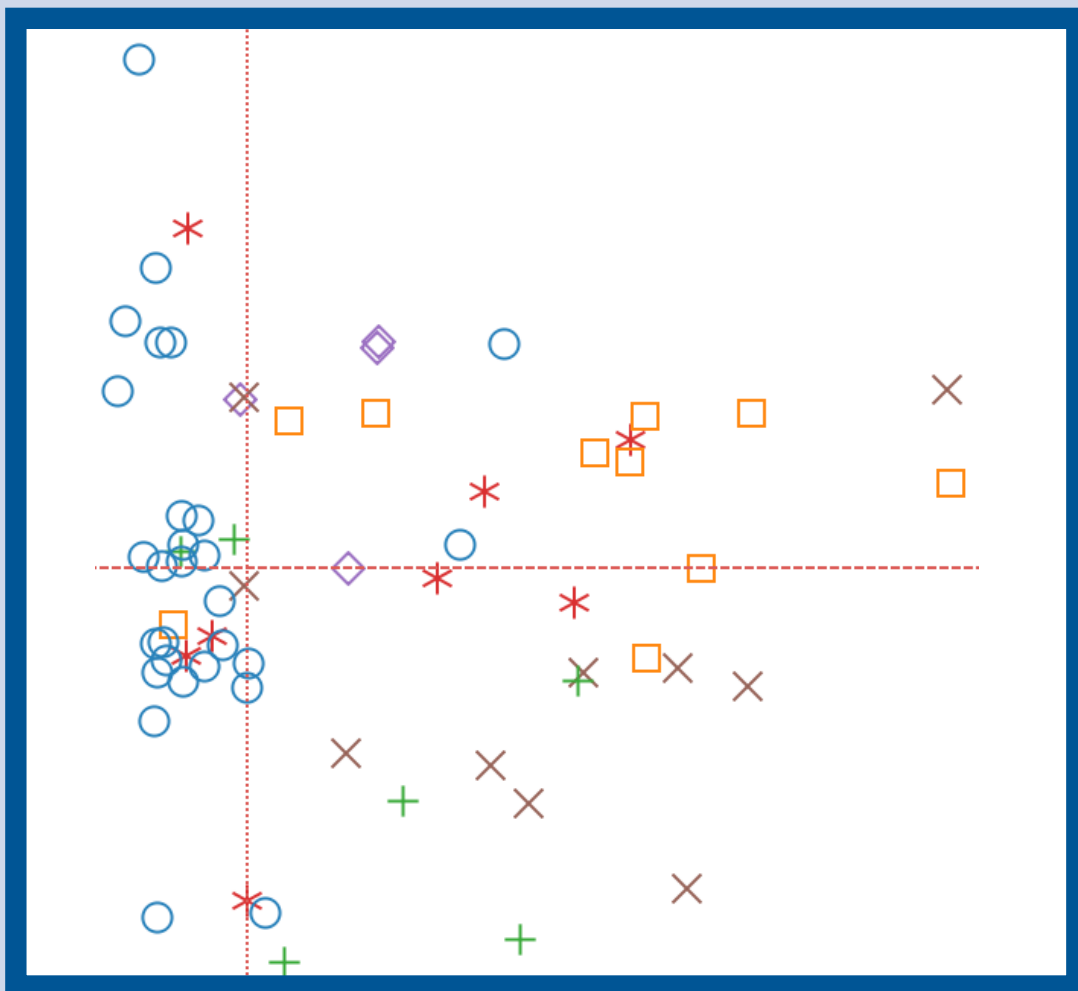


# Health inequities in the Eastern Mediterranean Region

*Selected country case studies*





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## Executive summary

This report focuses on the available evidence on inequities in health and inequities in socioeconomic determinants that exist both within and across countries in the WHO Eastern Mediterranean Region. It uses data from the Pan-Arab Project for Child Development (PAPCHILD) and Pan-Arab Project Family Health Survey (PAPFAM). The report aims to assess the extent of health inequality in the Region and identify what contributed to the changing levels of inequalities in the 1990s. The study analyses the role of changing socioeconomic and behavioural characteristics of the population and the changes in health system in contributing to widening or narrowing health inequalities. The analysis is limited to six countries in the Region for which we have data on health outcomes in two points in time (early 1990s and early 2000).

Three main research questions were asked as follows.

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

A child born in Djibouti is five and a half times more likely not to live until its fifth birthday compared to a child born in the Syrian Arab Republic. Within Yemen, children born to the poorest 20% of households are more than twice as likely to die before their fifth birthday compared to children in the richest 20% of households.

Within countries health inequalities are quite strong. For maternal health-related indicators the inequalities have widened over time in all the countries surveyed except Lebanon. The health status of the poorest has generally improved but the gap between the richest and the poorest has widened with the richest gaining the most from the positive economic performance and investment in health over time.

Coverage of diphtheria-pertussis-tetanus vaccination has improved, and the gap between the richest and the poorest has narrowed over time, except in Yemen, where a major gap still exists, with children from richer backgrounds being twice as likely to be vaccinated than children from poorer backgrounds.

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

Three main domains were identified: health system factors, socioeconomic factors and behavioural and biological factors.

We analysed in depth the factors that contributed to the inequalities in skilled birth attendance. We were able to perform this analysis of inequalities for Yemen, Syrian Arab Republic, Tunisia and Morocco. We could not run the same analysis for Lebanon or for Djibouti. In Lebanon, this analysis was not done because the analysis of inequalities showed little difference in skilled birth attendance between the rich and the poor. As far as Djibouti is concerned, the PAPFAM data for Djibouti did not contain information on asset ownership, so it was not possible to estimate the wealth index and perform the analysis of decomposition of inequalities.

Results of the analysis indicate that inequities in health system factors contribute between 20% and 33% among the countries considered. In the Syrian Arab Republic and Yemen the contribution of health system factors to the overall inequality in skilled birth attendance were above 30%, whereas in Tunisia and Morocco these proportions were much lower.

Both in Yemen and the Syrian Arab Republic the contribution of behavioural and biological factors to the overall inequalities is minimal (less than 1%), whereas for Tunisia and Morocco around 10% of the inequalities could be attributed to behavioural and biological factors.

The main determinants of inequalities for all the countries studied were the contribution of socioeconomic factors, explaining more than 60% of the inequalities in all countries.

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

The result of the decomposition analysis highlights the contribution to health inequities

of factors outside the health sector. This indicates that to lower the inequalities in these selected health outcomes and health system factors effective intersectoral action is needed. Results clearly show that improvement in health can only be achieved through investments in the social and economic sector, via an increase in women's education, reducing poverty and improving well-being across the whole of society with particular focus on the worst off.



# I. Introduction

## I.1 Objectives

This report uses available data from the Pan-Arab Project for Child Development Survey (PAPCHILD) and Pan-Arab Project Family Health Survey (PAPFAM) to analyse the magnitude of health inequalities in the WHO Eastern Mediterranean Region. The report will provide a quantitative analysis of main health and system indicators and will analyse the factors contributing to the inequities.

### Describing the magnitude of health inequities

National averages often mask inequalities at subnational level and across population subgroups (1, 2). This report will analyse the inequalities in a series of health outcomes in six selected countries in the Region. Similar analysis done using data from 30 countries in the Africa region found huge variation within and between countries in the level of under-five mortalities with the poorest in some countries being as much as 10 times more likely to die before their fifth birthday (3:256).

### Identifying the determinants of health inequities

This report also aims to help the formulation of policies to address the inequalities in the Region by analysing the determinants of health inequities. Decomposition analysis, for instance, demonstrates pathways of health determinants and highlights the factors that need attention in order to reduce the overall inequality. Similar decomposition analysis done in the Africa region show that more than 10% of the inequalities in child stunting in Malawi

is due to health system factors, whereas for the other countries this factor was less important (3:269). For example, the result for Malawi suggests that in order to address inequalities in child malnutrition, multisectoral policies need to be developed to address both socioeconomic disadvantages in families as well as improving the delivery of health services for the poor.

## I.2 Country context

The countries included in this report represent a wide range of social and economic status. Yemen and Djibouti are classified as having a low human development according to ranking of the Human Development Index (HDI), whereas the Syrian Arab Republic and Morocco are classified as having a medium HDI. Tunisia and Lebanon are classified as having a high HDI (4).

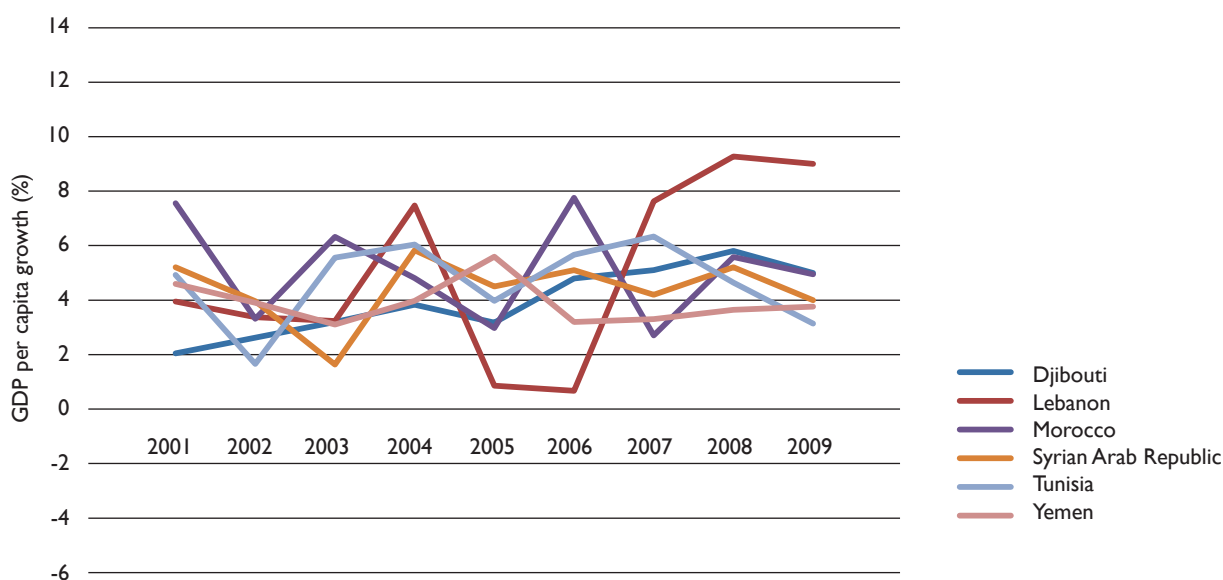
Life expectancy at birth ranges from 55 years in Djibouti to 74 years in the Syrian Arab Republic, whereas adult female literacy ranges from 43% in Morocco to above 80% in Lebanon and Morocco. Data on the level of poverty measured in terms of consumption are available only for a few countries (see Table 1) and the data show a huge diversity in poverty levels. Poverty levels range from above 40% in Djibouti and Yemen to around 15% in the Syrian Arab Republic and Morocco (see Table 1).

All the countries included in this report experienced a positive per capita income growth between 2000 and 2009 with some fluctuation in positive growth for most of the countries (see Fig. 1). In addition, the six countries included in this report have a substantially high level of income inequalities with a GINI coefficient above 35% for the countries for which data on income distribution are available.

**Table 1. Socioeconomic indicators for the countries included in this report**

	HDR rank	GDP per capita, PPP (constant 2005 int \$)	GINI index	Average GDP per capita growth	Life expectancy at birth	Poverty headcount ratio at \$2 a day PPP (% of population)	Unemployment, (% of labour force)	Adult literacy rate (%) of females aged 15 and above
Yemen	133	2242	37.69	3.5	63.9	46.6	15.0	44.7
Syrian Arab Republic	111	4295	35.78	4.6	74.4	16.8	8.4	77.9
Tunisia	81	7511	–	4.9	74.5	–	14.2	70.9
Lebanon	–	11868	–	6.6	72.2	–	8.9	85.9
Morocco	114	4081	40.8	5.2	71.6	13.9	10.0	43.9
Djibouti	147	2106	39.8	5.2	55.7	41.2	59.5	–

Source: references (4) and (5), most recent data available.


**Fig. 1. Trends in GDP per capita growth rates (%), 2001–2009**

Source: reference (5).

### 1.3 Health situation in countries

Health outcomes range widely, with Yemen and Djibouti having the worst health indicators. Under-five mortality rate ranges from 120 per 1000 live births for Djibouti to 17 per 1000 live births in the Syrian Arab Republic. Stunting prevalence (height for age) among children under five years of age are among the highest in the world in Yemen. According to the PAFAM data, 48% of children under five years have a lower height for their age,

showing a chronic state of undernutrition. For the other countries included in the report the level of stunting is still relatively high in the Syrian Arab Republic and Djibouti with a quarter of the population in each country showing low growth.

In terms of system coverage indicators Morocco, Syrian Arab Republic, Lebanon and Tunisia are performing much better than Yemen and Djibouti. The coverage of DPT3 vaccination is almost universal in Morocco and Lebanon and around 70% in Djibouti. Almost

all children born in the five years prior to the survey date were assisted by a skilled birth attendant in Lebanon whereas only one third of births were assisted by a health professional in Yemen. Only 7% of births were delivered in health facilities in Djibouti, and over three quarters of births were delivered in health facilities in Lebanon.

The use of modern methods of contraception is very low in some countries, with 6% and 16% of women aged 15-49 using a modern method in Djibouti and Yemen, respectively. In other countries, the percentage of women using a modern method of contraception is much higher with more than half of women using a modern method in Morocco and Tunisia.

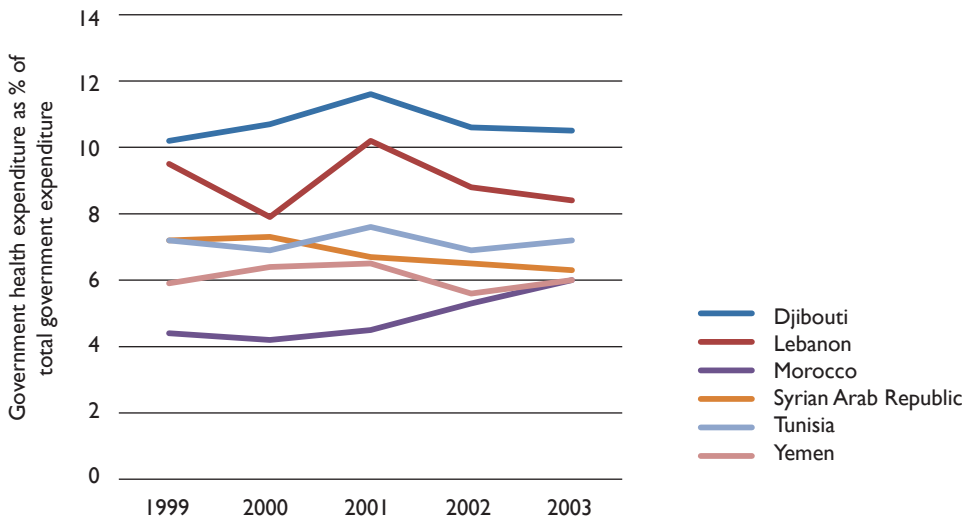
The data on health expenditure reveal a huge variation in the importance that those countries attribute to health. Djibouti and Yemen have one of the worst health indicators in the Region; however the government of Djibouti is responding with more government investment in the health sector than Yemen. Djibouti dedicates more than 10% of the national budget to health, whereas in Yemen the government spends only 6% of the national budget on health (see Fig. 2).

**Table 2. Selected health outcomes, health systems and health determinant indicators for surveyed countries**

	Yemen		Syrian Arab Republic		Tunisia		Lebanon		Morocco		Djibouti
	1991–2	2003	1993	2001	1994–5	2001	1996	2001	1992	2001	2004
<b>Health outcomes</b>											
IMR per 1000 live births	81	73	34	17	35	23	27	18	44	40	96
U5MR per 1000 live births	116	97	42	19	44	29	31	19	52	47	120
Stunting in children under 5 years (%)	43	48	25	25	22	–	12	13	21	18	21
<b>Health systems</b>											
Coverage of DPT3 vaccinations (%)	21	73	24	80	22	–	8	88	–	99	68
Coverage of skilled birth attendance (%)	14	35	50	89	46	91	45	98	16	65	75
Number of antenatal care visits	7	13	21	42	20	63	34	79	7	30	7
Place of delivery	10	20	11	55	45	90	43	97	15	64	
Current use of modern method of contraception (%)	8	16	34	39	55	57	42	36	56	60	6

Note: IMR = infant mortality rate; U5MR = under-five mortality rate.

Source: based on calculation of PAFAM and PAPCHILD surveys; – = data not available.



**Fig. 2.** Trends in government expenditure on health as a percentage of total government expenditure, 1999–2003

Source: (2).

## 2. Health inequities: concepts and measurement

### 2.1 Health inequities, inequalities and social justice

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

In general, evidence shows that the lower an individual's socioeconomic position the worse their health. There is a social gradient in health that runs from top to bottom of the socioeconomic spectrum.

Health inequities are unjust, unfair and avoidable in health achievement. Not all inequalities can, therefore, be considered to be inequitable. This can be illustrated by the difference between men's and women's health. Women, in general, live longer than men.

This could be a consequence of biological sex differences in which case this inequality may not be classified as an inequity. On the other hand, if somewhere women's life expectancy is lower than men's it is likely that adverse social conditions act to reduce the natural longevity advantage of women. Such a scenario would be considered an inequity.

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

### 2.2 Measurement of health inequities

For several decades, studies have consistently shown inequalities in health among socioeconomic groups and by sex, race or ethnicity, geographical area and other categories. Because health inequities

generally reflect imbalances in power and wealth in society, addressing them requires strategic action. Better information alone is not sufficient to resolve the problems; political will and continuous action in the monitoring of inequities, as well as country-level capacity to use this information for effective planning, are also required for progress towards health equity and movement towards social justice in health to take place.

In order to measure the magnitude of health inequalities we need data on both measures of health and measures of social positioning that define strata in a social hierarchy.

### Health measures

This report will consider the following health indicators:

- infant mortality rate; under-five mortality rate
- percentage of stunting among children under five years
- coverage of DPT3 vaccination
- coverage of skilled birth attendance
- percentage of women who had four or more antenatal visits
- percentage using a modern method of contraception.

### Equity stratifiers

We will consider the following equity stratifiers:

- household wealth quintile.
- mother's education
- place of residence (urban/rural)

### Measures of inequity/inequality

The report will use two main measures of inequities: the range and the concentration index.

#### Range

Simple range measures, including ratio and difference, are the most frequently used in the literature to describe inequalities between

groups. In this report ratios of the average in the two extreme quintiles (poorest versus richest) are used to assess the degree of inequalities in selected health indicators. The poorest to the richest ratio is used for infant mortality rate, under-five mortality rate and stunting in children under five years of age. The richest to the poorest ratio is used for all the other health systems indicators.

### Concentration index

In addition to the simple measure of inequalities, the more complex measure of concentration index is adopted. The concentration index is a summary measure of the distribution of health across the spectrum of socioeconomic stratifiers, such as wealth, where there is a social hierarchy. It allows quantifying the degree of income-related inequality in a specific health indicator.

The concentration curve plots the cumulative percentage of the health indicator against the cumulative percentage of the sample, ranked by their socioeconomic status, beginning with the most disadvantaged and ending with the least disadvantaged (see Annex 1: technical notes and concepts).

## 3. Methods

### 3.1 Conceptual framework

The conceptual framework is largely a synthesis of models used by the Commission on Social Determinants of Health (7). This conceptual model illustrates the pathways by which social determinants of health affect health outcomes, makes explicit the linkages among different types of health determinant and makes visible the ways social determinants contribute to health inequities among groups in society, given the increasing evidence of significant social stratification in health status. This conceptual framework served as the departure point on how to “operationalize” or make concrete monitoring and assessment, with the initial purpose of describing levels and potential links across components within national settings. The four key components of the model are summarized here.

**Geographical, socioeconomic context.** What are the main characteristics of a country

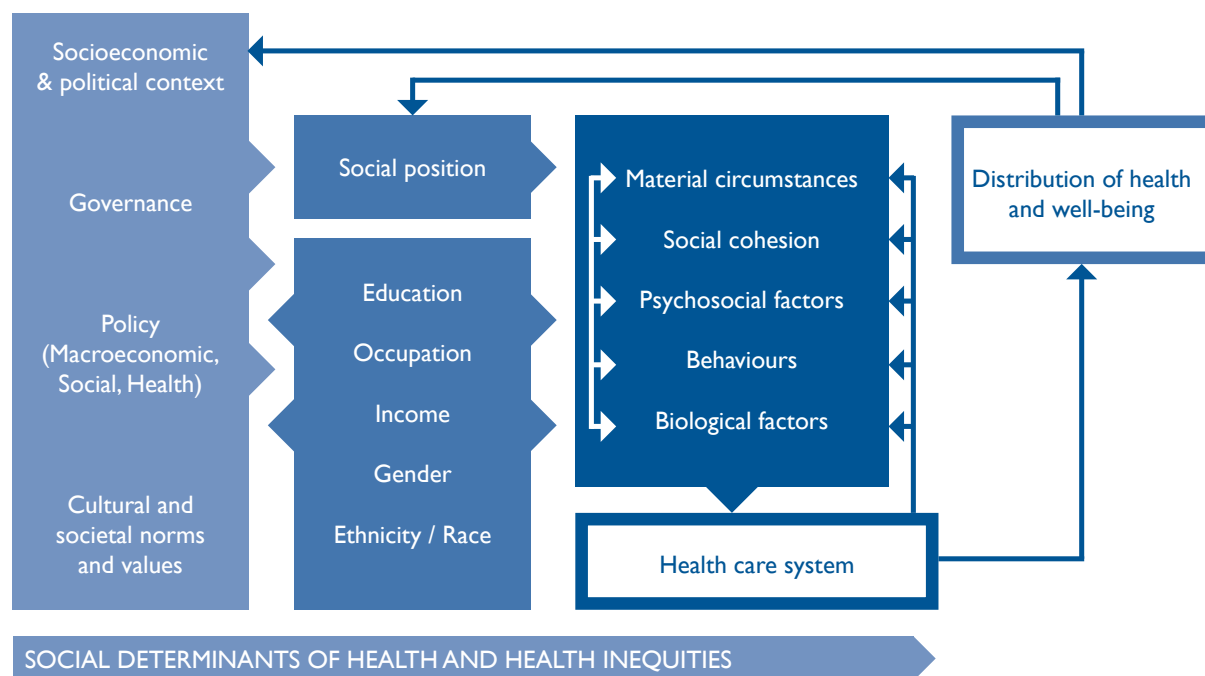
that influence the form and magnitude of social stratification as well as the implications of stratification for the circumstances in which people live and work?

**Social stratification or socioeconomic position.** What are the key dimensions of social stratification? How extensive is the social stratification?

**Differential exposures, vulnerabilities, and consequences.** What is the extent of differential vulnerabilities, differential exposures and differential consequences? These include behavioural and biological factors, and health system factors.

**Differential outcomes in health.** What are the main resulting health inequities that emerge in a given society and what is the extent of these health inequities?

This framework guided the approach to the analysis and interpretation of the results, and is based on the one adopted by the Commission on Social Determinants of Health noted in Fig. 3.



**Fig. 3.** Framework adopted by the Commission on Social Determinants of Health, August 2008, page 43

Source: adapted from reference (7).

## 3.2 Data

We analysed data from 11 surveys in six countries: five surveys from the PAPCHILD and six surveys from the PAPFAM. The data from the PAPCHILD survey refer to the beginning of the 1990s, whereas the data from the PAPFAM survey refer to the beginning of 2000 (see Table 3).

Some information was not available in some surveys (see Table 4); for example, it was not possible to calculate the prevalence of stunting and the coverage of DPT vaccination in Tunisia from the data at the beginning of the 1990s. Equally, it was not possible to calculate the coverage of DPT vaccination from data for the beginning of 2000 for Morocco, as this information was not available in the PAPFAM Moroccan questionnaire.

**Table 3. Countries for which we have PAPCHILD or PAPFAM data**

	PAPCHILD	PAPFAM
Yemen	1991–92	2003
Syrian Arab Republic	1993	2001
Tunisia	1994–95	2001
Lebanon	1996	2004
Morocco	1992	2003
Djibouti	-	2002-2004

**Table 4. List of indicators and stratifiers available by survey type**

	Yemen		Syrian Arab Republic		Tunisia		Lebanon		Morocco		Djibouti
	PAPCHILD	PAPFAM	PAPCHILD	PAPFAM	PAPCHILD	PAPFAM	PAPCHILD	PAPFAM	PAPCHILD	PAPFAM	PAPFAM
<b>Health indicator</b>											
IMR/U5MR											
Anthropometric					x						
<b>Health system</b>											
Coverage of DPT3					x					x	
Delivery in a health facility											
Contraceptive use											
Skilled birth attendance											
Number of antenatal care visits											
<b>Social stratifiers</b>											
Urban/rural											
Household assets							x				x
Mother's education	x		x		x		x		x		x

### 3.3 Indicators

Table 5 shows the eight indicators used in the health equity analysis.

