

CHILD HEALTH IN THE ARAB REGION DURING THE 1990s

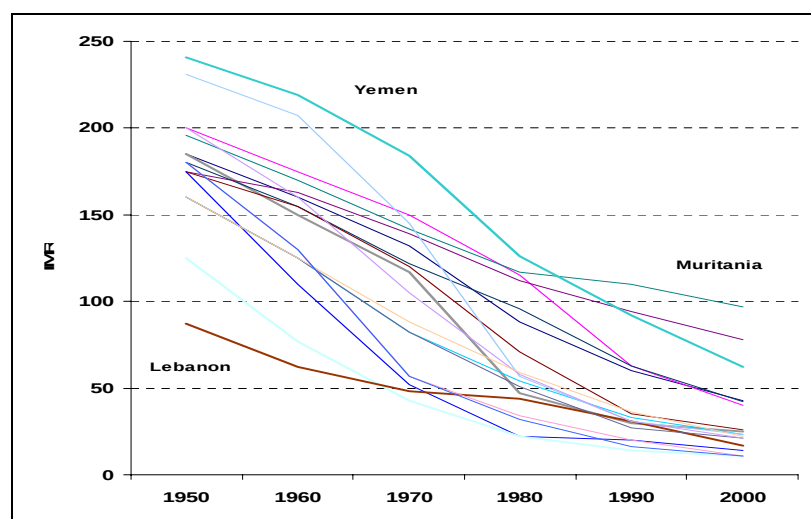
AMERICAN UNIVERSITY OF BEIRUT (AUB*)

Introduction

Arab countries have made considerable progress over the past few decades in improving the health and well being of their people. According to UN estimates, infant mortality rate, which is one of the most widely used indicator of socio-economic development, declined on average from 124 per 1000 live births in 1970 to 44.5 in 2000 (Figure 1). This is an impressive decline of about 64% on average over the course of 30 years, compared to a corresponding decline of 41% for the world, and 44% for less developed countries. Yet, such progress often leads to increased disparities across and within countries. Within Arab countries, issues affecting children's health remains crucial to understanding their well being. In 1986, John Caldwell illustrated that many Arab countries, particularly the wealthy oil-producing Gulf Arab countries, are "poor health achievers" when analyzing infant mortality data in relation to the economic wealth within individual countries (Caldwell 1986). Almost two decades later, these concerns remain relevant as wealth within these Gulf countries increases and the state of children's health remains below international averages representative of their respective income levels. Establishing the state of children's health goes beyond analyzing mortality statistics and should include consideration of factors that measure

deterioration of health such as nutritional status and disease as well as preventative aspects that protect children's health such as immunization and breastfeeding status. This chapter, therefore, examines such factors related to child health in an attempt to build a more comprehensive index for estimating and understanding relative differences in child health within the Arab region. The chapter begins by providing a brief socio-economic background to the region. It then provides a description of the data sources used in the study. The chapter next turns to children's health, providing descriptive results from population-based surveys on child survival, including infant and child mortality, children's nutrition as measured by stunting (height-for-age) and wasting (weight-for-age), morbidity, and preventive care (immunization and breastfeeding). For each of these domains, levels across countries as well as within-country disparities by gender and socio-economic status are described. For socio-economic status, we rely on differentials along residence and maternal education. Maternal education has been extensively used as a component of socioeconomic status in studying child health (Spencer 2005). The chapter then turns to the construction of an overall child health index, presenting results pertaining to the associations between child health and selected indicators of socio-economic development. The final section presents a summary and conclusions.

Figure 1. Infant mortality rate by period, Arab countries



*Marwan Khawaja, Jesse Down, Anna Shadarevian - Center for Research on Population and Health - Faculty of Health Sciences American University of Beirut, Lebanon

1. The Arab region – an overview

The Arab region refers to the 22 member Arabic-speaking countries of the League of Arab States. With an estimated population of 284,372,000 in 2000 (PRED 2002), it contains only about 5% of the World population. However, the region's population is growing at a faster rate than any other region of the world, except sub-Saharan Africa. It has also been undergoing other rapid demographic shifts, including fast urbanization, intra-regional migration, owing partly to its relative affluence and persisting civil wars and conflicts. It is a region 'unified' by language, culture and geography. The region's population is predominantly Muslim, although some countries include significant proportions of religious and ethnic minorities. Common colonial heritage and shared history often times brought the countries of the region together, and shaped the formation of similar social and economic institutions. Yet, the region is quite diverse in its demographic and socio-economic make up. The region is rather polarized demographically, thanks to a varying pace of the demographic transition that has been taking place in various countries during the recent past (Courbage 1996; Rashad 2000). In some countries such as Lebanon, Tunisia, and Morocco, fertility and mortality have been declining rapidly. The fertility rates in these countries are currently estimated at or below replacement levels. Such rapid decline in fertility, combined with a drop of mortality at older ages, produced an ageing population but also a large number of adolescents. In addition, these countries are experiencing rapid urbanization, increased educational attainment, and transformations of the family. However, such dramatic demographic and socio-economic changes are paralleled by new forms of economic hardship facing vulnerable groups, such as the urban poor, the displaced and female headed households. Furthermore, these countries have been undergoing a shift in disease profiles, with a recent rise in chronic, or otherwise lifestyle, diseases and health risk behaviors, and an increase in the utilization and heterogeneity of health services. Such changes have profound consequences for the well-being of families and children. On the other extreme, some countries such as Yemen, Sudan and Mauritania are demographically pre-transitional with relatively high mortality and fertility levels. For example, Yemen's total fertility is estimated at nearly 7 children per woman. These countries still have high rates of maternal mortality and infrastructural problems such as lack of universal access to sanitation and piped water. Here, high rates of population growth are contributing to persistent poverty and ill-health, in addition to infectious diseases such as malaria that are still predominant. Furthermore, the populations in these countries are largely rural, with low levels of education

