A Report
on Inequities in
Maternal and Child Health
and their Determinants in
South-East Asia Region (SEAR)

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1. INTRODUCTION

1.1. Health inequities, health policy and development

Health inequalities in relation to socioeconomic position and other personal characteristics are universal, and are found in all countries. However, the magnitude of these inequalities does vary significantly between countries, and even poor countries can substantially reduce or mitigate such inequalities through effective government policies. South-East Asia is characterized by substantial health inequalities, and it also lags most other regions in its overall health attainments. Nevertheless, several countries in the region, particularly Sri Lanka, Thailand and the Maldives, have been demonstrating that it is possible to reduce the most important inequalities and inequities that are found in the health sector.

Reducing health inequities matters, not only because such inequities usually imply that the most vulnerable and impoverished in each country suffer the worst outcomes, but also because reducing inequities is also key to improving overall health indicators, and attaining the Millennium Development Goals (MDGs), amongst other goals.

If health inequities are to be reduced, then governments and policy makers must understand better what drives these inequities, and they must identify what the critical determinants are and which ones can be most easily affected through government policies. It is also necessary to understand in each case 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 beginning to do this, by examining in a small way some of these inequities and their determinants.

1.2 Measurement of health inequities

Health inequalities between individuals and households must be assessed in relation to some characteristic, such as income level, place of residence, gender or ethnic group. This study focuses on health inequalities that exist in relation to socioeconomic status, which itself is a proxy for underlying differences in economic resources.

In doing this, the study uses a measure known as the wealth index to identify the relative socioeconomic position of households in each country. This is because in most countries, the survey data that are used to track and monitor health outcomes, typically the demographic and health surveys, lack data on the income level of households. However, recent statistical developments now enable researchers to estimate the approximate socio-economic level of a household using other variables that are usually collected in these surveys. This typically involves computation of what is known as an asset index, which relates the overall ranking of a household to the number and type of assets that it possesses, such as a bicycle or car or tiled roofing.

Having ranked households in this way, this report generally groups all individuals in a country into quintiles, which indicate the relative per capita wealth of each household. Thus, poorest households are found in the first quintile, whilst the richest quintiles will be grouped in the fifth quintile. In addition, to summarise the relative inequality that might exist for a particular outcome, a single number statistic, known as the concentration index is also computed. Details of how this is estimated are given in the Annexes. The key point to note is that the concentration index ranges from -1 to +1, and the greater the degree of inequality in relation to income, the higher the value of the index in absolute terms.

1.3 Determinants of health inequities

1.3.1. CSDH Framework used for Analysis

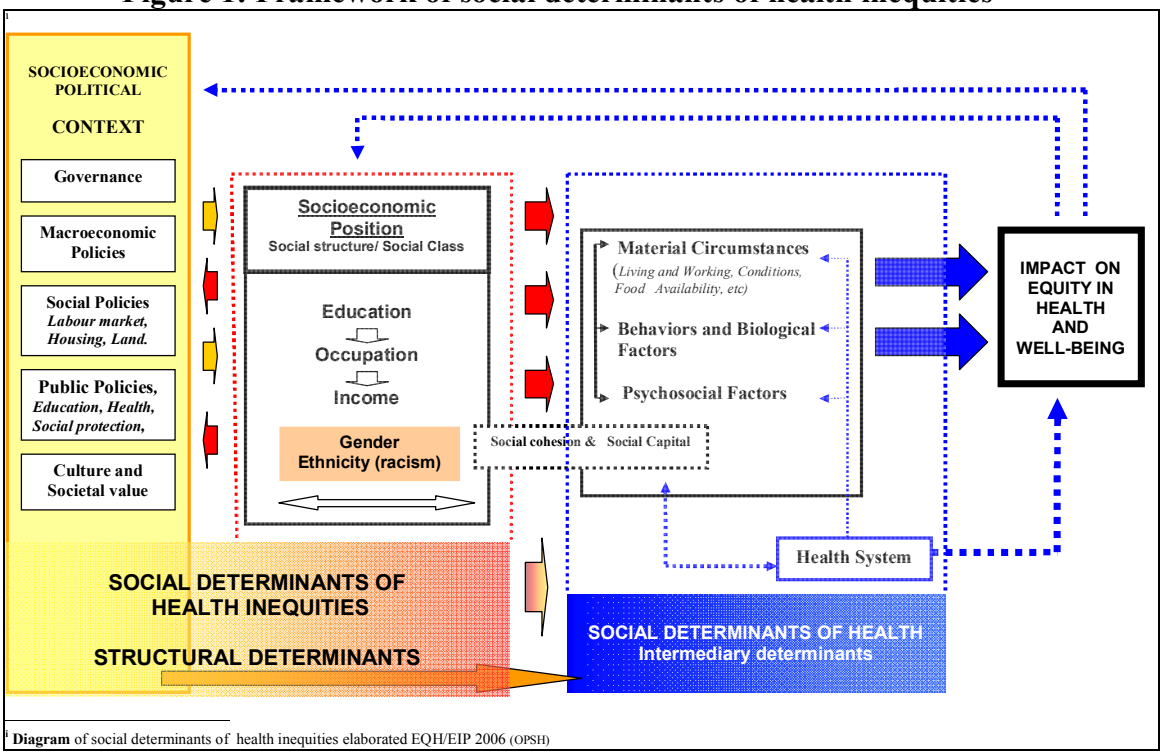
In order to conceptualize and analyze the potential determinants of health inequities in this analysis, we use the framework developed for the Commission on Social Determinants of Health (CSDH). Figure 1 shows the framework developed, which primarily attempts to describe the pathways through which health inequities are produced.[1] There are three main elements of the framework:

1. *Socioeconomic-political contex*t: 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 exert 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 inequality 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; behavioral 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.

[1] Solar O. and Irwin A. "A Conceptual Framework for Action on the Social Determinants of Health", Discussion paper for the Commission on Social Determinants of Health (Draft, April 2007)

Figure 1: Framework of social determinants of health inequities



[i] **Diagram** of social determinants of health inequities elaborated EQH/EIP 2006 (OPSH)

1.3.2. Data

The data used in this analysis consisted of data collected in household surveys in the relevant countries, in particular demographic and health surveys (DHS), which collect data on relevant health and demographic outcomes, as well as data relevant for characterizing socioeconomic differences. The typical demographic and health survey samples adult women of reproductive age, and collects information about their household situation, their birth and reproductive history, and information about the health of their children.

In the case of Maldives, no suitable survey was available for any recent year. 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 lacked any questions on household socioeconomic characteristics, and therefore it was not suitable for analysis of health inequalities. 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 inequalities 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. A more recent version of the survey exists but the data were not obtainable at the time the analysis was undertaken. For Nepal, only data from

1996 and 2001 were analyzed. Data from the 2006 Demographic and Health Survey were not available at the time of analysis and therefore have not been included.

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

The 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 received 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 greatly reduced the sample size for the analysis of stunting and skilled birth attendance.

The household surveys analysed in the study are listed in Table 1.

Table 1: 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 not included in the analysis of health inequalities owing to gaps in provided data sets.

2. HEALTH INEQUITIES: MAGNITUDE AND TRENDS

2.1 Introduction

Substantial health-related inequities exist both within and across countries in South-East Asia. For this study, selected health outcomes were analysed, which were infant mortality rates, under-five mortality rates, prevalence of stunting in children under-five years of age, prevalence of underweight women and prevalence of overweight women. 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 studied using data from the DHS and DHS-type surveys and reports.

2.2. Inequities in health systems variables within and across countries in SEAR

2.2.1. Coverage of DPT3 vaccination

It is recommended that all children receive three doses of the DPT vaccine to obtain immunity against three of the six major preventable childhood diseases: diphtheria, pertussis and tetanus. These diseases can be substantially prevented and eventually eradicated through vaccination. Coverage of the relevant populations by immunisation is far from universal, however, with rates among South-East Asian countries ranging between 55 and 94 percent (Figure 2). India has the lowest coverage rate while Sri Lanka and Thailand have the highest. 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 3). Significant differences by income 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. On the other hand, coverage rates among the rich and poor in Sri Lanka and Thailand are similar, suggesting that attaining near universal coverage levels maybe critical to reducing socio-economic inequalities in this indicator.

Differences are seen in DPT3 vaccination coverage by mother's educational attainment in countries without universal 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).

Figure 2: DPT3 coverage in SEAR countries (recent years)

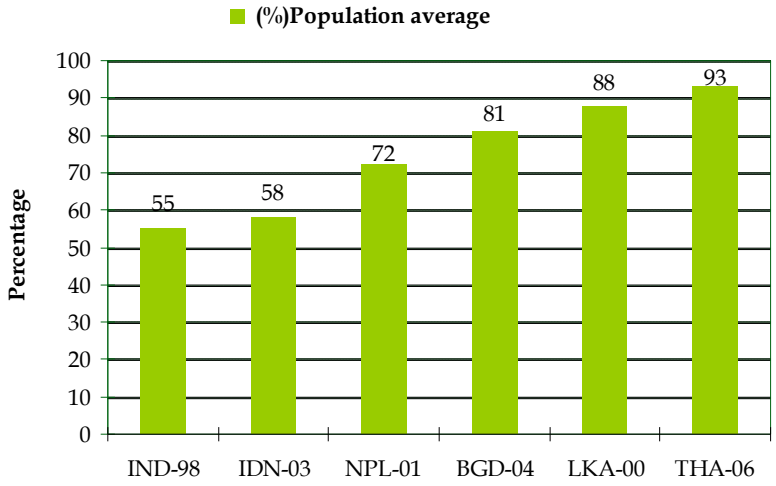
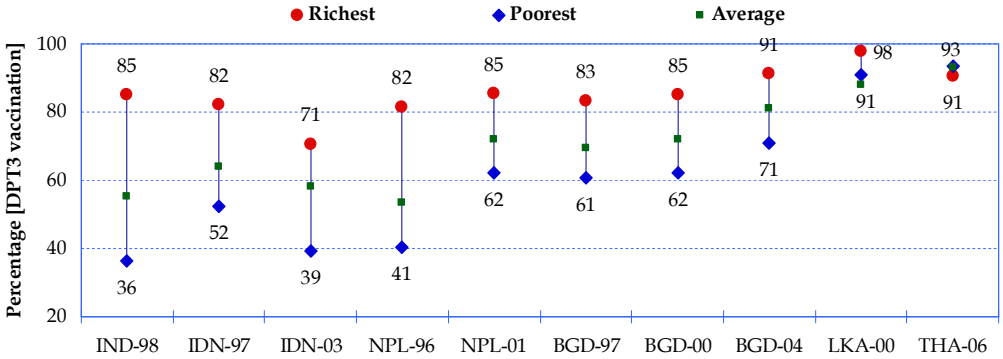


Figure 3: Inequalities in DPT3 vaccination between the poorest and richest wealth quintiles by country



2.2.2. 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 4). This is particularly because a large percentage of the population in the other countries lives in rural areas, where access to medically-trained individuals is in practice limited for most SEAR countries. This is the case in Nepal and Bangladesh, where only 13 percent of children were delivered with a skilled birth attendant present. The gap in coverage of skilled birth attendance is high between rich and poor and has remained the same or increased between the 1990s and post-2000 (Figure 5). Urban/rural differences are particularly high (Figure SA 3). In India and Indonesia, coverage rates

are higher: 42 percent and 66 percent, respectively. However, the gap in skilled birth attendance coverage between rich and poor is significant.

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 4). In these latter countries, coverage rates are high regardless of socio-economic, educational and geographical differences.

Figure 4: Skilled birth attendance coverage in SEAR countries (recent years)

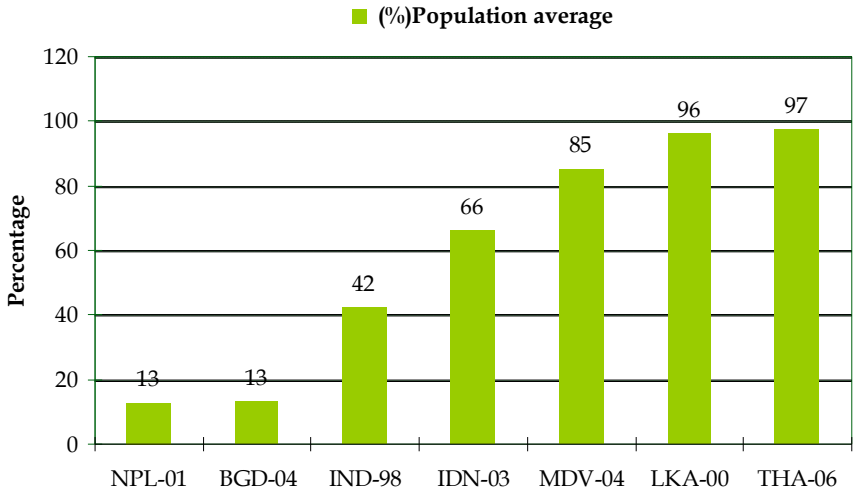
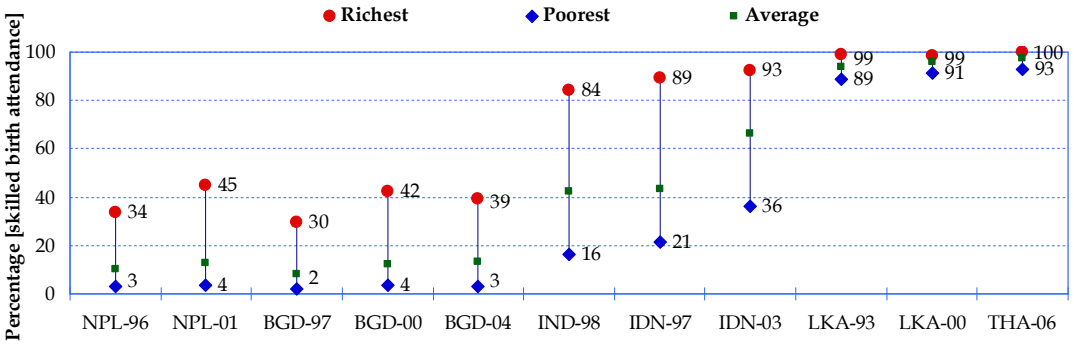


Figure 5: Inequalities in skilled birth attendance between the poorest and richest wealth quintiles by country



2.2.3. 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 6). 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 7, 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.

Figure 6: Use of modern contraception in SEAR countries (recent years)

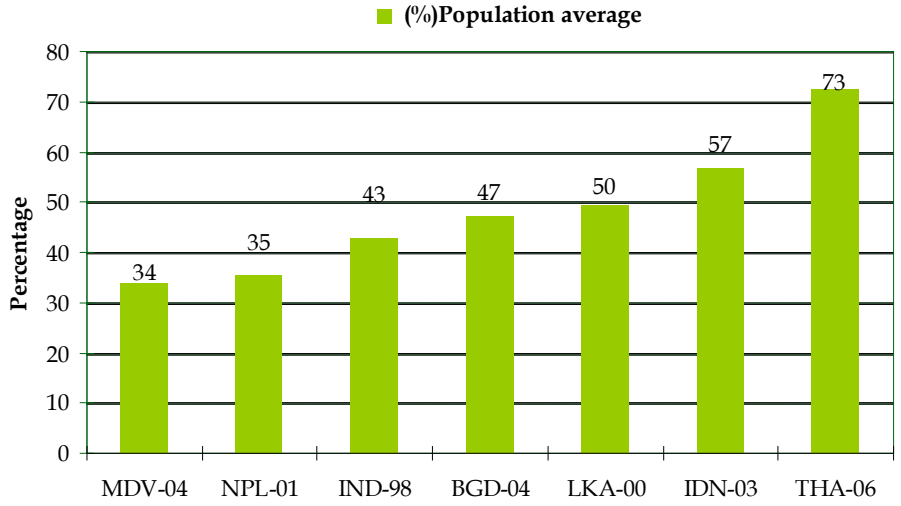
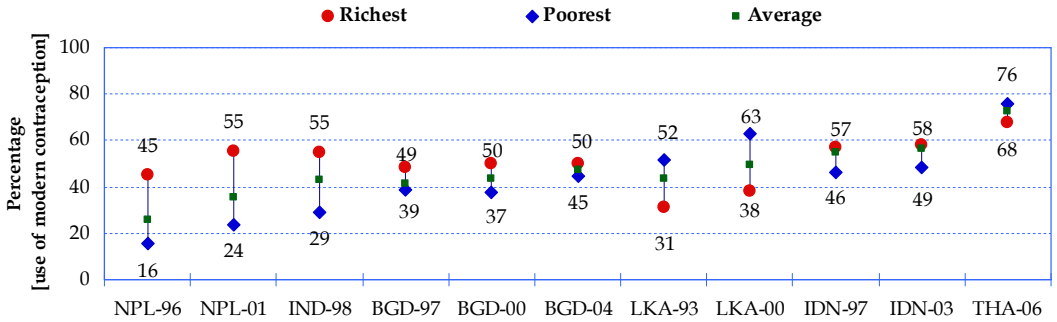


Figure 7: Inequalities in use of modern contraception between the poorest and richest wealth quintiles by country



2.3. Inequities in health outcomes within and across countries in SEAR

2.3.1. Infant mortality

Reducing infant mortality is a key MDG goal. Infant mortality is defined as the probability of dying between birth and exact age one year. 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 those countries with relatively good vital statistics (Maldives, Sri Lanka), the survey estimate will usually lag the actual rate as reported from other data sources. In Bangladesh, Nepal and India, infant mortality rates exceed 65 deaths per 1,000 live births (Figure 8). However, the rate for Sri Lanka was significantly lower at 19 deaths per 1,000 live births, whilst the available data indicate that the infant mortality rate in Maldives is similar to that of Sri Lanka. Sri Lanka's (and probably Maldives') low infant mortality rates are facilitated by the fact that most women in the country have a skilled birth attendant present when they deliver a child, and the relatively high levels of access mothers have to basic medical services when their children fall ill. The difference in infant mortality rates between children in the poorest quintile and those in the least poor quintile are large for Bangladesh and Nepal, but even more substantial for India and Indonesia (Figure 9). The gap between infant mortality for the rich and the poor has narrowed marginally for Bangladesh and Indonesia, but to a larger extent for Sri Lanka. No assessment of inequalities in infant mortality rates by income level can be made for the Maldives and Thailand. 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).

Figure 8: Infant mortality rates in SEAR countries (recent years)

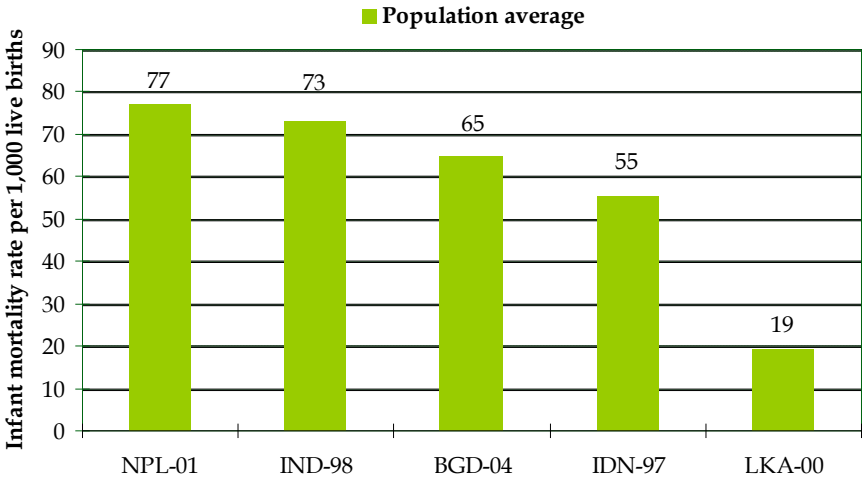
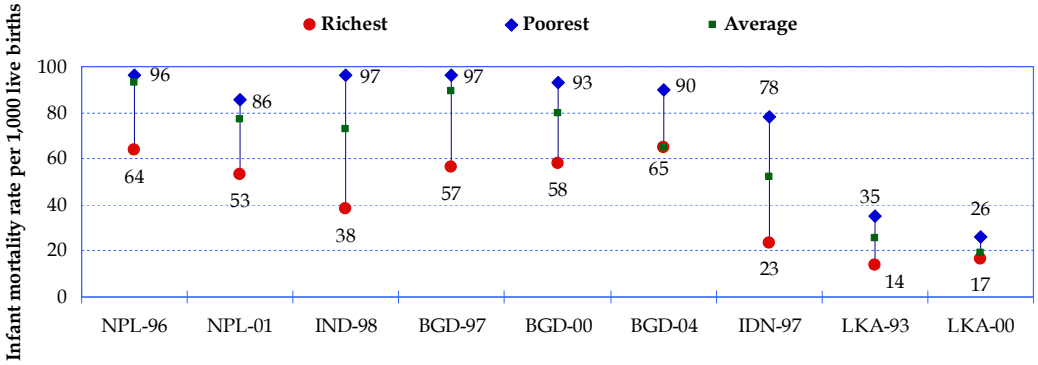


Figure 9: Inequalities in infant mortality rates between the poorest and richest wealth quintiles by country



2.3.2. Under-five mortality

There is a huge range in under-five mortality rates in countries of South-East Asia. The survey estimates considered in this study range from less than 20 in Sri Lanka, Thailand and Maldives to more than 100 in Nepal and India (Figure 10). The variation in child mortality rates is more likely to reflect differences in access to child health services than is the case for infant mortality, which is also influenced by the levels of 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, but the data also show that the size of this disparity tends to fall the lower the overall level of under-five mortality (Figure 11). The disparity is greatest in India and Indonesia, where it is more than three times, and the poor-rich disparity 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).