**Table 5. Definitions of indicators analysed in the study**

No.	Indicator	Definition
1	Infant mortality	Probability of dying before first birthday (1q0)
2	Under-five mortality	Probability of dying between birth and fifth birthday (5q0)
3	Stunting in children	Percentage of children with chronic malnutrition
4	Coverage of DPT3 vaccination	Percentage of children aged 12–23 months receiving three doses of diphtheria-pertussis-tetanus vaccine
5	Coverage of skilled birth attendance	Percentage of births attended by skilled health personnel
6	Coverage of antenatal care (4+ visits)	Percentage of women who had a birth in the previous five years who attended at least four antenatal care visits
7	Current use of modern contraception	Percentage of women currently using modern contraception

### 3.4 Analytical approach

#### Descriptive

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

- household wealth quintiles
- education (categorized according to country classifications)
- area of residence (urban/rural areas)

#### Time trends

The descriptive analysis was performed for the two surveys where data were available for two time points.

#### Decomposition of socioeconomic inequality

For policy purposes it is especially relevant to understand why unfair and avoidable inequalities (inequities) exist and what actions may be taken to improve equity. Decomposition analysis is one approach used to quantify the contribution made by different factors to inequities in health.

The contributions of determinants to socioeconomic inequality in “skilled birth attendance” in Yemen, Syrian Arab Republic, Tunisia and Morocco were calculated using the most recent survey data (PAPFAM).

#### Interpretation approach

##### *Patterns of inequality*

The extent and the depth of inequality vary from region to region within countries, but also between countries. At one extreme are the poorest countries where large parts of the population are deprived of care, even among the better off: only a small minority enjoys reasonable access to a reasonable range of health benefits, creating a pattern of mass deprivation.

Looking at health care coverage by wealth group provides a crude illustration of these different patterns. Between the extremes of mass deprivation (typical for countries with major constraints in supply of services and low-density health care networks) and marginal exclusion (typical for high- and middle-income countries with dense health care networks) are countries where poor populations have to queue behind the better off, waiting to



get access to health services and hoping that benefits will eventually trickle down.

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

## 4. Health inequities: magnitude and trends

Results in this section show that there is a substantial health-related inequity among the countries selected for this report. We analysed three health outcome indicators: infant mortality rate, under-five mortality rate and prevalence of stunting among children under five years of age. The health system indicators studied were coverage of DPT3 vaccination, coverage of skilled birth attendance, antenatal care visits and current use of modern methods of contraception, difference in health outcomes and health system indicators stratified by urban/rural, mother's educational attainment, wealth and child's sex where possible. We used two rounds of data from the PAPCHILD and PAPFAM surveys.

### 4.1 Inequities in health outcomes within and across countries

#### Infant mortality

Reducing Infant mortality is a key Millennium Development Goal (MDG). Infant mortality rate (IMR) is defined as the probability of dying between birth and one year of age and it is expressed as the number of infant deaths per 1000 live births. In Yemen and Djibouti the infant mortality rates exceed 80 infant deaths per 1000 live births, whereas in Morocco the rate is around 40 deaths per 1000 live births. In the Syrian Arab Republic, Tunisia and Lebanon the infant mortality rates range around 20 deaths per 1000 live births (see Fig. 4).

The difference in infant mortality rates between the poorest and the richest is largest in Yemen, Morocco and Tunisia (see Fig. 5). The level of infant mortality rate has increased in Yemen between the beginning of the 1990s and the latest data from 2003, whereas it has reduced in all the other countries. The gap in infant mortality rate between the rich and the poor has considerably narrowed in Lebanon and remains the same in all the other countries included in this analysis.

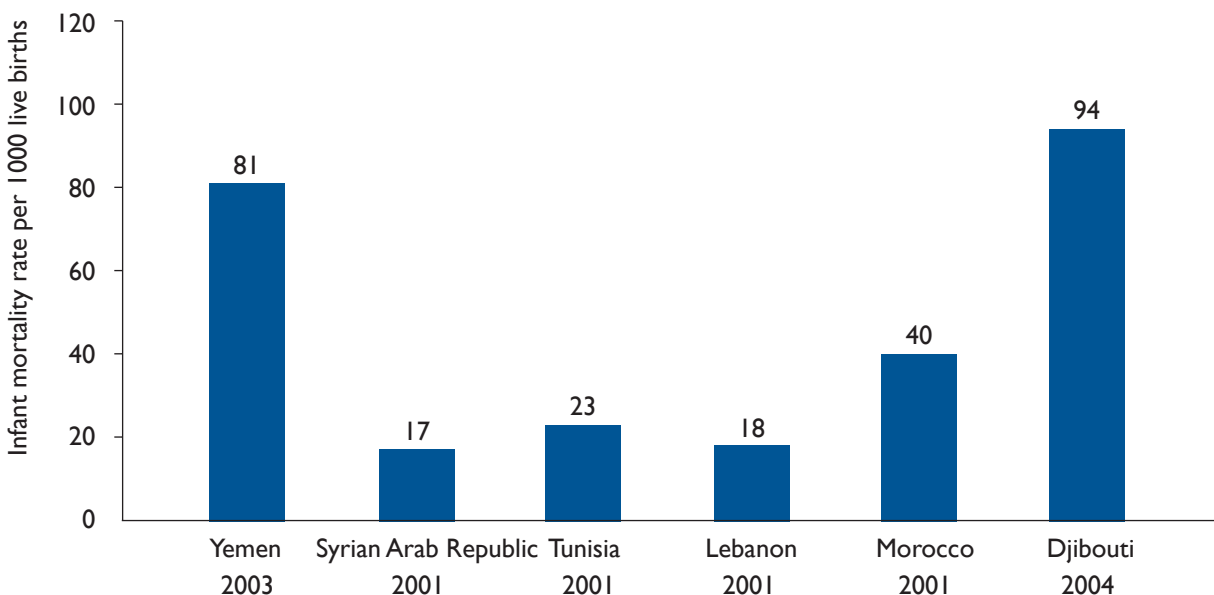
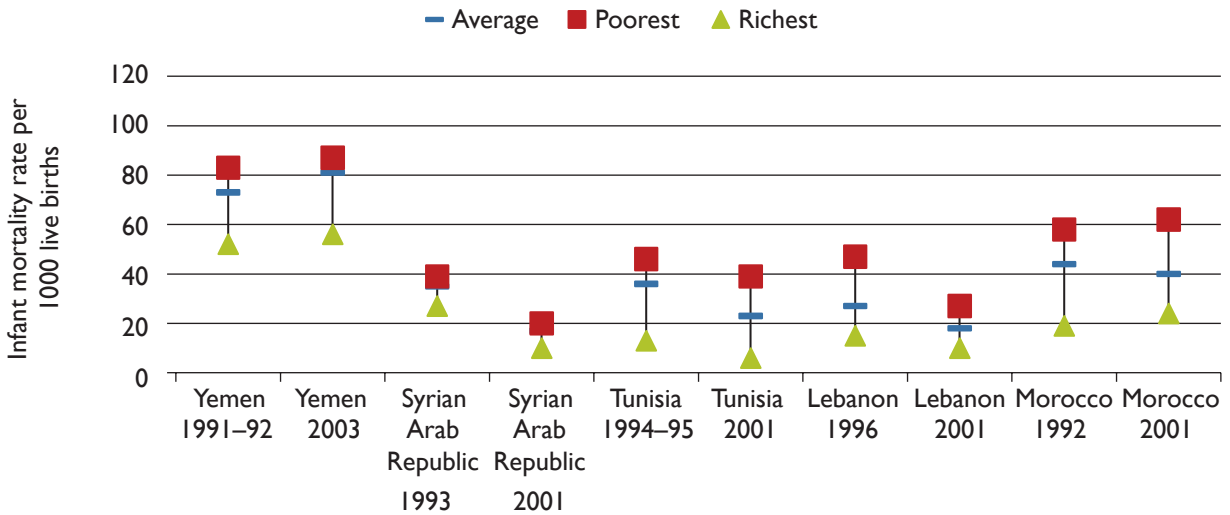


Fig. 4. Infant mortality rate in the countries surveyed (PAPFAM published results)



**Fig. 5.** Inequities in infant mortality rates between the poorest and the richest by country and survey year

No assessment of inequities in infant mortality by income level could be made for Djibouti due to unavailability of appropriate data.

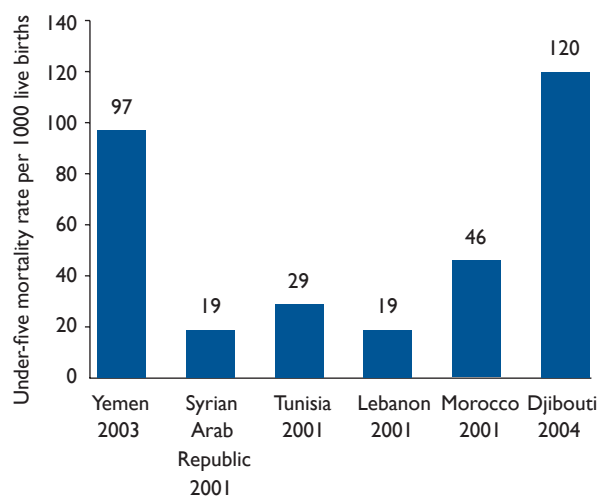
The gap in infant mortality rate by mother’s education fell significantly in Yemen and the Syrian Arab Republic but increased in Lebanon and Morocco (see Fig. A3.1 in Annex 3). The gap in IMR by place of residence has narrowed in all the countries except Morocco (see Fig. A3.2).

### Under-five mortality

The level of under-five mortality is high in Djibouti and Yemen with 120 and 97 deaths per 1000 births, respectively (see Fig. 6). Morocco’s under-five mortality rate is around 46 deaths per 1000 births, whereas in Tunisia it is around 29 deaths and in the Syrian Arab Republic and Lebanon just under 20 deaths per 1000 births.

The gap in under-five mortality rate between the rich and the poor has narrowed in Lebanon and Morocco but has remained the same or has increased slightly in all the other countries (see Fig. 7). The gap in the under-five mortality rate has decreased in all the countries except

for Lebanon and Morocco, where the gap in under-five mortality rate for children of mothers with higher education and children of mothers with lower education has increased over time (see Fig. A3.3). The gap in under-five mortality rate by place of residence has remained the same in all countries except for Tunisia, where the gap in under-five mortality rate for urban and rural areas has reduced over time (see Fig. A3.4).



**Fig. 6.** Under-five mortality rate in the countries surveyed (PAPFAM published results)

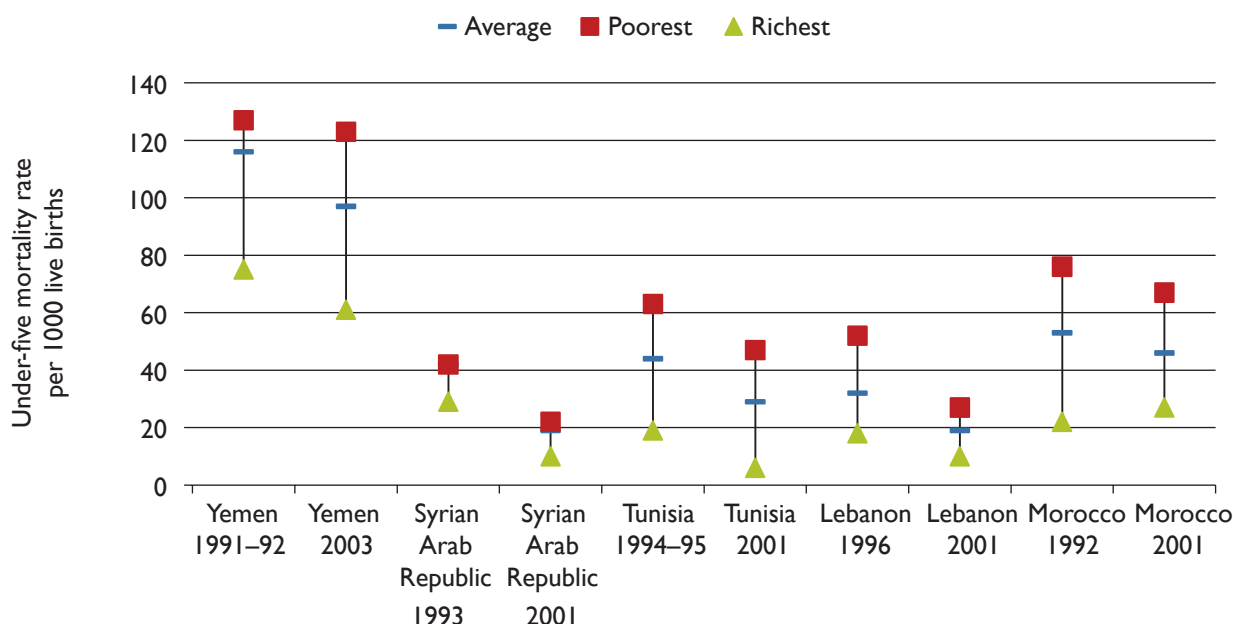


Fig. 7. Inequities in under-five mortality rates between the poorest and the richest by country and survey year

## Prevalence of stunting in children under five

Stunting in children, defined by low height for age, is a marker of chronic undernutrition, and its reduction is a key MDG objective. Yemen has a high level of children stunting with almost half of the children with a low height for their age (see Fig. 8).

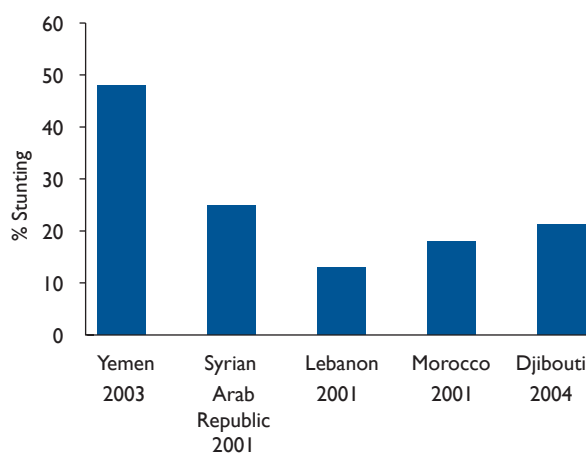


Fig. 8. Prevalence of stunting in the countries surveyed (PAPFAM published results)

The level of stunting slightly increased in Yemen and remained at the same level in the other countries for the two time periods. The gap in the level of stunting between the rich and the poor increased in Yemen and the Syrian Arab Republic and decreased in Tunisia, Lebanon and Morocco (see Fig. 9). It was not possible to analyse the gap in stunting by mother's education in the latest PAPFAM data because it was not possible to link the mothers' ID for each child resident in the household for which we had anthropometric information. In the PAPCHILD data the information was collected differently and it was possible to link these two pieces of information. At the time of the PAPCHILD survey in the early 1990s, Yemen had the highest gap in stunting by mother's education, with almost 35 percentage points difference in the level of stunting for children of mothers with no education compared with children of mothers with higher education (see Fig. A3.5). The gap in percentage of children stunting by place of residence did not change much between the two survey rounds, except for a slight increase in gap in Yemen (see Fig. A3.6).

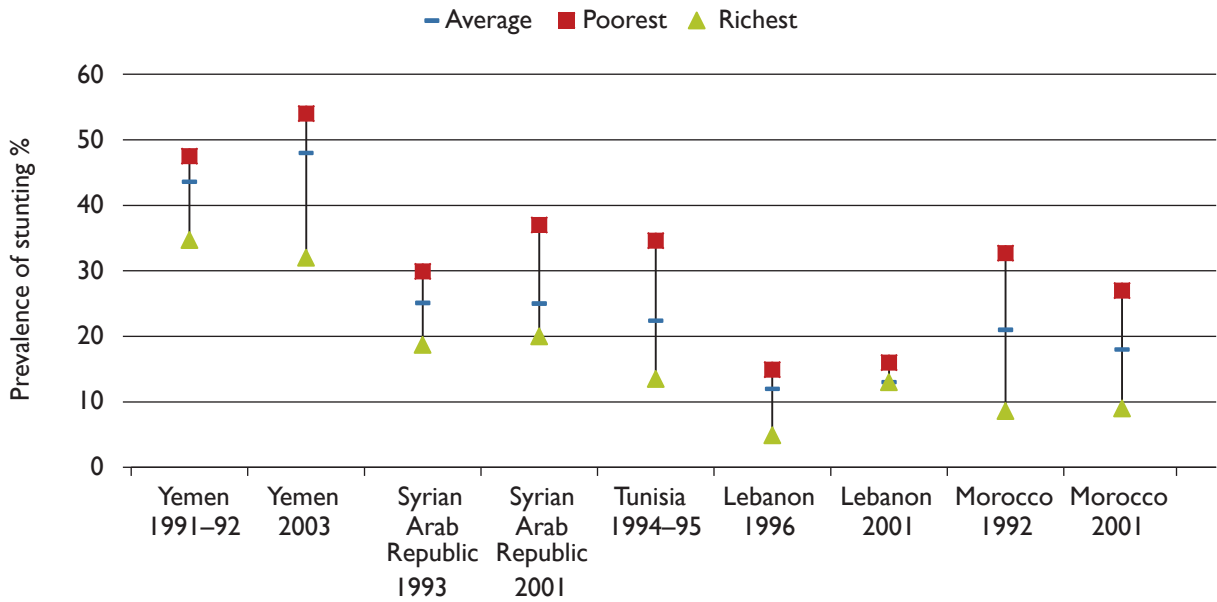


Fig. 9. Prevalence of stunting between the poorest and the richest by country and survey year

## 4.2 Inequities in health systems variables within and across countries

### Coverage of DPT3 vaccination

The World Health Organization recommends that all children receive three doses of the DPT (diphtheria, pertussis and tetanus) vaccine to obtain immunity against these diseases. Coverage of DPT vaccination is almost universal in Morocco and varies greatly in the other countries. It is around 70% in Yemen and Djibouti (see Fig. 10).

Yemen has the largest gap between the receipt of all three DPT doses among children in the poorest quintile (44%) and children in the richest quintile (91%). In the Syrian Arab Republic, Tunisia, Morocco and Lebanon, however, the gap between the rich and the poor is small (see Fig. 11). Differences in DPT vaccination by mother’s education are higher in the Syrian Arab Republic and Yemen. In these two countries, children of mothers with higher

education have 1.4 times higher probability of having been vaccinated than children born to a mother with no education (see Fig. A3.7). As far as the difference in DPT3 vaccination by place of residence is concerned, the biggest gap is found in Yemen and Djibouti where children living in urban areas were 1.4 times more likely to have been vaccinated than children living in rural areas (see Fig. A3.8).

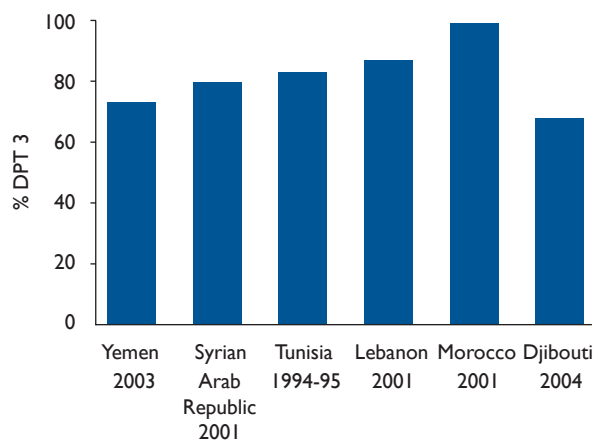
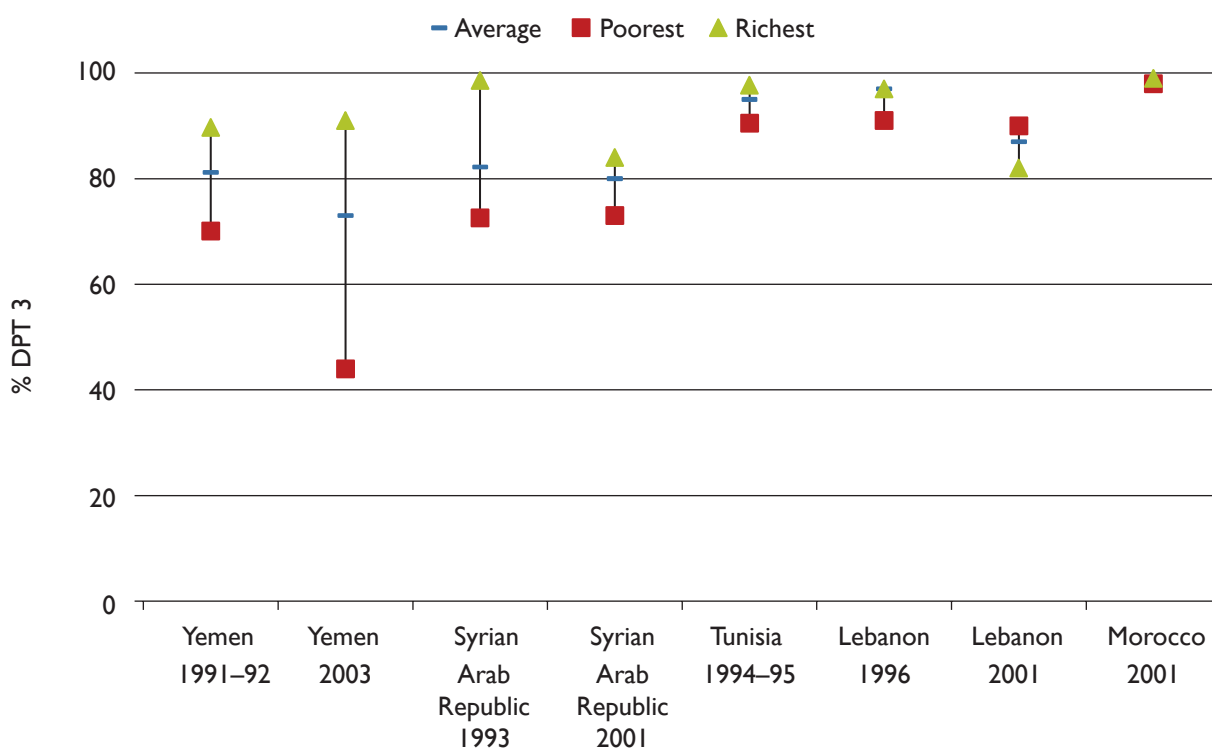


Fig. 10. Percentage of DPT3 vaccination coverage in the countries surveyed (PAPFAM published results)

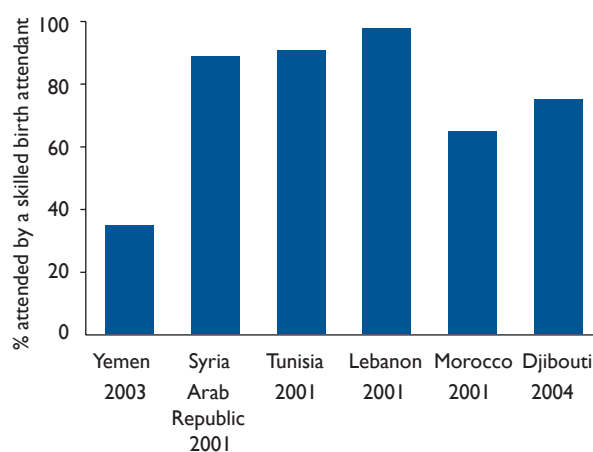


**Fig. 11.** Inequities in DPT3 vaccination coverage between the poorest and the richest by country and survey year

## Coverage of skilled birth attendance

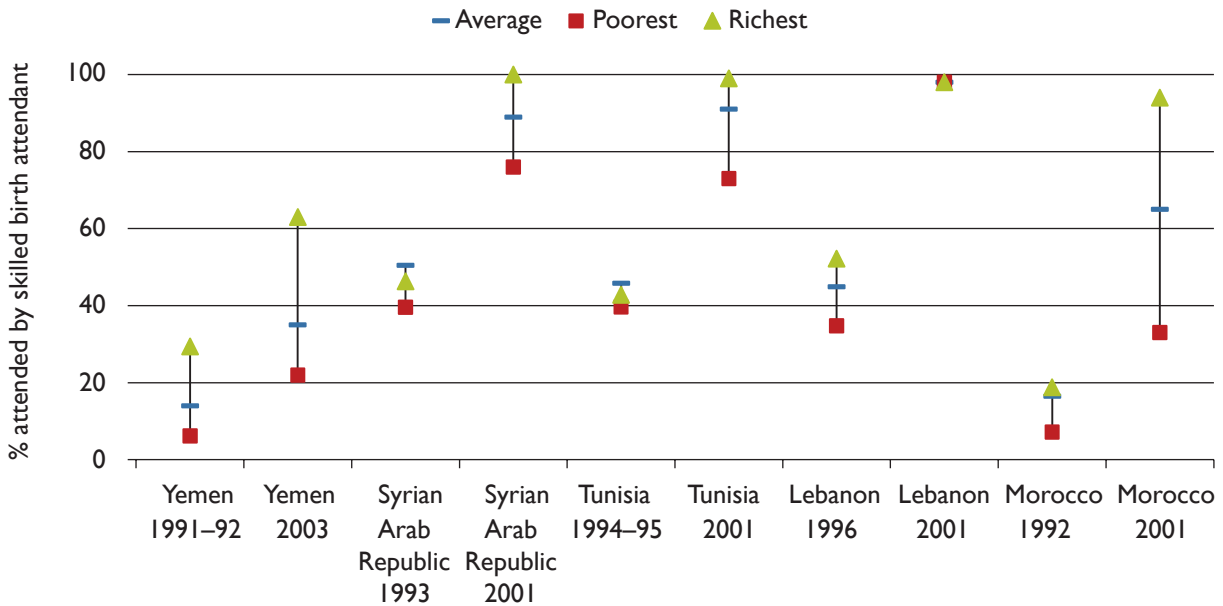
Having a skilled birth attendant present during the birth of a child improves the likelihood of a safe delivery. A skilled birth attendant is a medical doctor, midwife or nurse who has been given appropriate training to care for mothers giving birth. The global experience and scientific evidence is very 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-related MDGs.