and labor force participation, especially for females. Unlike other regions of the world however, economic growth and development does not necessarily correspond to demographic and health behaviours. Some of the Gulf countries (and Libya) are characterized by high GDPs, high rates of urbanization, impressively low infant and maternal mortality rates. Some of these countries could be characterized demographically as pre-transitional. Saudi Arabia and Oman for example have estimated TFRs of 6.2 and 5.9 children, respectively. Other Gulf countries such as Bahrain and United Arab Emirates (UAE) could be classified instead as transitional countries. Upper middle income countries such as Algeria, Egypt, Jordan, Palestine and Syria are characterized by high urbanization, high female literacy rates, and satisfactory socioeconomic and health conditions. Yet, fertility rates in some of these countries (e.g., Palestine and Syria) are still high.

To a large extent, public health does not figure prominently in the national policy agenda of governments in the region. Recently, countries in the region have given particular attention to national health policy priorities, and health sector reform initiatives, to improve the quality of health care services especially in Bahrain, Egypt, Jordan, Palestine, and Yemen (Banks et al 2000; El-Henawy 2000; Hamdan and Defever 2003; McEurn 1997). In UAE, the development of health care delivery system reduced infant mortality rate by 85% (10.93 per 1000 live birth by 1992) (Sedaghtian 1997). However, there are high disparities between the Arab states regarding the national health account indicators. WHO (2004) data show that the total expenditure on health as % of GDP is highest in Lebanon (12.2%) and lowest in Oman (3%) and Qatar (3.1%). Surprising enough, Lebanon (US \$ 673) rates the 3rd highest country in per capita total expenditure on health at international dollar rate following UAE (\$ 921) and Qatar (\$ 782). In addition, Lebanon has the highest rate of physicians (210 per 100,000 population/ year) followed by Egypt (202 physicians per 100,000 population/year) while the lowest is in Sudan and Mauritania with 9 and 13.8 physicians per 100,000 population/ year, respectively. This could explain the high rates of mortality levels prevailing in these countries. It is also worth mentioning that some countries have medical services at government clinics and hospitals free of charge, while others have a largely private sector or otherwise a large out-of-pocket fee structure. For convenience, the countries examined were classified into three groups based on their geographic locations rather than their demographic, health or socio-economic profiles. Thus, we distinguish between three groups of countries: the *Levant*, Gulf countries, and North African countries.

2. Data sources

For the purpose of this study, we use (1) survey data on child health indicators and (2) macro data on the socio-economic development of the countries under examination. In both cases, we rely on secondary sources or readily available, published reports. Unlike previous studies using largely UN estimates, our main sources of data on child health are the most recent population-based household surveys conducted in 18 Arab countries during the 1990s. The majority of the surveys were completed in 1995-1998. The exceptions are Mauritania (1990), Algeria (1992), Sudan and Syria (1993). These surveys were from the following sources: DHS (Egypt, Jordan, Yemen), PAPChild (Algeria, Lebanon, Libya, Mauritania, Morocco, Sudan, Syria, Tunisia), Gulf Family Health Surveys (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE) and the PCBS Health Survey (Occupied Palestinian Territories). Occasionally, when data was not available from these surveys, corresponding estimates from UNICEF were substituted. All of these national surveys rely on fairly standardized instruments and similar methodologies, thus enhancing comparability of data between countries and over time. Table 1 provides information about sample characteristics of all the surveys used here. In the surveys, women of reproductive age were asked the same questions about their reproductive history, with dates of birth and age of death of all their live born children. These birth history data are used to estimate infant and child mortality levels. Furthermore, women (or care givers) were asked questions about the health and nutritional status of their children aged less than 5 years. The data for national-level demographic and socioeconomic indicators were from UN PRED (2002) and WHO (2002) cross-national databases except for Palestine. Corresponding data for the Palestinian areas were obtained directly from the Palestinian Central Bureau of Statistics in Ramallah, West Bank. The UN PRED is a machine-readable database prepared by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. This database contains comprehensive and consistent measures of population size and dynamics, resources, environment and development for 228 countries or areas of the world. All the indicators obtained from these two machine-readable databases and from the Palestinian Central Bureau of Statistics were for the mid 1990s, or otherwise chosen based on their proximity to the year in which the survey for a given country was conducted. In case that we could not obtain macro data for the same year of the survey date, we used available data for the year closest to the survey date. We relied on some widely known development indicators, including percent of the population urban, adult female literacy rate, gross

domestic product per capita in \$US adjusted for purchasing power parities (GDP), total fertility rate (TFR), and proportion of physicians per 100,000 people.

3. Child survival

This section addresses across and within countries differentials in mortality levels, including infant mortality rates (number of infant deaths per 1,000 live births) and children under-5 mortality rates (number of deaths of children under-5 years per 1,000 live births). In the absence of good vital registration systems in countries of the region, the survey programs used here are known to produce reliable estimates of infant and child mortality rates. These surveys collect detailed birth histories from national samples of women of reproductive ages. However, there are some variations in the reliability of the estimates, depending on the survey design and competence of the field organizations responsible for data collections. It remains that the rates provided by these surveys are much better than the estimates and projections used by UN agencies.