Figure 10: Under-five mortality rates in SEAR countries (recent years)

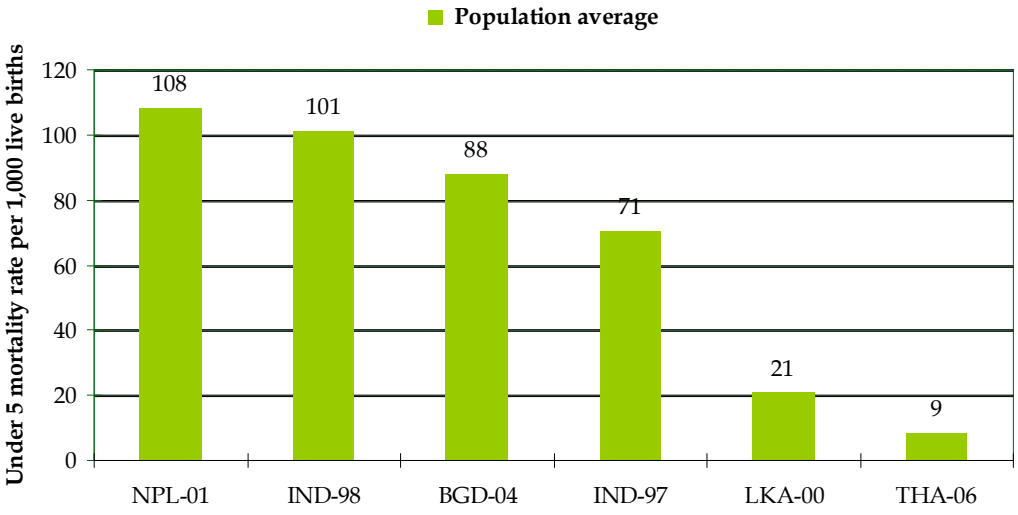
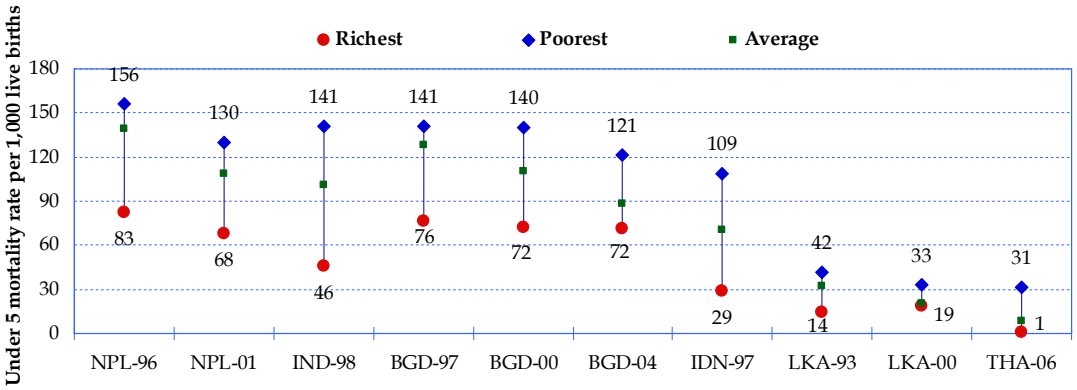


Figure 11: Inequalities in under-five mortality rates between the poorest and richest wealth quintiles by country



2.3.3. Prevalence of stunting in children under five

Stunting, which is low height-for-age, in children 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. There is a large variation in the region in the levels of overall stunting, with countries falling into two groups, with stunting levels being 40-50% in Bangladesh, Nepal and India, and 10-25% in Sri Lanka, Maldives and Thailand (Figure 12). In general, it is clear that overall national stunting rates are closely related to national income levels, with stunting being lowest in the richest countries of the region, and falling the fastest in the past two decades in the two most rapidly growing economies – Thailand and Maldives. Within countries, stunting varies considerably between the richest and poorest households, with stunting levels being on average twice as high in the poorest quintile as in the richest quintile in Bangladesh, Nepal, India and Indonesia (Figure 13). However, the disparity between the poorest and richest quintiles is much greater in Sri Lanka and Thailand, where it is as much as three to six times, but this appears to reflect a situation where stunting levels in these countries have fallen to low levels in the richest quintiles, whilst still remaining high

in the rest of the population. Interestingly, it is worth noting that whilst income disparities in stunting were also the case in the Maldives previously, the most recent 2004 survey data indicate that not only has stunting fallen considerably in the Maldives, but also that there are no major inequalities by income level. The rapid improvement and elimination of stunting in children in Maldives in the past decade appears to be explained by its very rapid economic growth, which has ensured that few Maldivian families exist in food insecurity. Children in India, Nepal and Thailand exhibit large differences in stunting by educational attainment of mothers (Figure SA 11). Urban/rural differences are apparent in India, Nepal and Sri Lanka (Figure SA 12).

Figure 12: Prevalence of stunting in SEAR countries (recent years)

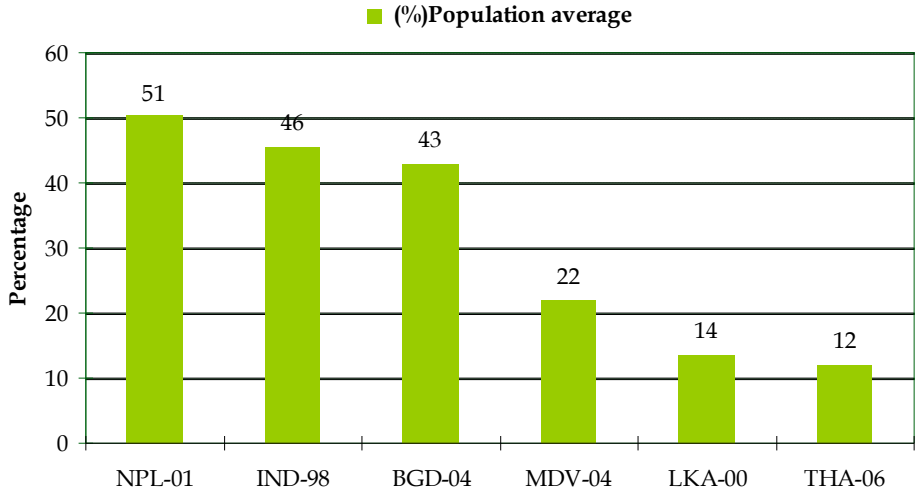
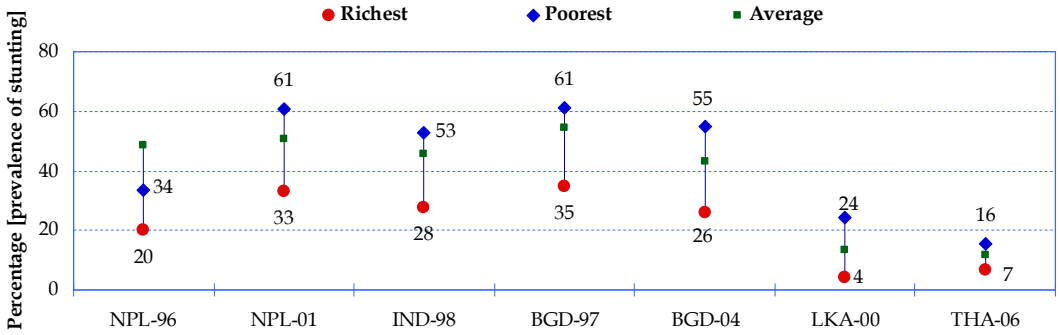


Figure 13: Inequalities in prevalence of childhood stunting between the poorest and richest wealth quintiles by country



2.3.4. Prevalence of underweight women

Inadequate food security is reflected not only in child malnutrition, but also maternal undernutrition and maternal under-weight. Under-weight in mothers also contributes to worse maternal health outcomes, as well as under-nutrition in children. Levels of underweight in women are high in South-East Asia, but have been falling. They were over 50% in Bangladesh in the mid-1990s, but have now fallen to less than 40%. In most countries of the region, levels remain between 25% to 40% (Figure 14). The differences in national levels closely mirrors those in child stunting rates, and overall

rates are lowest in Sri Lanka (22%) and Thailand. Similarly, there is considerable disparity by income level and education in all the countries (Figure 15 and Figure SA 13). The prevalence of maternal underweight is higher in poorer households than in richer households with the poor 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.

Figure 14: Prevalence of women underweight in SEAR countries (recent years)

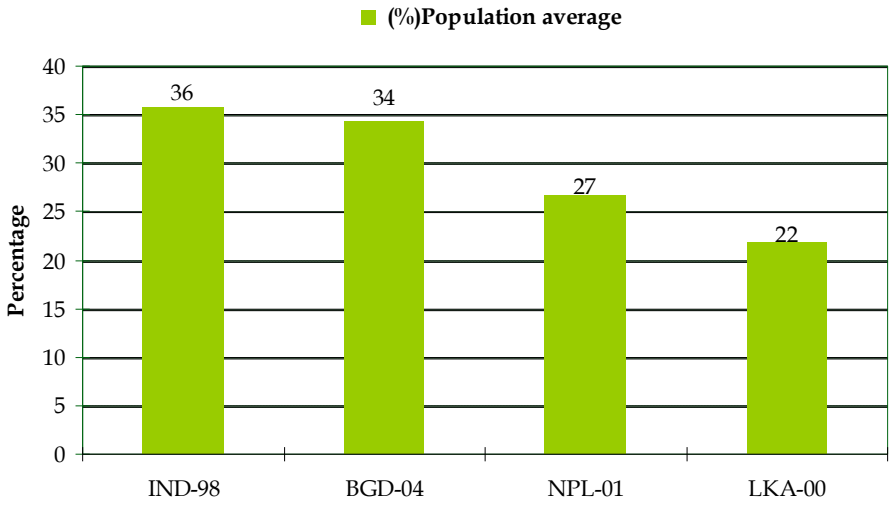
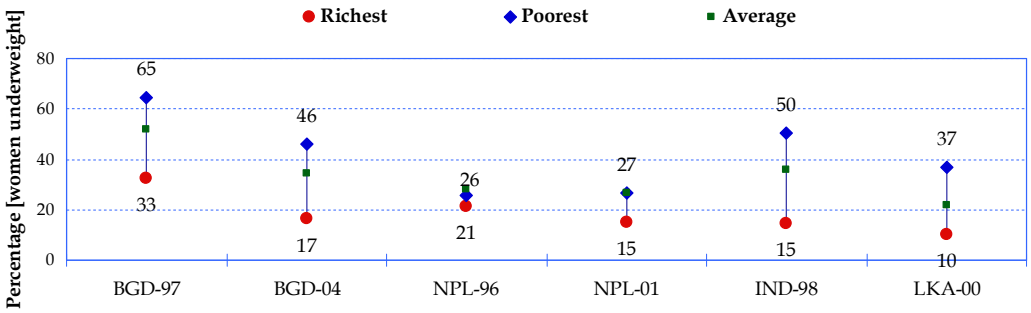


Figure 15: Inequalities in prevalence of maternal underweight between the poorest and richest wealth quintiles by country



2.3.5. Prevalence of overweight women

As income levels and food security improve in the region, obesity in adults and in women is emerging as a significant problem. Obesity is a significant risk factor for many types of non-communicable disease, and non-communicable disease accounts for a growing share, and in some countries (Sri Lanka, Maldives, 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 increasing at higher national per capita GDP. Levels are highest in Sri Lanka and Thailand, and lowest in Nepal, Bangladesh and India (Figure 16). Similarly, the disparities are the opposite, with obesity being significantly higher in richer, more educated, urban households than in poorer, less educated, rural households in all the countries studied (Figure 17, Figure

SA 15, Figure SA 16). Interestingly, the disparities between the poorest and richest households are greater than for the previous two indicators discussed, with obesity concentrated in all the countries in the richest quintile, typically at levels four to six times higher than in the poorest quintile. Disparities by education mirror those by income: obesity is concentrated among women with more than a secondary education.

Figure 16: Prevalence of women overweight in SEAR countries (recent years)

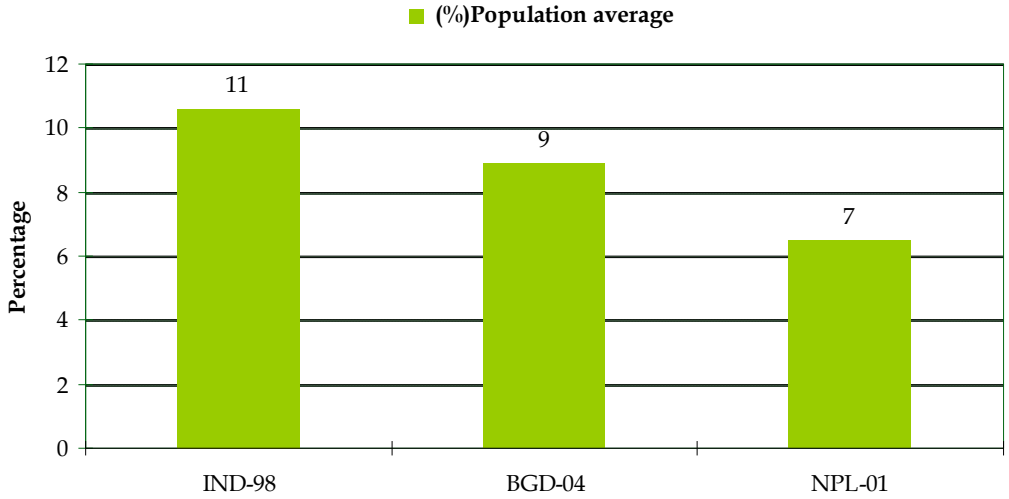
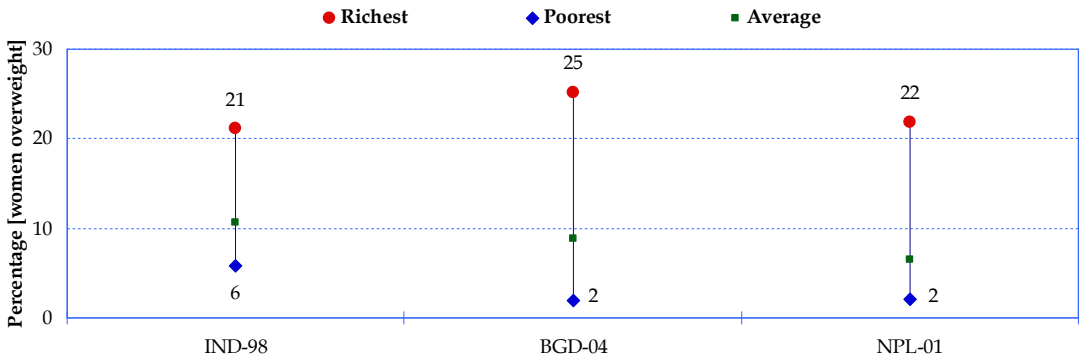


Figure 17: Inequalities in prevalence of maternal overweight between the poorest and richest wealth quintiles by country



2.4 Inequities in key health determinants within and across countries in SEAR

Inequalities in key health determinants parallel the inequalities 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: exposure to safe water and 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 goals.

2.4.1. Exposure to safe water

Many serious diseases, including typhoid, cholera and dysentery, breed in 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 18). However, in Indonesia, less than 60 percent 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 percent in 1997. In India, Nepal and Sri Lanka, the percentage of households that use safe drinking water is just over 75 percent. Disparities are apparent by income and urban/rural residence. Households in the richest wealth quintile in Indonesia are three times as likely to have access to safe drinking water as those in the poorest quintile (Figure 19). The difference between the richest and poorest households in Nepal is less than in Indonesia but is still large. In all countries but Bangladesh, urban residents are 1.5 times more likely to have access to safe drinking water than their rural counterparts (Figure SA 17).

Figure 18: Exposure to safe drinking water in SEAR countries (recent years)

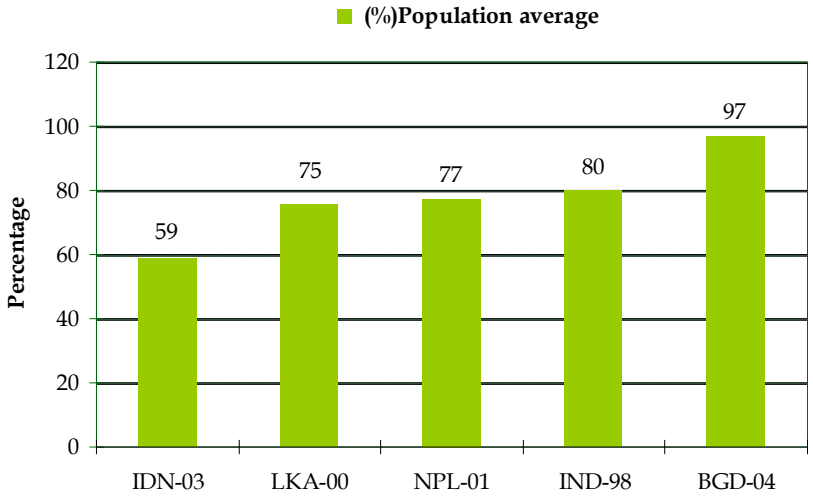
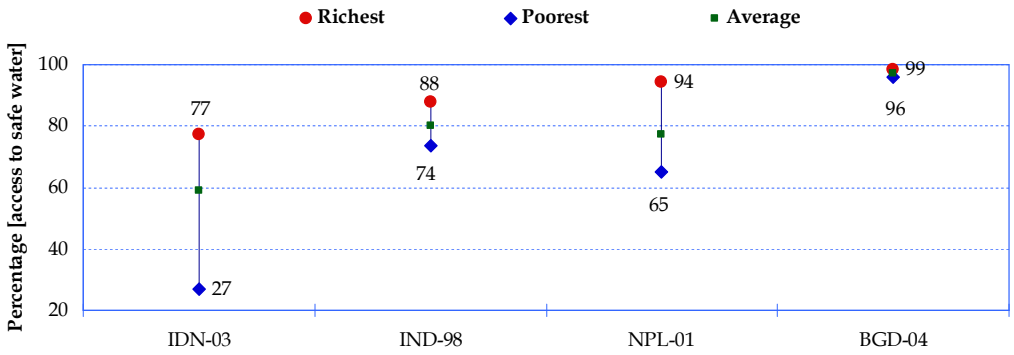


Figure 19: Inequalities in access to safe water between the poorest and richest quintiles by country



2.4.2. 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 20). Access is substantially higher in Sri Lanka (80 percent). It is encouraging to note that access has improved for all countries for which more than one year of survey data were available (Figure 21). 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 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.

Figure 20: Exposure to safe sanitation facilities in SEAR countries (recent years)

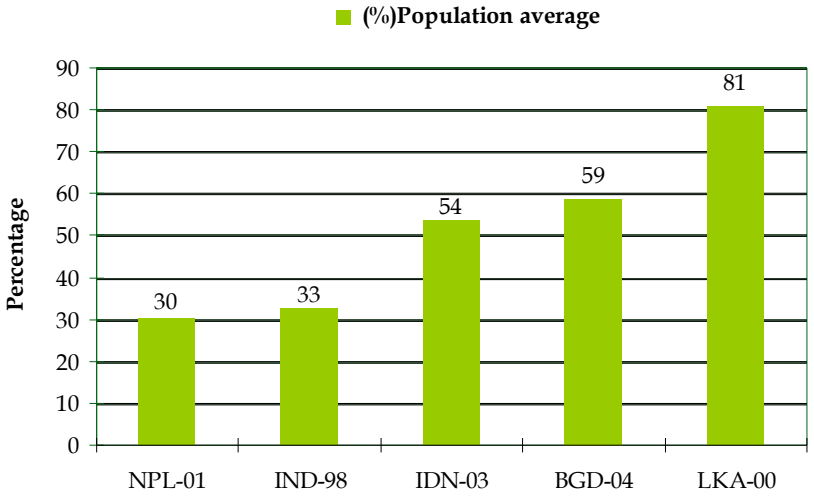
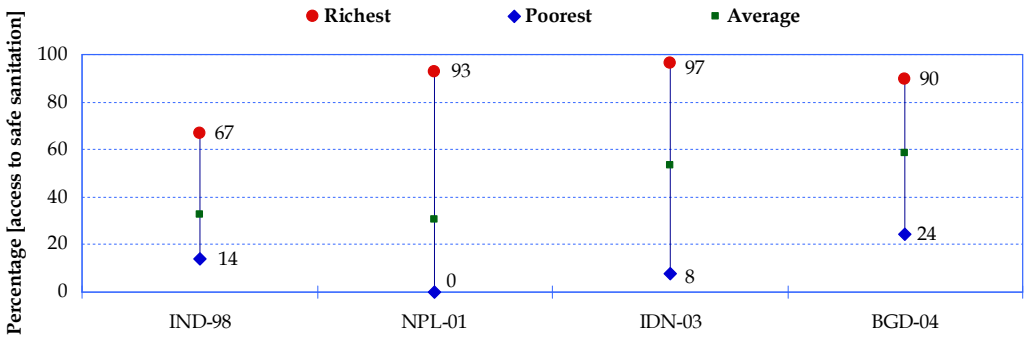


Figure 21: Inequalities in access to safe sanitation between the poorest and richest quintiles by country



3. IDENTIFYING DETERMINANTS OF HEALTH INEQUITIES

The general objective of this section is to identify factors and their contributions 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 Southeast Asia. In addition, the region has almost two-thirds of the global burden of malnutrition.[2] Therefore, this analysis will primarily focus on determinants of maternal mortality and child malnutrition (under five years of age).

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, we have used the percentage of skilled birth attendance 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 inequalities in it also matter directly.

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

The framework described in section 1.3.1 was used to identify the pathways and determinants to inequities in these variables in the region. Table 2 highlights the major determinants that comprise the framework's broad categories.

[2] Bhutta Z. et al."Maternal and child health: is South Asia ready for change?" BMJ 2004;328:816-819 (3 April), doi:10.1136/bmj.328.7443.816

Table 2: Major determinants identified under broad categories of the framework

	Geographical & socioeconomic 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 1.3.3 was used to conduct a decomposition analysis of determinants of inequities.

3.1 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. Inequalities in Sri Lanka and Thailand were not analyzed, as there are essentially no inequalities in access to skilled birth attendance in these two countries, and Maldives was not analyzed because of lack of suitable data.

Figure 22: Contribution of broad factors to inequities in skilled birth attendance

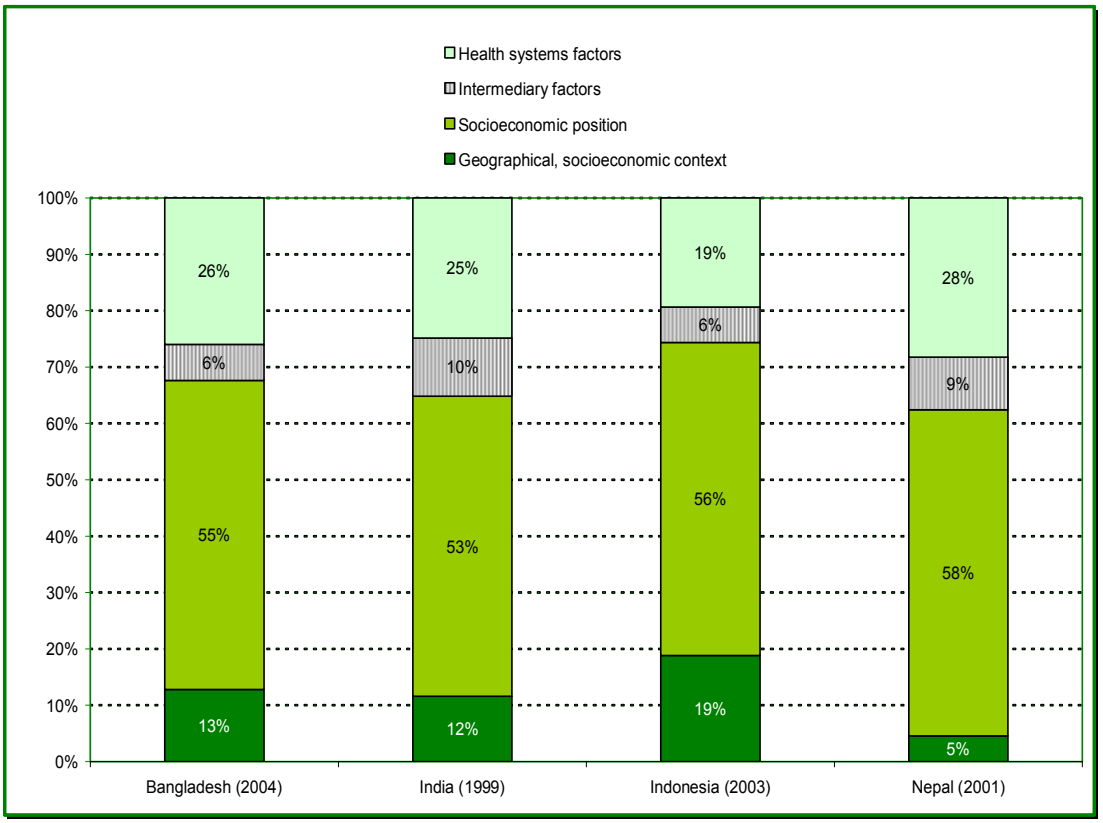


Figure 22 shows an overview of the major factors that contribute to inequalities in skilled birth attendance. We can see that in all four countries socioeconomic position and health systems factors accounted for between 75-86% of inequities in skilled birth attendance. The contribution of socioeconomic position ranged between 53% Bangladesh to 58% in Sri Lanka while the contribution of health systems factors ranged from 19% in Indonesia to 28% in Sri Lanka. Geographical and socioeconomic context in which women live in was also a significant contributor in Indonesia (19%).