The percentage of births attended by a skilled birth attendant vary greatly for the countries analysed in this report; Yemen has the lowest percentage of deliveries attended by a professional with only 35% of births being assisted, whereas in Morocco 65% of all births were attended by a professional. In Lebanon almost all births were attended by a skilled birth attendant at delivery (see Fig. 12).



**Fig. 12.** Percentage of births attended by a skilled birth attendant in the countries surveyed (PAPFAM published results)

The percentage of births attended by a skilled birth attendant increased in all countries between the two surveys. On the other hand, the gap between the rich and the poor has widened in all the countries. The widest gap was reported in Morocco with a 60% point difference between the rich and the poor.



**Fig. 13.** Inequities in percentage of women delivering in a health facility between the poorest and the richest by country and survey year

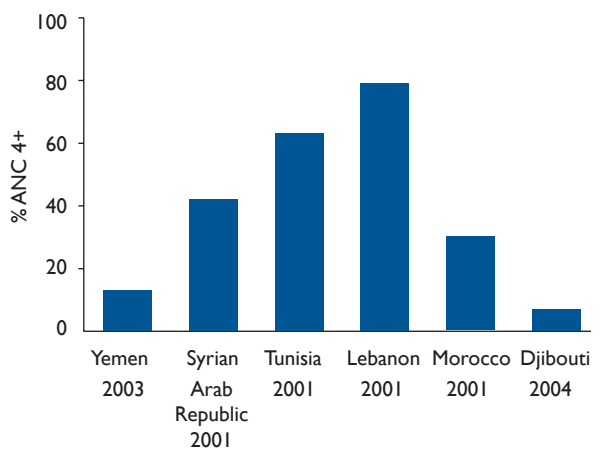
The gap in births attended by a skilled attendant narrowed in all the countries and was reduced to zero in Lebanon (see Figs. 13 and A3.9). The gap in percentage of births attended by skilled personnel between the rich and the poor decreased in all countries, however, it is still relatively wide in Yemen and Morocco (Fig. A3.9). The gap by place of residence was very high in Djibouti with 93% of births attended by a skilled birth attendant in urban areas and only 23% in rural areas (see Fig. A3.10).

### Four or more antenatal care visits

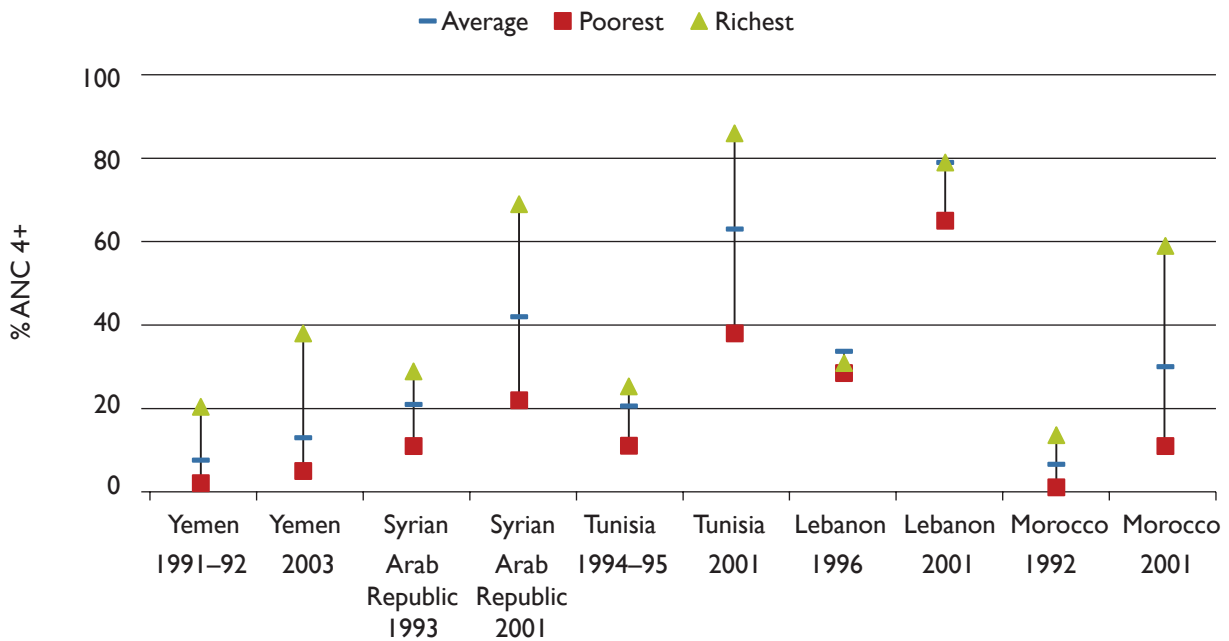
The antenatal period presents important opportunities for reaching pregnant women with a number of interventions that may be vital to their health and well-being and those of their infants.

Regular contact with a doctor, nurse or midwife allows health personnel to manage the pregnancy and provide a variety of services, such as treatment of hypertension to prevent eclampsia; tetanus immunization; intermittent preventive treatment for

malaria and distribution of insecticide-treated mosquito nets; prevention of mother-to-child transmission of HIV; micronutrient supplementation; and birth preparedness, including information about danger signs during pregnancy and childbirth. The antenatal period is also an ideal opportunity to supply information on birth spacing, which is recognized as an important factor in improving infant survival.



**Fig. 14.** Percentage of women having four or more antenatal care visits in the countries surveyed (PAPFAM published results)



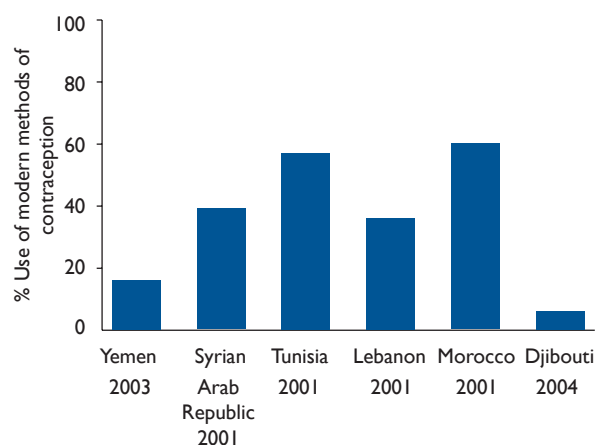
**Fig. 15:** Inequities in percentage of women having four or more antenatal care visits between the poorest and the richest by country and survey year

WHO recommends a minimum of four antenatal visits. In all countries included in this report, the percentage of women who had four or more antenatal care visits increased between the two surveys (see Fig. 14). The analysis of wealth inequalities also revealed that the gap between the rich and the poor increased (see Fig. 15). The gap in the percentage of women who attended four or more antenatal care visits by women's education increased in all countries except for Yemen that recorded a reduction in the gap between the rich and the poor (see Fig. A3.11). The gap between the rich and the poor by place of residence increased significantly in Tunisia and Morocco and remained unchanged in the other countries (see Fig. A3.12).

### Use of modern contraception

The use of modern methods of contraception is extremely low in the countries surveyed. In Djibouti and Yemen less than 20% of women currently use modern methods of contraception. Only in Tunisia and Morocco did the percentage of users increase to just over 50% (see Fig. 16).

The gap between the rich and the poor decreased in all the countries except Yemen, where the gap increased over time (see Fig. 17). The gap in use of contraception by women's education reduced in all countries and is minimal in Tunisia and Lebanon (see Fig. A3.13). Similarly the gap in use of contraception between urban and rural areas is modest in all countries, with exception of Yemen, where the gap is greatest, on the order of 20 percentage points (see Fig. A3.14).



**Fig. 16.** Percentage of women using a modern method of contraception in the countries surveyed (PAPFAM published results)

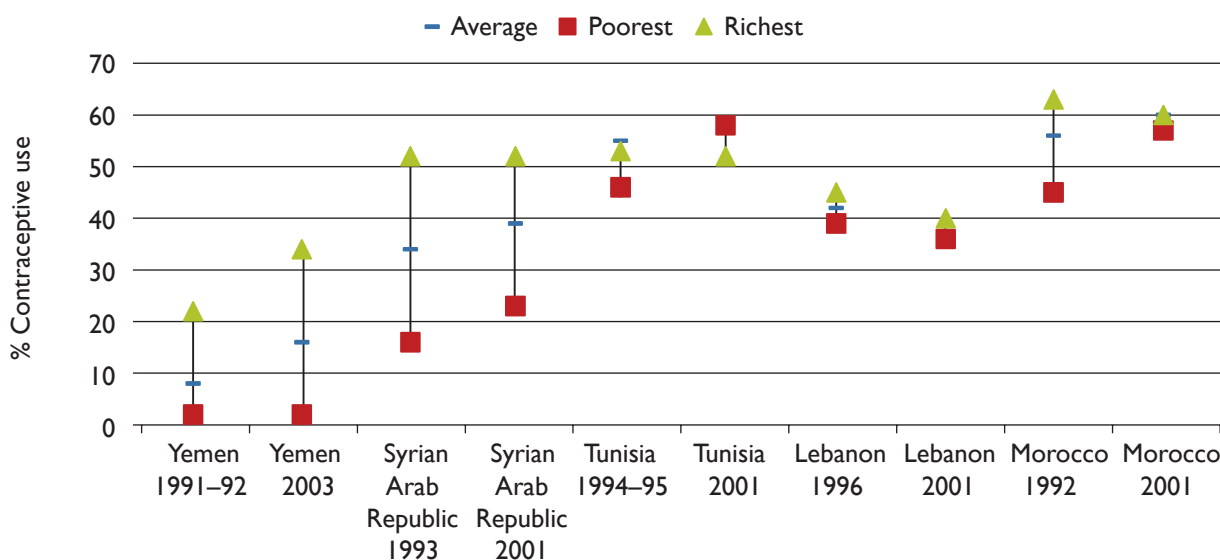


Fig. 17. Inequities in use of modern contraception by wealth quintile by country

## 5. Identifying determinants of health inequities

### 5.1 Four broad domains

In this section we are interested in identifying factors that contribute to the observed inequities in maternal and child health in the countries selected for this report. We will focus on analysing the determinants of inequality of births attended by a skilled birth attendant.

The framework described in section 2.1 was used to identify the pathways and determinants to inequities in these variables in the countries surveyed in this report. We considered four broad domains encapsulating the pathways to health inequities that were identified in the framework:

- socioeconomic, political context
- socioeconomic position
- intermediary determinants
- health system factors.

Table 6 highlights the major determinants that comprise the framework’s broad categories.

Table 6. Major determinants identified under broad categories of the framework

	Socioeconomic, political context	Socioeconomic position	Intermediary determinants	Health systems factors
Major factors	Area of residence (urban/rural) Region (district, zone)	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 five in household)	Antenatal care (number of visits, quality of care, place of care) Barriers to accessing care

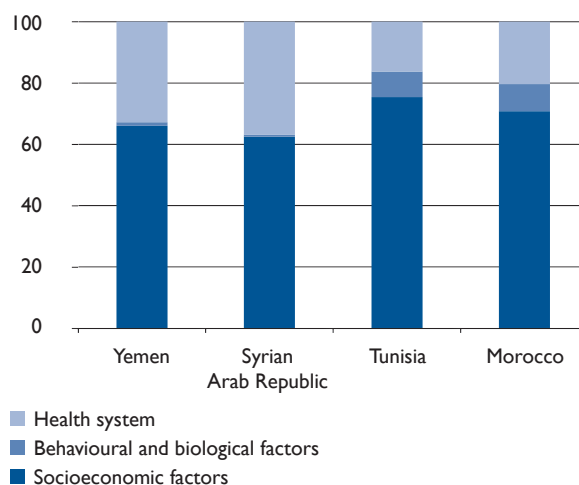


The analytical approach described in section 2 was used to conduct a decomposition analysis of determinants of inequalities.

## 5.2 Main contributors to inequities in skilled birth attendance

We decomposed inequalities in access to skilled birth attendance at delivery in Yemen, Syrian Arab Republic, Tunisia and Morocco. We did not run the decomposition of inequalities in Djibouti as we did not have information on the wealth quintile and for Lebanon where the gap between the rich and the poor at the time of the latest survey was reduced to zero.

Fig. 18 shows that socioeconomic factors together contribute to 60% to 75% in inequities in skilled birth attendance at delivery. Socioeconomic position ranges from just above 66% in the Syrian Arab Republic to above 75% in Tunisia. Health system factors account for a substantial proportion of inequalities in Yemen and the Syrian Arab Republic, where more than one third of the inequalities of attendance of a skilled birth attendant at delivery is due to health system factors. The percentage is much smaller in Tunisia and Morocco where only less than 20% of the inequalities are due to health system factors. This suggests that improving health service delivery will strongly reduce inequalities in countries such



**Fig. 18.** Contribution of broad factors in skilled birth attendance

as Yemen and the Syrian Arab Republic and to a lesser extent in Tunisia and Morocco.

Table 7 shows the contribution of each specific factor to inequities in skilled birth attendance. Household wealth was a strong determinant in the Syrian Arab Republic and in Tunisia, where more than half of the inequity in access could be explained by a difference in wealth quintile. Other important factors are place of residence in Yemen and Morocco, where around a sixth of the inequalities can be attributed to it (18% in Yemen and 17% in Morocco). Interestingly the place of the most recent antenatal check-up and whether or not the mother had had four or more antenatal care visits explains more than 20% of inequities in Yemen and the Syrian Arab Republic.

**Table 7. Percentage contribution to inequities in skilled birth attendance of six of the most common determinants (that contribute positively to inequities) across four countries**

	Yemen	Syrian Arab Republic	Tunisia	Morocco
Urban (residence)	18	1	10	17
Household's wealth	30	51	61	33
Women's education	5	6	5	18
Other socioeconomic characteristics	1	–	–	–
Exposure to media	12	4	+	4
Behavioural and biological factors	1	1	8	9
Had four or more ANC visits	11	6	4	5
Place of most recent ANC check-up	11	21	2	9
Quality of care	8	10	8	2
Distance to health facility	3	–	2	5
Other socioeconomic characteristics	1	–	–	–
	100	100	100	100

Note: – = factors that did not contribute to inequities; + = variable not available in survey data.

## 6. Discussion

### 6.1 Overall magnitude and trends in health inequities

Inequities in health outcomes and health services are substantial in the selected countries for this report. A child born in Djibouti is five and a half times more likely not to live until its fifth birthday compared to a child born in the Syrian Arab Republic. Within Yemen, children born to the poorest 20% households are more than twice as likely to die before their fifth birthday compared to children in the richest 20% of households.

Within the countries health inequalities are quite strong. For maternal health-related indicators the inequalities have widened over time in all countries except in Lebanon. The health status of the poorest has generally improved but the gap between the richest and the poorest has widened with the richest gaining the most from the positive economic performance and investment in health over time.

Coverage of DPT vaccination has improved, and the gap between the richest and the poorest has narrowed over time, except in Yemen where a major gap still exists, with children from richer backgrounds being twice more likely to be vaccinated than children from poorer backgrounds.

### 6.2 Key discussion points from the skilled birth attendance analysis

Levels of skilled birth attendance were still low for some countries in the Region (i.e. Yemen, Morocco and Djibouti; 35%, 65%, 75%). Improvements in the previous 10 years benefited richer households more than poorer ones. We analysed in depth the factors that contributed to the inequalities in skilled birth attendance. Three main domains

were identified: health system factors, socioeconomic factors, and behavioural and biological factors.

Results of the analysis indicate that inequities in health system factors contribute between 20% and 33% among the countries considered. In the Syrian Arab Republic and Yemen the contribution of health system factors to the overall inequality in skilled birth attendance were above 30%, whereas in Tunisia and Morocco these proportions were much lower.

Both in Yemen and the Syrian Arab Republic the contribution of behavioural and biological factors to the overall inequalities is minimal (less than 1%), whereas for Tunisia and Morocco around 10% of the inequalities could be attributed to behavioural and biological factors.

The main determinants of inequalities were, for all the countries studied, the contribution of socioeconomic factors, explaining more than 60% of the inequalities in all countries.

### 6.3 Limitations of the analysis

Some key limitations of the analysis.

- a) The analysis is based on cross-sectional data, and time series data are not linked to individuals but to population subgroups.
- b) The decomposition analysis is limited on the available information collected in the survey such as household welfare status, level of education, parity, maternal age at birth, whether or not the mother had four or more antenatal care visits, etc.

### 6.4 The role of the health sector

The result of the decomposition analysis highlights the contribution to health inequities of factors outside the health sector. This indicates that to lower the inequalities in health

outcomes and health system factors effective intersectoral action is needed. Results clearly show that improvements in health can only be achieved through investments in the social

and economic sectors, either via an increase in women's education or reducing poverty and raising welfare throughout all sections of society with particular focus on the worst off.

## Annex I. Technical notes and concepts

### Household wealth index

Very few demographic surveys in developing countries gather information on household income or consumption expenditure, despite the theoretical importance of these measures. Furthermore income and consumption data are both expensive and difficult to collect, and many otherwise useful data sources lack direct measures of living standards (notably the demographic and health surveys). On the face of it, this precludes the analysis of socioeconomic inequalities in health, as well as testing of hypotheses relating to the impact of living standards on health and fertility. Moreover, the exclusion of living standard measures in multivariate analysis raises the possibility that other coefficients are rendered biased, because of their correlation with living standards measures. Consequently researchers have been forced to rely on ad hoc use of proxies for measures of living standards (8). Principal component analysis allows deriving an asset quintile measure that is correlated with household long-run wealth.

### Principal components analysis

Principal components analysis is a technique for extracting from a large number of variables those few orthogonal linear combinations of the variables that best capture the common information.

Intuitively, the first principal component is the linear index of all the variables that captures the largest amount of information that is common to all of the variables. The result of principal components is an asset index for each household  $A_j$  based on the formula:

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

where  $f_i$  is the “scoring factor” for the  $i$ th asset as determined by the procedure,  $a_{ji}$  is the  $j$ th household’s value for the  $i$ th asset and  $a_i$  and  $s_i$  are the mean and standard deviation of the  $i$ th asset variable over all households.

The crucial assumption and it is just an assumption is that household long-run wealth is what causes the most common variation in asset variables (8). The scoring factor is the “weight” assigned to each variable (normalized by its mean and standard deviation) in the linear combination of the variables that constitute the first principal component.

### Decomposition analysis

The method proposed by Wagstaff, Van Doorslaer and Watanabe (9) was used to decompose socioeconomic inequality in infant mortality into its determinants. The concentration index is the preferred to other measures of inequalities in that it reflects the experiences of the entire population and that it be sensitive to changes in the distribution of the population across socioeconomic group (10, 11).

We decompose the concentration index to estimate how determinants proportionally contribute to inequality (for example, 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  $\varepsilon_i$  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:

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

where  $\mu$  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),  $GC\mathcal{E}$  is the generalized concentration index for  $\varepsilon_i$ . 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 of  $y$  with respect to each  $x_k$ . The second is a residual or “unexplained” component. This reflects the inequality in health that cannot be explained by systematic variation in the  $x_k$  across socioeconomic groups. The method allows to establish which factors

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

## Annex 2. Country reports

### Djibouti

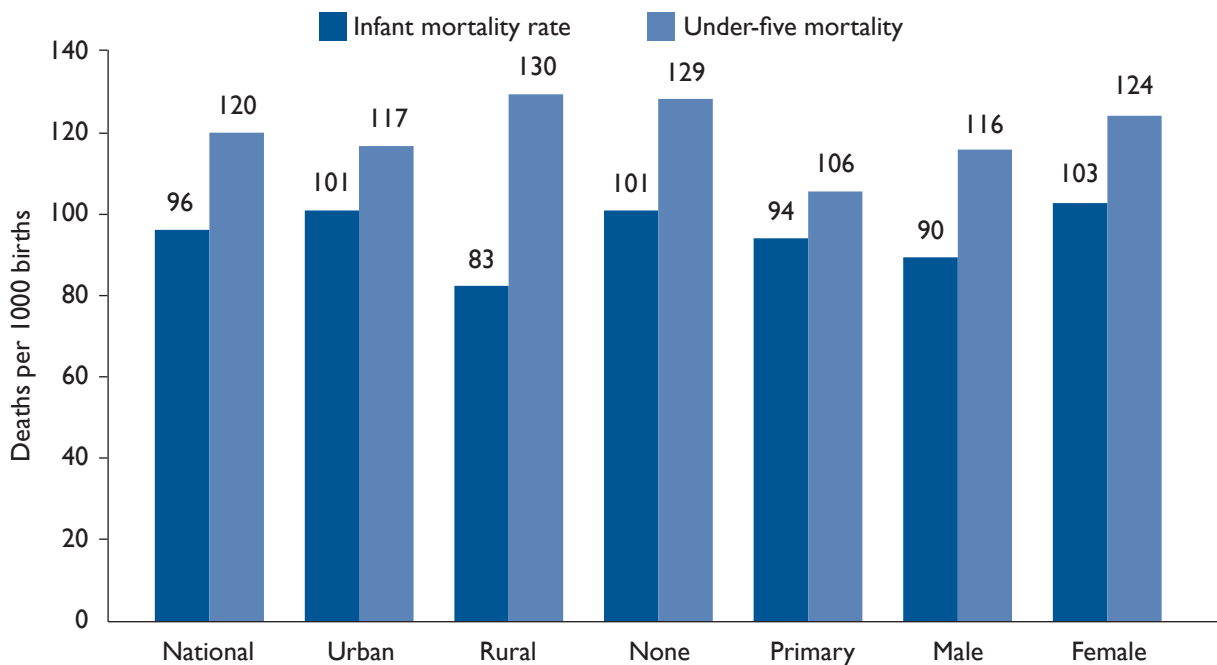
#### Indicators analysed

The data sources used in this study are from the PAFAM survey. For Djibouti we use data from the 2004 PAFAM survey; data from the PAPCHILD survey were not available. Health indicators assessed include infant and under-five mortality and prevalence of stunting in children. Health system indicators include coverage of DPT vaccination, coverage of skilled birth attendance, percentage of women who attended four or more antenatal care visits, percentage of delivery in health facilities and current use of modern contraception.

#### Results

Data from the 2004 Djibouti Family and Health Survey show that there is a steady decline in infant and under-five mortality rate by mother's education. The levels of infant and under-five mortality are higher in rural than urban area and slightly higher for girls than for boys (Fig. A2.1).

Fig. A2.2 shows that there are inequities between rural and urban areas, especially with respect to the percentage coverage of skilled birth attendance and antenatal care visits. For these indicators, rural residents are worst off.



**Fig. A2.1.** Infant and under-five mortality by stratifier, Djibouti, 2004

Note: the data do not contain data on asset ownership, and there were few deaths among children with mothers with secondary and higher education.

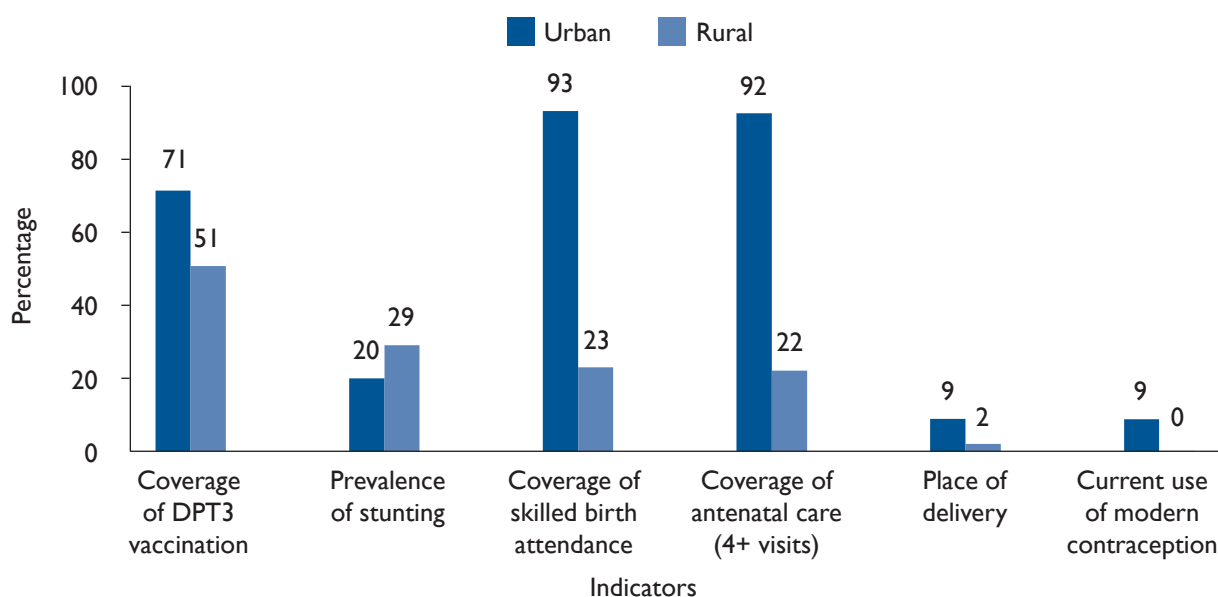


Fig. A2.2. Selected indicators by area, Djibouti, 2004

Mother's educational achievement is an important factor associated with inequities in health. For most indicators, increased education levels are associated with better

outcomes. Almost all women with a higher education were attended by a skilled professional at delivery compared with 68% of women who had no education (Fig. A2.3).