Infant Mortality.

There is a wide regional range for infant mortality (Table 2). Qatar has the lowest rate with 10.2 deaths per 1000 live births and Yemen has the highest rate with 89.5 deaths. With the exception of Yemen, the Gulf countries have the lowest rates of infant mortality, which range from 10.2 to 21.4 in Saudi Arabia. Levant countries fall in the middle with a range of 27.3 to 34.6 per 1,000 births. North African countries tend to have the highest rates of infant mortality amongst Arab countries (35.3 to 69.5 per 1,000 live births), save Libya (24.4). However, when accounting for income differences, the four Gulf countries ranked as high income countries, fall behind the average infant mortality rate for high income countries. Qatar (10.2), Kuwait (11.6), UAE (12.5) and Bahrain (14.2) have significantly higher rates for infant mortality than the high income country average of 5 infant deaths per 1,000 live births. Yemen (89.5), Sudan (69.5), Egypt (62.6) and Mauritania (59) have the highest rates of infant mortality of the Arab countries, and all have higher rates than the average for Arab countries (48). Yemen, Sudan and Egypt also ranked below the average for developing countries (61). Contrary to some recent findings based on estimated data from the UN (Yount 2001), survey estimates do not show consistent gender disparities in infant deaths. With the exception of Saudi Arabia and Egypt, all countries show female advantage in infant deaths as would be expected. In these two countries, however, the mortality rate for female infants is only marginally higher than for male children. On the other hand, there are clear socio-economic disparities in infant survival.

Table 1. Household surveys used by year and sample size

Country	Year of survey	Source	Number of households	Under-five population
Algeria	1992	PAP Child	6133	5092
Bahrain	1995	GFHS	4166	3120
Egypt	1995	DHS	16957	-
Jordan	1997	DHS	7335	-
Kuwait	1996	GFHS	3673	3514
Lebanon	1996	PAP Child	4600	2156
Libyan	1995	PAP Child	6312	5348
Morocco	1990	PAP Child	5686	6000
Mauritania	1997	PAP Child	5686	4971
O. Palestine	1995-96	Health Survey	6204	6169
Oman	1995	GFHS	6103	9033
Qatar	1998	GFHS	6103	3775
Saudi Arabia	1996-97	GFHS	10510	10831
Sudan	1993	PAP Child	5320	4585
Syrian	1993	PAP Child	5998	4356
Tunisia	1994-95	PAP Child	6085	3679
United Arab Emirates	1995	GFHS	5822	6285
Yemen	1997	DHS	10701	-

The uneven distribution of child survival along geographic location is apparent in every country, with a clear urban advantage. The largest urban-rural differentials within individual countries are in Egypt (35.7 more infants die in rural areas compared to urban), Tunisia (28.1), Morocco (22.3), Algeria (21.3) and Yemen (18.2). Although an urban advantage in child health has been observed in many developing countries and regions, the rural-urban gaps in the Arab region are quite large. Tunisia and Morocco have the highest urban advantage, and there are, respectively, 226 and 197 rural deaths for each 100 urban deaths. The relatively affluent Gulf countries have high urban advantage, but poorer countries such as Sudan and Mauritania (but also Syria) have the lowest urban advantage. Previous analyses based on UN estimates arrive at fairly similar conclusions (UNDP 2002).

Child Mortality

With few exceptions, the trends in child mortality are similar to the trends in infant mortality in Arab countries. Qatar again has the lowest rate with only 15.2 deaths of children under 5 per 1,000 live births (Table 2). The highest is Mauritania with 183 children out of 1,000 dying before they reach the age of 5 (It is necessary to note that the data for Mauritania is an estimate from UNICEF 1990 as there is not sufficient data from the survey conducted in 1990). Again with the exception of Yemen (121), the Gulf countries have the lowest rates of child mortality, which range from 15.2 in Qatar to 29 in Saudi Arabia. Levant countries fall in the middle with a range of 32.2 to 41.7 per 1,000 live births. North African countries have the highest rates of infant mortality amongst Arab countries (43.6 to 183 per 1,000 live births) with the exception of Libya (30.1). As with infant mortality, when accounting for income differences, the four Gulf countries ranked as high income countries, fall

behind the average child mortality rate for high income countries. Qatar (15.2), UAE (15.5), Kuwait (17.2), and Bahrain (17.2) have significantly higher rates for infant mortality than the high income country average of 7 deaths per 1,000 live births for children under 5. Mauritania (183), Yemen (121), Sudan (112.7), and Egypt (80.6) have the highest rates of child mortality of the Arab countries and rank above the average for Arab countries (62). Mauritania, Yemen and Sudan also ranked above the average for developing countries (89). Compared to infant mortality, Mauritania declines significantly and Egypt improves in relative. In Egypt the child mortality rate for male children is 92.6 and the rate for female children is 99.3 deaths of children under 5 per 1,000 live births. The difference between child mortality in rural and urban areas categorically shows significantly higher rates in rural areas. The largest urban-rural gaps within individual countries are in Tunisia (231 rural deaths per 100 urban deaths), Morocco (204 deaths in rural areas per 100 urban deaths), and Egypt (180 rural deaths per 100 urban deaths). Algeria, UAE, and Jordan show high rural urban disparities, but again, Tunisia and Morocco stand out as having the highest urban advantage in child mortality. With 112 rural deaths per 100 urban deaths of children below 5, Syria has the lowest urban advantage in child mortality among the countries in the region.