Among the individual factors, wealth (of household) 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 3, we can see that in all four countries inequalities 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 inequalities in wealth does not always have to result in inequalities in skilled birth attendance. Inequalities in wealth are as high, if not higher in Thailand and Sri Lanka as the countries examined, and yet inequalities in skilled birth attendance are much less. 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 inequalities 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 3: 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

3.2 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 23: Contribution of broad factors to inequities in child malnutrition (stunting) rates in the region

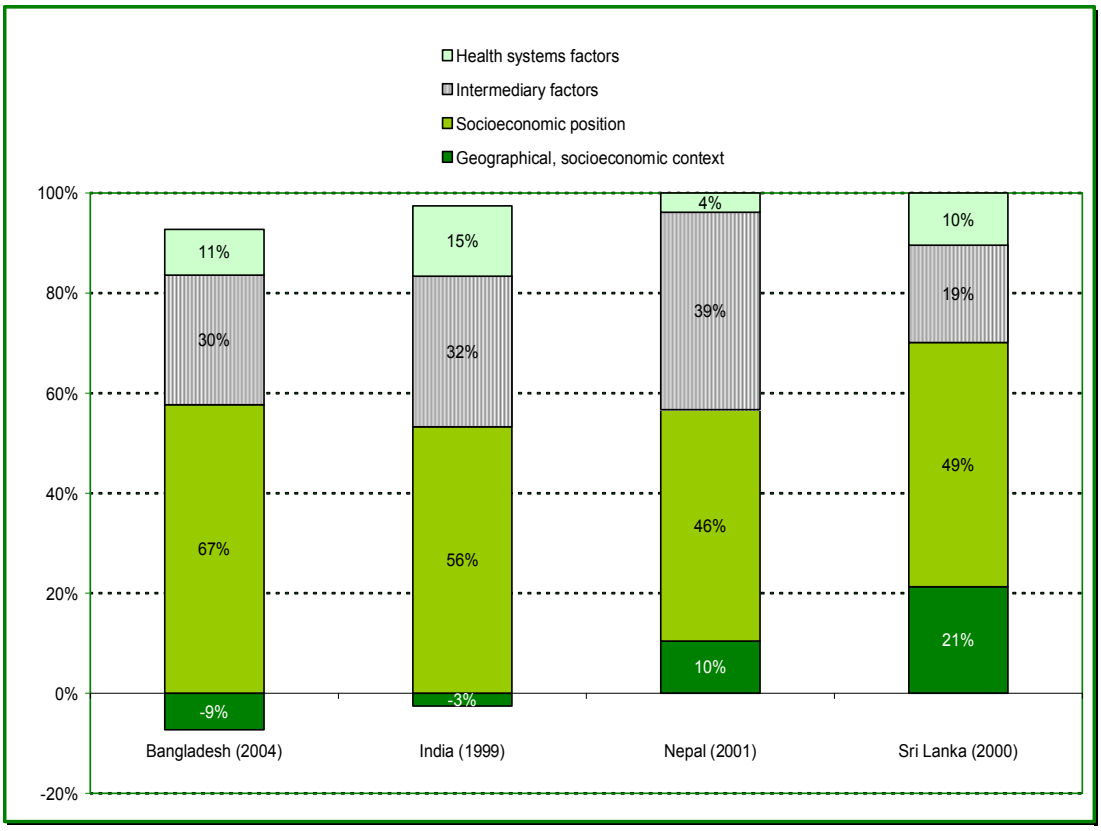


Figure shows that socioeconomic position and intermediary factors together contribute to 68-98% of inequities in stunting of children under five years of age. Socioeconomic position, as a whole, accounts for 49% of inequities in Sri Lanka up to 68% of inequities in Bangladesh in childhood stunting. Intermediary factors are the most significant contributors to inequities in stunting in Nepal (39%) and the least in Sri Lanka (19%). It is also worth stressing that health system factors account for only a small proportion of the factors that contribute to inequalities in stunting in all the countries. Given that inequalities 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 inequalities in child stunting.

Table 4 reveals further that inequalities in 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. The contribution of wealth inequalities is greatest in Bangladesh (68%) and Sri Lanka (40%). Wealth inequalities 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%).

Table 4: 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		

4. CONCLUSIONS AND IMPLICATIONS

4.1 Discussion of main findings from the analysis

Inequalities in health outcomes and in health services access are large between poor and rich households in most of South-East Asia. In general, where levels of health services access are high, particularly in Sri Lanka and Thailand (and to some extent in the Maldives), such socio-economic inequalities tend to be reduced. Nevertheless, even in Sri Lanka, some inequalities in access to health services can be observed.

Levels of skilled birth attendance are low in most countries of the region, and inequalities in access to skill birthing care are considerable. Where improvements have occurred in the past decade, they have tended to benefit the richer households more than the poorer ones. Such disparities matter, because reducing disparities in maternal mortality and also reducing overall maternal mortality rates will require addressing such disparities. In all the countries, where the inequalities could be analysed, it was found that socio-economic position was by far the dominant determinant of whether mothers had skilled birth attendance, followed by a smaller contribution from health system factors. This suggests that the major barriers to improving access to skilled birthing care relate to those linked to socioeconomic position. The most likely explanation is that although governments in all countries do provide maternal care services to the poor, in practice, socioeconomic factors act as significant barriers to prevent many or most mothers making use of provided services. Such barriers can include the 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 to accessing available services.

In the case of child malnutrition, the analyses suggest that the key factors have more to do with socio-economic status, particularly wealth, in all the countries studied, and much less to do with health system factors. Unlike in the case of use 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 status is an indicator of the overall income and food security of a household. Economic inequality in child malnutrition is thus clearly related to factors beyond the scope of health authorities and the health care delivery system. 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. Moreover, although intermediary factors such as healthcare behaviours and child care practices, were found to have some impact, their overall contribution was still less than over socioeconomic position. Reducing child malnutrition is thus likely to come 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 eliminated socioeconomic disparities in child malnutrition.

4.2 Policy implications

Health inequalities have many determinants, and these vary by type of inequality and by country. Nevertheless, some general conclusions can be drawn and recommendations made:

1. In general, improving overall access to health services and moving towards universal access is likely to reduce socioeconomic disparities for most indicators of health system use and access, and in the case of outcomes which are strongly related to such access, such as maternal mortality, reduce their disparities too.

2. Improving food and income security of the poorest households in all the countries of the region (except the Maldives and Thailand) will be the key to reducing overall child malnutrition and disparities by income level. Certainly, this is more critical than health system interventions, and will require concerted intersectoral actions.

3. Provision of public sector maternal care services have not been sufficient in many countries of the region to reduce inequalities in access to maternal care, but some countries, in particular Sri Lanka, Maldives and Thailand, have been successful in using such provision to reduce inequalities in access. It is therefore necessary for countries such as Nepal, Bangladesh and Indonesia 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 Sri Lanka, Thailand and Maldives.

4. Whilst health system factors and inequalities lie behind most health inequalities, social and economic factors explain a large amount of many health inequalities, and health policies must take into account these factors, and attempt to alleviate them where possible, or lead efforts for intersectoral action where necessary.

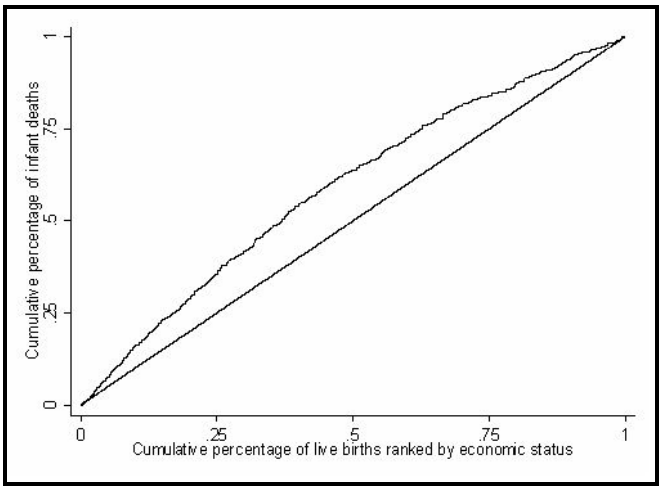
ANNEX I. TECHNICAL NOTES AND DEFINITIONS

a. Concentration index

The concentration index and curve provide a means of assessing the degree of socioeconomic inequality in the distribution of a health variable. For example, they could be used to assess whether infant/child mortality is more unequally distributed to the disadvantage of children in households with a lower socioeconomic status in one country/province than another.

There two variables underlying the concentration curve: the health variable, the distribution of which is the subject of interest; and a variable of socioeconomic status, against which the distribution is to be assessed. As shown in Figure A1, the concentration curve plots the cumulative proportions of a health variable (y-axis) against the cumulative percentage of the sample, ranked by their socioeconomic status, beginning with the most disadvantaged, and ending with the least disadvantaged (x-axis).

Figure A 1: The concentration curve



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.

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 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).

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

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.

b. Decomposition method

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:

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

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:

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

where μ is the mean of y, $\bar{x}_k$ 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_ε 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[3] $\left(\beta_k \bar{x}_k / \mu\right)$ 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 xk 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

[3] An elasticity is a unit-free measure of (partial) association, i.e. the % change in the dependent variable (health or infant mortality in this case) associated with a % change in the explanatory variable.

concentration indices of its determinants additively, the usefulness of the method is limited to linear models.

ANNEX II. COUNTRY REPORTS

Bangladesh

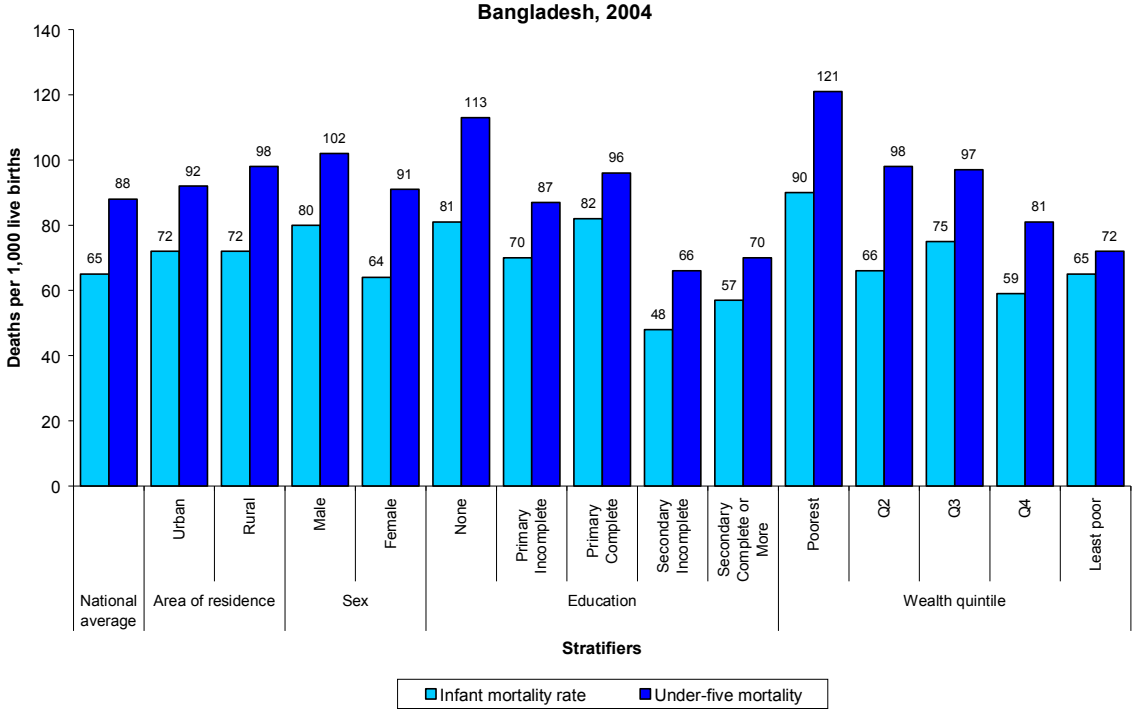
Indicators analysed

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.

Figure 1
Infant and Under-five Mortality By Stratifiers
Bangladesh, 2004

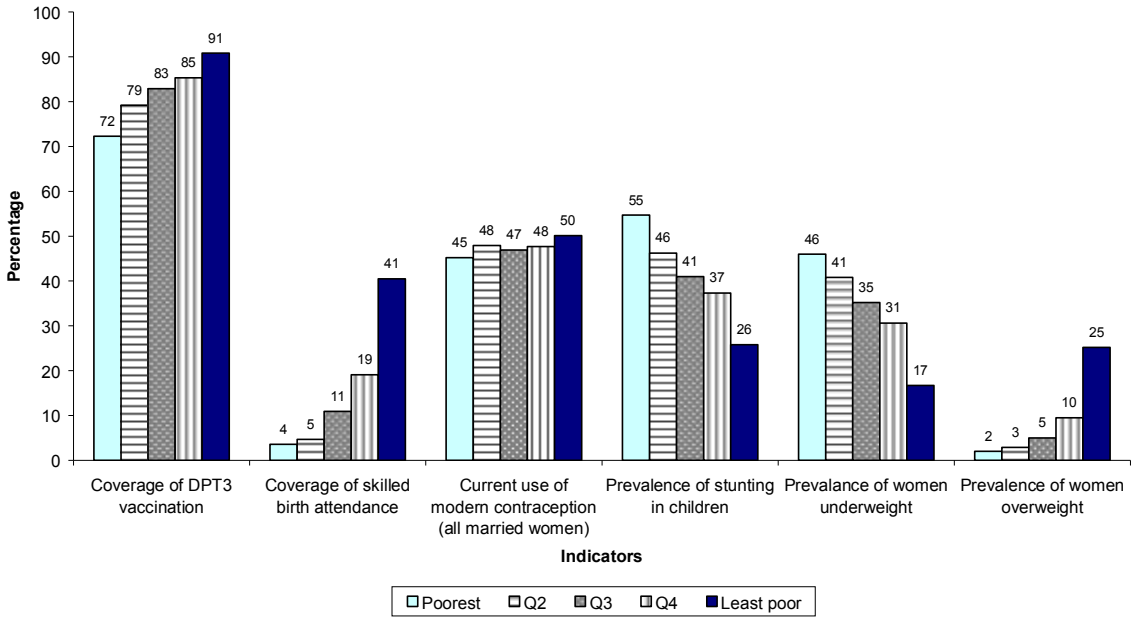


The data from 2004 show that the poorest quintile experienced 1.7 times the under-five mortality and 1.4 times the infant mortality experienced by the richest quintile. The under-five mortality gradient by wealth quintile reflects a steady decline across wealth quintiles but the pattern for infant mortality 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.

Figure 2
Selected Indicators By Wealth Quintile
Bangladesh, 2004

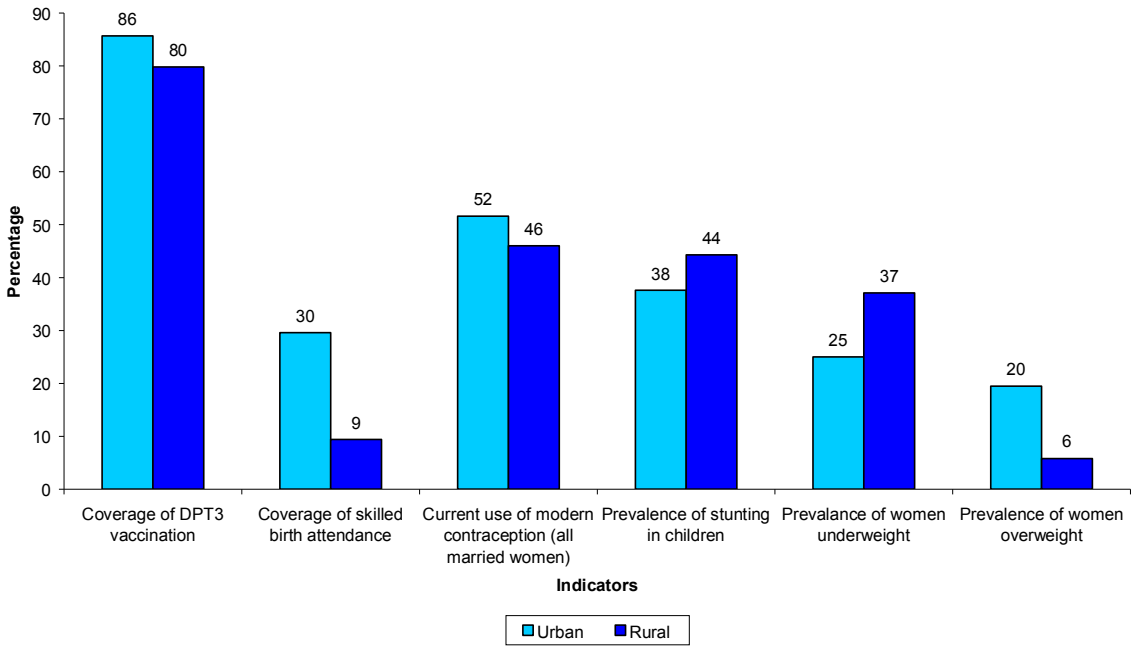


In terms of access to health services, the data shows income-related inequities for skilled birth attendance and coverage of DPT3 vaccination. For the former, coverage increases gradually across wealth quintiles but for the latter, a sharp increase is seen between the fourth and the richest quintile, 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 percent.

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.

Figure 3
Selected Indicators By Area
Bangladesh, 2004

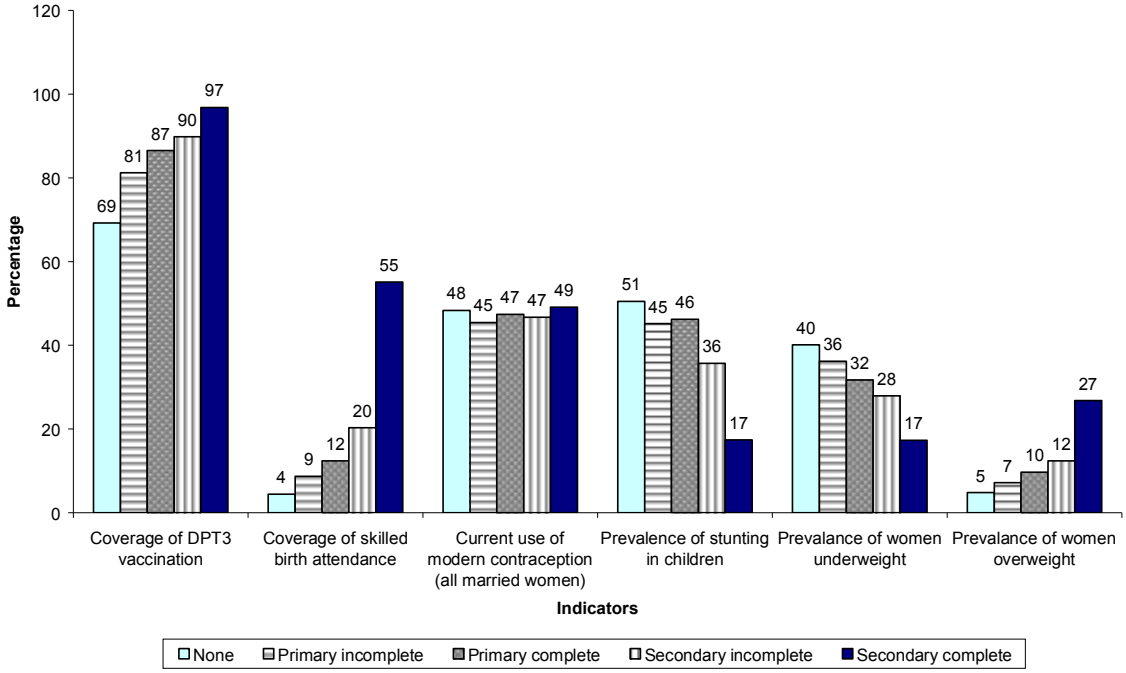


The figure shows that there are disparities between rural and urban areas, especially with respect to skilled birth attendance. For all indicators, rural residents are worse off. For example, coverage of skilled birth attendance is 3.3 times higher in urban areas than in rural areas. Disparities in coverage 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.

Figure 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 inequalities

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 inequalities 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 inequality trends over the 8-year time period. The relative gap in stunting in under-five children shows a slight increase in inequality, whereas prevalence of women underweight shows a marked increase. All health systems indicators exhibit a reduction in inequality.

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.[4]

[4] Minujin A, Delamonica E (2003). Mind the Gap: Widening child mortality disparities. *Journal of Human Development*, 4(3): 397-418.

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 the time. All but two indicators under study fall into this category. Figure 5 illustrates this pattern in infant mortality rates. It is possible to see a widening of 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 6 illustrates this pattern in stunting among children under five years old. 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.