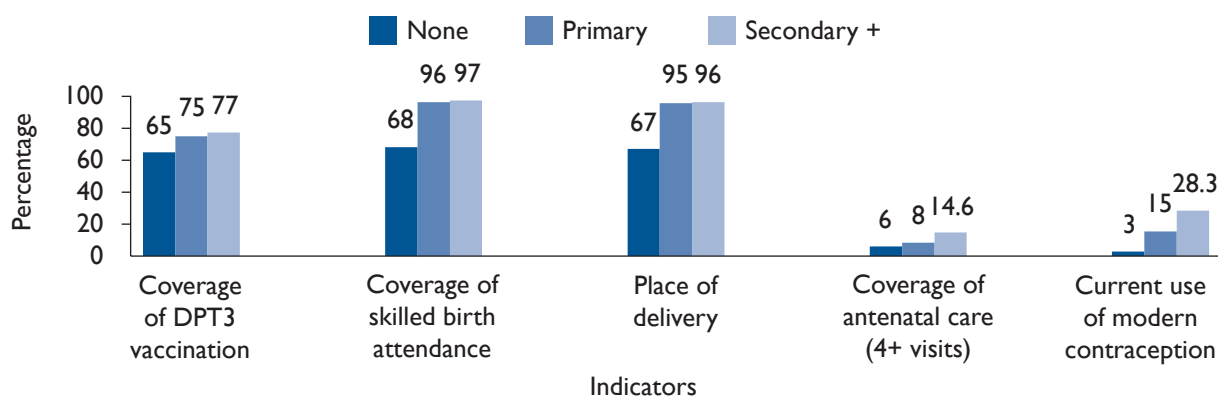


Fig. A2.3. Selected indicators by education, Djibouti, 2004

## Lebanon

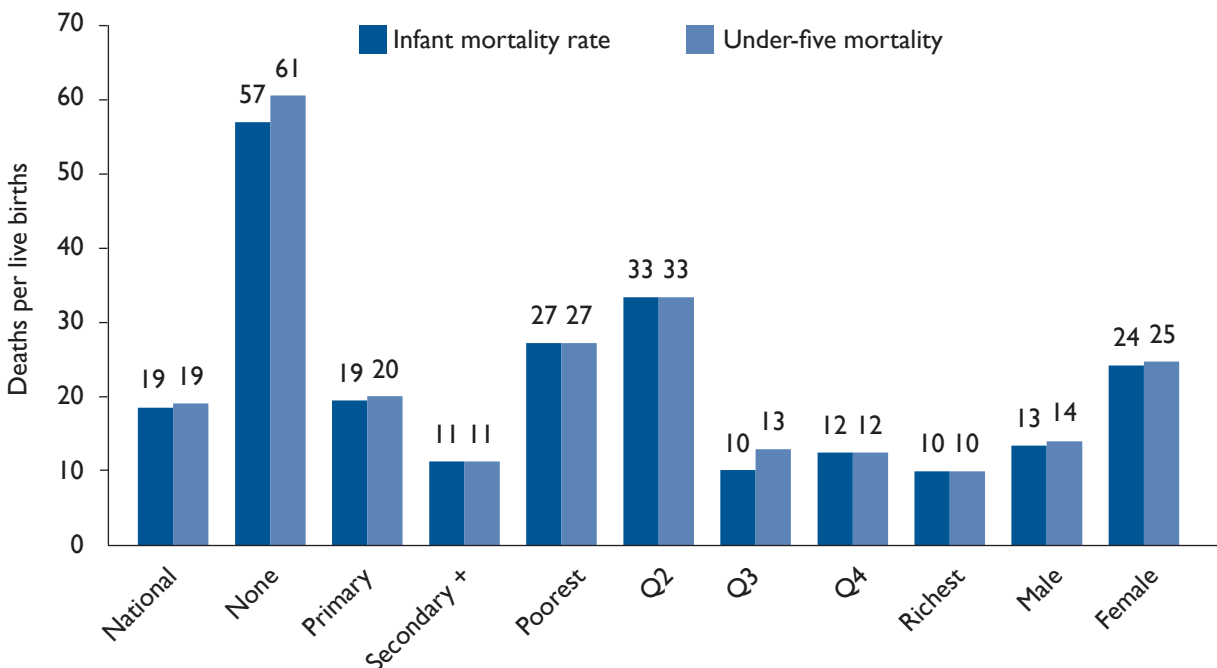
### Indicators analysed

The data sources used in this study are from the PAPFAM and PAPCHILD surveys. For Lebanon we use data from the 2004 PAPFAM survey and the 1994–1995 PAPCHILD survey. Health indicators assessed include infant and under-five mortality and prevalence of stunting in children. Health system indicators include coverage of DPT vaccination, coverage of skilled birth attendance, percentage of women who attended four or more antenatal care visits, percentage of deliveries in health facilities and current use of modern contraception.

### Results

Data from the 2004 Lebanon Family and Health Survey shows that the poorest quintile experienced 2.7 times the under-mortality and infant mortality rates of the richest quintile (Fig. A2.4). Both the infant and under-five mortality rates show a fairly steady decline across wealth quintiles (with the exception of the second quintile, which shows a different pattern) (Fig.A2.5). There is a steady decline in infant and under-five mortality rates by mother’s education (Fig.A2.6). The levels of infant and under-five mortality are higher for girls than for boys. It was not possible to calculate the difference in the health indicator for urban and rural areas, as the PAPFAM data for Lebanon did not contain this information.

In terms of access to health services, the data shows wealth-related inequities for all the indicators. There is not a clear relationship between wealth quintile and the health indicators. Coverage of skilled birth attendance and delivery in a health facility are almost universal.



**Fig.A2.4.** Infant and under-five mortality by stratifier; Lebanon, 2004

Note: the asset index for Lebanon contains mainly dwelling characteristics. For this reason the wealth gradient is not well defined. There were few deaths among the poorest.



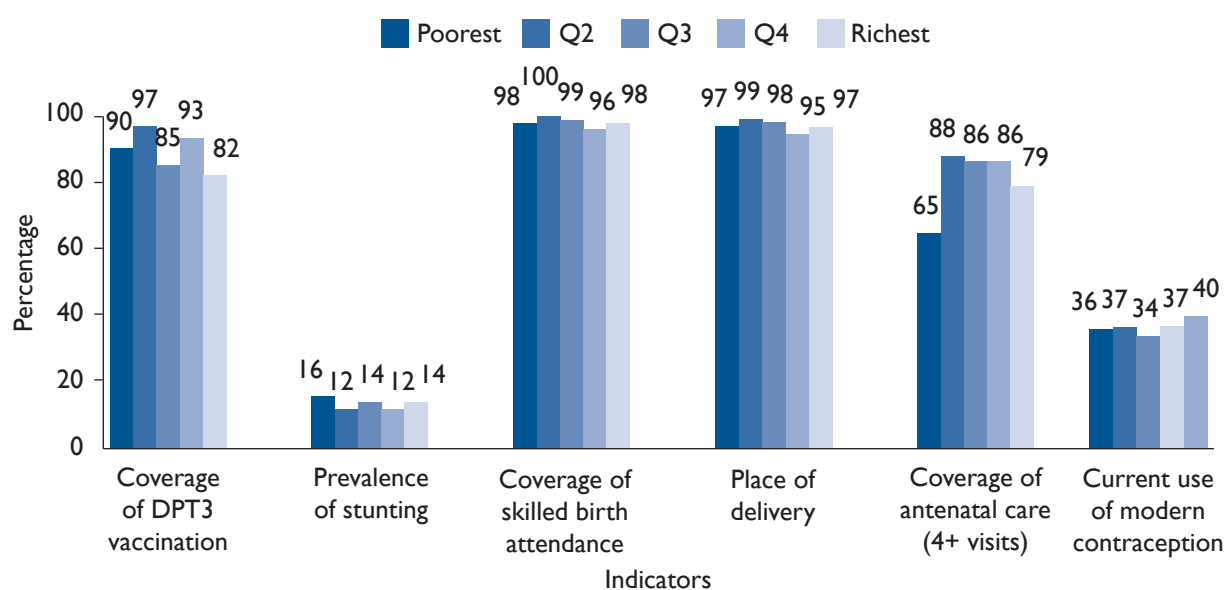


Fig.A2.5. Selected indicators by wealth quintile, Lebanon, 2004

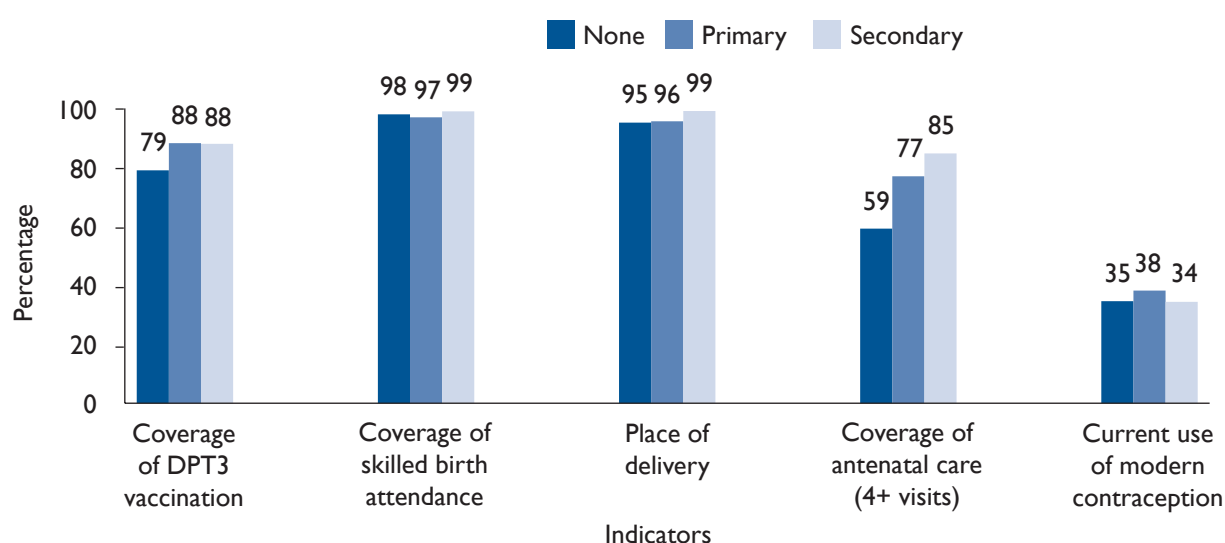


Fig.A2.6. Selected indicators by education, Lebanon, 2004

Mothers' educational achievement is an important factor associated with inequities in health. For most indicators, increased education levels are associated with better outcomes. Coverage of skilled birth attendance and delivery in a health facility was almost universal, so there is no difference by mother's education. According to the data, 85% of women had four or more antenatal care visits compared to 59% of women with

no education. There were little differences in use of contraception by mother's education.

### Trends in population averages and wealth inequities

Table A2.1 summarizes the trends of health status and health systems indicators. The findings indicate improved infant and under-five mortality rates over time. Similarly improvements were evident for delivery by a

**Table A2.1. Trends in population average and household wealth inequities for selected health and health care indicators, Lebanon**

	Population average		Ratio	
	1994–95	2004	1994–95	2004
<b>Health status</b>				
Infant mortality rate	27	19	3.1	2.7
Under-five mortality rate	31	19	2.9	2.7
Stunting in children (%)	12	13	3.0	1.1
<b>Health system</b>				
DPT3 coverage	97	88	1.1	0.9
Delivery by skilled birth attendant	45	98	1.5	1.0
Delivery in a health facility	43	97	0.7	1.0
Coverage of antenatal care (4+ visits)	34	79	1.1	1.2
Contraceptive prevalence rate (all married women)	42	36	1.1	1.1

\* Poorest to richest ratio is used for infant mortality rate, under-five mortality rate, stunting in children under five years and prevalence of underweight in women, while richest to poorest is used for DPT3 coverage, delivery by skilled birth attendants and contraceptive prevalence rate. This provides a consistent way to interpret ratios, as health outcome indicators 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).

skilled attendant, delivery in a health facility and the percentage of women who made four or more antenatal care visits. The data on coverage of DPT vaccination and prevalence of stunting do not show sign of deterioration; however, this may be due to lack of comparability in the PAPCHILD and PAPFAM questionnaires in relation to this question. Interestingly the percentage of women using contraception reduced between the two surveys.

The different indicators present different patterns in terms of inequity trends over the 10-year time period. The relative gap between the rich and the poor narrowed for all indicators except for coverage of antenatal care.

Table A2.2 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 an input to health policies.

**Table A2.2 Changes in inequities and population averages**

		Relative gap	
		Narrowing	Widening
Population average	Improving	A Best outcome IMR/U5MR Underfive mortality Coverage by skilled birth attendant Delivery in a health facility Contraceptive prevalence	B Coverage of antenatal care (4 + visits)
	Worsening	C	D Worst outcome
		Stunting DTP3 vaccination coverage	

The best outcome cell (cell A) shows that the relative gap ratio between the richest and the poorest wealth quintiles, narrows and the population average improves over time. Almost all the indicators fall into this category. One exception is the coverage of antenatal care in which, despite improvements in the population average, the gap between the rich and the poor widened. Two indicators fall in this category: coverage of antenatal care and contraceptive prevalence (cell B). One reason

why this pattern could result is when the richest group improves faster than the poorest group. A worsening in the population average coupled with a narrowing of the relative gap is also possible (cell C). This is the case with the other two exceptions: prevalence of stunting and coverage of DPT vaccination. The worst outcomes (cell D) are when there is a widening of both the relative gap and a worsening of the population average. No indicators exhibited this pattern.

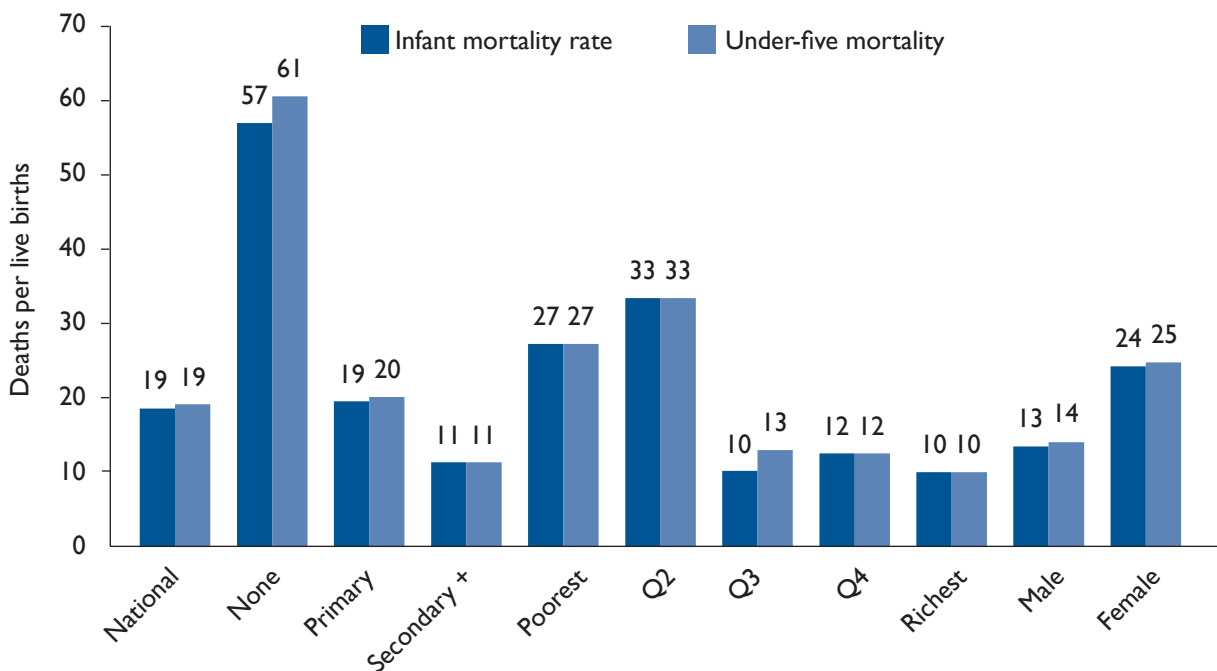
## Morocco

### Indicators analysed

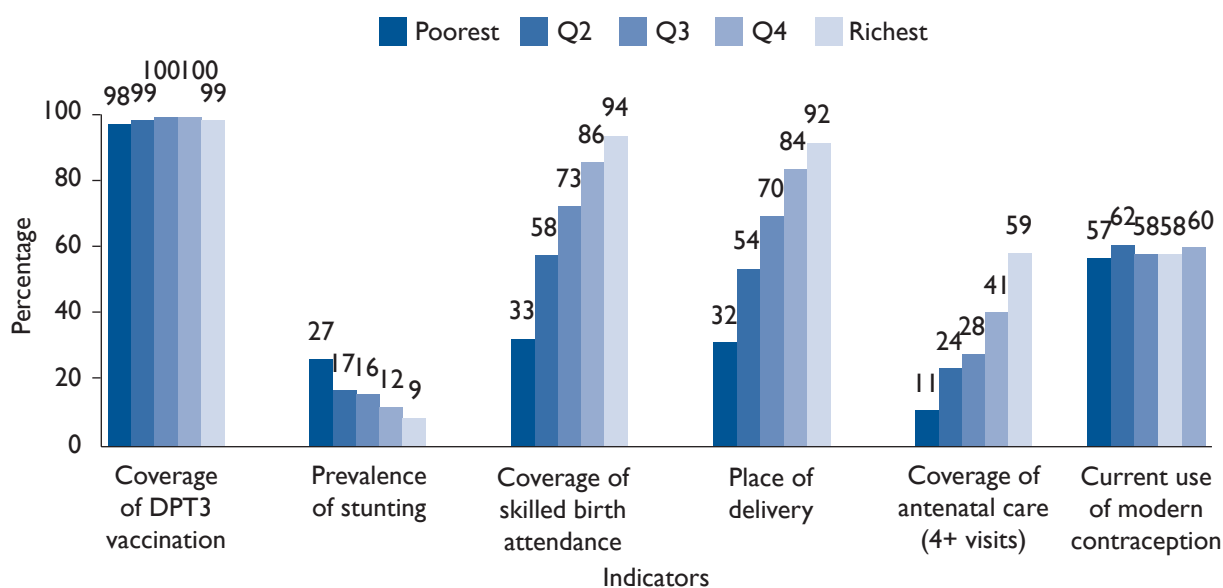
The data sources used in this study are from the PAPFAM and PAPCHILD surveys. For Morocco we use data from the 2001 PAPFAM survey and the 1992 PAPCHILD survey. Health indicators assessed include infant and under-five mortality and prevalence of stunting in children. Health system indicators include coverage of DPT vaccination, coverage by skilled birth attendant, percentage of women who attended four or more antenatal care visits, percentage of delivery in health facilities and current use of modern contraception.

### Results

Data from the 2001 Morocco Family and Health Survey shows that the poorest quintile experienced two and half times the under-five mortality and infant mortality rates of the richest quintile. Both the infant and under-five mortality rates show a fairly steady decline across wealth quintiles (with the exception of the fourth quintile, which shows a different pattern). There is a steady decline in infant and under-five mortality rates by mother's education. The levels of infant and under-five mortality are higher in rural than urban areas and slightly higher for boys than for girls. (See Figs. A2.7–A2.10.)



**Fig.A2.7.** Infant and under-five mortality by stratifier, Morocco, 2001

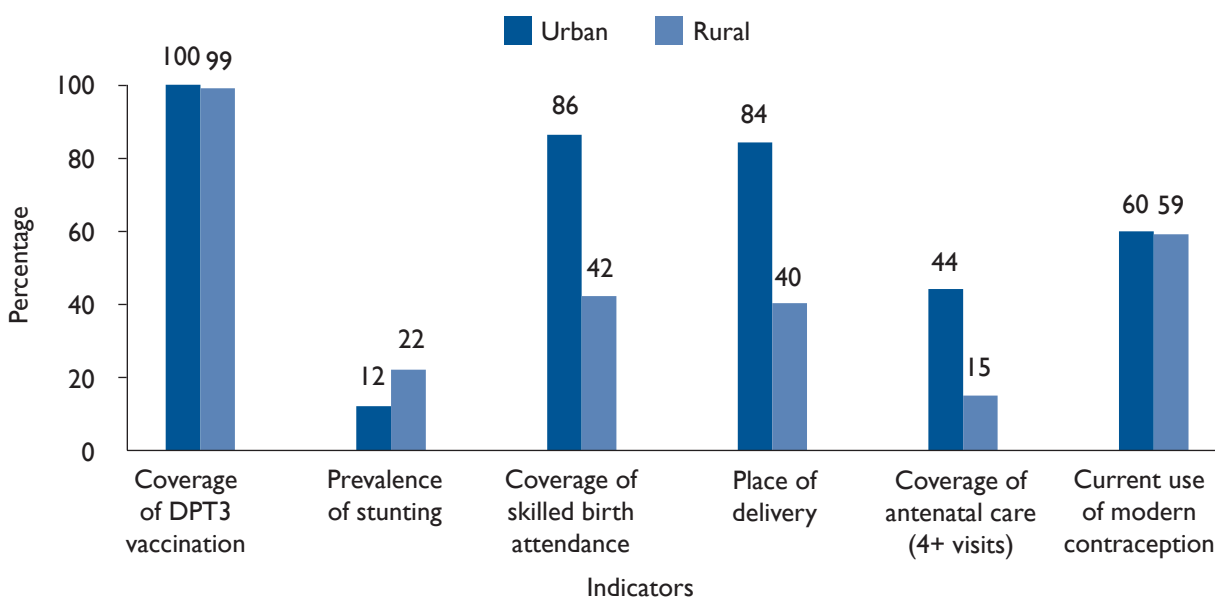


**Fig.A2.8.** Selected indicators by wealth quintile, Morocco, 2001

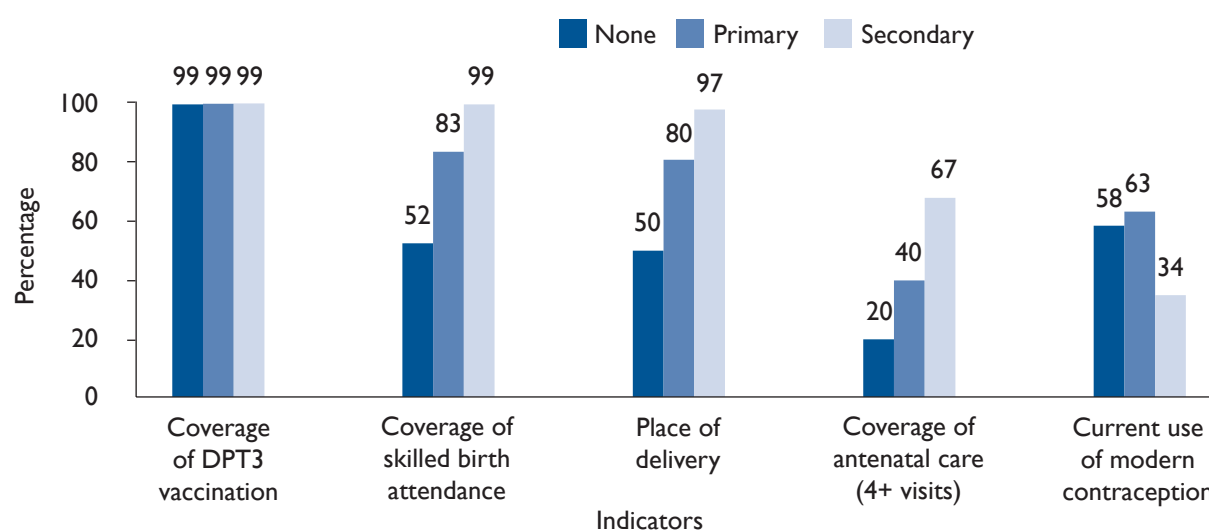
The figure below shows that there is an inequity between rural and urban areas, especially with respect to the percentage of women who made four or more antenatal care visits, coverage by a skilled birth attendant and delivery in health facility. For these indicators, rural residents are worse off. There is no difference between

urban and rural areas in women using modern methods of contraception, and there is almost universal coverage of DPT3 vaccination.

Women living in urban areas are three times more likely to attend four or more antenatal care visit than women living in rural areas.



**Fig.A2.9.** Selected indicators by area, Morocco, 2001



**Fig. A2.10.** Selected indicators by education, Morocco, 2001

### Trends in population averages and wealth inequities

Table A2.3 summarizes the trends of health status and health system indicators. The findings indicate improvement in infant and under-five mortality rates and prevalence of stunting over time. Similarly improvements were evident for delivery by a skilled attendant, delivery in a health facility, the percentage of women who made four or more antenatal care visits and the percentage using contraception. The PAPCHILD data does not contain information on coverage of DPT3 vaccination, so it was not possible to analyse the trend in this indicator.

The different indicators present different patterns in terms of inequity trends over the nine-year time period. The relative gap between the rich and the poor narrowed for all indicators except for delivery by a skilled attendant and delivery in a health facility.

Table A2.4 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 an input to health policies.

