92	94	91	93	98	98	99	100	76	77	73	70	68										

	Health Outcome Indicators									
	Infant mortality rate (per 1,000 live births)		Under five mortality rate (per 1,000 live births)		Prevalence of stunting in children under five years (%)		Prevalence of underweight women (%)		Prevalence of overweight women (%)	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Bangladesh (1)	72	72	92	98	38	44	25	37	20	6
India (2)	49	80	65	112	36	49	36	39	11	10
Indonesia (3)	32	52	42	65						
Maldives (4)										
Nepal (5)	50	79	66	112	37	52	17	28	24	5
Sri Lanka (6)	21*	24	26*	30	17	23				
Thailand** (7)			7	9	9	13				

	Health Systems Indicators						Health Determinants			
	Coverage of DPT3 vaccination (%)		Coverage of skilled birth attendance (%)		Current use of modern contraception (%)		Exposure to safe water (%)		Exposure to safe sanitation (%)	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Bangladesh (1)	86	80	30	9	52	46	99	97	71	55
India (2)	73	50	73	33	51	40	76	89	22	56
Indonesia (3)	65	53	79	55	57	57	72	48	74	37
Maldives (4)										
Nepal (5)	78	72	51	10	56	33	97	75	80	25
Sri Lanka (6)	82	87	99	95	37	46				
Thailand (7)	91	94	99	97	68	74				

	Health Outcome Indicators									
	Infant mortality rate (per 1,000 live births)		Under-five mortality rate (per 1 000 live births)		Prevalence of stunting in children under five years (%)		Prevalence of underweight women (%)		Prevalence of overweight women (%)	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Bangladesh (1)	64	80	91	102	44	43				
India (2)	71	75	105	98	47	44				
Indonesia (3)	40	46	51	58						
Maldives (4)										
Nepal (5)	75	79	112	105	52	49				
Sri Lanka (6)	20	31	27	38	25	23				
Thailand (7)					12	12				

Poor people encounter high rates of illness and premature deaths from preventable causes and are thus more vulnerable to disease. In the WHO South-East Asia Region, many Member countries carry a significant proportion of the total burden of disease in the Region. Available evidence indicates that inequalities in social and economic determinants of health exist both within and across countries in the Region. The less educated, marginalized, women, children and the elderly living in rural areas and urban slums carry a conspicuous burden of disease. The report is a compilation of data analysis from seven countries of the SEA Region; namely, Bangladesh, India, Indonesia, Maldives, Nepal, Sri Lanka and Thailand. The analysis has been conducted concurrently with the work of the Commission on Social Determinants of Health (CSDH). The analysis reveals a strong association between a wide gamut of social and economic inequalities and health inequities. It shows how health inequities relate not only to immediate material or psychosocial circumstances of the individual but also to structural factors, including government social welfare policies, quality of governance and other issues such as the power and clout that an individual wields in society. Ultimately, addressing inequities in health requires a social justice approach to improve the circumstances of the poor. The work of the WHO Commission on Social Determinants of Health (CSDH) including the Knowledge Networks complements publication Health inequities in the South-East Asia Region: selected country case studies.

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