Figure 5: Trend in Infant Mortality by Wealth Quintile, Bangladesh

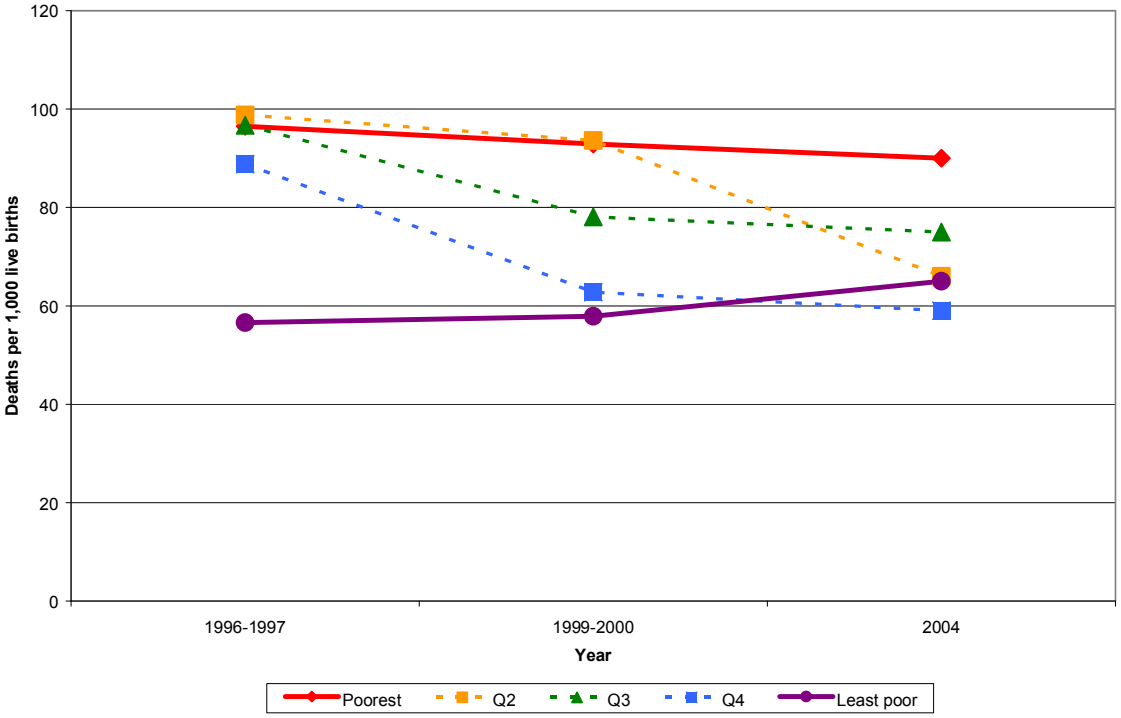
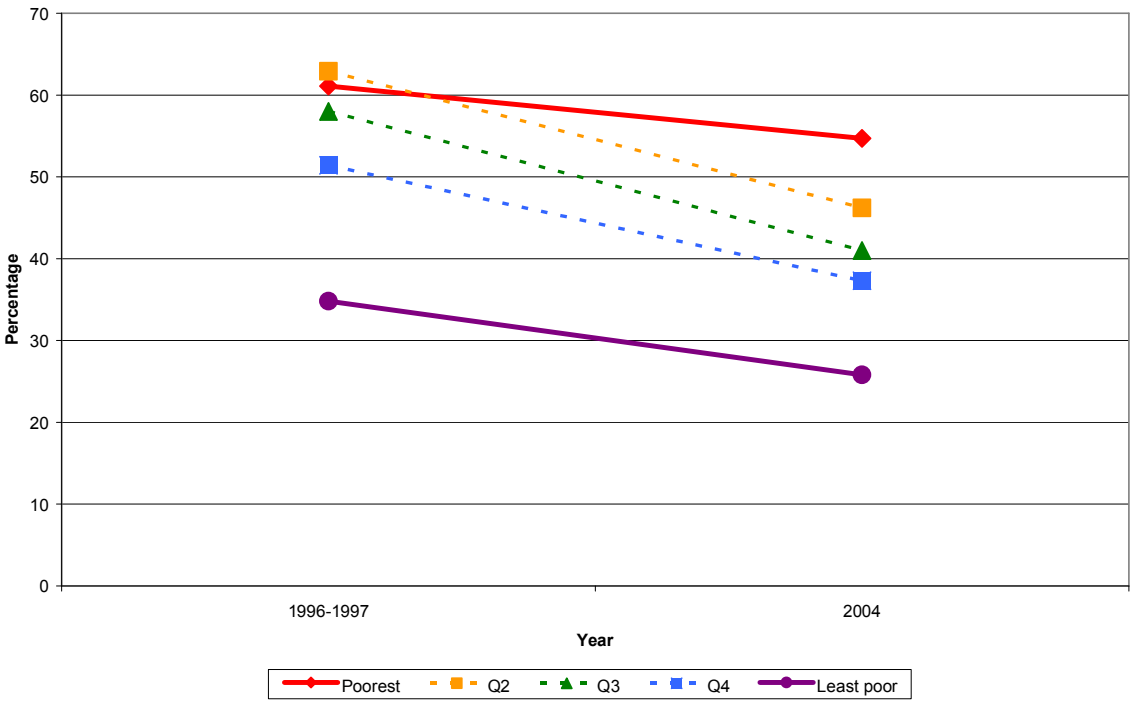


Figure 6: Trend in Stunting by Wealth Quintile, Bangladesh



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 7). Health systems factors also contribute significantly. The primary determinant of socio-economic position that contributes to inequities is household wealth, accounting for 27 percent of the differences (Figure 8). 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.

Figure 7:
Contribution of broad factors to inequities in skilled birth attendance
Bangladesh, 2004

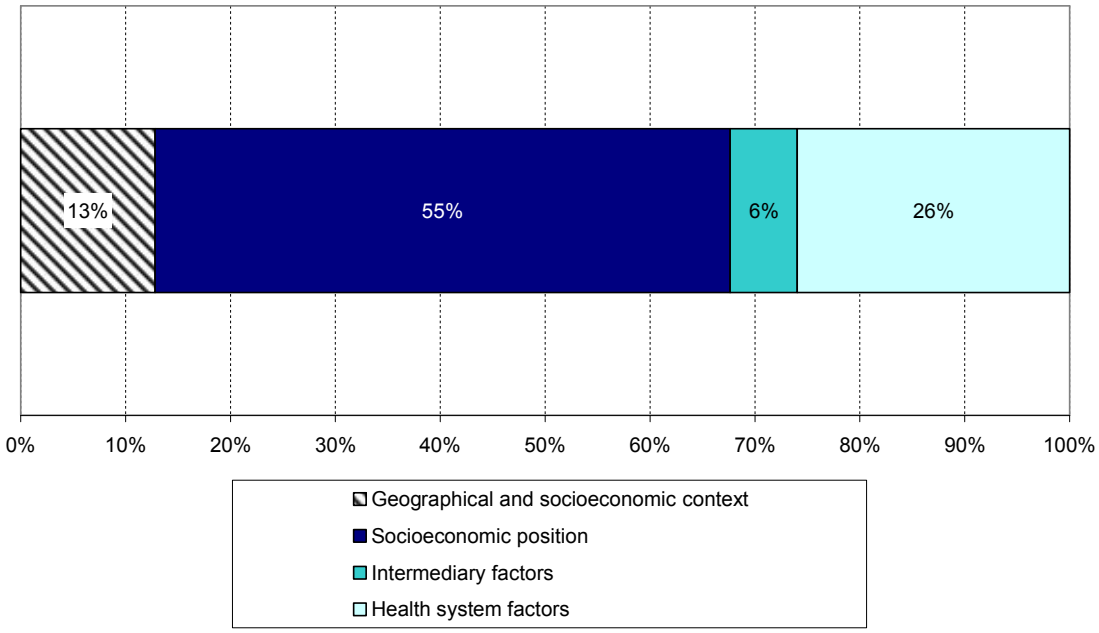
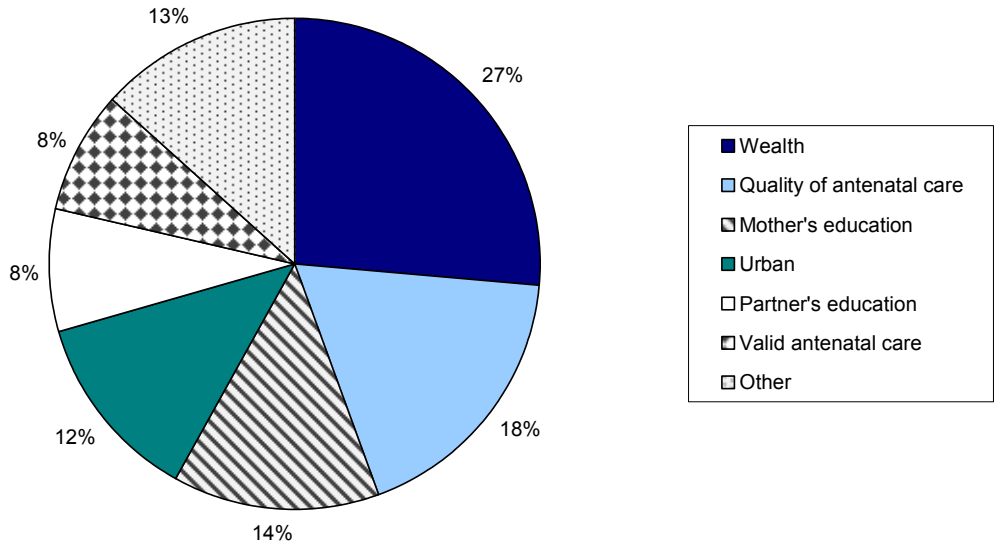


Figure 8:
Major determinants contributing to inequities in skilled birth attendance
Bangladesh, 2004



Main determinants of inequities in stunting

Decomposition analysis of inequities in stunting among children under five years old shows that socio-economic position is by far the most important contributor to increasing inequities, followed by intermediary factors (Figure 9). 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 socio-economic 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 socio-economic position category are household wealth and partner's education, which together account for 60 percent of differences (Figure 10). 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).

Figure 9:
Contribution of broad factors to inequities in childhood stunting
Bangladesh, 2004

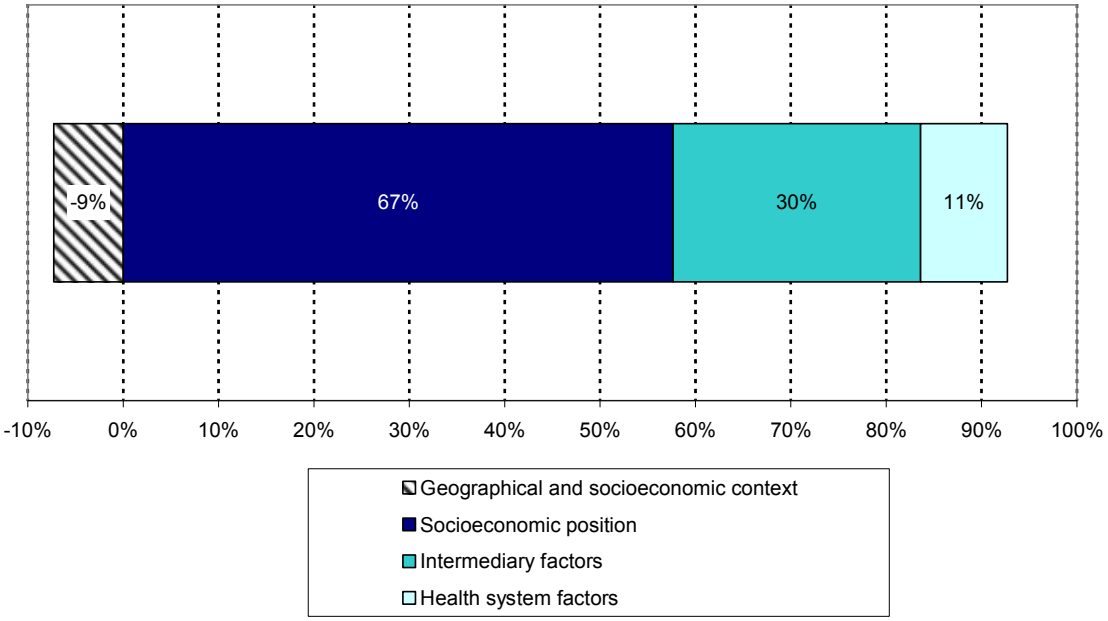
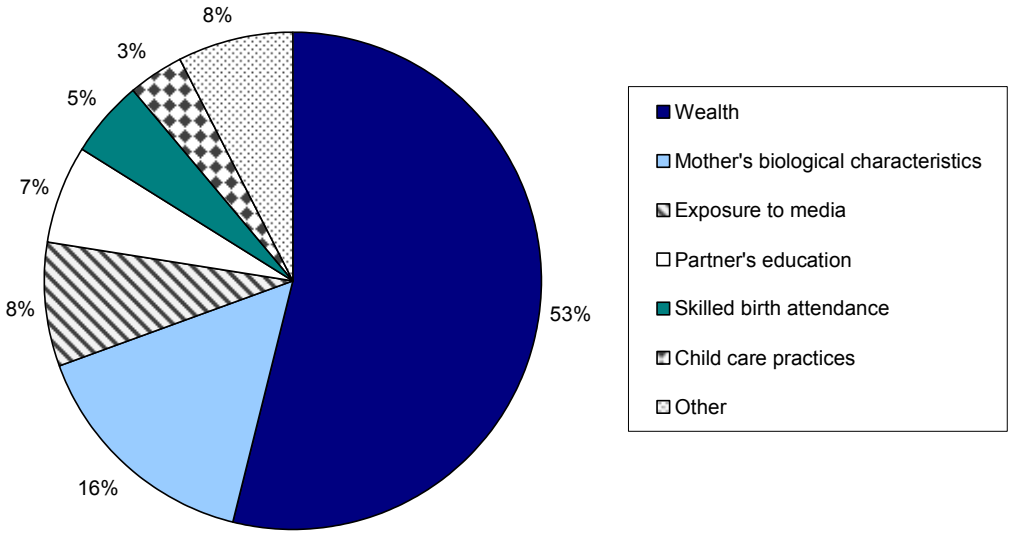


Figure 10:
Major determinants of inequities in childhood stunting
Bangladesh, 2004



India

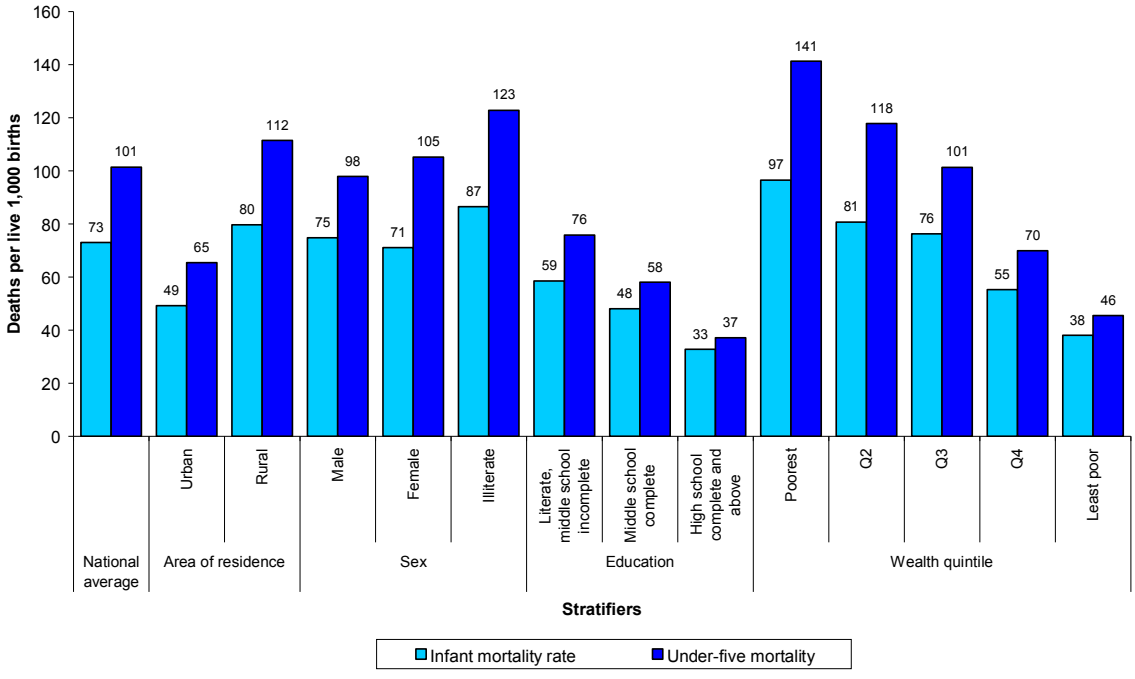
Indicators analysed

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.

Figure 1
Infant and Under-Five Mortality by Stratifiers
India, 1998-1999

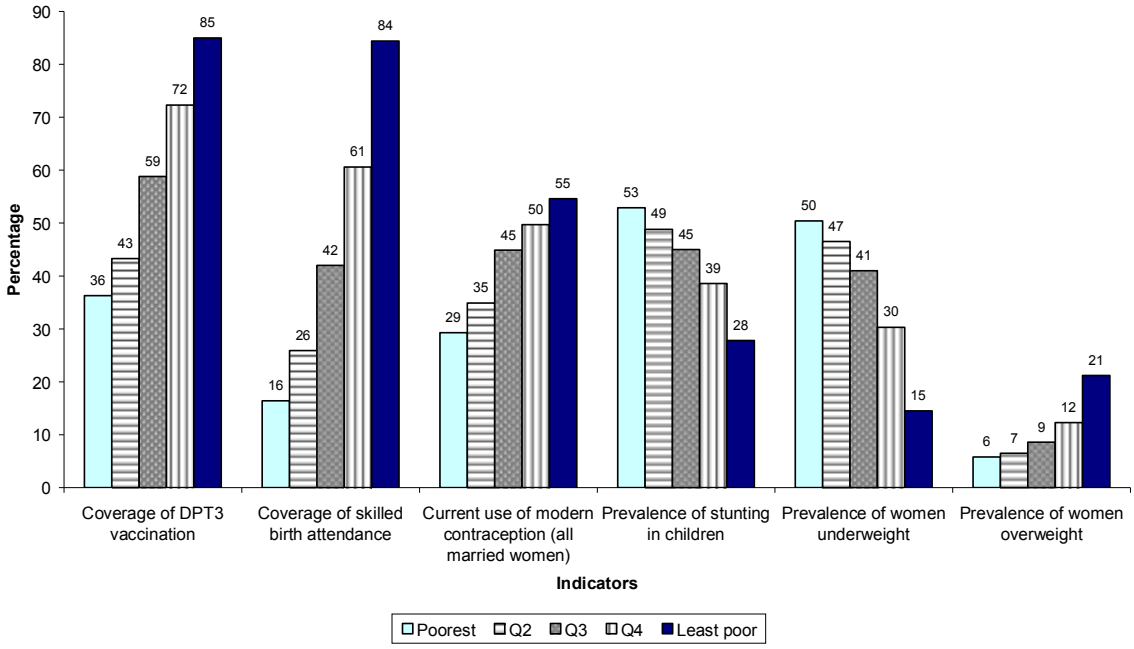


The data from 1998-1999 shows that the poorest quintile experienced 3.1 times the under-five mortality experienced by the richest quintile. The under-five and infant mortality gradients by wealth quintile reflect a steady decline. However, by mother's education level, a sharp drop in both mortality rates 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.

Figure 2
Selected Indicators By Wealth Quintile
India, 1998-1999

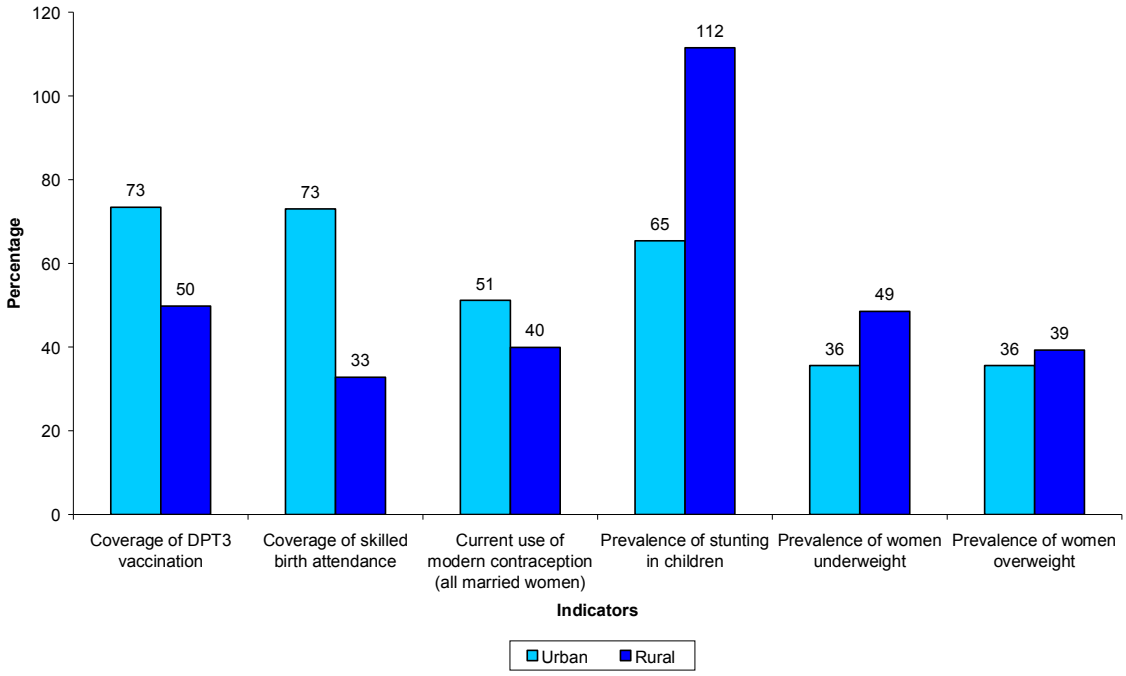


In terms of access to health services, the data shows income-related inequities for all indicators. Inadequate health care access and poor health outcomes are more prevalent among the poor. There is a gradual increase in coverage rates across wealth quintiles for DPT3 vaccinations and for use of modern 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 percent 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.

Figure 3
Selected Indicators By Area
India, 1998-1999

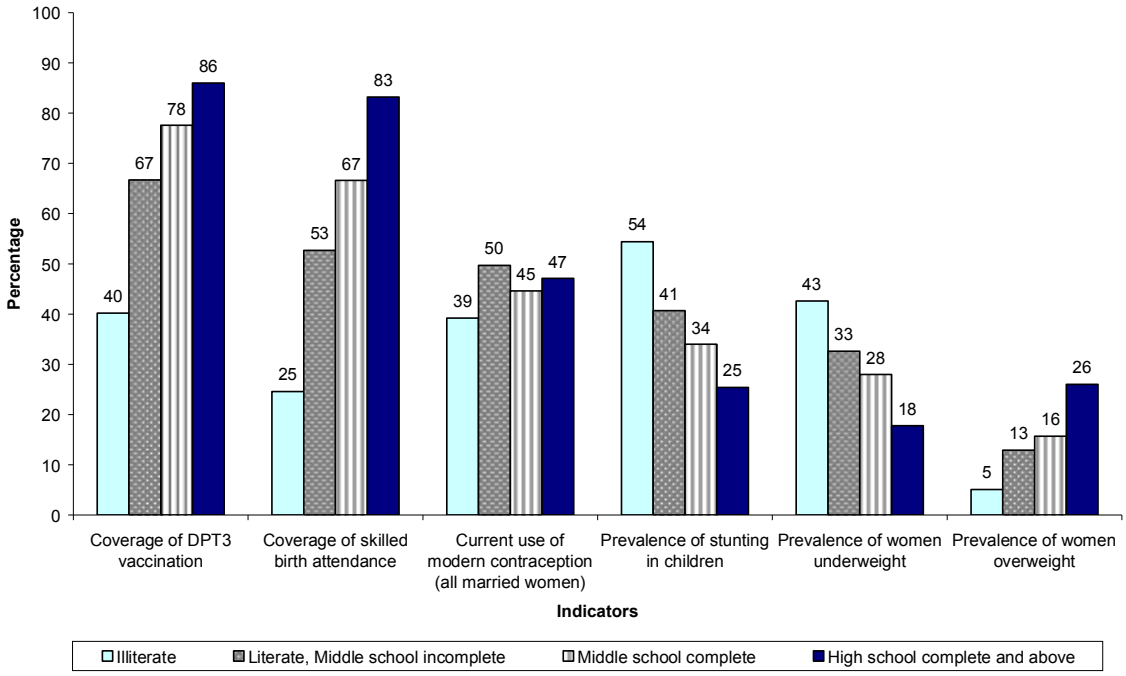


The figure shows that there are disparities between rural and urban areas, especially with respect to skilled birth attendance and coverage of DPT3 vaccination. For all indicators, rural residents are worse off. For example, coverage of skilled birth attendance is 2.2 times higher in urban areas than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

Figure 4
Selected Indicators By Education
India, 1998-1999



Educational achievement is an important factor associated with inequities in health. All indicators exhibit disparities 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 of socioeconomic position and health systems factors together account for 78% of inequities in skilled birth attendance in India (Figure 5). The major determinants of socio-economic 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%).