**Table A2.3 Trends in population average and household wealth inequities for selected health and health care indicators, Morocco**

	Population average		Ratio	
	1992	2001	1992	2001
<b>Health status</b>				
Infant mortality rate	44	40	3.0	2.6
Under-five mortality rate	52	47	2.5	2.5
Stunting in children	21	17	3.9	3.1
<b>Health system</b>				
Delivery by skilled birth attendant	16	66	2.6	2.8
Delivery in a health facility	15	64	2.7	2.9
Coverage of antenatal care (4+ visits)	7	31	12.4	5.2
Contraceptive prevalence rate (all married women)	56	59	1.4	1.1

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

**Table A2.4 Changes in inequities and population averages**

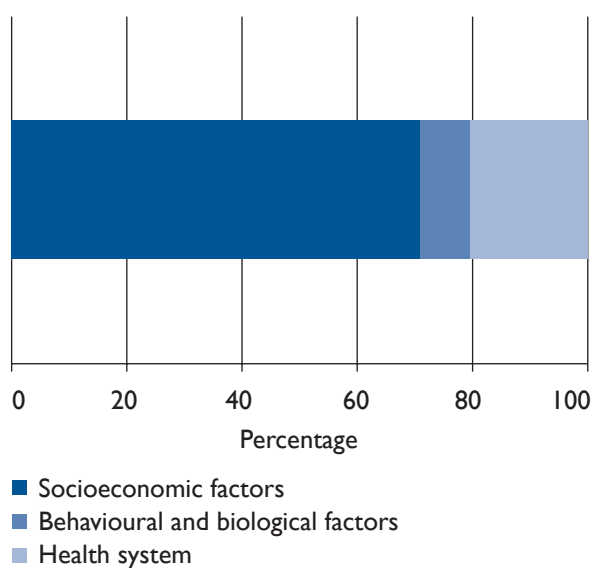
		Relative gap	
		Narrowing	Widening
Population average	Improving	A Best outcome IMR/U5MR Stunting Coverage by skilled birth attendant Coverage of antenatal care (4 + visits) Contraceptive prevalence	B Delivery by a skilled attendant Delivery in a health facility
		Worsening	D Worst outcome
		C	

The best outcome cell (cell A) shows that the relative gap, ratio between the richest and the poorest wealth quintiles, narrows, and the population average improves over time. Almost all the indicators fall into this category. The exceptions are coverage by a skilled attendant and delivery in a health facility where, despite improvements in the population average, the gap between the rich and the poor widened (cell B). One reason why this pattern could result is when the richest group improves faster than the poorest group. A worsening in the population average coupled with a narrowing of the relative gap is also possible (cell C). The worst outcomes (cell D) are when there is a widening of both the relative gap and a worsening of the population average. No indicators exhibited these patterns.

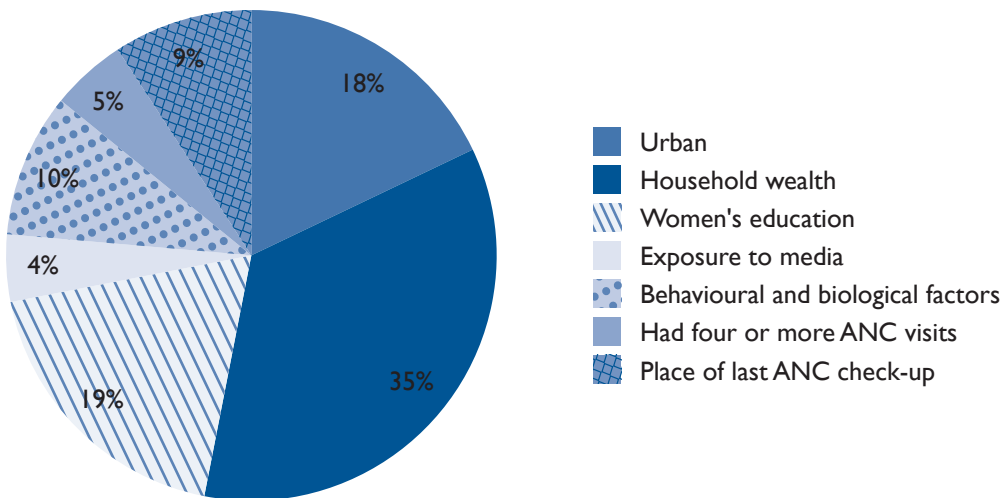
### Main determinants of inequities in skilled birth attendance (Figs.A2.11–A2.12)

In this section the decomposition technique is used to unpack the contribution of factors to inequities in coverage by a skilled birth attendant (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 almost 70% of the inequities in skilled birth attendance in Morocco. Health system factors also contribute significantly (around 20%). The primary determinant of socioeconomic position that contributes to inequities is household wealth, accounting for 35% of the difference. Women's education accounts for another 19% of the inequality. The place of antenatal care check-ups and the percentage of women making four or more antenatal visits explain most of the inequalities in health system factors.



**Fig.A2.11.** Contribution of broad factors to inequities in skilled birth attendance, Morocco, 2001



**Fig.A2.12.** Major determinants of inequities, Morocco, 2001



## Syrian Arab Republic

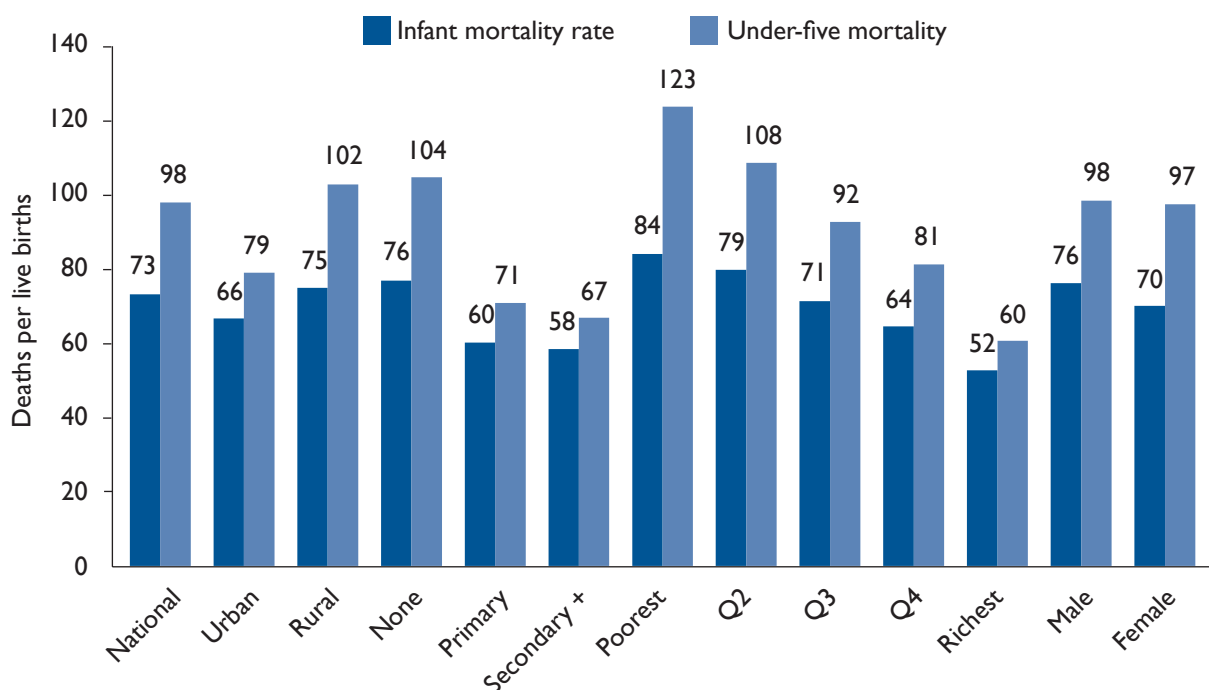
### Indicators analysed

The data used in this study are from the PAFAM and the PAPCHILD surveys. For the Syrian Arab Republic we use data from 2001 PAFAM survey and the 1994–1995 PAPCHILD survey. Health indicators assessed include infant and under-five mortality and prevalence of stunting in children. Health system indicators include coverage of DPT vaccination, coverage by a skilled birth attendant, percentage of women who made four or more antenatal care visits, percentage of delivery in health facility and current use of modern contraception.

### Results

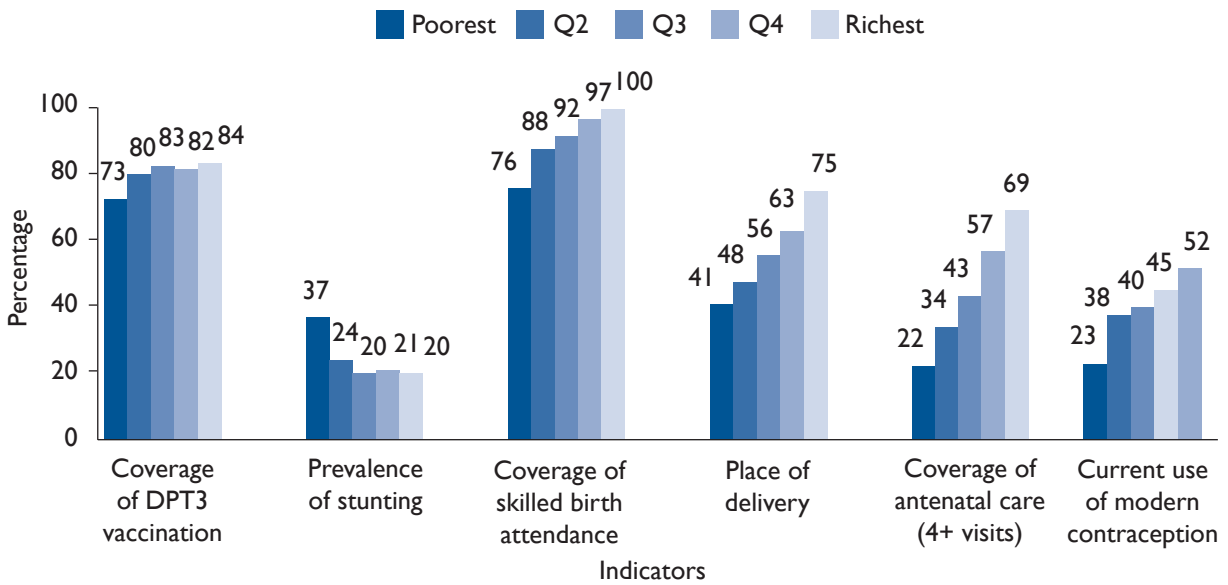
Data from the 2001 Syrian Family and Health Survey shows that the poorest quintile experienced twice the under-five mortality and infant mortality rates of the richest quintile. Both the infant and under-five mortality rates show a steady decline across wealth quintiles. Similarly, there is a steady decline in infant and under-five mortality rates by mother's education. The level of infant and under-five mortality is higher in rural than in urban areas and slightly higher for boys than for girls. (See Figs. A2.13–A2.16)

In terms of access to health services, the data show income-related inequities for all the indicators. The coverage of DPT3 vaccination, skilled birth attendance and delivery in a health facility is higher for the richest quintile than for the poorest. Similarly, the level of stunting is lower for the richest quintile and higher for the poorest quintile.



**Fig. A2.13.** Infant and under-five mortality by stratifier, Syrian Arab Republic, 2001

Note: it was not possible to calculate the IMR and U5MR for children of women with higher education because there were only few deaths.



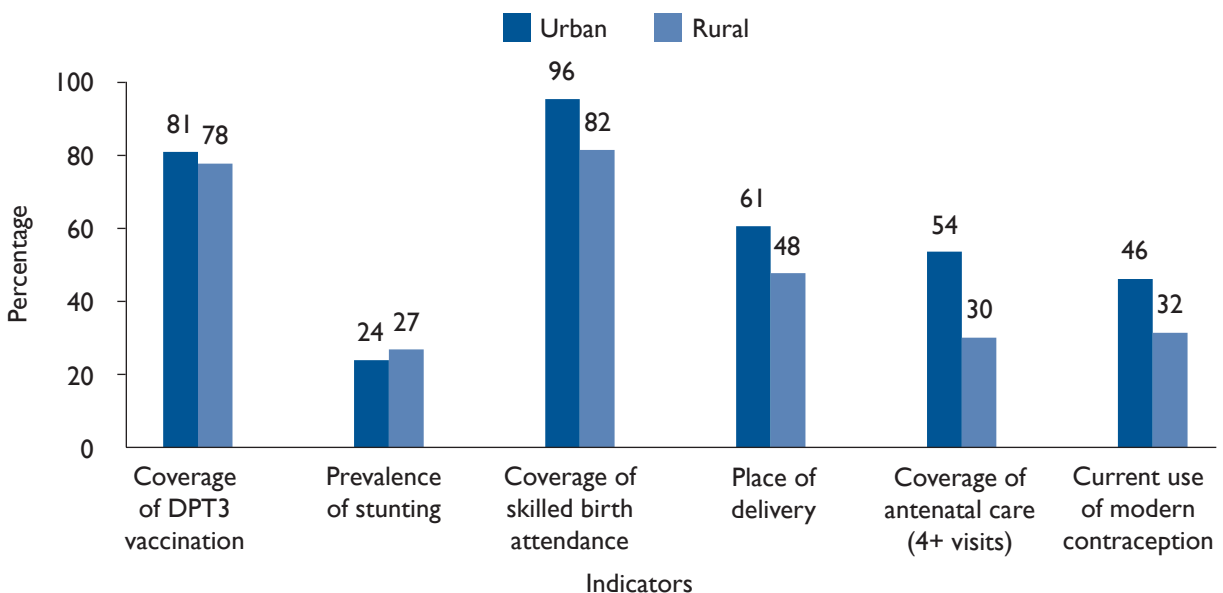
**Fig.A2.14.** Selected indicators by wealth quintile, Syrian Arab Republic, 2001

The figure below shows that there are inequities between rural and urban areas, especially with respect to the percentage of women who attended four or more antenatal care visits. For all the indicators, rural residents are worst off.

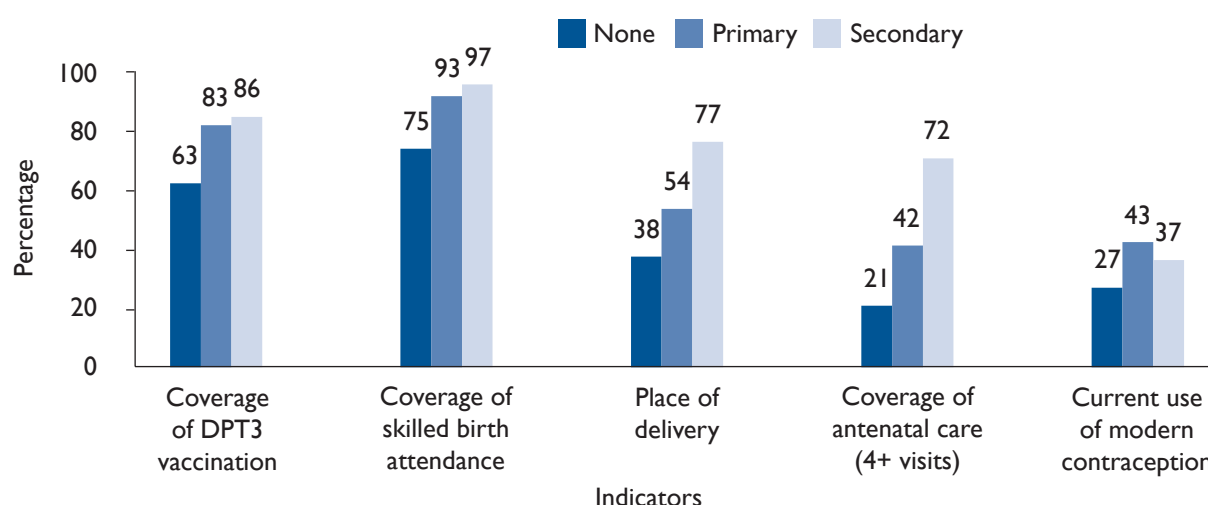
Women living in urban areas are 1.8 times more likely to attend four or more antenatal

care visits than women living in rural areas and 1.5 times more likely to use a modern method of contraception.

The difference between urban and rural areas is slow for the prevalence of stunting and the DPT3 vaccination coverage, where the level of these indicators does not differ much for urban and rural areas.



**Fig.A2.15.** Selected indicators by area, Syrian Arab Republic, 2001



**Fig. A2.16.** Selected indicators by education, Syrian Arab Republic, 2001

Mothers' educational achievement is an important factor associated with inequities in health. For most indicators, increased education levels are associated with better outcomes. 97% of women with a higher education were attended by a skilled professional at delivery compared with 75% of women who had no education. 72% of women with higher education had four or more antenatal care visits compared to only 21% of women with no education.

### Trends in population averages and wealth inequities

Table A2.5 summarizes the trends of health status and health system indicators. The findings indicate improved infant and under-five mortality rates over time. Similarly improvements were evident for delivery by a skilled attendant, delivery in a health facility, the percentage of women who made four or more antenatal care visits and the percentage using contraception. The data on coverage of DPT3 vaccination and prevalence of stunting do not show signs of improvement.

**Table A2.5. Trends in population average and household wealth inequities for selected health and health care indicators, Syrian Arab Republic**

	Population average		Ratio	
	1994–95	2001	1994–95	2001
<b>Health status</b>				
Infant mortality rate	35	17	1.4	2.0
Under-five mortality rate	42	20	1.4	2.2
Stunting in children (%)	25	25	1.6	1.8
<b>Health system</b>				
DPT3 coverage	82	80	1.3	1.1
Delivery by skilled birth attendant	50	89	1.2	1.3
Delivery in a health facility	11	55	0.7	1.8
Coverage of antenatal care (4+ visits)	21	42	2.6	3.2
Contraceptive prevalence rate (all married women)	34	40	3.2	2.3

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

Table A2.6. Changes in inequities and population averages			
		Relative gap	
		Narrowing	Widening
Population average	Improving	B Best outcome DPT3 vaccination coverage Contraceptive prevalence	B IMR/U5MR Stunting Delivery in a health facility Coverage of antenatal care
Worsening		C	D Worst outcome

The different indicators present different patterns in terms of inequity trends over the 6–7 year time period. The relative gap between the rich and the poor worsen for all indicators except for the DPT3 vaccination coverage and contraceptive prevalence rate.

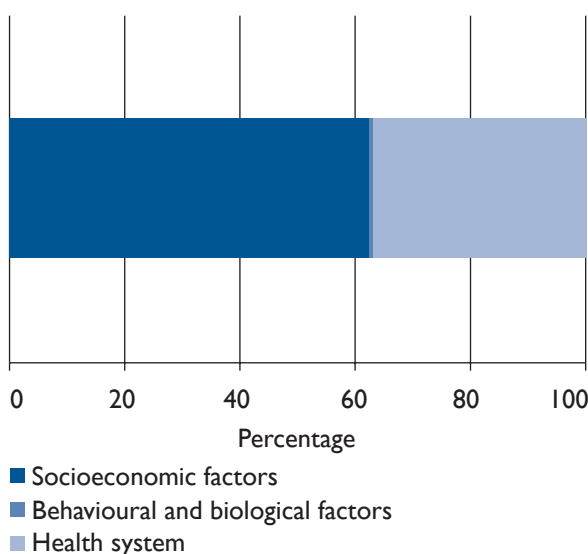
Table A2.6 summarizes trends in both population averages and relative gaps, and whether each is improving or worsening. Four cells, A–D, provide a framework to interpret the results over time, as an input to health policies.

The best outcome cell (cell A) shows that the relative gap—ratio between the richest and the poorest wealth quintiles, narrows, and the population average improves over time. Two indicators fall in this category: DPT3 vaccination coverage and contraceptive prevalence. It is possible to see a widening of the relative gap with improving population average (cell B). One reason why this pattern could result is when the richest group improves faster than the poorest group. This is the case for all the other indicators (infant and under-five mortality rates, delivery in a health facility, coverage of antenatal care). A worsening in the population average coupled with a narrowing of the relative gap is also possible (cell C. No indicators exhibit this pattern). The worst outcomes (cell D) are when there is a widening of both the relative gap and a worsening of the population average. No indicators exhibit this pattern.

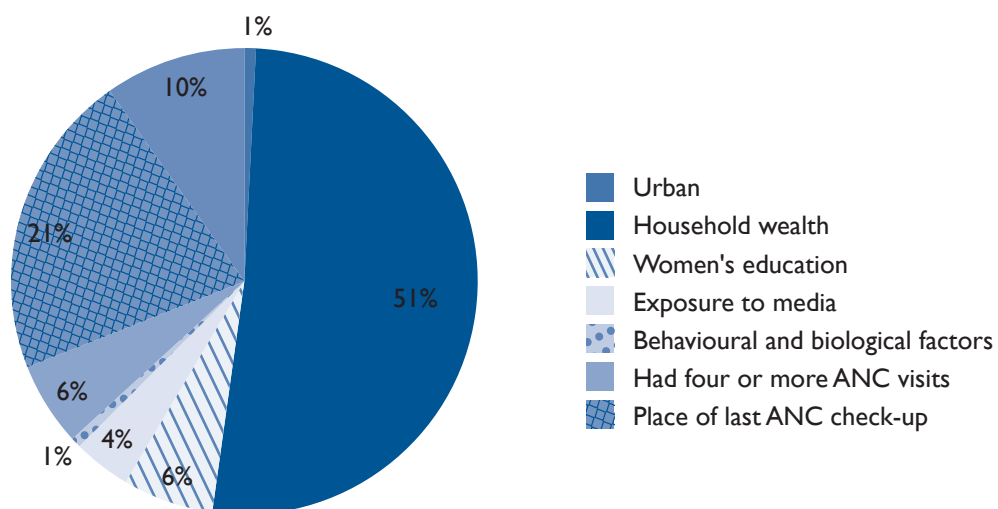
### Main determinants of inequities in skilled birth attendance (Figs.A2.17–A2.18)

In this section the decomposition technique is used to unpack the contribution of factors

to inequities in the 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 Yemen. Health system factors also contribute significantly. The primary determinant of socioeconomic position that contributes to inequities is household wealth, accounting for 51% of the difference. Women’s education account for another 6% of the inequality. The place of antenatal care checkups and the percentage of women having 4 or more visits account for almost three-quarters of the inequalities explained by health system factors.



**Fig.A2.17.** Contribution of broad factors to inequities in skilled birth attendance, Syrian Arab Republic, 2001



**Fig.A2.18.** Major determinants of inequities, Syrian Arab Republic, 2001

## Tunisia

### Indicators analysed

The data sources used in this study are from the PAFAM and PAPCHILD surveys. For Tunisia we use data from the 2001 PAFAM survey and 1994–1995 PAPCHILD survey. Health indicators assessed include infant and under-five mortality rates and prevalence of stunting in children. Health system indicators include coverage of DPT vaccination, coverage by a skilled birth attendant, percentage of women who attended four or more antenatal care visits, percentage of delivery in health facility and current use of modern contraception.

### Results

Data from the 2001 Tunisia Family and Health Survey shows that the poorest quintile experienced twice the under-five mortality and infant mortality rate of the richest quintile. Both the infant and under-five mortality rates show a fairly steady decline across wealth

quintiles (with the exception of the fourth quintile, which shows a different pattern). There is a steady decline in infant and under-five mortality rates by mother’s education. The level of infant and under-five mortality is higher in rural areas than in urban areas and slightly higher for boys than for girls. (See Figs. A2.19–A2.22)

In term of access to health services, the data shows income-related inequities for all the indicators. The coverage of DPT3 vaccination, skilled birth attendance and delivery in a health facility is higher for the richest quintile than for the poorest. The percentage of women using modern methods of contraception does not show a clear correlation with the wealth quintile. We could not calculate the level of stunting as the latest PAFAM data did not contain information on anthropometrics.