4. Nutritional status

The surveys used here collect data on the height and weight of children aged less than 5 years. Two standardized anthropometric measures, stunting and wasting, are provided in Table 3. *Stunting* refers to the proportion of children falling below minus 2 standard deviations from the median *height-for-age* of the

Table 2. Infant and under-five mortality by country and socio-economic disparities

Country	IMR				U5M			
	Rank	Total	Number of rural deaths per 100 urban deaths	Number of female death for 100 male	Rank	Total	Number of rural deaths per 100 urban deaths	Number of female death for 100 male
Jordan	10	28.5	146	68	10	34.2	146	79
Lebanon	9	27.9	-	98	8	32.2	-	94
O.Palestine	8	27.3	-	79	9	33.2	-	80
Syrian	11	34.6	117	84	11	41.7	112	90
Bahrain	4	14.2	-	87	3	17.2	-	82
Kuwait	2	11.6	-	89	3	17.2	-	92
Oman	5	20.3	128	90	5	26.4	129	93
Qatar	1	10.2	-	80	1	15.2	-	94
Saudi Arabia	6	21.4	152	103	6	29.0	135	89
United Arab Emirates	3	12.5	128	72	2	15.5	145	74
Yemen	18	89.5	124	81	17	121	134	89
Algeria	14	43.7	167	72	14	48.6	161	78
Egypt	16	62.6	170	101	15	80.6	180	107
Libyan	7	24.4	147	80	7	30.1	132	86
Mauritania	15	59.0	117	84	-	183	-	-
Morocco	13	36.6	194	87	13	45.8	204	94
Sudan	17	69.5	113	90	16	112.7	121	85
Tunisia	12	35.3	226	81	12	43.6	231	89

reference of the NCHS/CDC/WHO international reference population. This is an indicator of growth retardation, and signifies long-term or chronic deprivation. *Wasting* refers to the proportion of children falling below minus 2 standard deviations from the median *weight-for-age* of the same international reference population (National Population Council 1995). Wasting is an indicator of underweight and refers to short-term deprivation. Some surveys, e.g., DHS, also provide a composite index of weight for age, combining height for age and weight for height. Children whose weight-for-age measures are below minus two standard deviations from the median of the reference population are considered underweight for their age (National Population Council 1995).

Wasting

The lowest rate of wasting is in Jordan (1.9%) and the highest is in Mauritania (15.8%). Unlike mortality rates, wasting rates do not seem to correlate with GDP per capita. In fact, as a region, the wealthier Gulf states tend to rank poorly with wasting rates. Within the Gulf region, only Qatar (2%) and Bahrain (5.3%) have rates below the averages for MENA (6%), developing countries (8%) and the world (8%). The remaining Gulf states range between 10.6% in Kuwait to 15.2% in the UAE. Within the Levant, Jordan (1.9%), Palestine (2.8%) and Lebanon (2.9%) all have rates below the MENA average. Syria is the exception with 8.1%. North Africa also has relatively low rates ranging between 2.7% in Libya to 5.5% in

Algeria, with Mauritania (15.8%) and Sudan (12.9%) being exceptions. Like in mortality, there is a clear male disadvantage with regard to wasting in the region. From the 17 countries that have data available on gender differences, 11 have higher rates of male children under 5 wasting. The five countries where the gender gap is more than one point difference are in the category and all five are in the Gulf region: Kuwait (1.9% difference), Oman (2.2%), Saudi Arabia (2.3%), UAE (1.5%) and Yemen (1.7%). Only 3 countries, Jordan, Sudan and Tunisia, have marginally higher rates of female children wasting. With 123 wasted females per 100 wasted males, Tunisia ironically has the greatest gender gap in wasting rates. There are no gender differences in three countries, Bahrain, Algeria and Egypt. Again, like in mortality the gender gap does not seem as important as socio-economic disparities in wasting. From the 14 countries that have data available on urban-rural differences in wasting, 9 have higher rates in rural areas. The rural disadvantage ranges from 146 children wasted in rural areas compared to 100 children in urban areas to a corresponding rural-urban gap of 111 in Tunisia. There is clustering of rural disadvantage in North Africa, and with the exception of Egypt, all North African countries included here have clear rural disadvantage in wasting. On the other hand, Palestine, and Syria in the Levant and two countries in the Gulf, Saudi Arabia and UAE, have clear rural advantage in wasting. More striking perhaps is the socio-economic advantage in wasting by education of mothers. Although there are data gaps in wasting rates

broken down by mother's level of education, 12 countries show significant disadvantage of illiterate mothers compared to mothers with at least secondary education. The highest educational advantage is shown in Yemen, with 176 children of illiterate mothers wasted for every 100 children of mothers secondary education or more. This is followed by Oman, Syria and Mauritania, with corresponding gaps of 163, 160 and 159, respectively. The gaps in Jordan, Lebanon, and Sudan are also relatively high. On the other hand, only Kuwait and Saudi Arabia show educational disadvantage in wasting. Thus, there is really no clear association between the economic standing of a country and its educational gap in wasting.