Figure 5:
Contribution of broad factors to inequities in skilled birth attendance
India 1998-1999

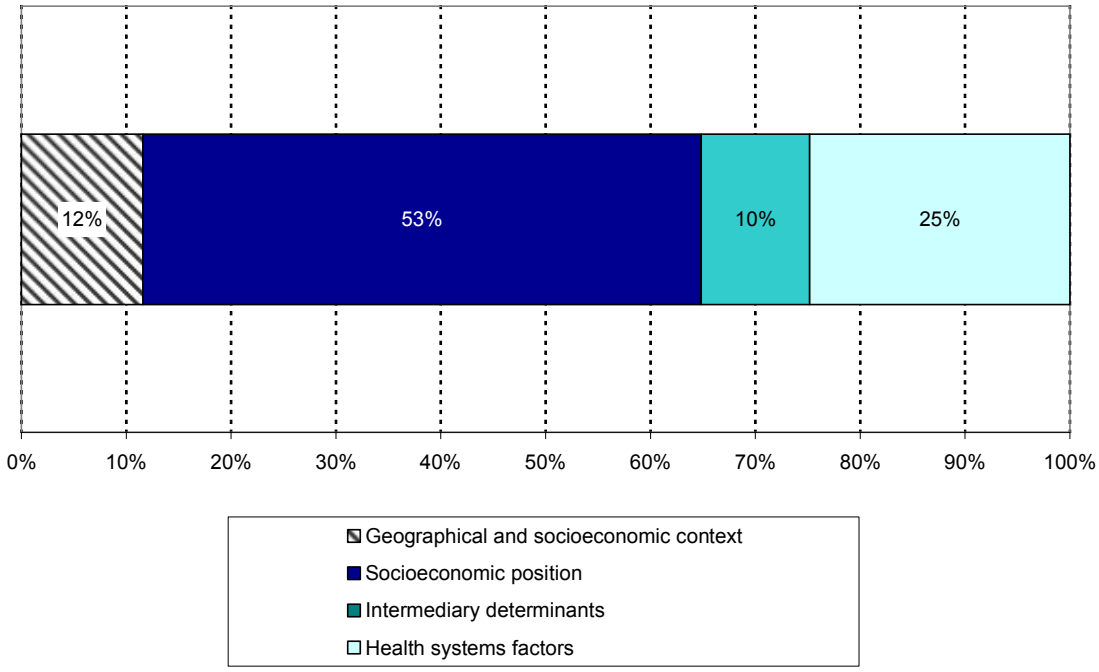
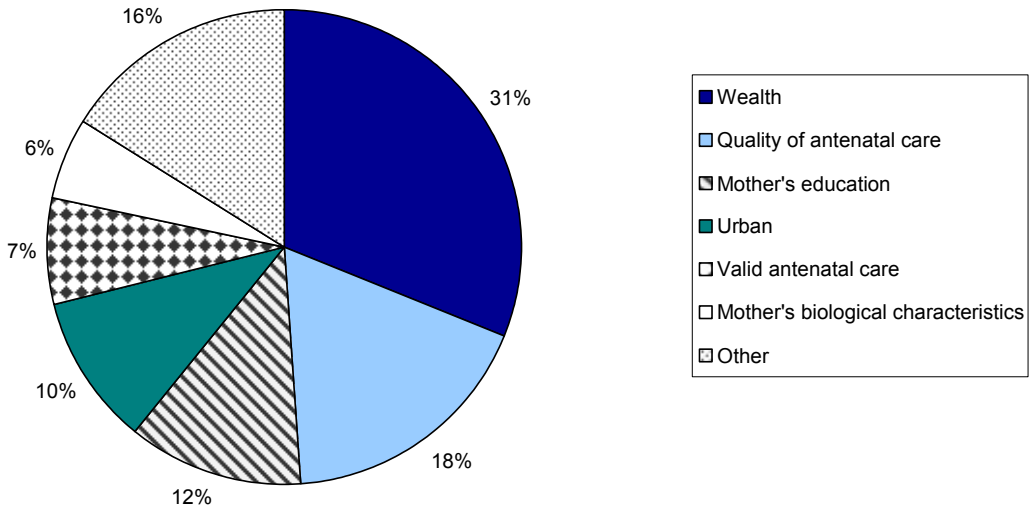


Figure 6:
Major determinants of inequities in skilled birth attendance
India 1998-1999



Main determinants of inequities in stunting

Decomposition analysis of inequities in stunting among children under five years old 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 socio-economic 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.

Figure 7:
Contribution of broad factors to inequities in childhood stunting
India 1998-1999

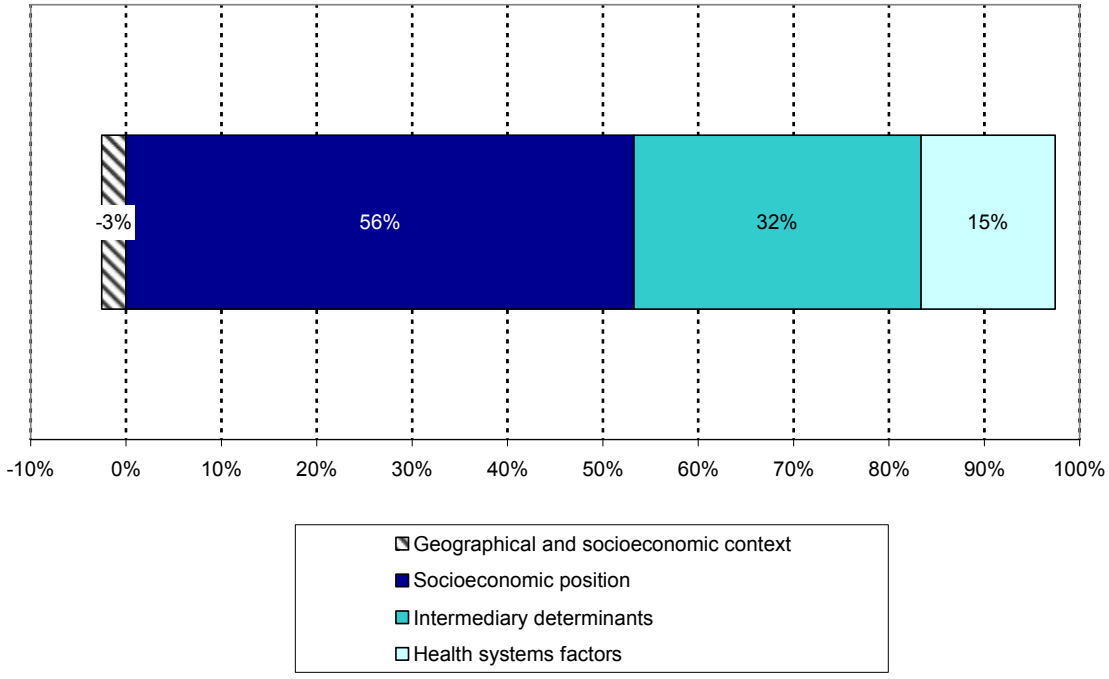
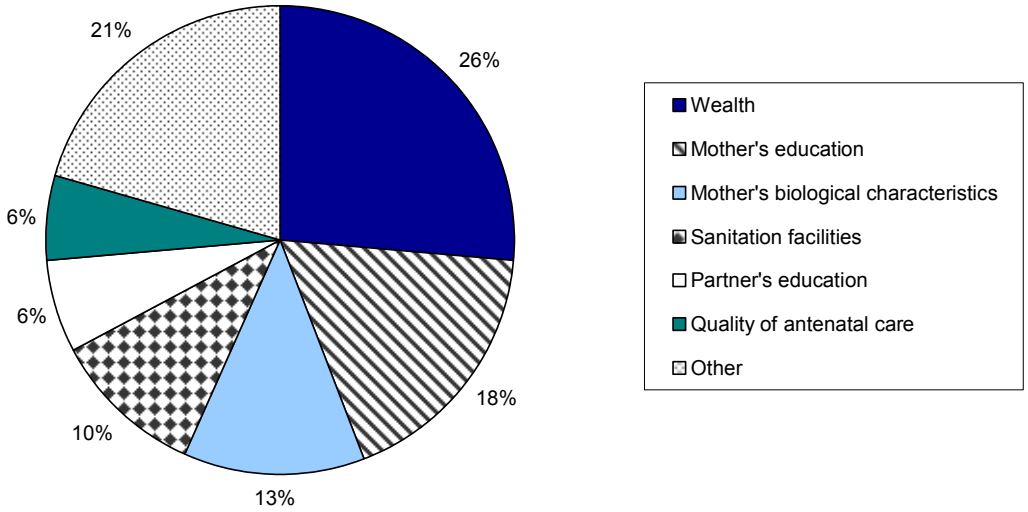


Figure 8:
Major determinants to inequities in childhood stunting
India 1998-1999



Indonesia

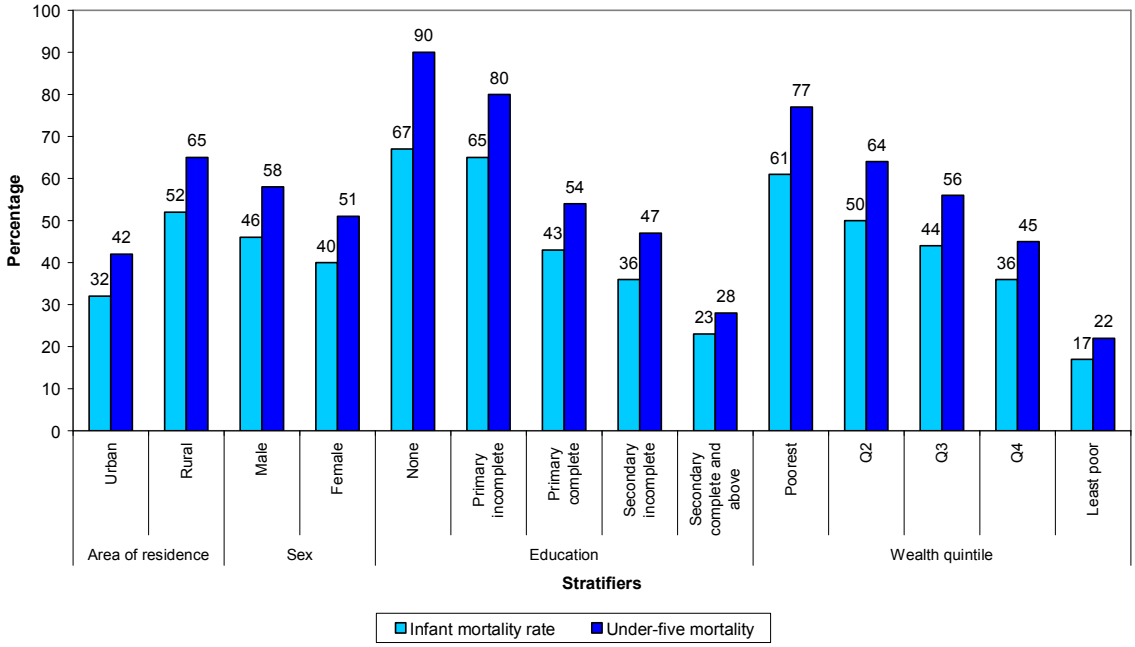
Indicators analysed

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.

Figure 1
Infant and Under-Five Mortality by Stratifiers
Indonesia, 2002-2003

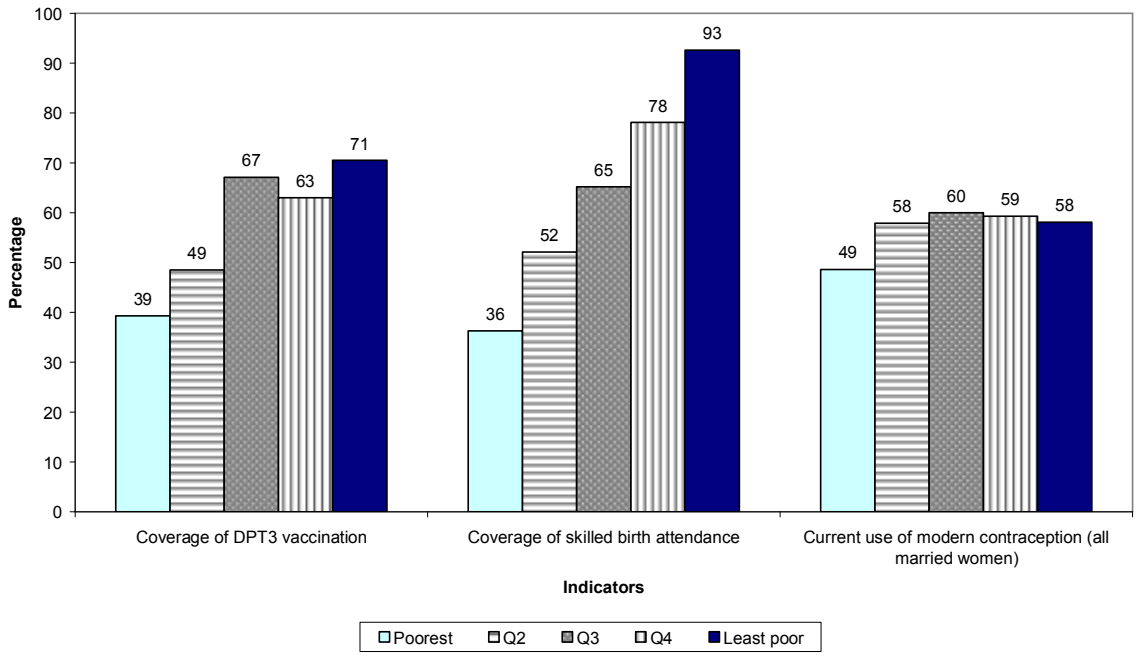


The data from 2002-2003 show that the poorest quintile has 3.6 times higher under-five and infant mortality rates compared to the richest quintile. The mortality gradients by wealth quintile reflect a steady decline across the four poorest quintiles but a sharp drop between the fourth quintile and the 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 with 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. Rural

area residents 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.

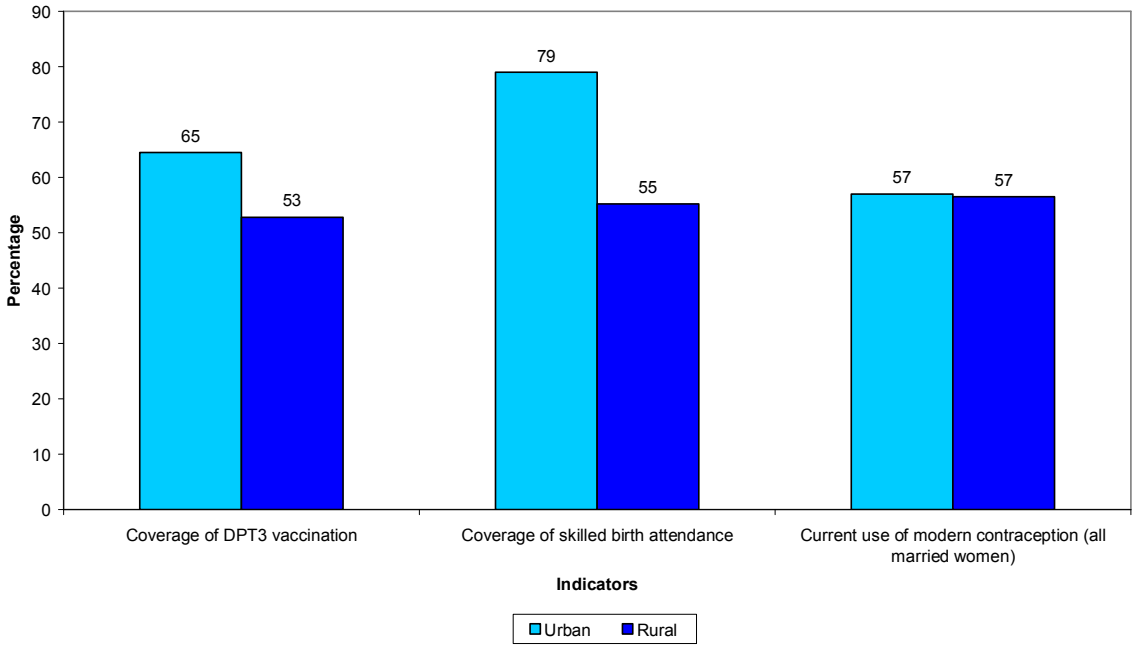
Figure 2
Selected Indicators by Wealth Quintile
Indonesia, 2002-2003



The indicators selected to analyze disparities 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.

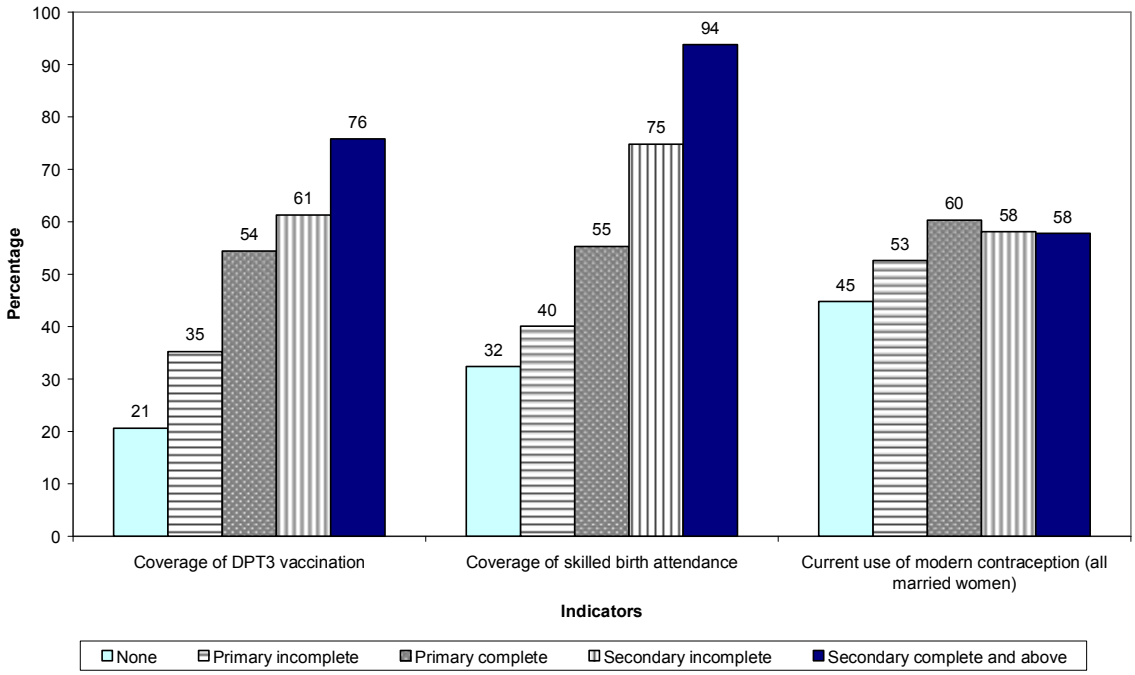
Figure 3
Selected Indicators by Area
Indonesia, 2002-2003



The figure shows that there are disparities 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.

Figure 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 inequalities

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 inequalities 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 inequality trends over the 5-year time period. The relative gap in infant mortality and DPT3 coverage shows a slight increase in inequality, whereas a slight decrease in inequality is exhibited for under-five mortality. The contraceptive prevalence rate shows no change in inequality between the two time periods. However, a significant reduction in inequality 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.[5]

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

[5] Minujin A, Delamonica E (2003). Mind the Gap: Widening child mortality disparities. *Journal of Human Development*, 4(3): 397-418.

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 the 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 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.

Figure 5: Trend in Skilled Birth Attendance Coverage by Wealth Quintile, Indonesia

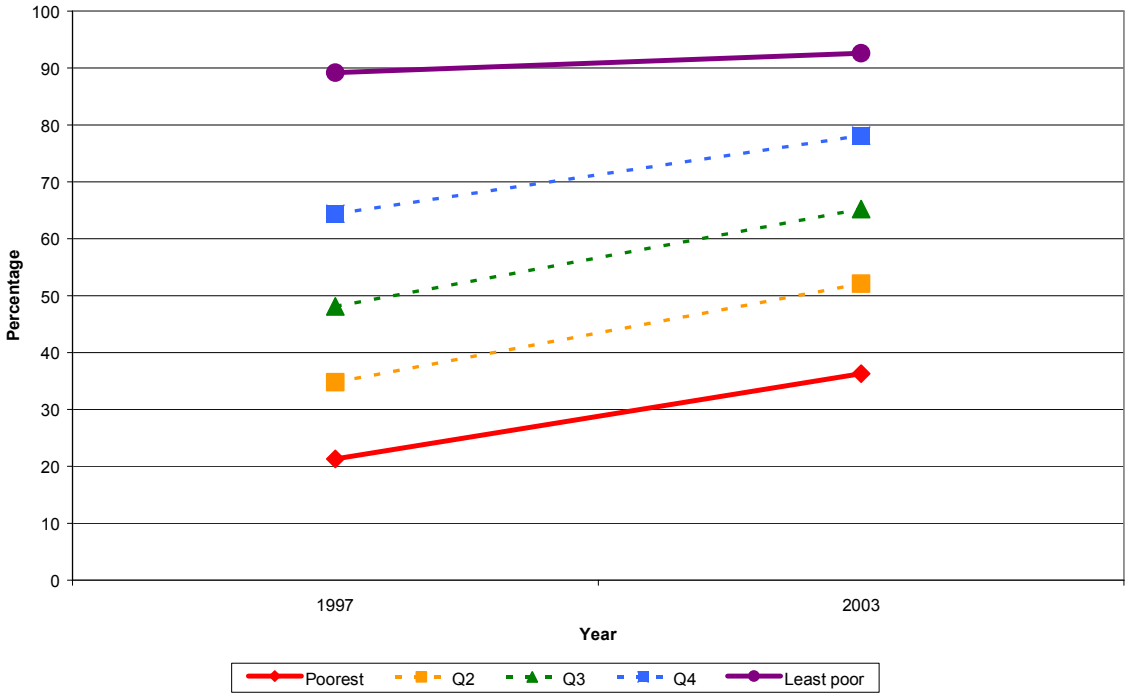
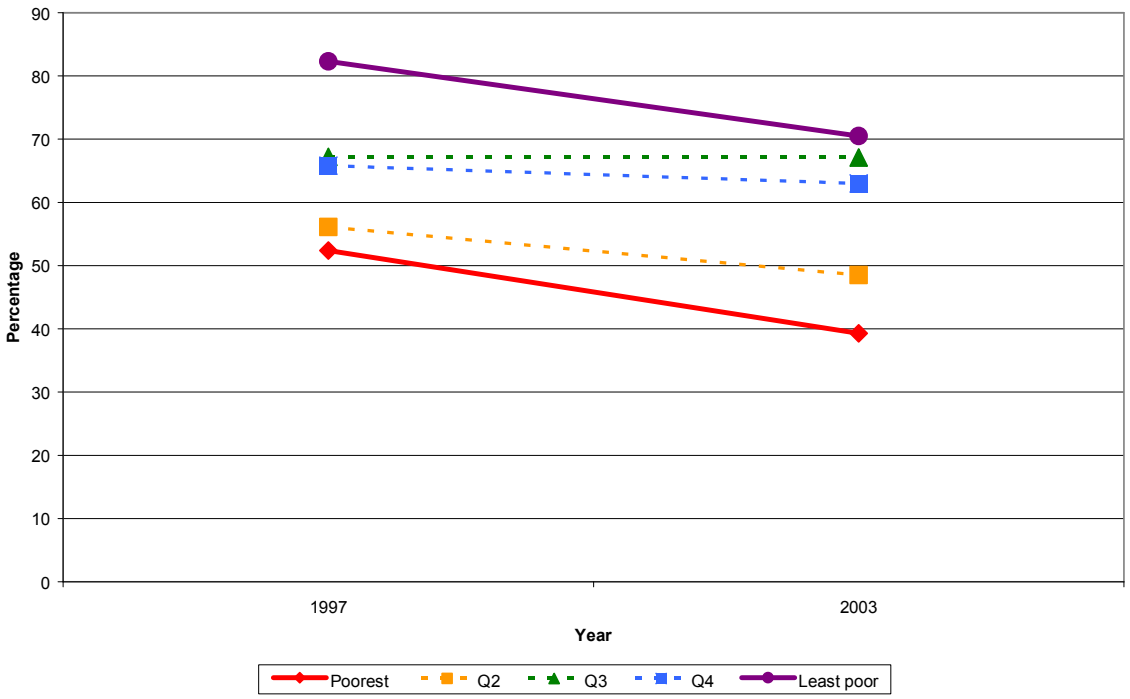


Figure 6: Trend in DPT3 Coverage by Wealth Quintile, Indonesia



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 of 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.