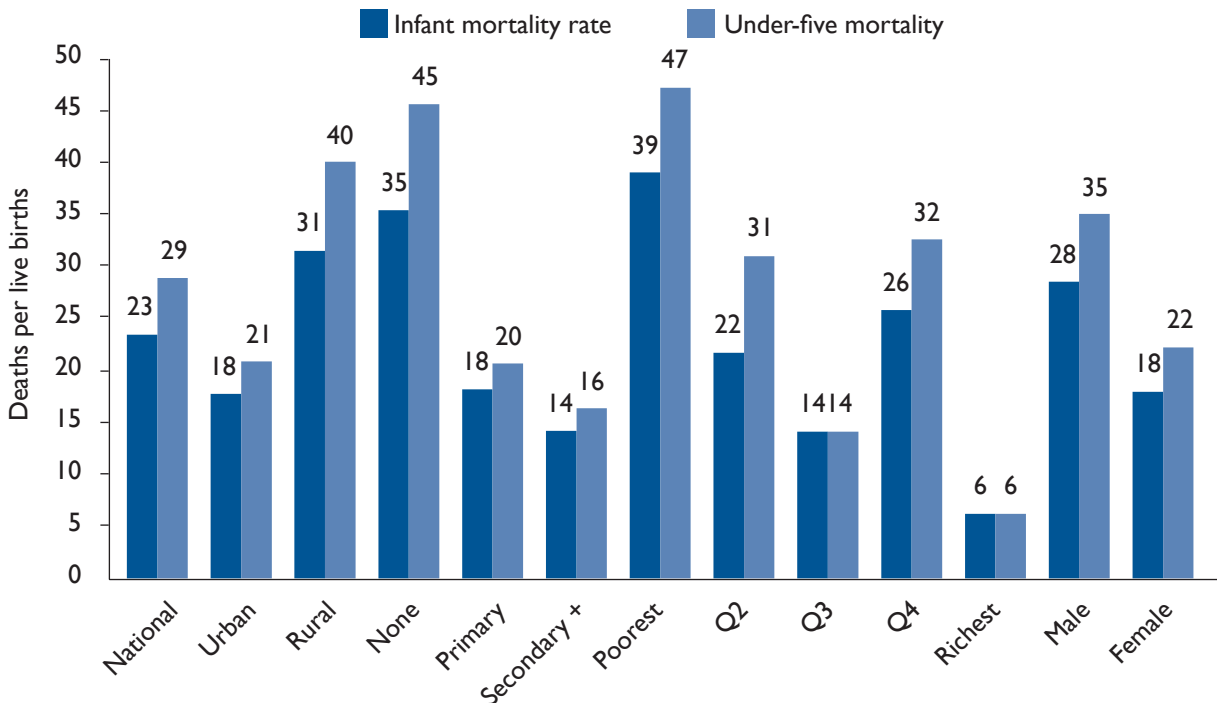
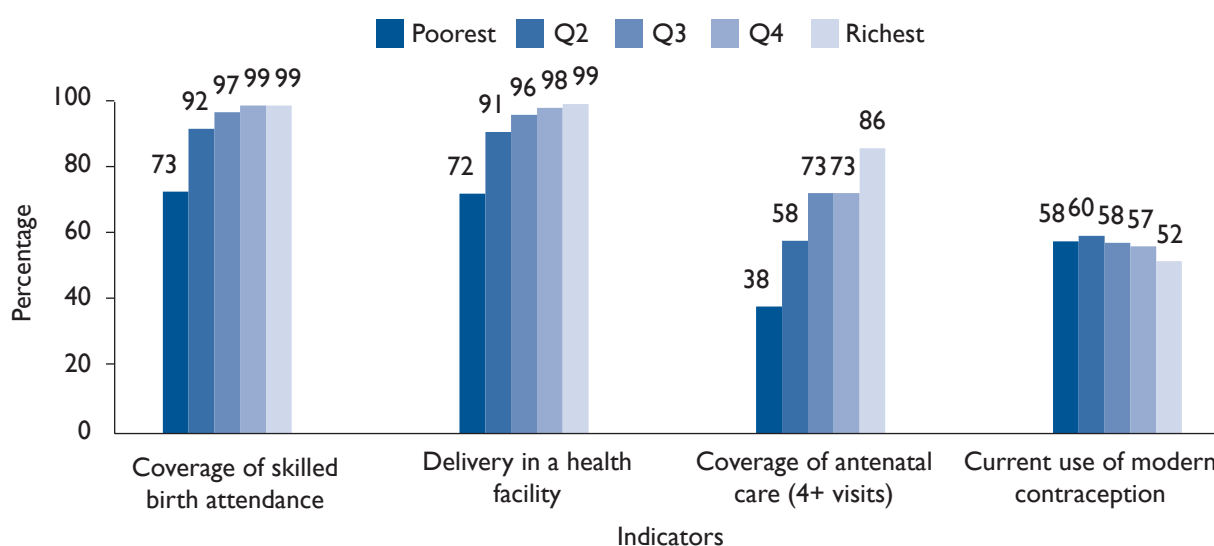


Fig. A2.19 Infant and under-five mortality by stratifier, Tunisia, 2001

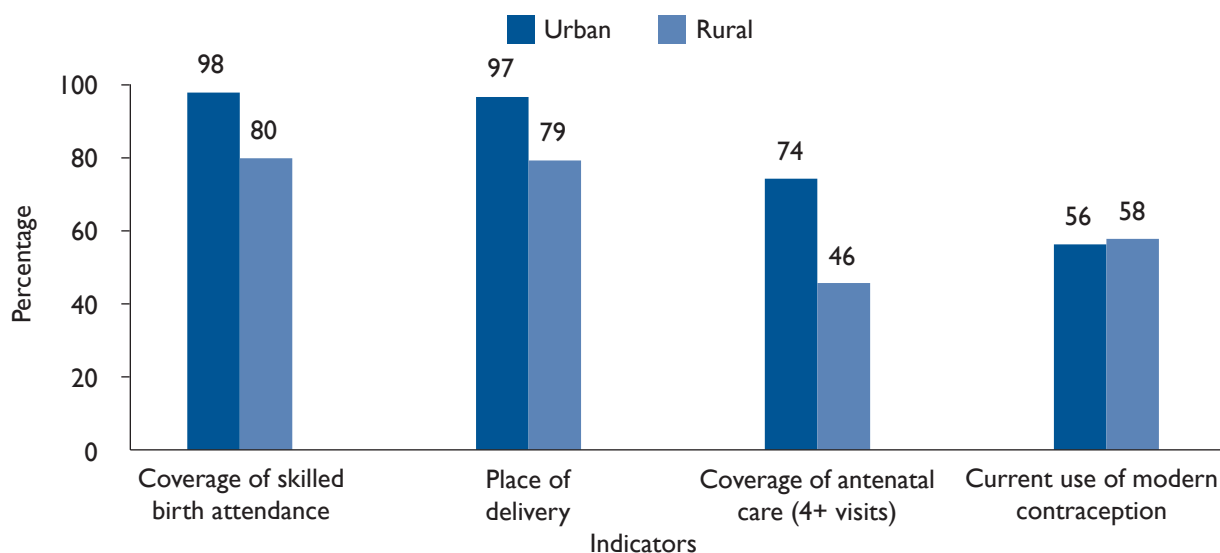


**Fig.A2.20.** Selected indicators by wealth quintile, Tunisia, 2001

The figure below shows that there is an inequity between rural and urban areas, especially with respect to the percentage of women who attended four or more antenatal care visits. For all the indicators, rural residents are worst off.

Women living in urban areas are 1.6 times more likely to attend four or more antenatal care visits than women living in rural areas. There is a small difference between urban and rural in percentage of women using contraception in favour of rural women.

Mothers' educational achievement is an important factor associated with inequities in health. For most indicators, increased education levels are associated with better outcomes. Almost all women with a higher education were attended by a skilled professional at delivery compared with 79% of women who had no education. 72% of women with higher education had four or more antenatal care visits compared to only 45% of women with no education.



**Fig.A2.21.** Selected indicators by area, Tunisia, 2001

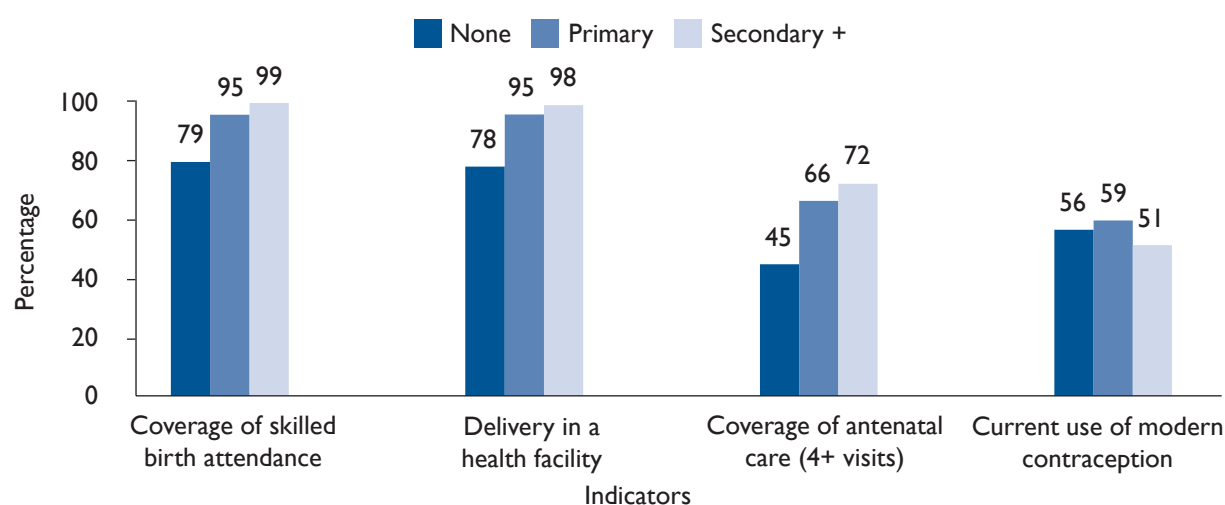


Fig. A2.22. Selected indicators by education, Tunisia, 2001

### Trends in population averages and wealth inequities

Table A2.7 summarizes the trends of health status and health systems indicators. The findings indicate improved infant and under-five mortality rates over time. Similarly improvements were evident for all the health system indicators.

The different indicators present different patterns in terms of inequity trends over

the 6–7 year time period. The relative gap between the rich and the poor worsen for all indicators except for coverage of antenatal care and contraceptive prevalence rate.

Table A2.8 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 an input to health policies.

Table A2.7. Trends in population average and household wealth inequities for selected health and health care indicators, Tunisia

	Population average		Ratio	
	1994–95	2001	1994–95	2001
<b>Health status</b>				
Infant mortality rate	35	23	3.5	6.3
Under-five mortality rate	44	29	3.3	7.6
<b>Health system</b>				
<b>Delivery by skilled birth attendant</b>	46	91	1.1	1.4
Delivery in a health facility	46	90	1.1	1.4
Coverage of antenatal care (4+ visits)	21	64	2.3	2.2
Contraceptive prevalence rate (all married women)	55	57	1.1	0.9

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



**Table A2.8. Changes in inequities and population averages**

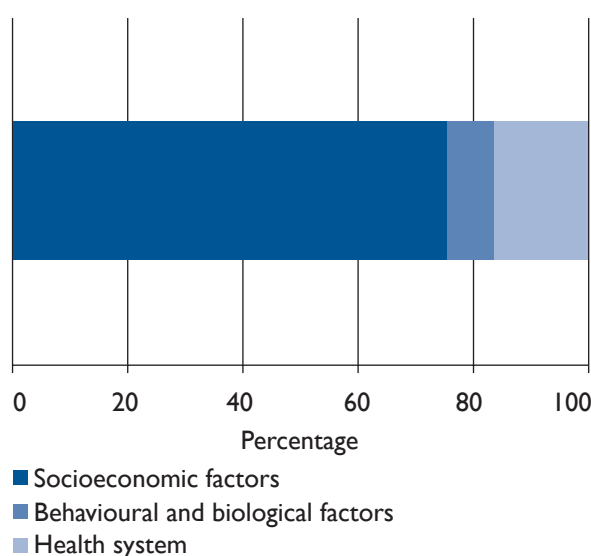
		Relative gap	
		Narrowing	Widening
Population average	Improving	A Best outcome Coverage of antenatal care (4+ visits) Contraceptive prevalence	B IMR/U5MR Delivery by a skilled birth attendant Delivery in a health facility
	Worsening	C	D Worst outcome

The best outcome cell (cell A) shows that the relative gap—ratio between the richest and the poorest wealth quintiles, narrows and the population average improves over time. Two indicators fall in this category: coverage of antenatal care and contraceptive prevalence. It is possible to see a widening of the relative gap with improving population average (cell B). One reason why this pattern could result is when the richest group improves faster than the poorest group. This is the case for all the other indicators (infant and under-five mortality rates, delivery by a skilled attendant, delivery in a health facility). 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 outcomes (cell D) are when there is a widening of both the relative gap and a worsening of the population average. No indicators exhibit this pattern.

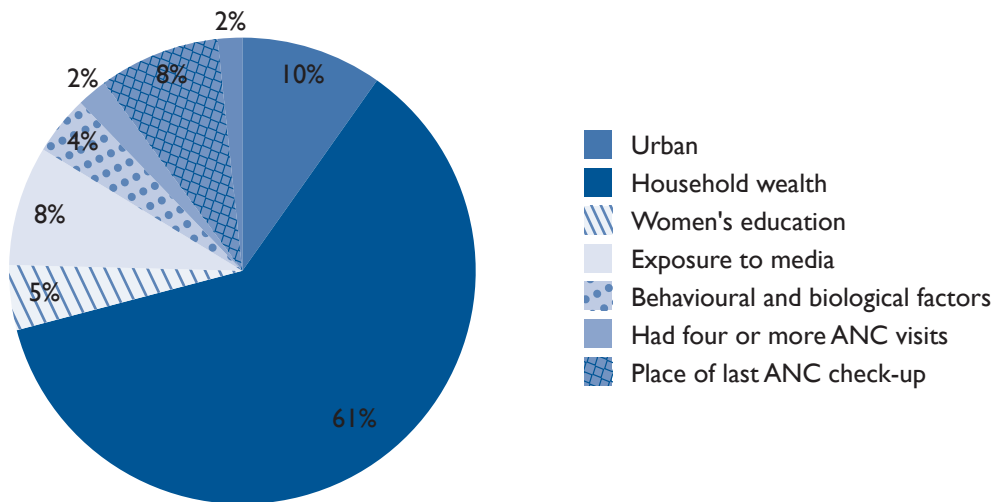
### Main determinants of inequities in skilled birth attendance (Figs.A2.23–A2.24)

In this section the decomposition technique is used to unpack the contribution of factors to inequities in the 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 almost three quarters of the inequities in skilled birth attendance in Tunisia. Health system factors also contribute significantly (around 16%). The primary determinant of socioeconomic position that contributes to inequities is household wealth, accounting for 61% of the difference. Women's education accounts for another 5% of the inequality. Quality of care, the place of antenatal care checkups and the percentage of women having four or more visits explain most of the inequalities in health system factors.



**Fig. A2.23.** Contribution of broad factors to inequities in skilled birth attendance, Tunisia, 2001



**Fig. A2.24.** Major determinants of inequities, Tunisia, 2001

## Yemen

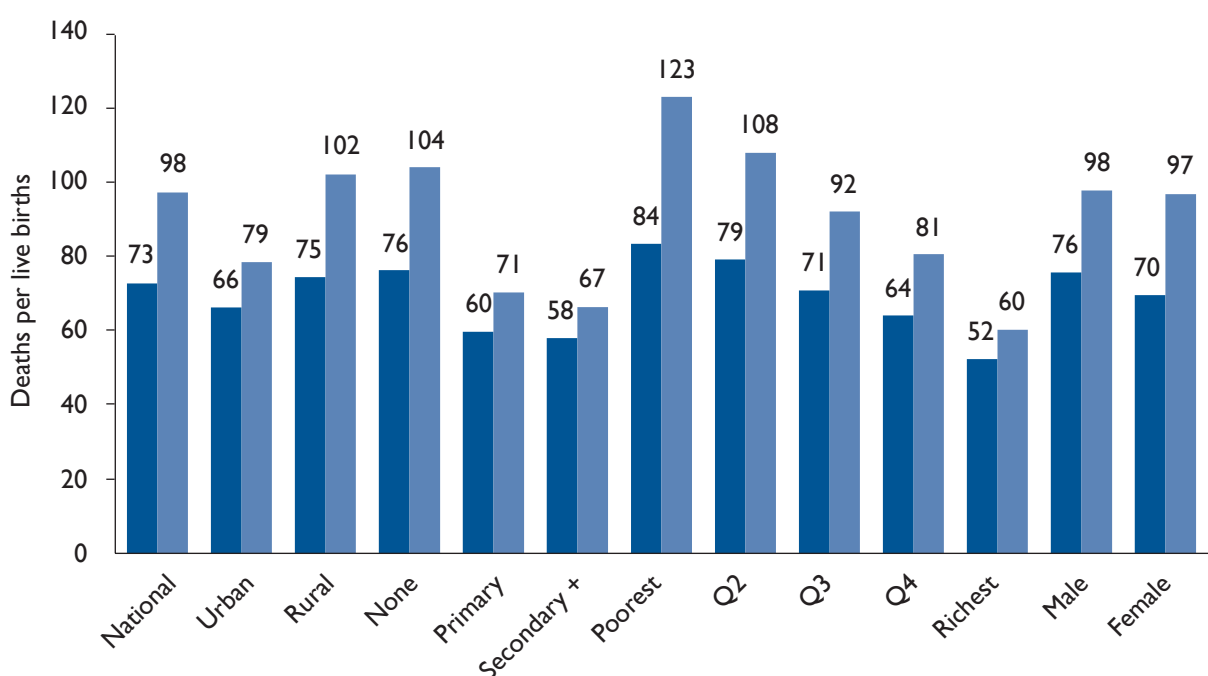
The data sources used in this study are from the PAPFAM and PAPCHILD surveys. For Yemen we use data from the 2003 PAPFAM survey and 1991–1992 PAPCHILD survey. Health indicators assessed include infant and under-five mortality and prevalence of stunting in children. Health system indicators include coverage of DPT vaccination, coverage of skilled birth attendance, percentage of women who attended four or more antenatal care visits, percentage of delivery in health facility and current use of modern contraception.

## Indicators analysed

### Results

Data from the 2003 Yemen Family and Health Survey shows that the poorest quintile experienced twice the under-five mortality and 1.6 times the infant mortality rate of the richest quintile. Both the infant and under-five mortality rates show a steady decline across wealth quintiles. Similarly, there is a steady decline in infant and under-five mortality rates by mother's education. The level of infant and under-five mortality is higher in rural than in urban areas and slightly higher for boys than for girls. (See Figs. A2.25–A2.28)

In terms of access to health service, the data show income-related inequities for all the indicators. The coverage of DPT3 vaccination, skilled birth attendance and delivery in a health facility is higher for the richest quintile than for the poorest. Similarly, the level of stunting is lower for the richest quintile and higher for the poorest quintile.



**Fig. A2.25.** Infant and under-five mortality by stratifier, Yemen, 2003

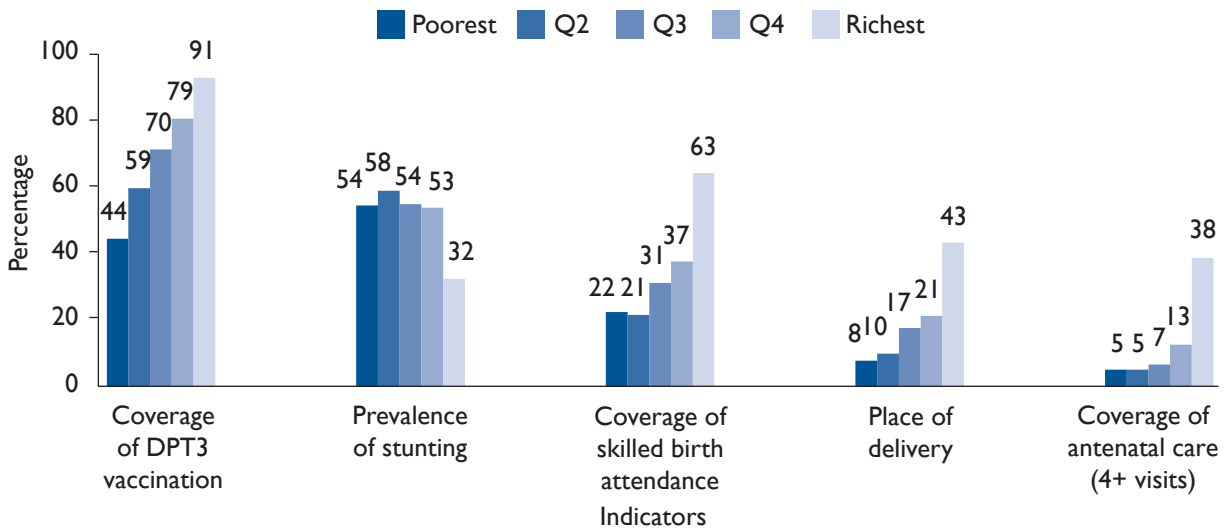


Fig. A2.26. Selected indicators by wealth quintile, Yemen, 2003

The figure below shows that there are inequities between rural and urban areas, especially with respect to skilled birth attendance, delivery in a health facility and percentage of women who attended four or more antenatal care visits. For all the indicators, rural residents are worst off.

Women living in urban areas are four times more likely to attend four or more antenatal care visits than women living in rural areas and 2.8 times more likely to use a modern method of contraception.

Children in rural areas are 1.4 times more likely to be stunted than children living in urban areas.

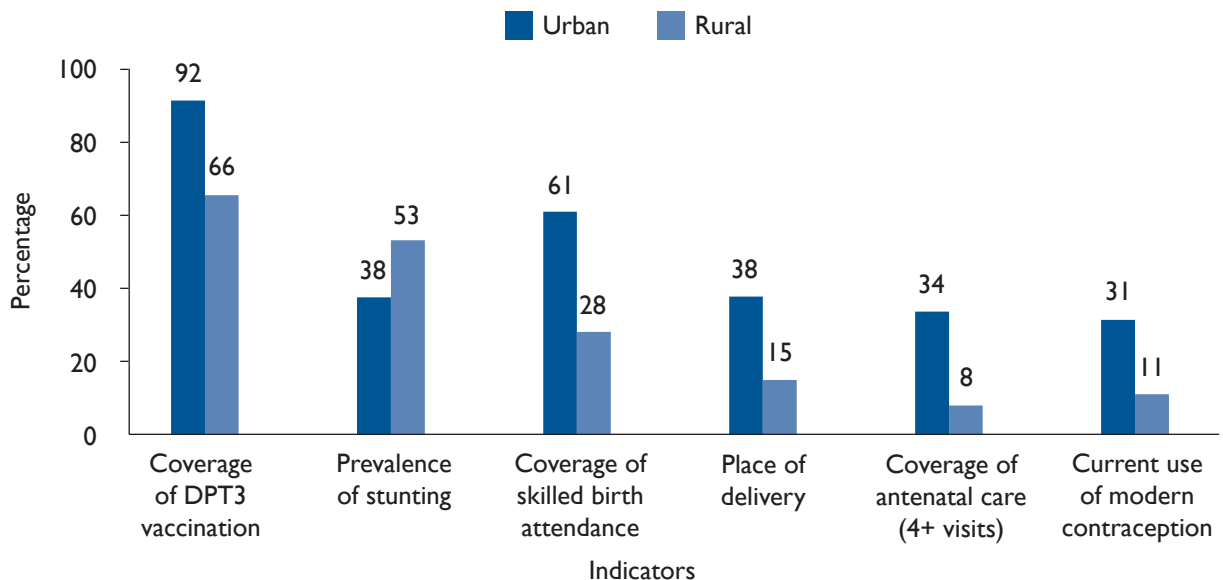
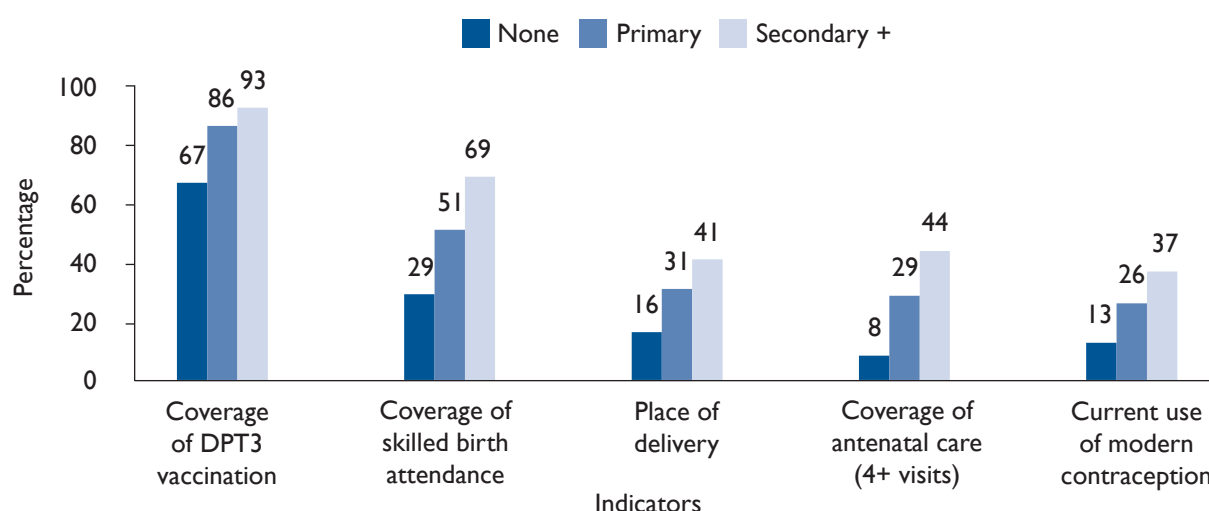


Fig. A2.27. Selected indicators by area, Yemen, 2003

Fig. A2.28 shows the five selected indicators by education achievement of the mother.



**Fig. A2.28.** Selected indicators by education, Yemen, 2003

Mothers' educational achievement is an important factor associated with inequities in health. For most indicators, increased education levels are associated with better outcomes. 69% of women with a higher education were attended by a skilled professional at delivery compared with only 29% of women who had no education. Of women with higher education 44% had four or more antenatal care visits compared to only 8% of women with no education.

### Trends in population averages and wealth inequities

Table A2.9 summarizes the trends of health status and health system indicators. The findings indicate improved infant and under-five mortality rates over time. Similarly improvements were evident for delivery by a skilled attendance, delivery in a health facility, the percentage of women who received four or more antenatal care visits and the percentage using contraception. The data on coverage of DPT vaccination show a sign of deterioration, however, the indicators were measured slightly differently in the questionnaire of the two surveys.