Stunting

Although the Arab region is below the world average in stunting rates, it is known that stunting (or chronic deprivation) is still a significant problem in many countries in the region, including middle and high income countries. The lowest rate of stunting is in the Palestine (7.2%) and the highest is in Mauritania (56.9%). Eight countries rate higher than the MENA average (22%) and include Tunisia (22.5%), Oman (22.9%), Kuwait (23.8%) and Syria (26.8%). Sudan (33.4%), Yemen (51.7%) and Mauritania (56.9%) have higher rates than the averages for MENA, developing countries (32%) and the world (32%). Thus, low income countries suffer from stunting as expected, but some

affluent countries such as Kuwait are not doing well in increasing the height of their children in comparison to their weight. Country averages mask significant within country disparities in stunting. Like in mortality and wasting, there is female advantage in stunting rates in the region. From the 17 countries that have data available on gender differences, 13 have higher rates of stunting for male than female children under 5. The five countries where the gender difference is more than one point are in the category include Syria (2% difference), Kuwait (1.9%), Saudi Arabia (3.5%), UAE (1.6%), Yemen (1.3%), Egypt (2.6%), Libya (2.5%) and Morocco (1.1%). Only 2 countries, Algeria and Tunisia, have marginally higher rates of female children stunting. In Palestine, female stunting (8.1%) outweighs male stunting by 1.1%. In Mauritania there is no gender difference for stunting. Rural disadvantage in stunting is the norm in the region, and especially high in North Africa. From the 14 countries that have data available on urban-rural differences in stunting, 13 have higher rates in rural areas and only Mauritania has higher rates in its urban areas (58.2% urban, 55.5% rural). With 225 stunted children in rural areas for every 100 urban children, Tunisia has the highest rural disadvantage in stunting. This is followed by Jordan with a corresponding gap of 2.14 in favor of urban areas. Disparities by education are even higher in the region, and 15 countries have their highest rates of wasting among children with illiterate mothers.

Table 3. Wasting and stunting by country and socio-economic disparities

Country	Wasting				Stunting			
	Total (%)	N. of rural children wasted for 100 urban	N. of female children wasted for 100 male	N. of children of illiterate mothers wasted for 100 with secondary-level mothers	Total (%)	N. of rural children wasted for 100 urban	N. of female children wasted for 100 male	N. of children of illiterate mothers wasted for 100 with secondary-level mothers
Jordan	1.9	117	118	151	7.8	214	91	322
Lebanon	2.9	-	93	141	12.2	-	94	248
O.Palestine	2.8	88	81	100	7.2	107	116	202
Syrian	8.1	86	91	160	26.8	106	93	173
Bahrain	5.3	-	100	-	9.7	-	95	-
Kuwait	10.6	-	83	61	23.8	-	92	174
Oman	13.0	120	84	163	22.9	121	98	160
Qatar	2.0	-	-	-	8.0	-	-	-
Saudi Arabia	10.7	88	81	89	19.9	106	84	127
United Arab Emirates	15.2	91	91	112	16.7	108	91	143
Yemen	12.9	132	88	176	51.7	138	98	290
Algeria	5.5	118	100	98	18.1	169	104	188
Egypt	4.6	96	96	116	29.8	151	92	148
Libyan	2.7	132	100	129	15.1	130	85	158
Mauritania	15.8	146	96	159	56.9	95	100	107
Morocco	3.2	125	85	123	14.5	172	93	450
Sudan	12.9	129	110	141	33.4	169	99	296
Tunisia	3.9	111	123	121	22.5	225	101	1835

Source: see appendix A

The disparity is extremely high in Tunisia, and there are 1835 stunted children of illiterate mothers for every 100 children of mothers with secondary education there. Significantly large gaps in stunting by education of mothers are also observed in Morocco, Jordan, Sudan and Yemen. The lowest education gap in stunting is observed for Mauritania (1.07), owing perhaps to overall low levels of female education there. As with wasting, there does not seem to be a consistent pattern of socio-economic disparities in stunting by levels of economic development. While children of illiterate mothers in North African countries are very disadvantaged in chronic malnutrition, so are their counterparts in the Gulf.

5. Morbidity

This section includes measures of two main diseases affecting children under 5 years old: Diarrhea and Acute Respiratory Infection (ARI). Diarrhea is measured in the surveys by asking mothers of children under 5 if a child has a diarrhea episode two weeks before survey date (1995-2000). According to Arar (1998), lack of water, parity, breastfeeding and household structure were significantly associated with the occurrence of diarrhea in Jordan. On the other hand, ARI is measured by asking mothers about symptoms of ARI within the 14 days preceding the survey. ARI is a common cause of death among children. The symptoms include cough accompanied by difficulty in breathing (National Population Council 1995).

Diarrhea

There are disparities among countries, and there are no consistent patterns in rates along geographical locations (Table 4). The lowest rate of diarrhea is in Tunisia (5.9%) followed by Palestine and Oman (6.7%). Highest rate is in Yemen (27.8%). There are other 6 countries which rate more than 10%, ranging from 10.2% in Kuwait to 19.8% in Algeria. Unfortunately there are no data available to assess socio-economic or gender disparities in Diarrhea episodes within countries.