Figure 7:
Contribution of broad factors to inequities in skilled birth attendance
Indonesia, 2003

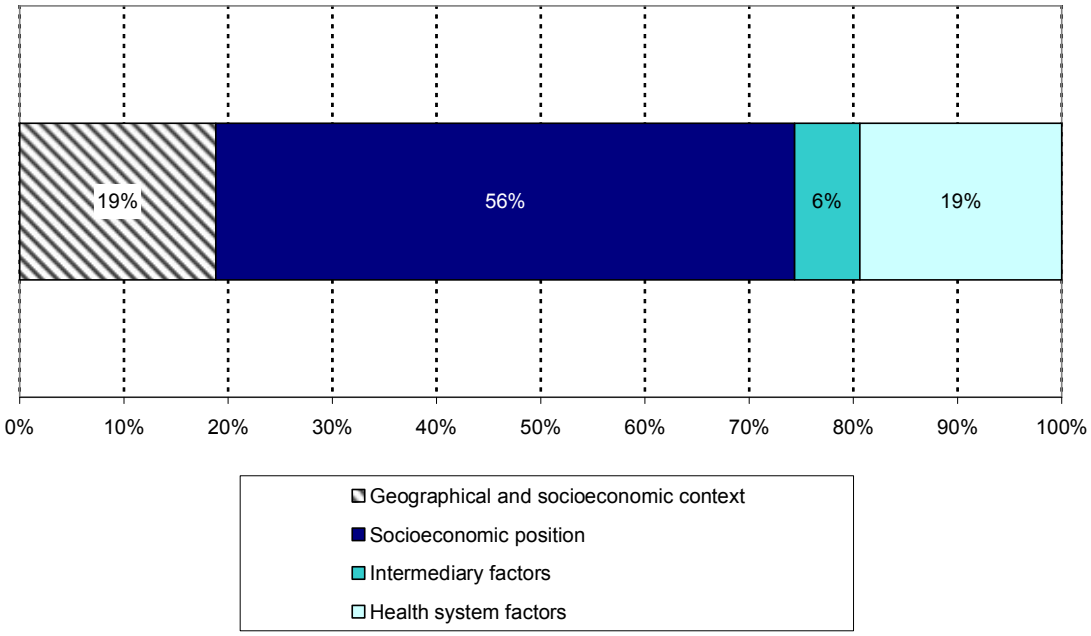
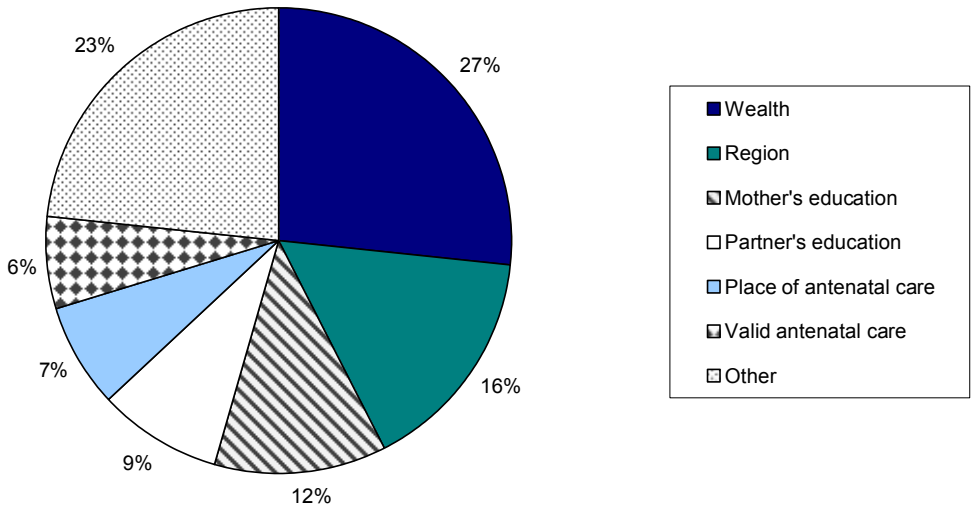


Figure 8:
Major determinants of inequities in skilled birth attendance
Indonesia, 2003



Nepal

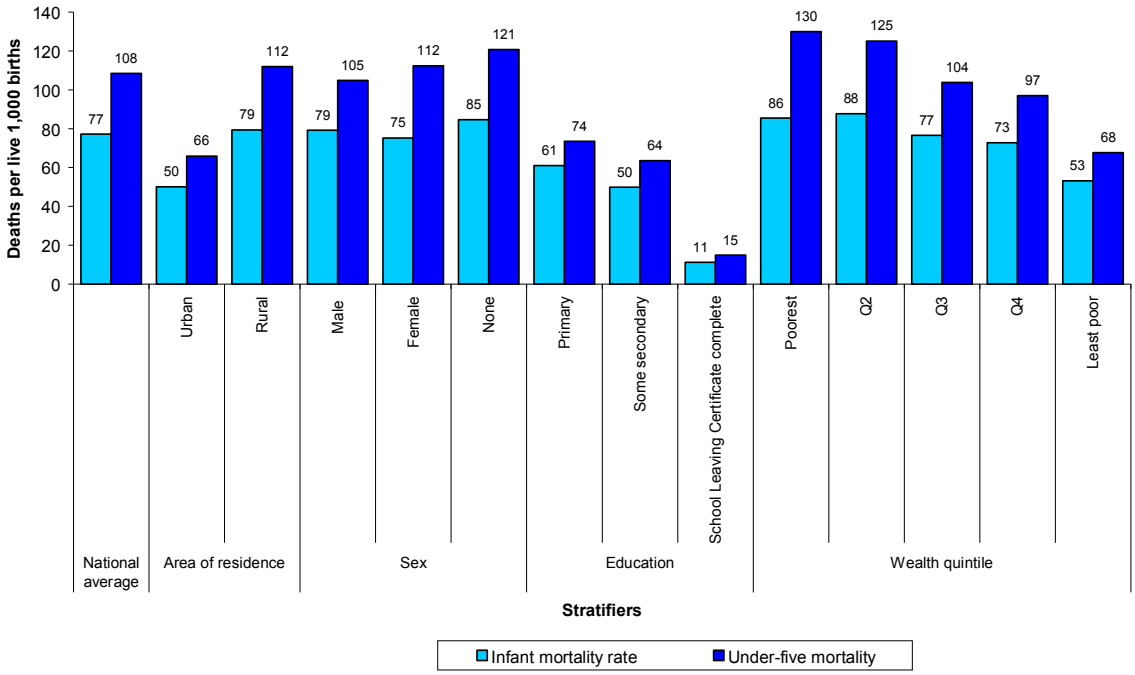
Indicators analysed

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.

Figure 1
Infant and Under-Five Mortality by Stratifiers
Nepal, 2001

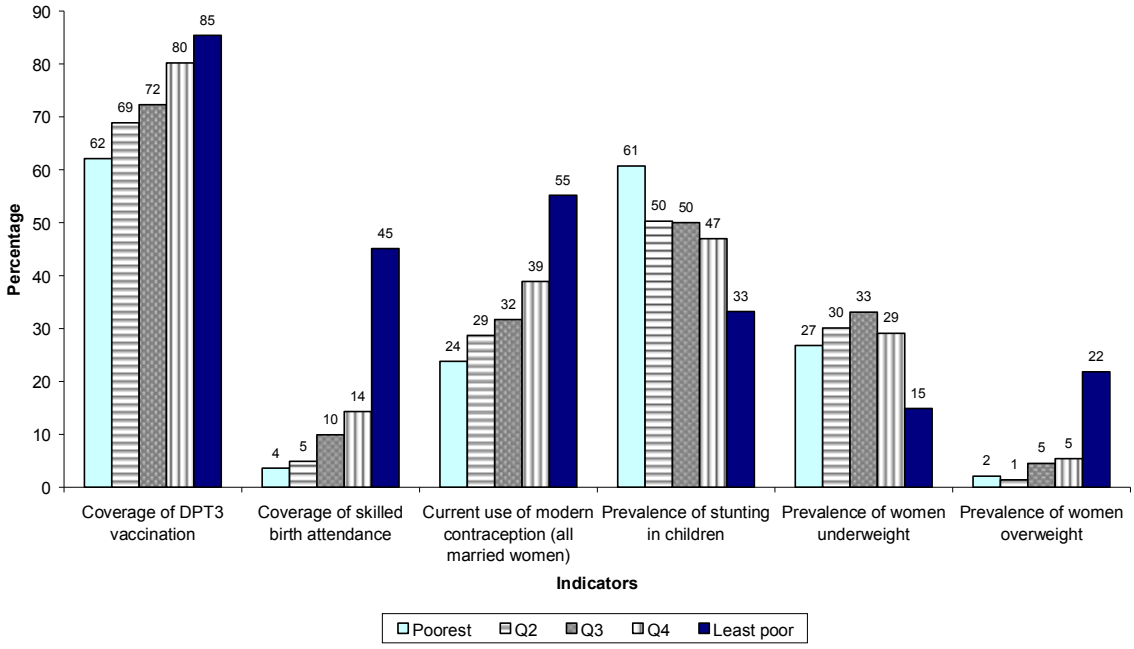


The data from 2001 shows that the poorest quintile experienced 1.9 times the under-five mortality experienced by the richest quintile. The under-five and infant mortality gradients by wealth quintile reflect a steady decline after the two poorest quintiles and a sharp drop between the fourth quintile 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 a 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. 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.

Figure 2
Selected Indicators By Wealth Quintile
Nepal, 2001

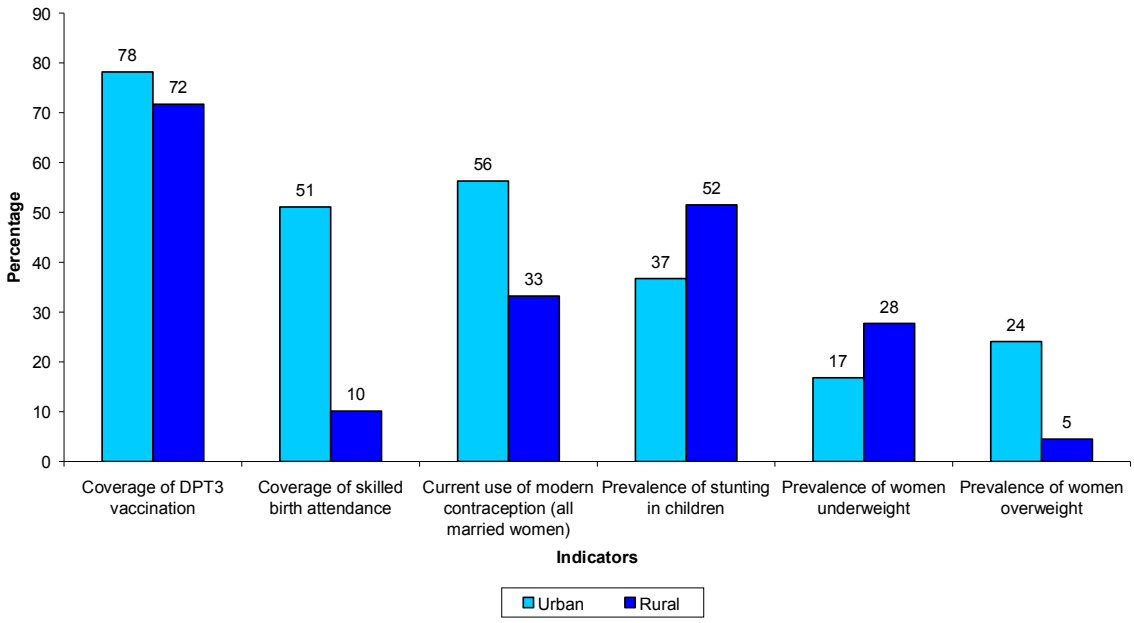


In terms of access to health services, the data shows income-related inequities for all indicators. There is a gradual increase in coverage rates across wealth quintiles for DPT3 vaccinations. However, for skilled birth attendance and use of modern contraception, the richest quintile has significantly 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.

Figure 3
Selected Indicators By Area
Nepal, 2001

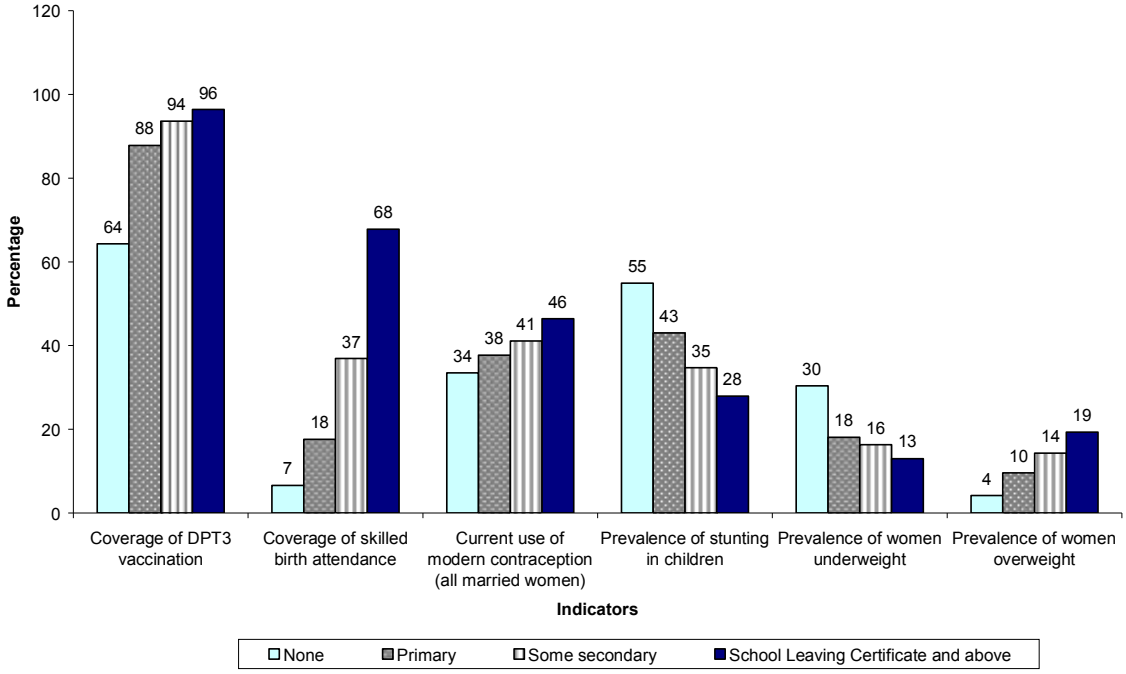


The figure shows that there are disparities between rural and urban areas in terms of access to health services, especially with respect to skilled birth attendance. For all indicators, rural residents are worse off. For example, coverage of skilled birth attendance is 5.1 times higher in urban areas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

Figure 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 disparities 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 inequalities

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

The findings indicate the 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.

Table 1 - Trends in population averages and household wealth inequalities 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).

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

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.[6]

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

[6] Minujin A, Delamonica E (2003). Mind the Gap: Widening child mortality disparities. *Journal of Human Development*, 4(3): 397-418.

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 the 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 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.

Figure 5: Trend in DPT3 Vaccination Coverage by Wealth Quintile, Nepal

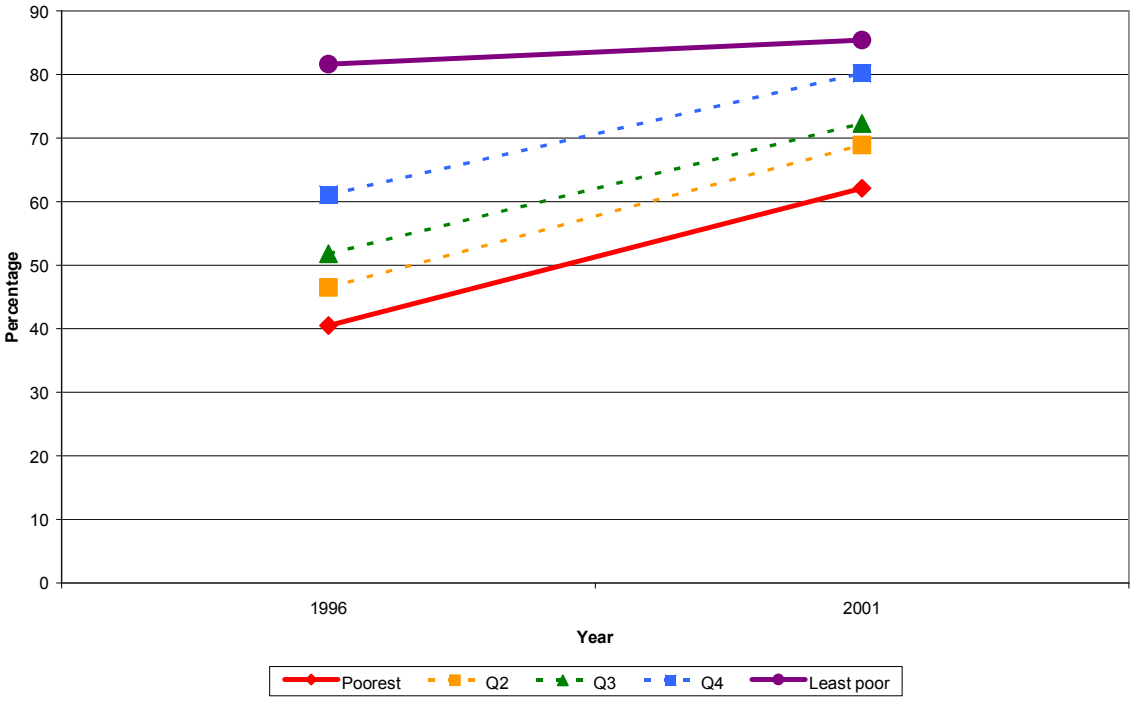
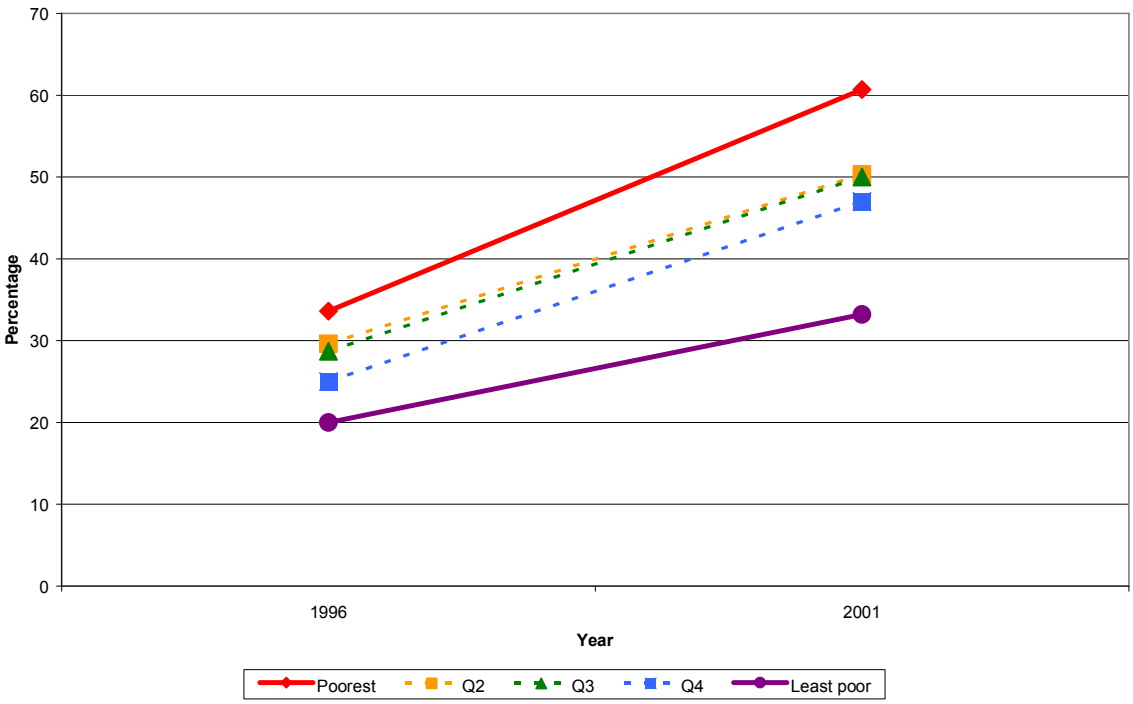


Figure 6: Trend in Stunting by Wealth Quintile, Nepal



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* inequalities. These factors have been excluded from the analysis conducted to determine the magnitude of individual determinants' contributions to inequities. Three socioeconomic position 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%).

Figure 7:
Contribution of broad factors to inequities in skilled birth attendance
Nepal 2001

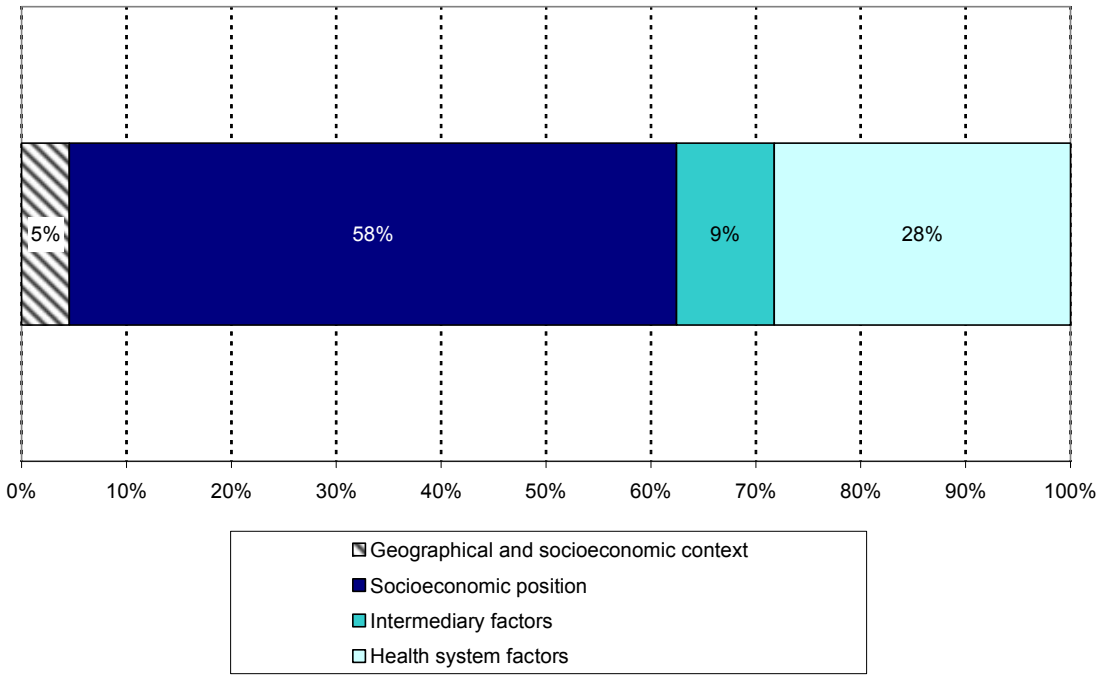
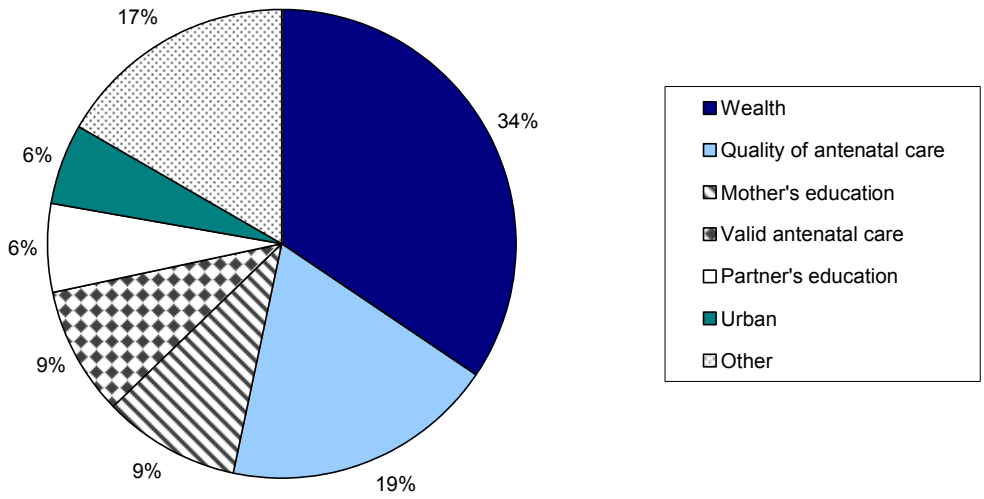


Figure 8:
Major determinants of inequities in skilled birth attendance
Nepal, 2001



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 socio-economic 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.