**Table A2.9.** Trends in population average and household wealth inequities for selected health and health care indicators, Yemen

	Population average		Ratio	
	1991–92	2003	1991–92	2003
<b>Health status</b>				
Infant and under-five mortality rates	81	73	1.6	1.6
Under-five mortality rates	116	98	1.7	2.0
Stunting in children (%)	43	48	1.4	1.7
<b>Health system</b>				
DPT3 coverage	81	73	1.3	2.1
Delivery by skilled birth attendance	14	35	4.7	2.9
Delivery in a health facility	10	20	6.1	5.5
Coverage of antenatal care (4+ visits)	7.6	14	10	7.5
Contraceptive prevalence rate (all married women)	8	16	11	16.9

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

**Table A2.10. Changes in inequities and population averages**

		Relative gap	
		Narrowing	Widening
Population average	Improving	A Best outcome Coverage of skilled birth attendance Delivery in a health facility Coverage of ANC 4+	B Under-five mortality DPT3 coverage Contraceptive prevalence rate
	Worsening	C	D Worst outcome - Stunting

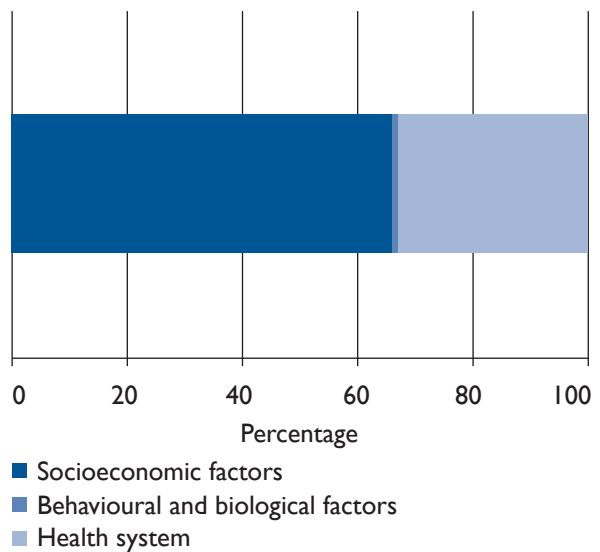
The different indicators present different patterns in terms of inequity trends over the nine-year time period. The relative gap in under-five mortality rate, DPT3 coverage, the contraceptive use and in stunting increase, while for the coverage of skilled birth attendance, delivery in a health facility and coverage of four or more antenatal care visits, the gap narrowed over time.

Table A2.10 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 input to health policies.

The best outcome cell (cell A) shows that the relative gap—ratio between the richest and the poorest wealth quintiles, narrows, and the population average improves over time. Three indicators fall in this category: the coverage of skilled birth attendance, delivery in a health facility and coverage of four or more antenatal care visits. It is possible to see a widening of the relative gap with improving population average (cell B). One reason why this pattern could result is when the richest group improves faster than the poorest group. This is the case for under-five mortality rate, DPT vaccination coverage and contraceptive prevalence. 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 outcomes (cell D) are when there is a widening of both the relative gap and a worsening of the population average. The percentage of stunting shows exactly this pattern.

**Main determinants of inequities in skilled birth attendance (Figs A2.29–A2.30)**

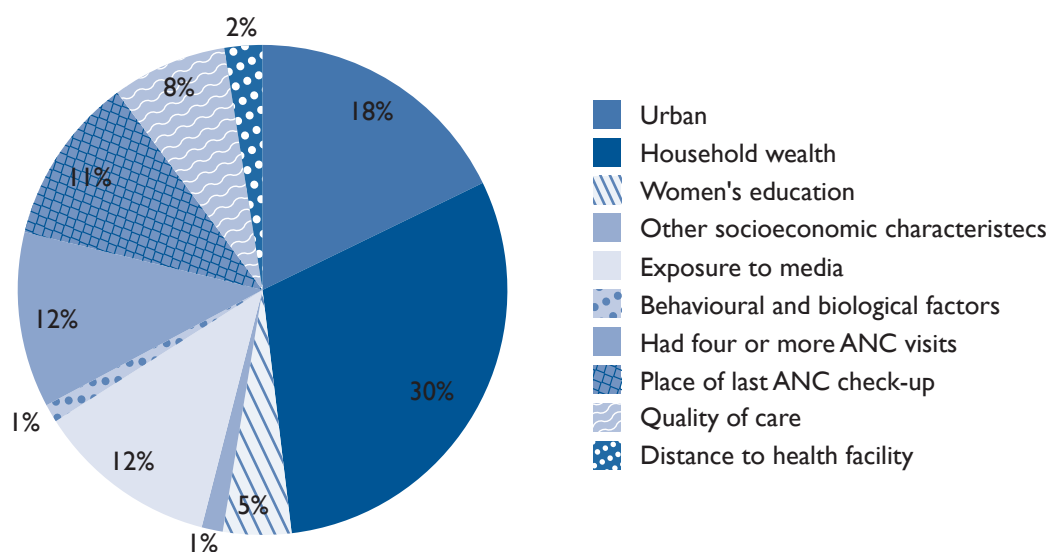
In this section the decomposition technique is used to unpack the contribution of factors to inequities in coverage of skilled birth attendance (rather than the national average). This exercise provides a useful lens to consider areas for potential improvement that would specifically reduce inequities. 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 Yemen. Health system factors also contribute significantly. The primary determinant of socioeconomic position that contributes to inequities is household wealth, accounting for 27% of the difference. Urban residence contributes for another 18%. The



**Fig. A2.29.** Contribution of broad factors to inequities in skilled birth attendance, Yemen, 2003

place of antenatal care checkups and the percentage of women having four or more

visits account for almost three quarters of the inequalities explained by health system factors.



**Fig. A2.30.** Major determinants of inequities, Yemen, 2003

### Annex 3. Statistical annex: inequities in health determinants and outcomes by equity stratifier

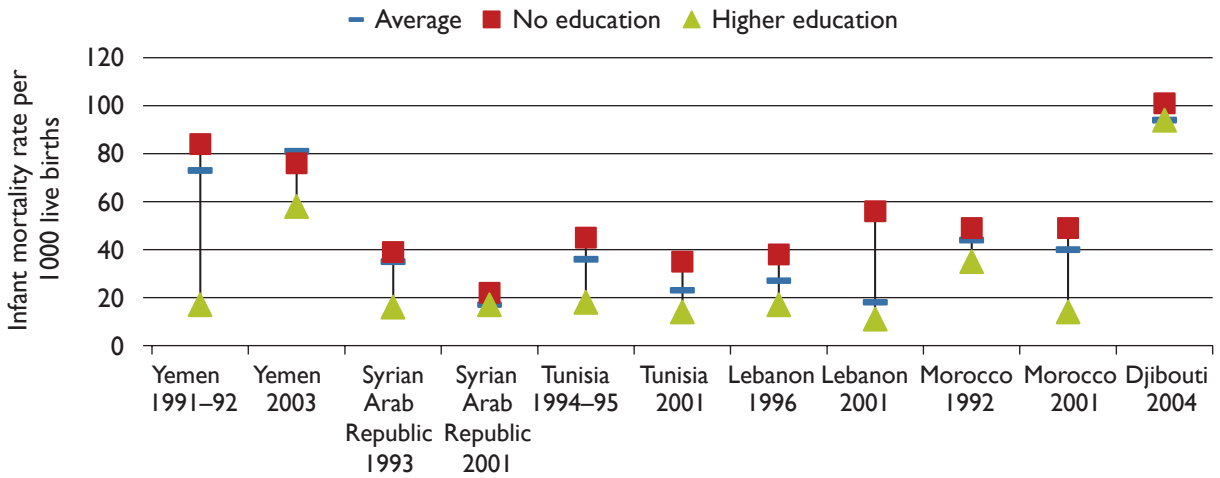


Fig.A3.1 Inequities in infant mortality rate by mother's education by country

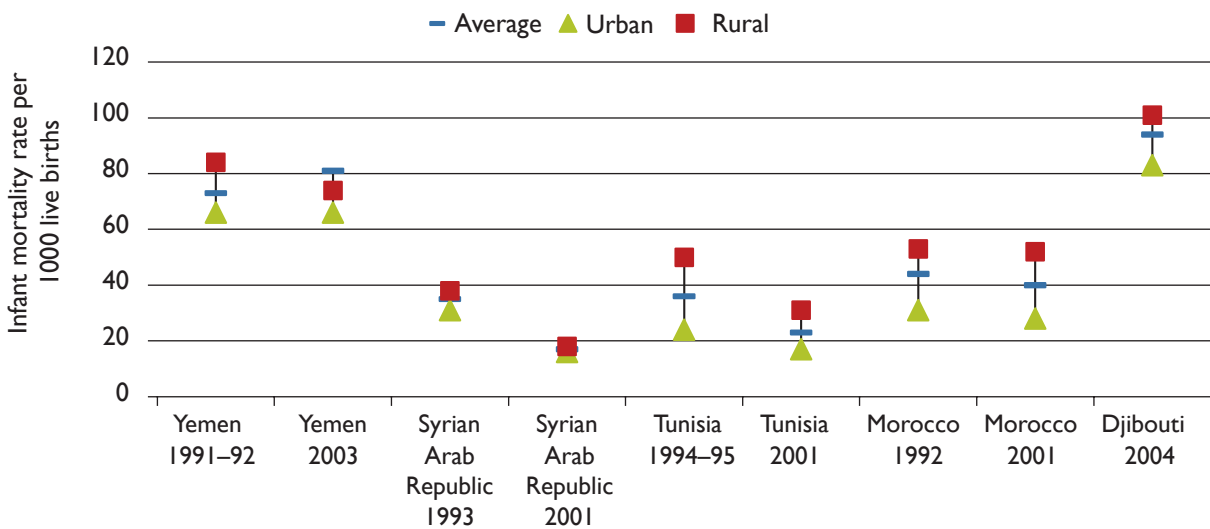
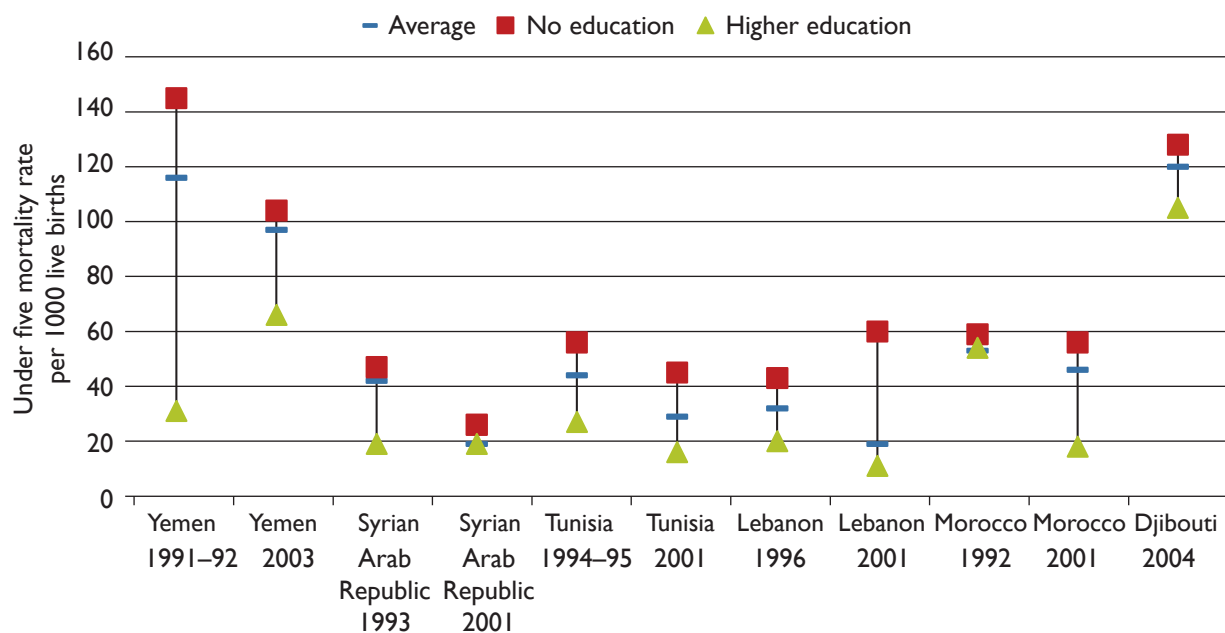
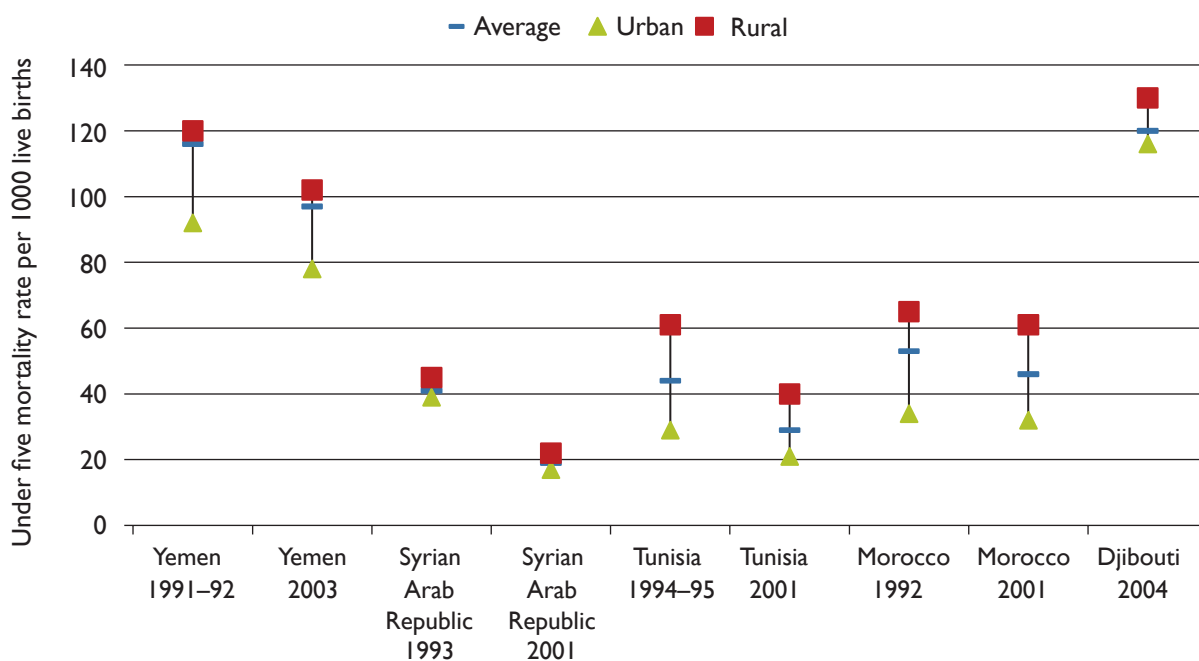


Fig.A3.2 Inequities in infant mortality rate by urban/rural residence by country

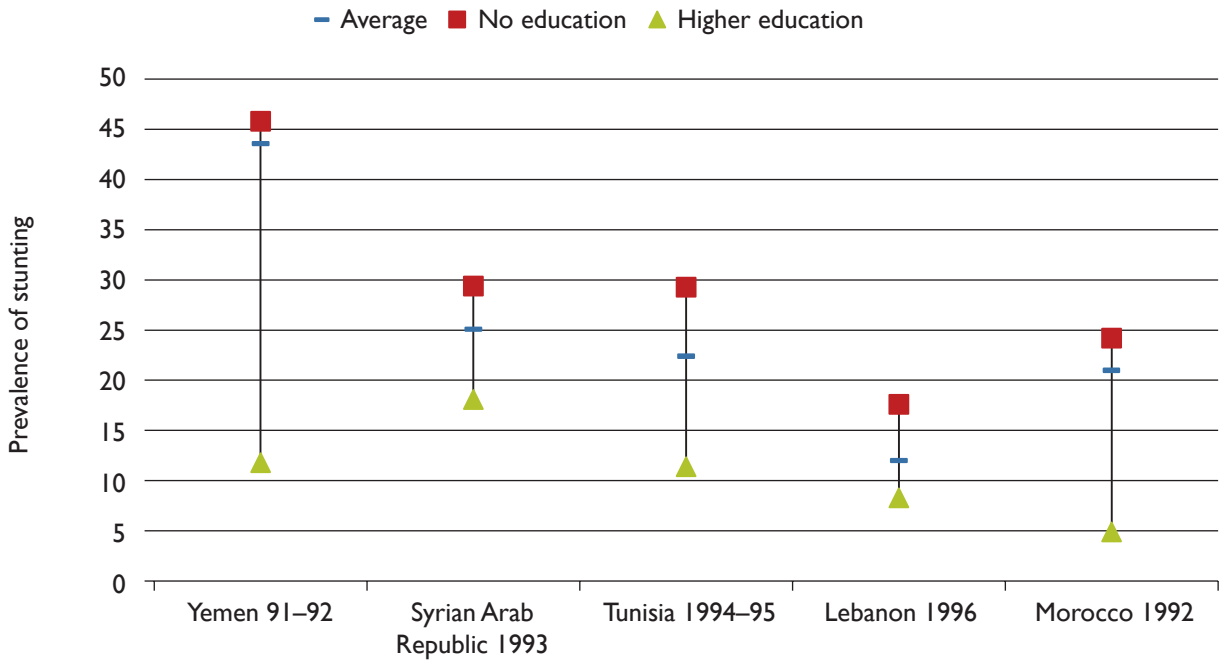




**Fig.A3.3** Inequities in under-five mortality rate by mother's education by country

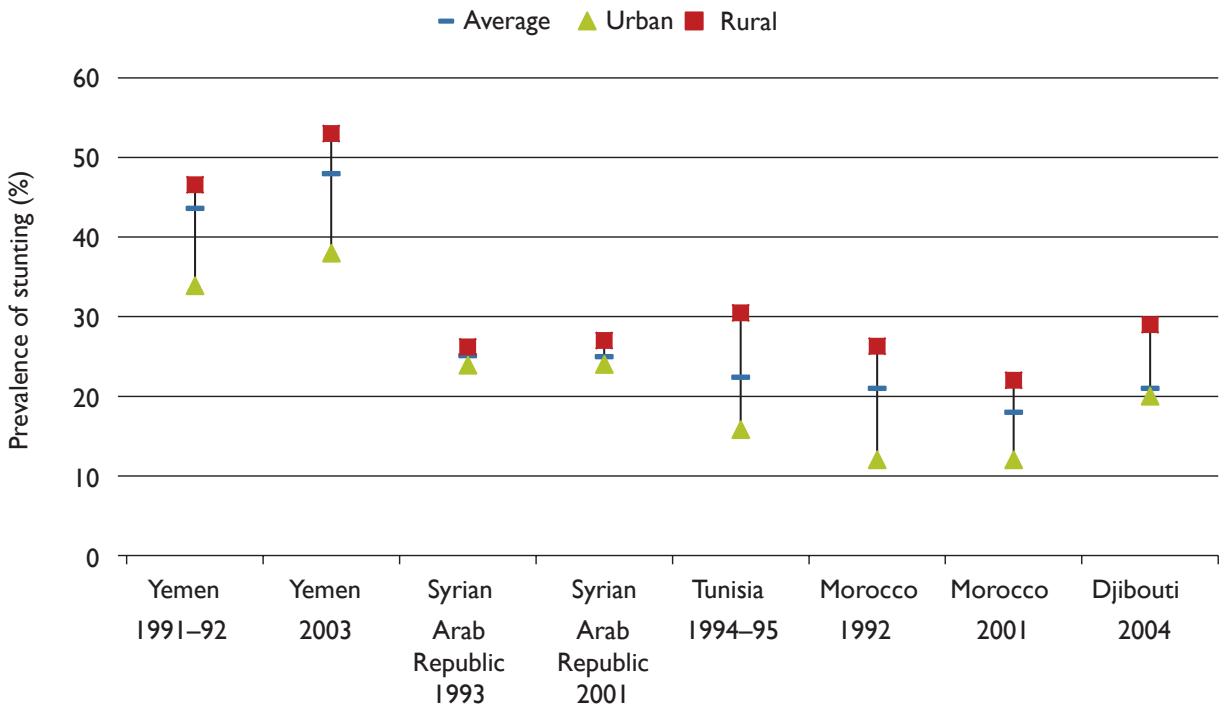


**Fig.A3.4** Inequities in under-five mortality rate by urban/rural residence by country

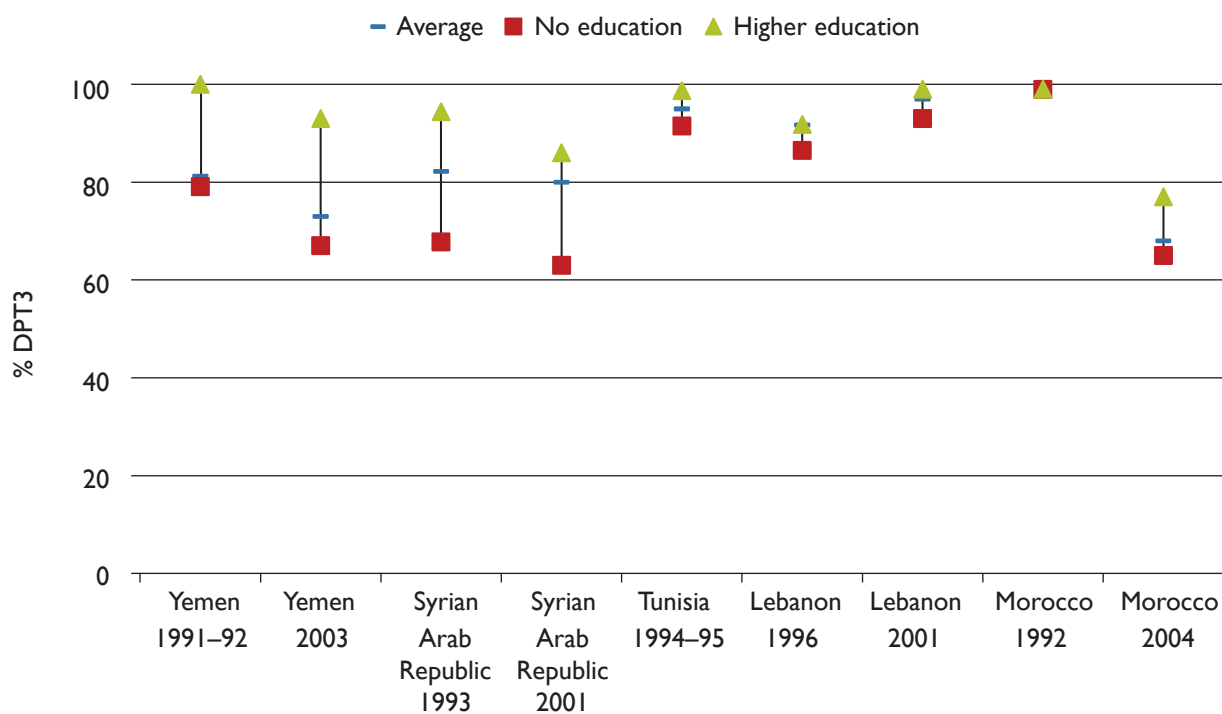


**Fig.A3.5** Inequities in prevalence of children stunting by mother's education by country

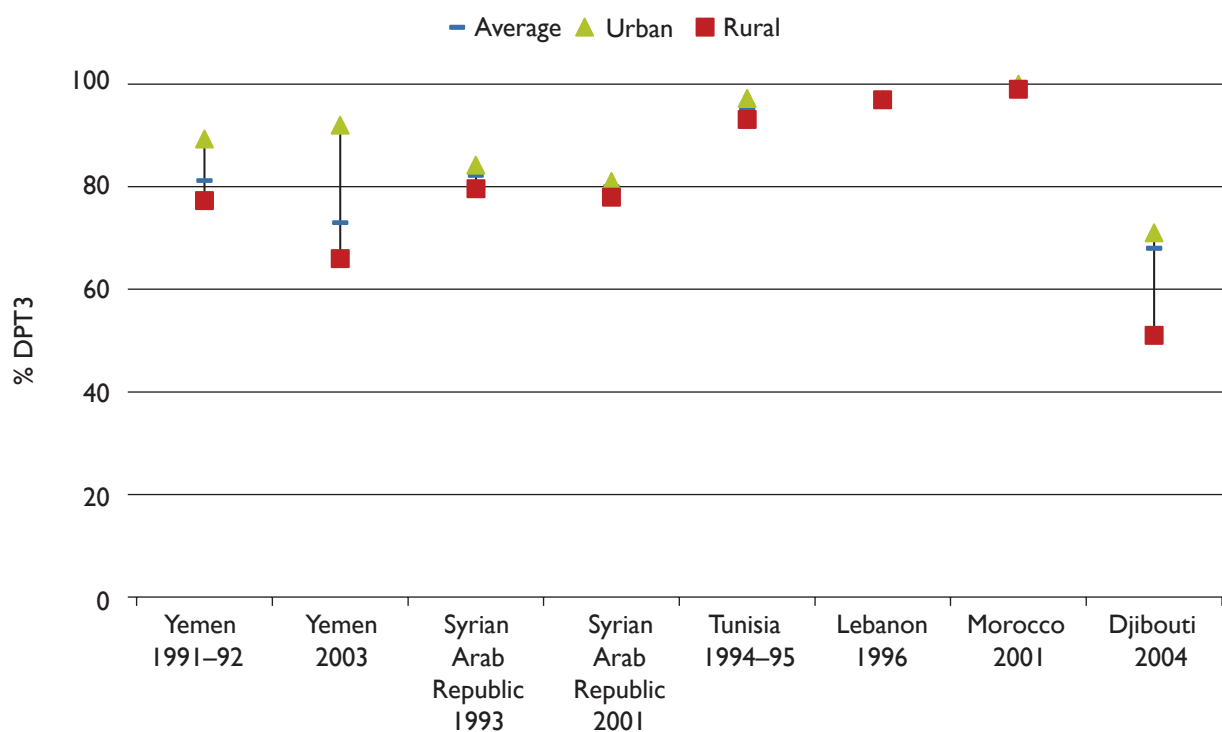
Note: it was not possible to link mother's education for children in PAFAM data.