Acute Respiratory Infection

Likewise, there are clear disparities in ARI across countries of the region (Table 4). The lowest rate of ARI is in Syria (7.6%) and the highest rate is in Lebanon (37.5%). Other countries with low rates include Jordan (10.2%) and Libya (11.2%). With the exception of Lebanon, the Levant states have low rates with Syria and Jordan ranking first and second overall and Palestine (17%) ranking fourth. The wealthier Arab Gulf states have relatively high rates, ranging from a rate of 21.5% in the UAE to rates over 30% in three countries, namely

Qatar (31.2%), Bahrain (33.7%) and Kuwait (37.1%). On average, North Africa has relatively low rates but with wide variations, ranging from 11.2% in Libya to 29% in Sudan. Four countries, Libya (11.2%), Morocco (18.9%), Tunisia (18.2%) and Mauritania (18.9%) all have rates below 20%, while three countries, Egypt (23.2%), Algeria (25.1%) and Sudan all have rates above 20%. There is male disadvantage in ARI. Except for Tunisia and Libya, 16 countries have higher rates of ARI symptoms for male children under 5 compared to female children. Libya and Tunisia are the only exceptions where the difference is less than one percentage point. From the countries with higher rates in male children, Palestine has the largest difference with male outweighing female rates by 5 percentage points (19.5% male, 14.5% female). However, these ratios can not be considered indicative of gender-bias because the differences are not large. There is also a clear urban disadvantage in ARI. With the exception of Yemen (23% urban, 23.6% rural) and Mauritania (14.5% urban, 21.5% rural), all other 12 countries, with data available, have their urban areas more disadvantaged than rural. With a rate of 9.6%, Syria has the least urban disadvantage. While rural areas of Mauritania are the most disadvantaged, within these 12 countries, the percentage difference that urban exceeds rural rates is two percent in Jordan, Libya and Sudan or more in the remaining 9 countries. The largest difference is in Morocco (8.4%) and Tunisia (5.3%). Clearly, the data reported here indicate an urban penalty in ARI, owing perhaps to higher rates of pollution within urban areas relative to rural places. There appears to be no association between mother's education and frequencies of ARI symptoms. The only exception is in Yemen, as the case was in wasting, with 143 children of illiterate mothers having ARI for every 100 children of mothers with secondary education or more. It should also be noted that we lack reliable data to assess the association between mother's education and ARI for the wealthy Gulf States, Algeria and Mauritania.

6. Preventive care

Preventive care for children is best exemplified by breastfeeding rates (% of children exclusively breastfed under 4-6 months) and immunization rates (half composed of the rates for measles immunization and half composed of rates of DPT3 and Polio 3 immunizations).

It is widely known that infant feeding has a clear positive influence on the health of a child, and also beneficial for the mother. Breast milk is the perfect food for a child's first 6 months of life (UNICEF 2005). Exclusive breastfeeding from birth through the first 6 months provides required nutrients and reduces infant from infectious diseases and malnutrition (Wagstaff

2004). Poor nutrition leads to an increase in the risk of child illness and death. On the other hand, vaccination of a child against major diseases of childhood is a fundamental factor in improving its survival rate. A child of 12-23 months old is considered to be fully covered by immunization if he received, according to WHO standards, all the recommended vaccinations; that is, BCG, measles, and three doses of both polio and DPT. Although immunization has saved billions of lives worldwide, it is not reaching the population that needs it the most (UNICEF 2005).

Breastfeeding

As shown in Table 5 the highest rates of exclusive breastfeeding is in Egypt (56%) and is the only country to rate higher than the developing country average (39%). The lowest rate of breastfeeding is in Jordan (11%). Other countries with relatively low rates include Kuwait, Qatar and Tunisia (12%), Algeria (13%), Sudan (16%) and Yemen (18%). The Levant, Lebanon (27%), Palestine and Syria (29%) rate moderately. Other countries with relatively higher rates include Morocco, Oman and Saudi Arabia (31%) and Bahrain and the UAE (34%). It is important to note that only the data for Jordan, Lebanon, Yemen, Algeria, Egypt, Libya and Mauritania are for children under 6 months. The data for the remaining eleven countries is for children under 4 months. Survey data for gender and rural/urban disparities in breastfeeding are not readily available. Here, we rely on estimates provided by *Poplas*. Four countries, United Arab Emirate, Bahrain, Kuwait and Saudi Arabia, out of 14 have a significant gap in the percentage of breastfeeding for male children under 5

years compared to female children. Moreover, 3 out of these 4 countries have higher rates for males than females with the exception of Bahrain with a rate of 46.9% for males compares to 58% for females. With the exception of Oman, Palestine and Morocco, the remaining 7 countries have higher rates of breastfeeding in rural areas compared to urban areas. The highest differences in rates are in Tunisia (difference of 12.3%) and Algeria (12.2%).

Immunization

The highest rate for children under 5 who have received measles immunization is in Qatar (98.8%) and the lowest rate is in the Palestinian areas (36.9%) (Table 5). It is important to note that in recent years, measles immunization rates in Palestine increased greatly to 70% in the year 2000. North African countries, Yemen (42.8%), Mauritania (63.2%) and Sudan (65.3%) also have relatively low rates of measles immunization. Countries with relatively higher rates of measles immunization are from the Gulf countries and include Oman (98.2%), Saudi Arabia (96.6%) and Bahrain (94.4%). There is a notable disparity between these wealthy Gulf Arab states which rate above 94% with the exception of Kuwait (70.4%) and the UAE (71.1%), which have significantly lower rates. The remaining states range from 71% in Syria to 88.5% in Morocco. For immunization rates of the third shot of DPT and Polio, Oman ranks highest with 98.1%. Yemen has the lowest rate with only 42% of children under 5 immunized. Mauritania (52.6%), Sudan (79.1%) and Syria (75.6%) also have relatively low rates of immunization and are the only countries with rates below 80%.