Figure 9:
Contribution of broad factors to inequities in childhood stunting
Nepal, 2001

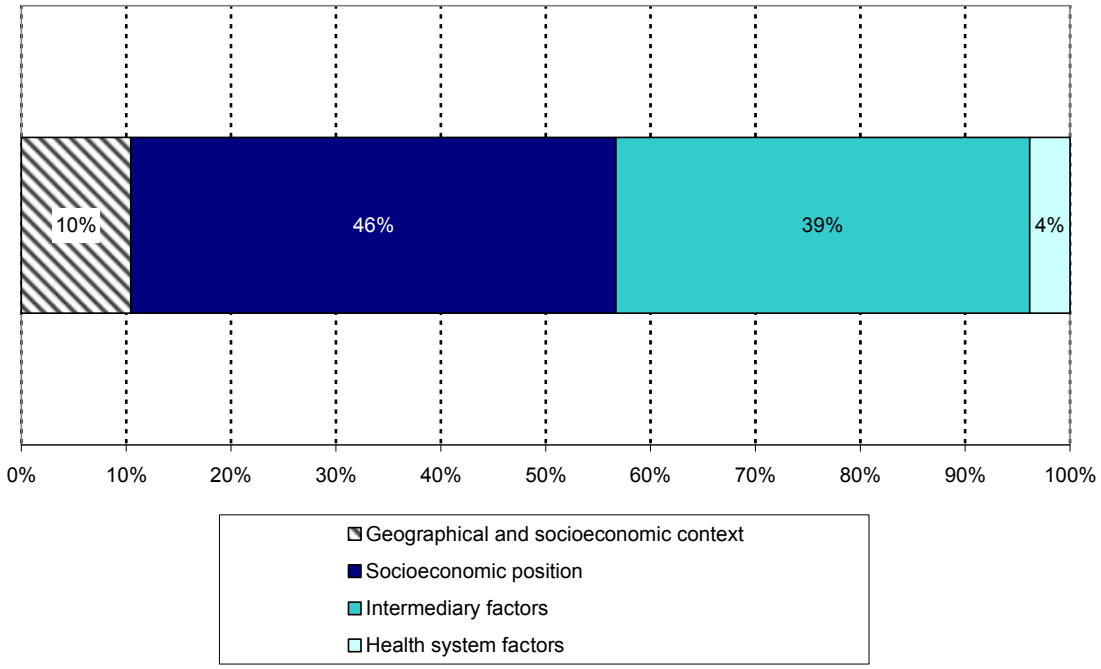
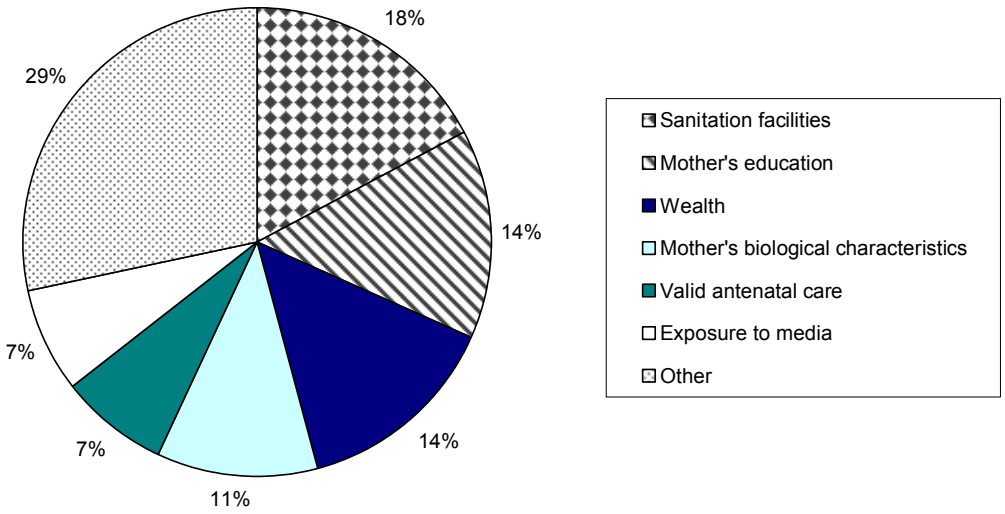


Figure 10:
Major determinants of inequities in childhood stunting
Nepal, 2001



Sri Lanka

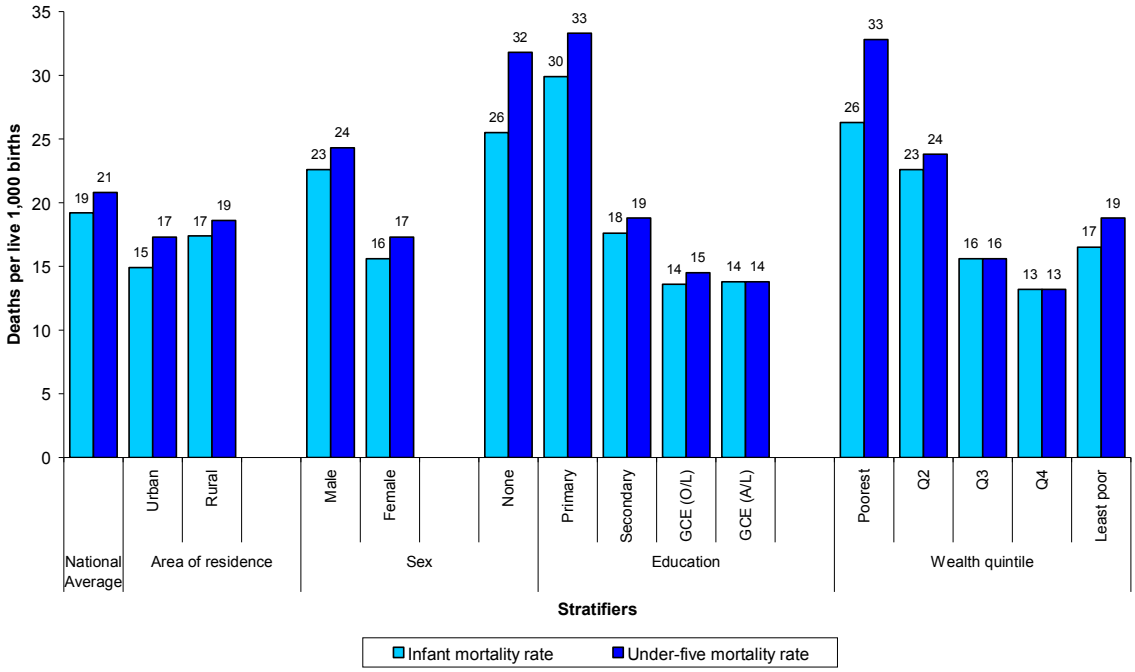
Indicators analysed

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.

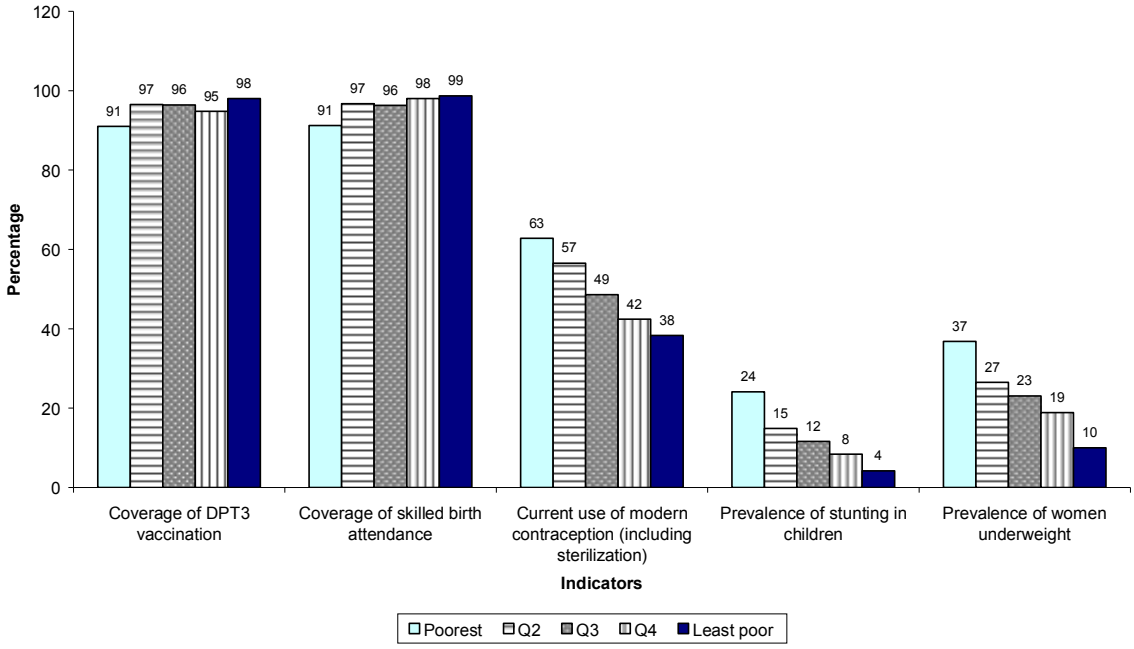
Figure 1
Infant and Under-Five Mortality by Stratifiers
Sri Lanka, 2000



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.

Figure 2
Selected Indicators by Wealth Quintile
Sri Lanka, 2000

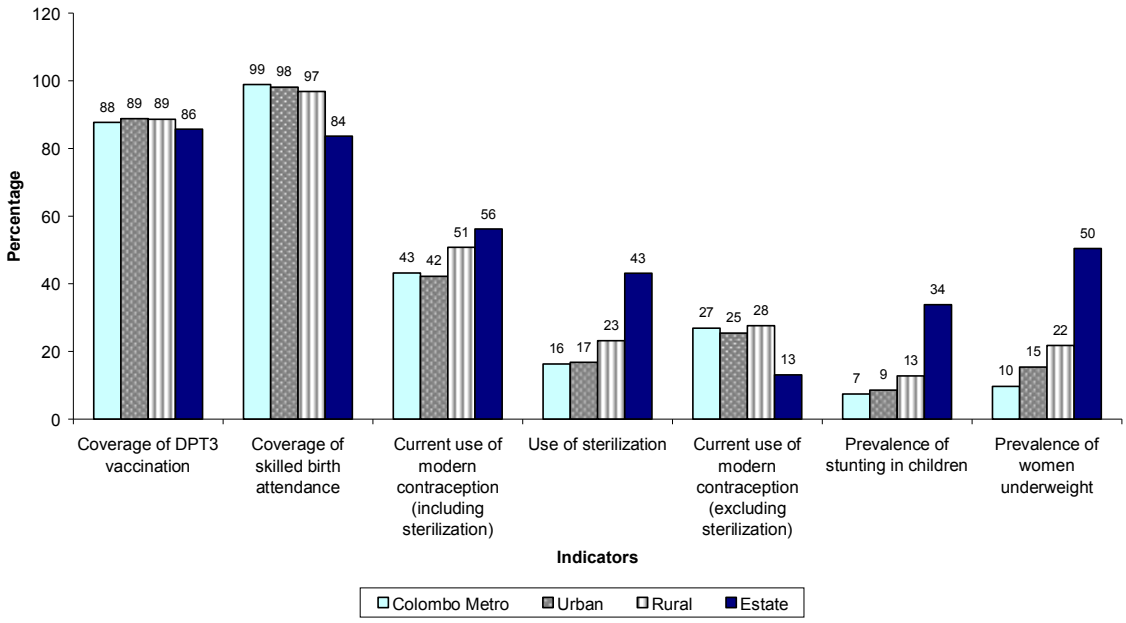


In terms of access to health services, there is almost full coverage across wealth quintiles for DPT3 vaccinations and for skilled birth attendance. The data show income-related inequities only for current use of modern contraception. Contrary to expectations, as income increases in Sri Lanka, use of 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.

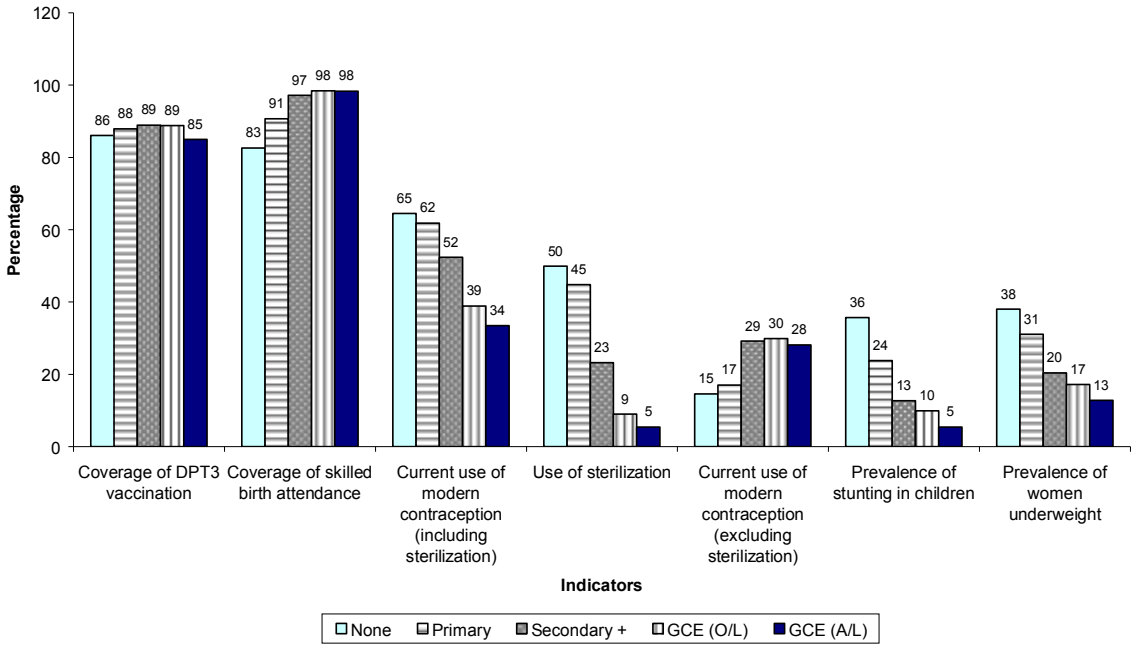
Figure 3
Selected Indicators by Area
Sri Lanka, 2000



The figure shows that there are virtually no disparities 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.

Figure 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 inequalities

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 inequalities 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).

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The different indicators exhibit similar patterns in terms of inequality 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 inequality 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.[7]

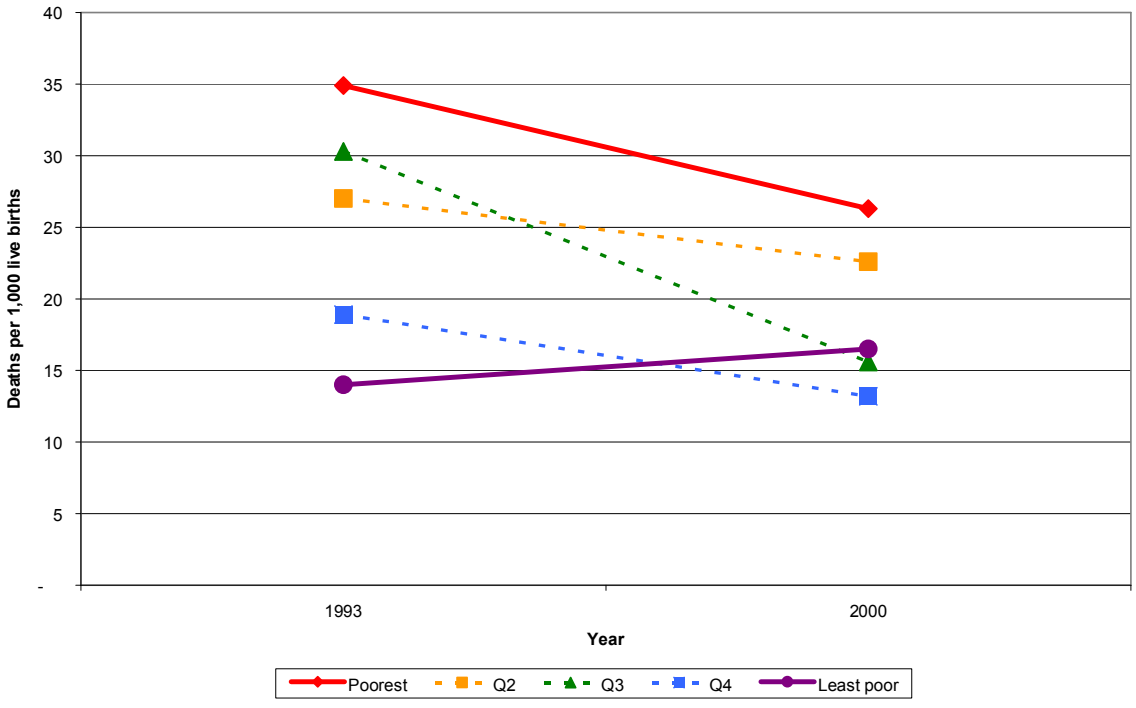
[7] Minujin A, Delamonica E (2003). Mind the Gap: Widening child mortality disparities. *Journal of Human Development*, 4(3): 397-418.

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 the 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 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.

Figure 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 7). 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 8). The district in which a household is located is also important in describing inequities in childhood stunting that exist in Sri Lanka.

Figure 7:
Contribution of broad factors to inequities in childhood stunting
Sri Lanka, 2000

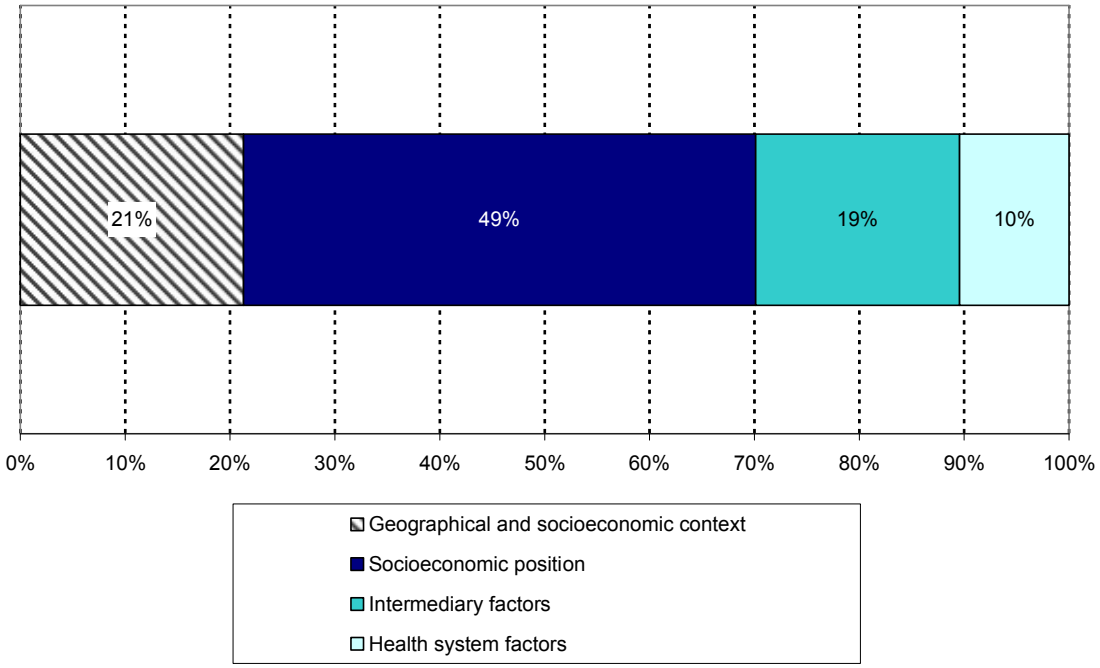
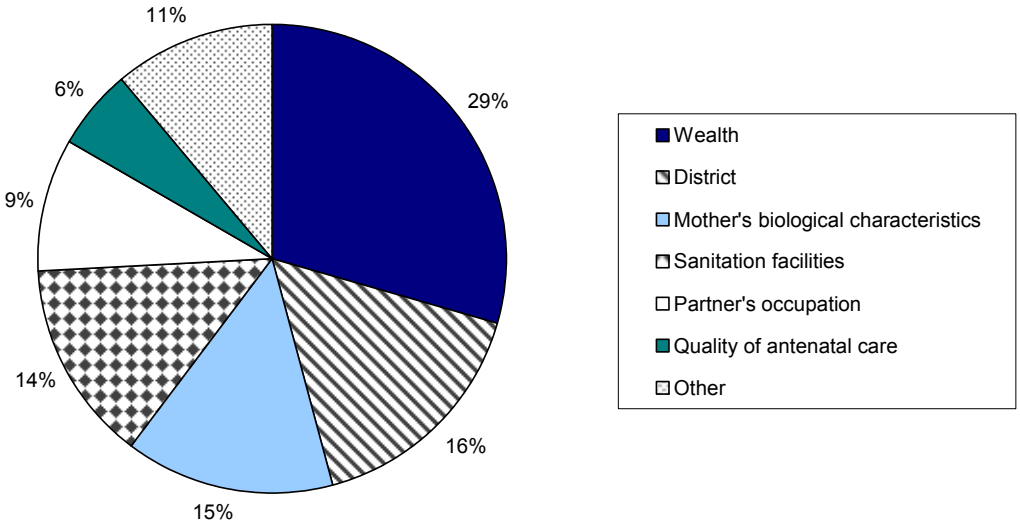