**Fig.A3.6** Inequities in prevalence of children stunting by urban/rural residence by country



**Fig.A3.7** Inequities in DPT3 vaccination by mother's education by country



**Fig.A3.8** Inequities in DPT3 vaccination by urban/rural residence by country

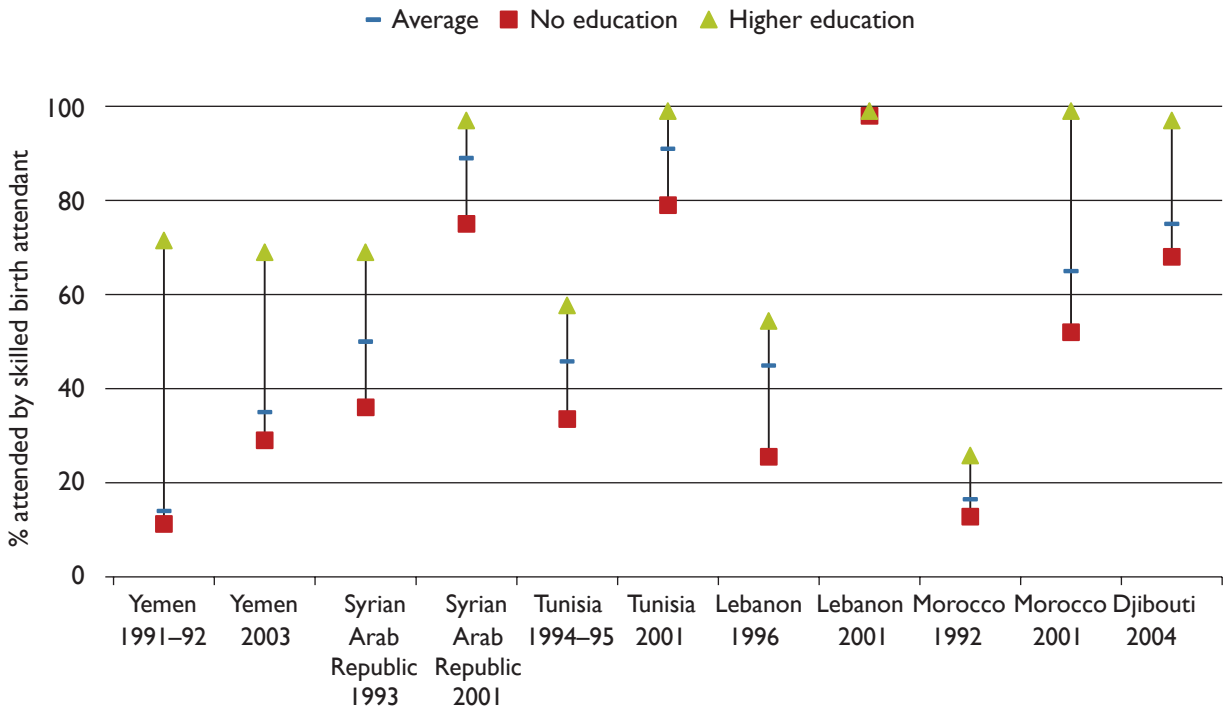


Fig.A3.9 Inequities in skilled birth attendance by mother's education by country

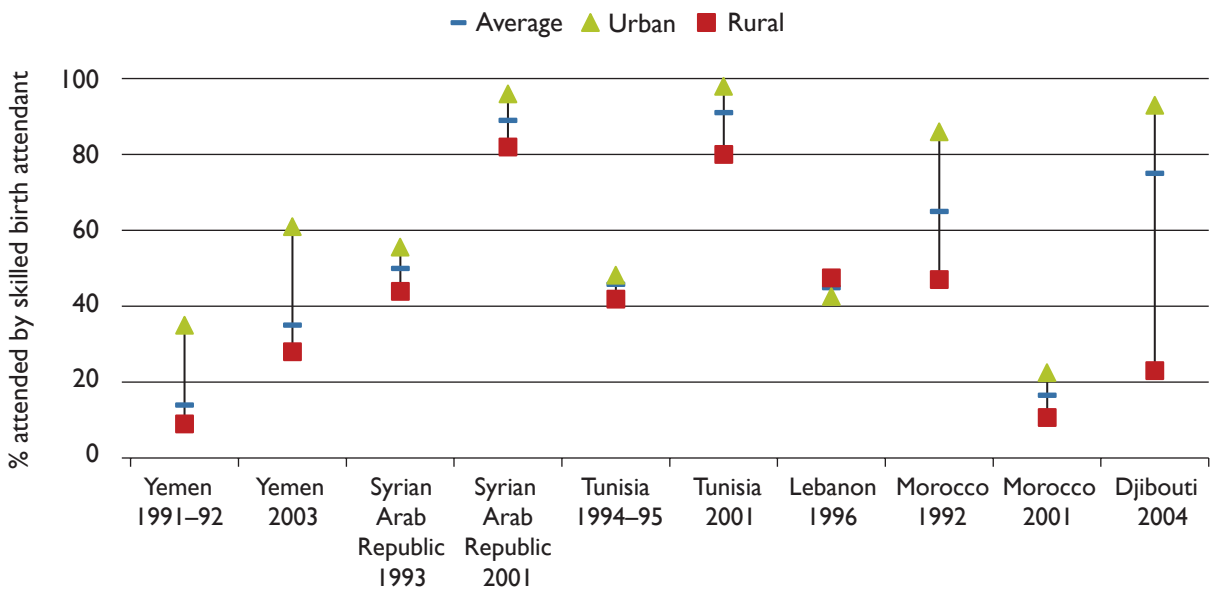
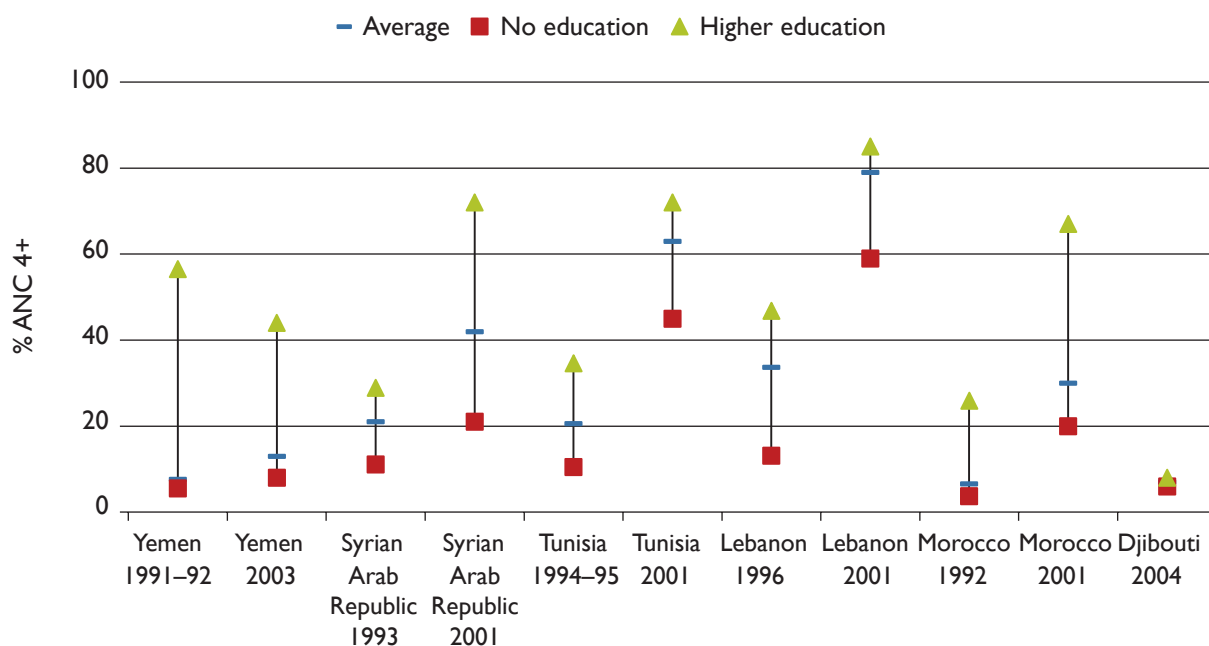
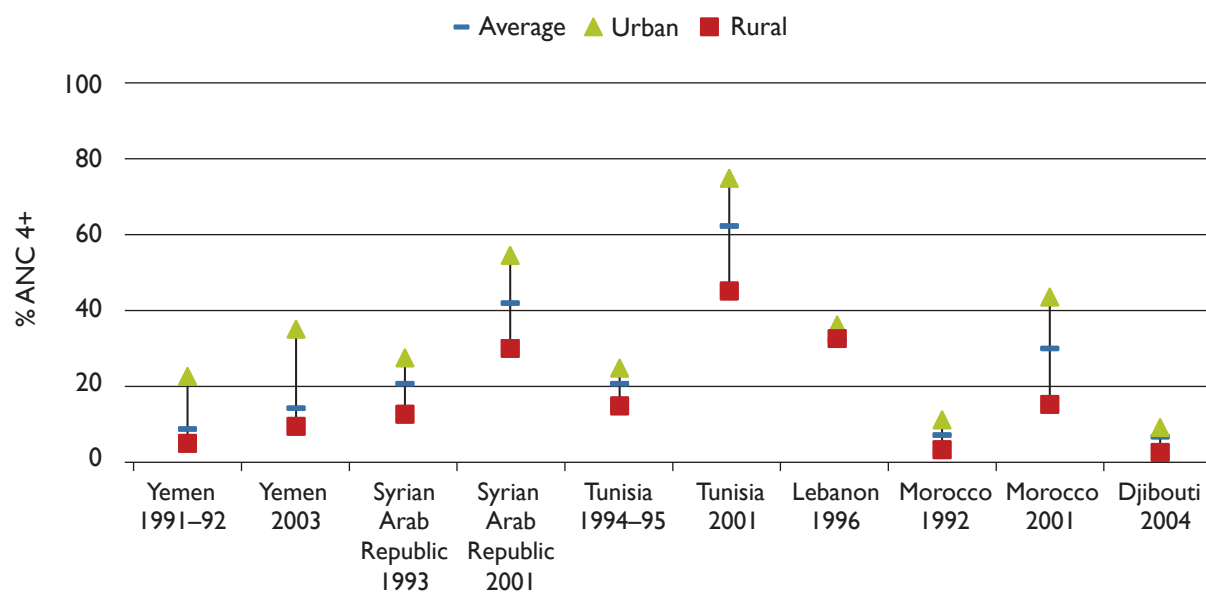


Fig.A3.10 Inequities in skilled birth attendance by urban/rural residence by country



**Fig.A3.11** Inequities in coverage ANC 4+ by mother's education residence by country



**Fig.A3.12** Inequities in coverage ANC 4+ by urban/rural residence by country

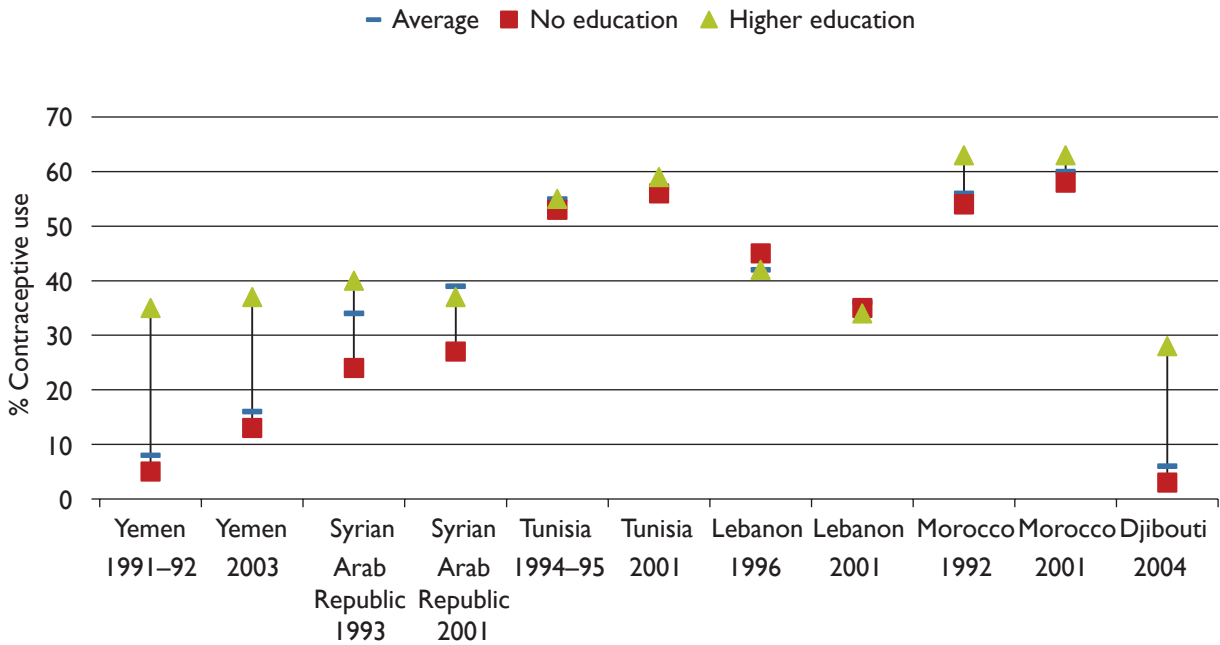


Fig.A3.13 Inequities in use of modern contraception by mother's education by country

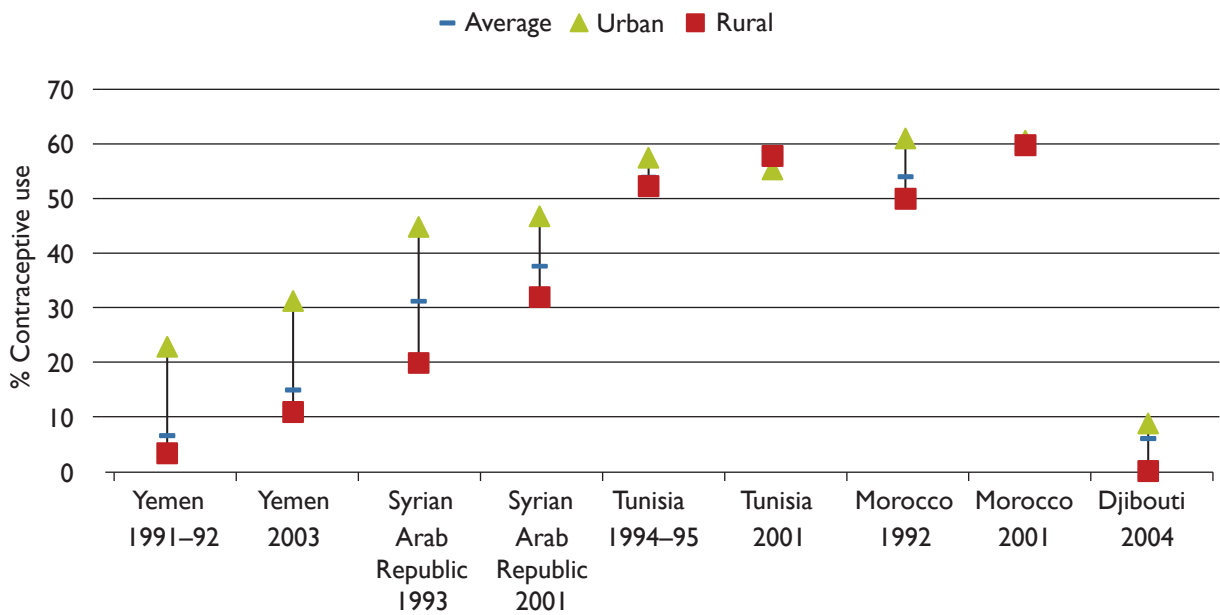


Fig.A3.14 Inequities in use of modern contraception by urban/rural residence by country

**Table A3.1 Decomposition of inequalities in access to skilled birth attendance at delivery in Yemen**

Determinant	Marginal effect	Weighted proportion	Concentration index C	Deterministic contribution C: 0.222	Unadjusted percentage contribution	Adjusted percentage contribution
<b>Socioeconomic context</b>						
Urban	0.133***	0.219	0.528	0.044	18.4	17.8
Quintile 2	-0.013	0.196	-0.437	0.003	1.3	1.3
Quintile 3	0.065*	0.207	-0.034	-0.001	-0.5	
Quintile 4	0.043	0.213	0.386	0.010	4.3	4.1
Quintile 5	0.134***	0.200	0.799	0.061	25.7	24.9
Primary	0.026	0.176	0.376	0.005	2.0	2.0
Secondary +	0.079*	0.048	0.584	0.006	2.6	2.6
Female household head	0.053	1.030	0.003	0.000	0.2	0.2
Husband's years of education	0.000	2.851	0.126	0.000	0.1	0.1
Woman working	-0.107**	0.053	-0.175	0.003	1.2	1.1
Read news	0.017	0.191	0.487	0.005	1.9	1.8
Listen to radio	-0.009	0.449	0.117	-0.001	-0.6	
Watch television	0.052**	0.383	0.440	0.025	10.4	10.1
<b>Behavioural and biological factors</b>						<b>66.0</b>
Maternal age at birth	0.020	2.371	-0.006	-0.001	-0.3	
Parity	-0.004	5.929	-0.0393	0.003	1.2	1.2
<b>Health system</b>						<b>1.2</b>
Had four or more ANC visits	0.172***	0.135	0.435	0.029	12.0	11.6
ANC in public health centre	-0.050*	0.075	0.103	-0.001	-0.5	0.0
ANC in private health facility	-0.027	0.146	0.288	-0.003	-1.4	0.0
ANC at home	-0.124**	0.593	-0.13	0.027	11.4	11.1
Quality of care index = medium	0.074***	0.312	0.048	0.003	1.3	1.3
Quality of care index = high	0.094***	0.196	0.295	0.015	6.5	6.3
Hospital more than an hour away	-0.027	0.578	-0.14	0.006	2.6	2.5
Constant	-0.296***			0.238	100.0	<b>32.8</b>
<b>Skilled birth attendant concentration index</b>	0.222					

**Table A3.2 Decomposition of inequalities in access to skilled birth attendance at delivery in Syrian Arab Republic**

Determinant	Marginal effect	Weighted proportion	Concentration index	Deterministic contribution C 0.05 I	Unadjusted percentage	Adjusted percentage contribution
<b>Socioeconomic context</b>						
Urban	0.033***	0.024	0.267	0.000	0.9	0.8
Quintile 2	0.021**	0.224	-0.292	-0.002	-5.8	
Quintile 3	0.023**	0.206	0.137	0.001	2.8	2.3
Quintile 4-5	0.062***	0.328	0.671	0.015	57.8	49.1
Primary	0.025**	0.587	0.018	0.000	1.1	0.9
Secondary +	0.021	0.177	0.411	0.002	6.3	5.3
Female household head	0.026**	1.030	-0.005	0.000	-0.6	
Husband's years of education	0.001	4.392	-0.007	0.000	-0.1	
Woman working	-0.014	0.006	-0.156	0.000	0.1	0.0
Read news	0.009	0.346	0.283	0.001	3.7	3.2
Listen to radio	-0.007	0.705	0.114	-0.001	-2.3	
Watch television	0.009	0.948	0.025	0.000	0.9	0.8
<b>Behavioural and biological factors</b>						<b>62.5</b>
Maternal age at birth	0.008	2.344	0.0015	0.000	0.1	0.1
Parity	-0.001	4.266	-0.065	0.000	0.7	0.6
<b>Health system</b>						<b>0.6</b>
Had four or more ANC visits	0.018*	0.423	0.214	0.002	6.9	5.8
ANC in public health centre	-0.057*	0.047	-0.128	0.000	1.4	1.2
ANC in private health facility	-0.015*	0.582	0.138	-0.001	-5.0	
ANC at home	-0.077**	0.333	-0.219	0.006	23.5	20.0
Quality of care index = medium	0.014*	0.492	-0.015	0.000	-0.4	
Quality of care index = high	0.042**	0.268	0.244	0.003	11.5	9.8
Hospital more than an hour away	0.011	0.393	-0.191	-0.001	-3.5	
<b>Constant</b>	0.017***			0.027	100.0	<b>36.8</b>
<b>Skilled birth attendant concentration index</b>	0.051					



**Table A3.3 Decomposition of inequalities in access to skilled birth attendance at delivery in Tunisia**

Determinant	Marginal effect	Mean	Concentration index	Deterministic contribution C: 0.057	Unadjusted percentage	Adjusted percentage contribution
<b>Socioeconomic context</b>						
Urban	0.012	0.625	0.268	0.002	10.6	9.8
Quintile 2	0.015*	0.210	-0.315	-0.001	-5.2	
Quintile 3	0.022*	0.211	0.105	0.001	2.6	2.4
Quintile 4	0.068***	0.181	0.496	0.007	32.1	29.9
Quintile 5	0.044**	0.161	0.838	0.006	31.0	28.8
Primary	0.006	0.475	0.064	0.000	0.9	0.8
Secondary +	0.007	0.216	0.505	0.001	3.9	3.6
Female household head	-0.022*	1.018	0.004	0.000	-0.5	
Husband's years of education	0.000	5.426	0.111	0.000	-0.7	
Woman working	-0.001	0.024	0.035	0.000	0.0	0.0
<b>Behavioural and biological factors</b>						<b>75.4</b>
Maternal age at birth	0.013*	2.507	0.002	0.000	0.3	0.3
Parity	-0.006**	3.157	-0.091	0.002	8.6	8.0
<b>Health system</b>						<b>8.3</b>
Had four or more ANC visits	0.009*	0.638	0.140	0.001	4.5	4.1
ANC in private health facility	0.002	0.310	0.377	0.000	1.1	1.0
ANC at home	-0.005	0.081	-0.522	0.000	1.1	1.0
Quality of care index = medium	0.014*	0.191	-0.091	0.000	-1.3	
Quality of care index = high	0.026**	0.717	0.091	0.002	9.1	8.4
Hospital more than an hour away	-0.005	0.201	-0.361	0.000	1.9	1.7
<b>Constant</b>	0.017			0.021	100.0	<b>16.3</b>
						<b>100.0</b>
<b>Skilled birth attendant concentration index</b>	<b>0.057</b>					

**Table A3.4 Decomposition of inequalities in access to skilled birth attendance at delivery in Morocco**

Determinant	Marginal effect	Mean	Concentration index	Deterministic contribution C:0.201	Unadjusted percentage	Adjusted percentage contribution
<b>Socioeconomic context</b>						
Urban	0.147***	0.520	0.375	0.044	17.4	16.6
Quintile 2	0.108***	0.216	-0.289	-0.010	-4.1	
Quintile 3	0.142***	0.192	0.118	0.005	2.0	1.9
Quintile 4	0.190***	0.174	0.485	0.025	9.8	9.3
Quintile 5	0.263***	0.170	0.829	0.057	22.6	21.5
Primary	0.065***	0.288	0.263	0.008	3.0	2.9
Secondary +	0.359***	0.111	0.633	0.039	15.3	14.6
Female household head	-0.015	1.081	0.007	0.000	-0.1	
Husband's years of education	0.000	2.195	0.193	0.000	0.1	0.1
Woman working	-0.103	0.006	0.029	0.000	0.0	0.0
Read news	0.019	0.230	0.476	0.003	1.3	1.2
Listen to radio	0.000	0.619	0.575	0.000	0.0	0.0
Watch television	0.044*	0.809	0.140	0.008	3.0	2.9
<b>Behavioural and biological factors</b>						<b>70.8</b>
Maternal age at birth	0.075***	2.390	0.009	0.002	1.0	0.9
Parity	-0.039***	3.431	-0.102	0.021	8.2	7.8
<b>Health system</b>						<b>8.8</b>
Had more four or more ANC visits	0.089***	0.307	0.291	0.012	4.8	4.6
ANC in public health centre	-0.092	0.324	-0.024	0.001	0.4	0.4
ANC in private health facility	-0.015	0.285	0.346	-0.002	-0.9	0.0
ANC at home	-0.132**	0.326	-0.324	0.021	8.5	8.1
Quality of care index = medium	0.001	0.286	-0.055	0.000	0.0	0.0
Quality of care index = high	0.038	0.420	0.261	0.006	2.6	2.4
Hospital more than an hour away	-0.069**	0.393	-0.313	0.013	5.1	4.9
Constant	-0.064			0.252	100.0	
<b>Skilled birth attendant concentration index</b>						
	0.201					

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*This report aims to assess the extent of health inequities within and across countries of the Eastern Mediterranean Region. It identifies the major factors contributing to these inequities and considers policy implications for countries as a result of the analysis. Analysis is limited to data on health outcomes from six countries representing a wide range of social and economic status – Djibouti, Lebanon, Morocco, Syrian Arab Republic, Tunisia and Yemen. The study also analyses the role of changes in the health system in contributing to widening or narrowing health inequalities and highlights the contribution to health inequities of factors outside the health sector.*