Table 4. Morbidity (Diarrhea and ARI) by country and socio-economic disparities

Country	Diarrhea	Acute Respiratory Infection			
	Children under 5 with diarrhea 2 weeks before survey	Total	N. of rural children with ARI for 100 urban	N. of female children with ARI for 100 male	N. of children of illiterate mothers with ARI for 100 with secondary-level mothers
Jordan	18.0	10.2	83	75	103
Lebanon	19.3	37.5	-	97	77
O. Palestine	6.7	17.0	79	74	67
Syria	8.6	7.6	59	81	85
Bahrain	8.4	33.7	-	95	-
Kuwait	10.2	37.1	-	99	-
Oman	6.7	25.1	85	91	-
Qatar	8.8	31.2	-	94	-
Saudi Arabia	9.1	27.7	91	91	-
United Arab Emirates	8.8	21.5	90	88	-
Yemen	27.5	23.4	103	92	143
Algeria	19.8	25.1	90	93	-
Egypt	7.1	23.2	98	93	110
Libya	16.9	11.2	84	101	61
Mauritania	-	18.9	148	87	-
Morocco	10.4	17.7	63	98	56
Sudan	-	29.0	93	98	77
Tunisia	5.9	18.2	74	104	61

Countries with relatively higher rates of immunization include Jordan (92.9%), Saudi Arabia (92.6%), Lebanon (91.8%) and Morocco (90.6%). The remaining countries range from 82.6% in Egypt to 89.9% in Bahrain. There are differences within countries when compared immunization rates of the shot of DPT and Polio on one hand and Measles on the other hand. Most countries have higher rates of DPT and Polio than Measles except for reverse rates in Bahrain, Qatar, Saudi Arabia and Mauritania. There are no disparities between female and male children when measured for immunization ratios. Likewise, there are no major socio-economic disparities when considered immunization in full terms. Only rural areas of Sudan (87.6% Urban, 69.5% Rural) and Mauritania (86.2% Urban, 68.9% Rural) are more disadvantaged than the rest of the Arab states where there are no significant disparities. Remarkable disparities by education of mothers are observed for immunization. 12 countries show disadvantage of illiterate mothers compared to mothers with at least secondary education. The highest advantage is in Sudan with 145 immunized children of mothers with secondary education for every 100 children of illiterate mothers. Similar is the case in Qatar (118), Lebanon (115) and UAE (113). In this case, the data displays that there is no association between Gulf, North African, and Levant states.

7. A child health index

Given the diversity in the levels and patterns of child health indicators described above across countries and groups of countries within the region, a simple summary measure of child health is warranted. The index was constructed to include outcome measures (e.g., disease) as well as indicators of preventive care (e.g., immunization and breastfeeding). Each of the child health indicators described in this study was ranked in descending order to compare relative patterns across the region. Each ranking also equaled their score for a particular indicator. The ranking scores for wasting, stunting, breastfeeding, immunization measure, and disease (ARI) were then aggregated with each variable having equal weight into a measure for child health. The values for this child health measure were then ranked. A mortality measure was then similarly created using solely the infant mortality ranking scores. The child health measure and mortality level were then combined with each complete measure having equal weight to create a final mortality and health index. Figure 2 presents the ranking of countries with respect to the child health index and income level. The three top ranked countries in child health are Qatar, Libya, and Bahrain and the lowest ranked countries are Yemen, Mauritania and Sudan. At first glance, it appears that richer countries rank better than poorer countries. Yet, there is no correspondence

between rankings of child health and income overall. Eight countries rank lower on child health than their corresponding income rank, including rich countries in the Gulf (Kuwait, Oman, UAE). On the other hand, middle income countries such as Jordan, Morocco and Palestine rank better on child health than their corresponding income ranking.

8. A closer look at child health and socio-economic development

The lack of correspondence between rankings of countries in terms of child health and income does not imply the lack of association between health and socioeconomic development in the region. The associations between child health and common indicators of socioeconomic development are assessed using Spearman's rank correlation coefficients. Although associations were examined with all the health outcome measures, we only report those pertaining to mortality and the child health index. Strong and significant associations are found between infant mortality rates and urbanization ($r_s = -0.842$), female literacy ($r_s = -0.84$), GDP per capita (adjusted for purchasing power) ($r_s = -0.743$), and doctors per 100,000 population ($r_s = -0.683$). These findings are consistent with a previous study reporting significant associations between infant mortality, socio-economic and perinatal factors (Shawky 2001). Our findings however indicate that mortality correlates more strongly with social development (urbanization and literacy) than economic development or health personnel. As shown in Figure 3, the associations between mortality and social development indicators are fairly linear, but the corresponding associations with income or doctors are non-linear. Middle income countries in particular seem to achieve fairly similar levels of mortality as high income countries. Likewise, significant but weaker associations are found between the child health index and urbanization ($r_s = -0.733$), female literacy ($r_s = -0.757$) and income ($r_s = -0.629$). However, the association between child health and the number of doctors is weak ($r_s = -0.386$) and non-significant. All the relationships shown in Figure 4 are hardly linear, and the one concerning income shows that some rich countries such as Kuwait, UAE, Oman and Saudi Arabia have comparable child health achievement as Jordan and Morocco. Evidently, while rich countries seem to be progressing well with regard to childhood mortality, they are not in good standing with regard to other child health measures such as nutrition, disease and prevention.