Figure 8:
Major determinants of inequities in childhood stunting
Sri Lanka, 2000



STATISTICAL ANNEX. INEQUITIES IN HEALTH DETERMINANTS AND OUTCOMES BY INCOME, EDUCATION AND URBAN/RURAL RESIDENCE

Figure SA 1: Inequalities in DPT3 vaccination by mother's education by country

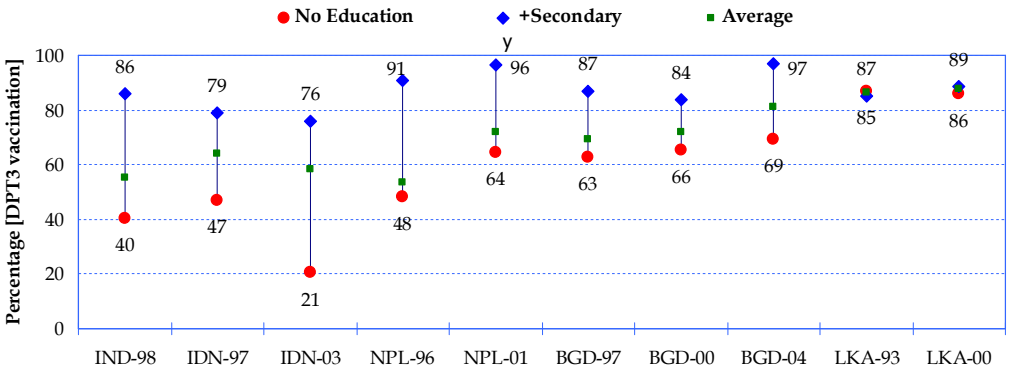


Figure SA 2: Inequalities in DPT3 vaccination by urban/rural residence by country

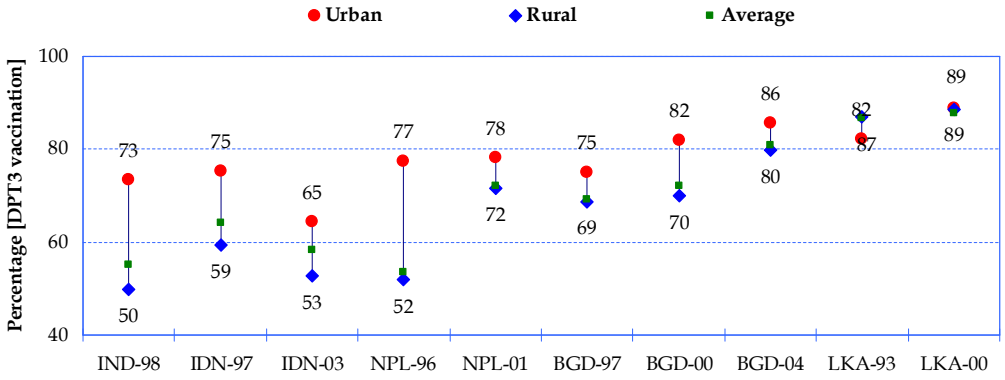


Figure SA 3: Inequalities in skilled birth attendance by mother's education by country

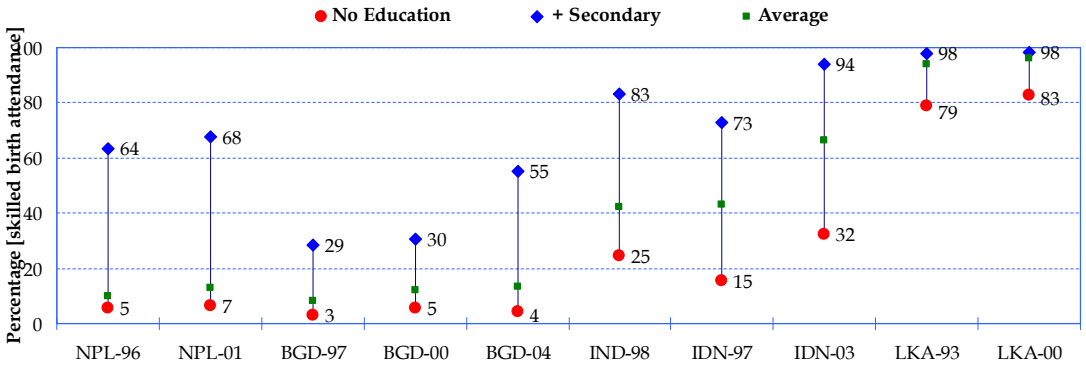


Figure SA 4: Inequalities in skilled birth attendance by urban/rural residence by country

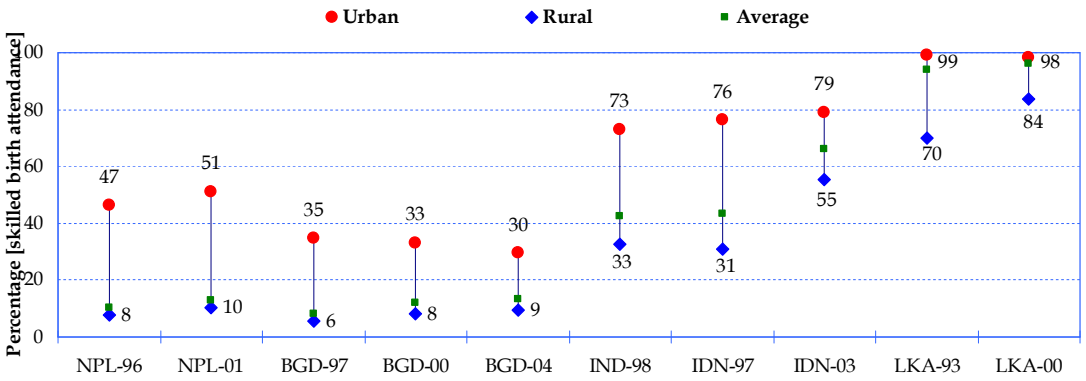


Figure SA 5: Inequalities in use of modern contraception by mother's education by country

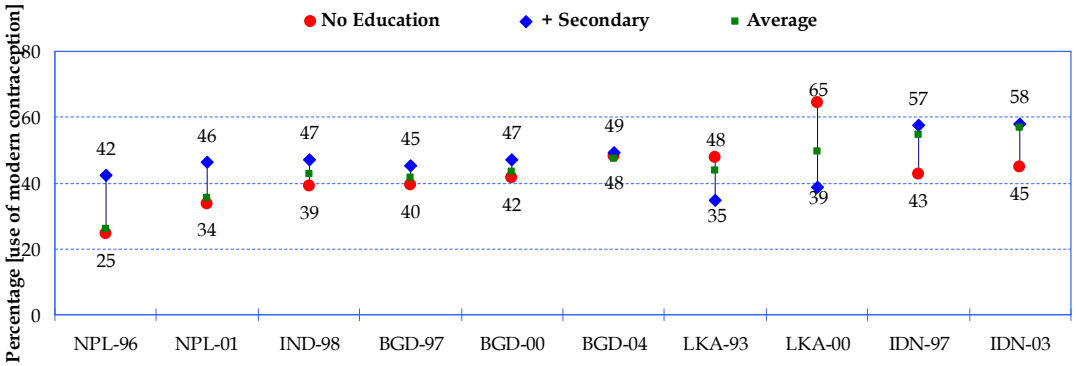


Figure SA 6: Inequalities in use of modern contraception by urban/rural residence by country

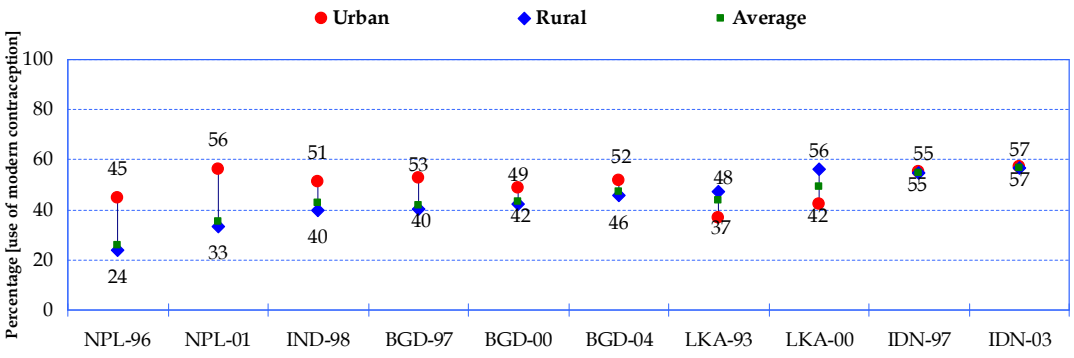


Figure SA 7: Inequalities in infant mortality rates by mother's education by country

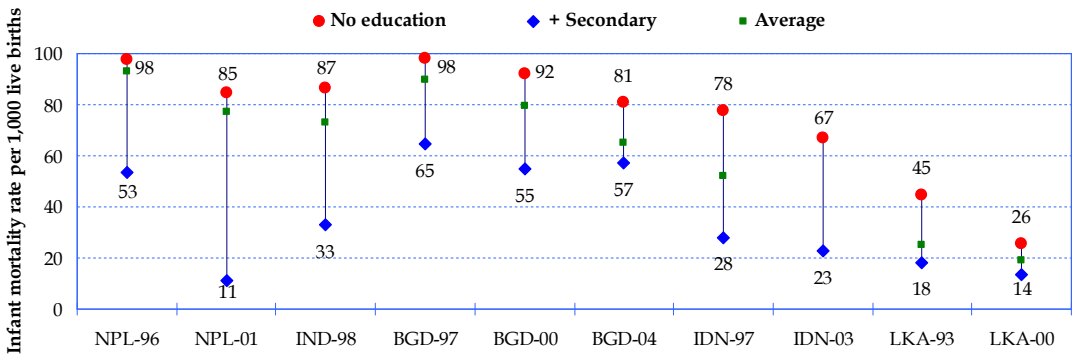


Figure SA 8: Inequalities in infant mortality rates by urban/rural residence by country

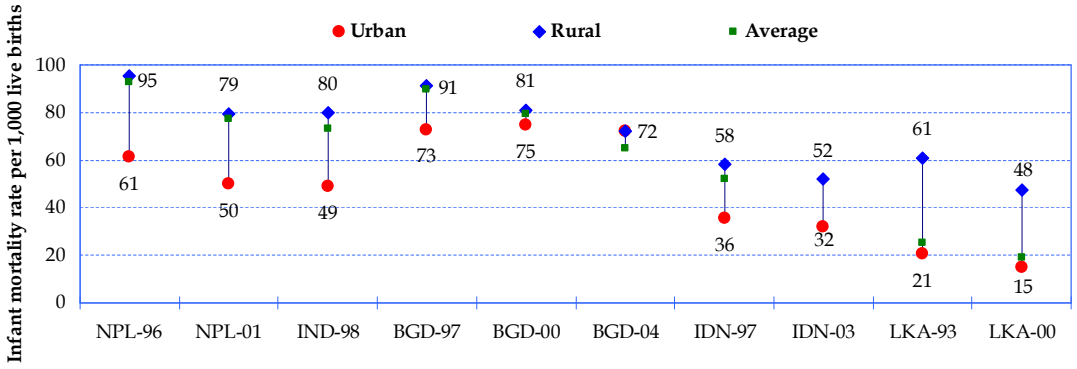


Figure SA 9: Inequalities in under-five mortality rates by mother's education by country

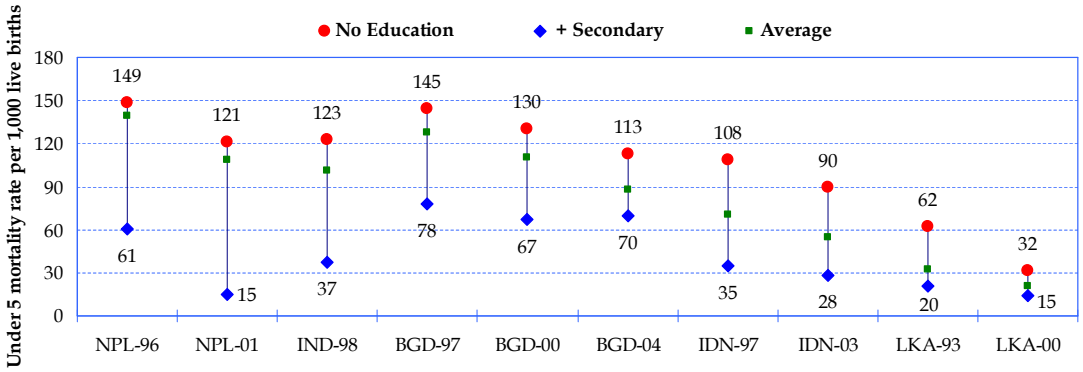


Figure SA 10: Inequalities in under-five mortality rates by urban/rural residence by country

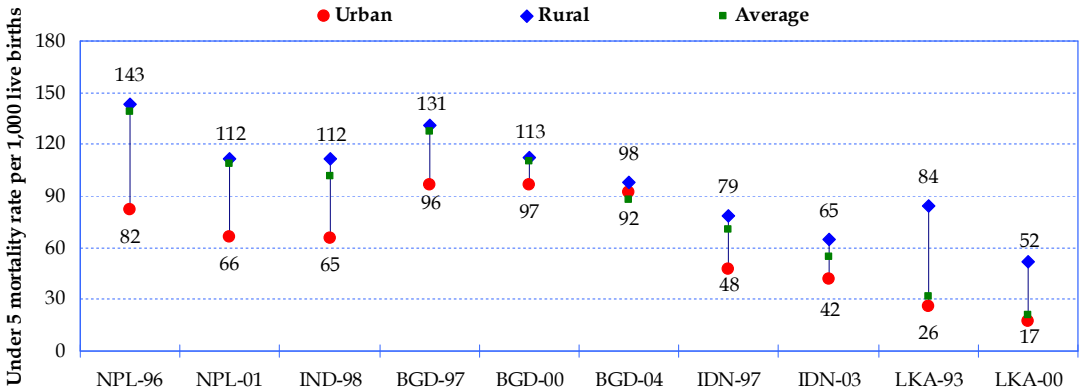


Figure SA 11: Inequalities in prevalence of childhood stunting by mother's education by country

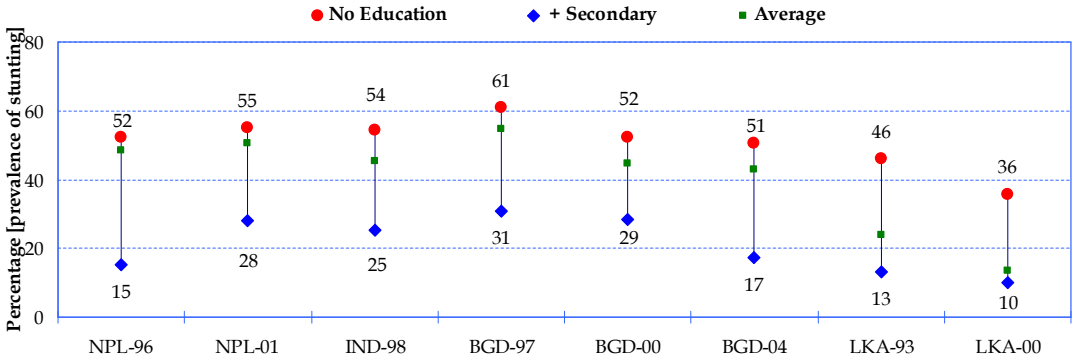


Figure SA 12: Inequalities in prevalence of childhood stunting by urban/rural residence by country

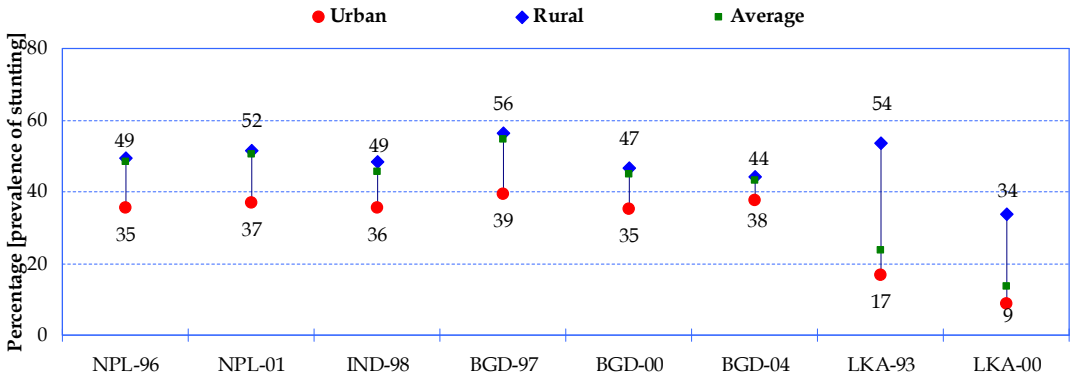


Figure SA 13: Inequalities in prevalence of maternal underweight by mother's education by country

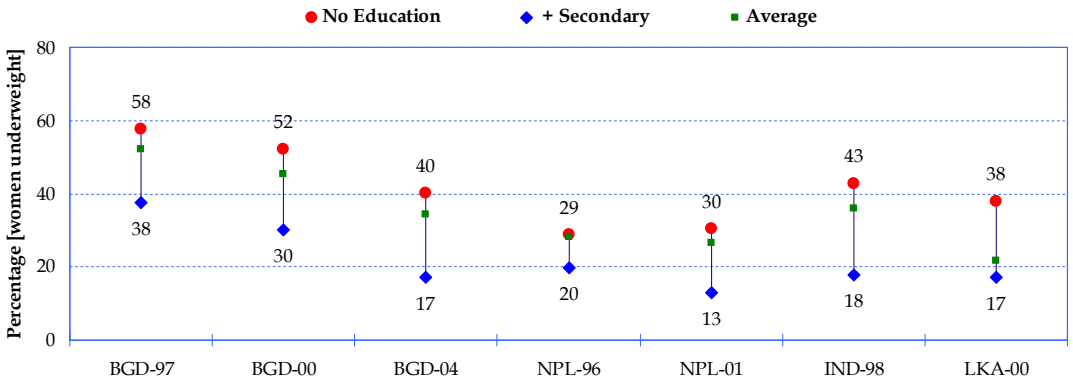


Figure SA 14: Inequalities in prevalence of maternal underweight by urban/rural residence by country

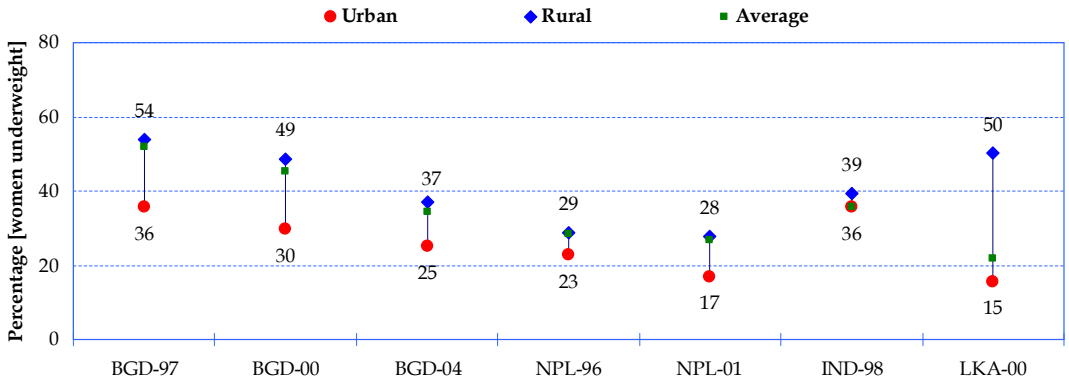


Figure SA 15: Inequalities in prevalence of maternal overweight by mother's education by country

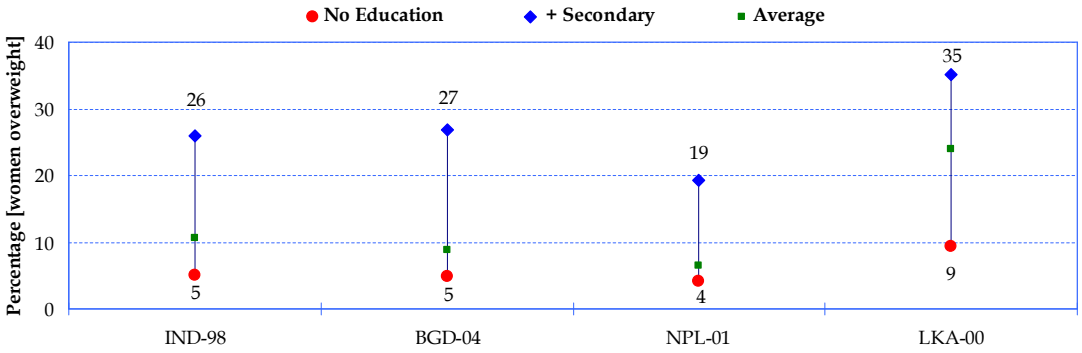


Figure SA 16: Inequalities in prevalence of maternal overweight by urban/rural residence by country

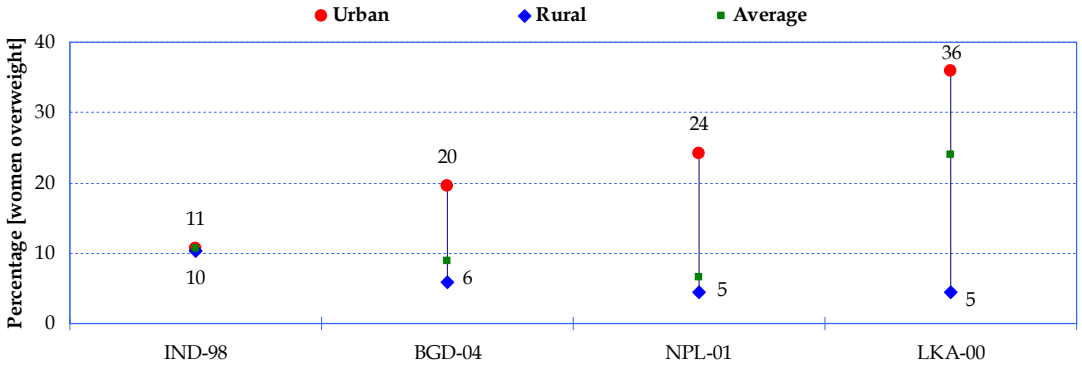


Figure SA 17: Inequalities in access to safe water by urban/rural residence by country

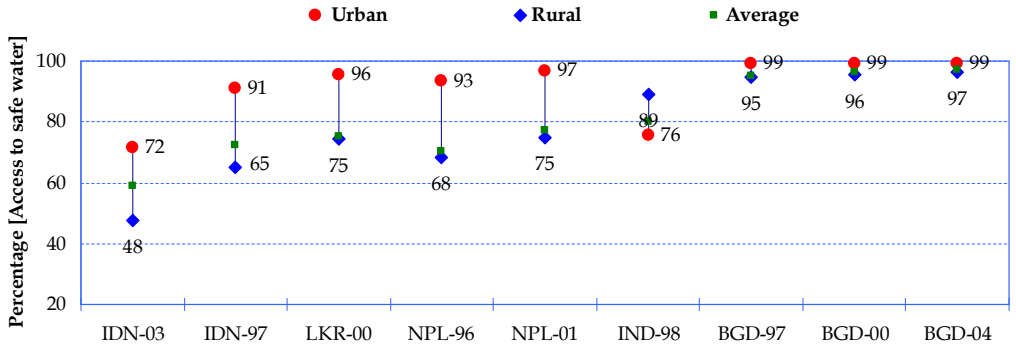


Figure SA 18: Inequalities in access to safe sanitation by urban/rural residence by country