Table 5. Breastfeeding and immunization by country and socio-economic disparities

Country	Breastfeeding	Immunization			
	Exclusive < 6 months (%)	Total (%)	Number of urban children immunized for 100 rural children	Number of males immunized for 100 female	Number of children of secondary mothers immunized for 100 illiterate mothers
Jordan	11	98.6	-	-	-
Lebanon	27	92.5	-	99	115
O. Palestine ²	29	-	-	-	-
Syrian ²	29	90.2	97	101	110
Bahrain ¹	34	83.6	-	100	98
Kuwait ¹	12	70.4	-	103	110
Oman ¹	31	97.0	99	100	99
Qatar ¹	12	80.4	-	-	118
Saudi Arabia ¹	31	90.9	96	100	98
United Arab Emirates ¹	34	71.1	97	-	113
Yemen	18	88.0	104	101	111
Algeria	13	95.8	104	100	105
Egypt	57	95.8	102	101	105
Libyan	-	98.8	101	100	102
Mauritania	20	72.6	125	95	92
Morocco ²	31	96.2	103	100	102
Sudan ²	81	75.8	126	100	145
Tunisia ²	12	98.4	102	100	103

¹ For exclusive breastfeeding, for children under 4 months, for ever breastfed, children under 24 months

² For exclusive breastfeeding, children under 4 months

Figure 2. Country ranking in child health and income, Arab countries

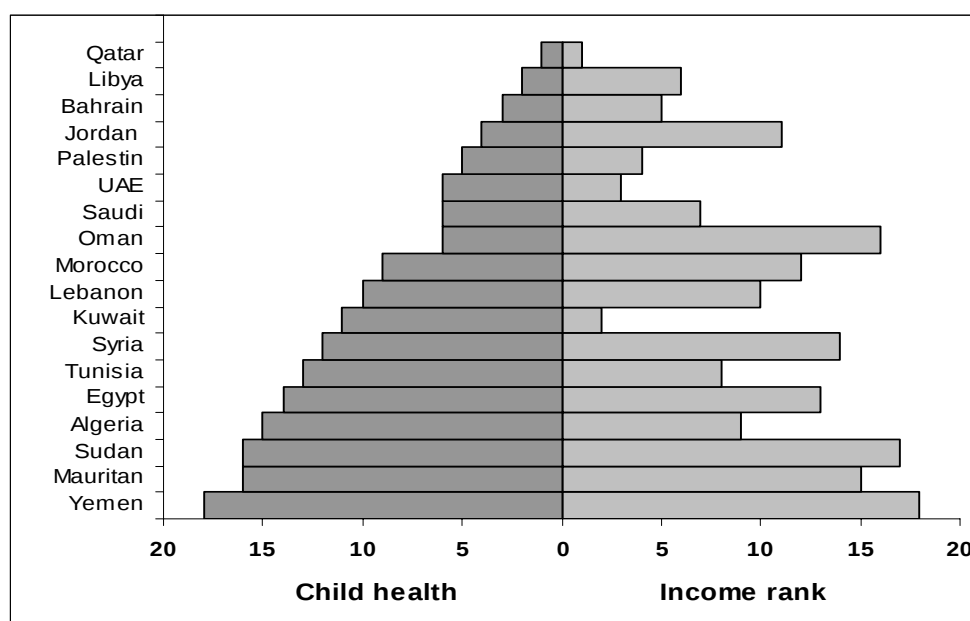
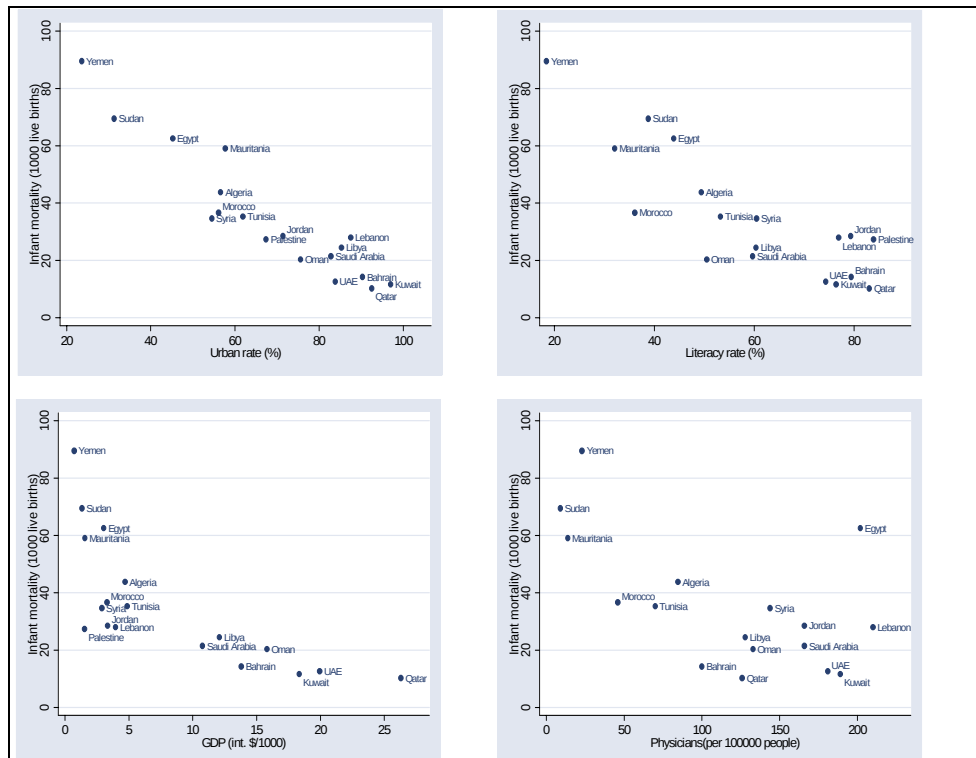


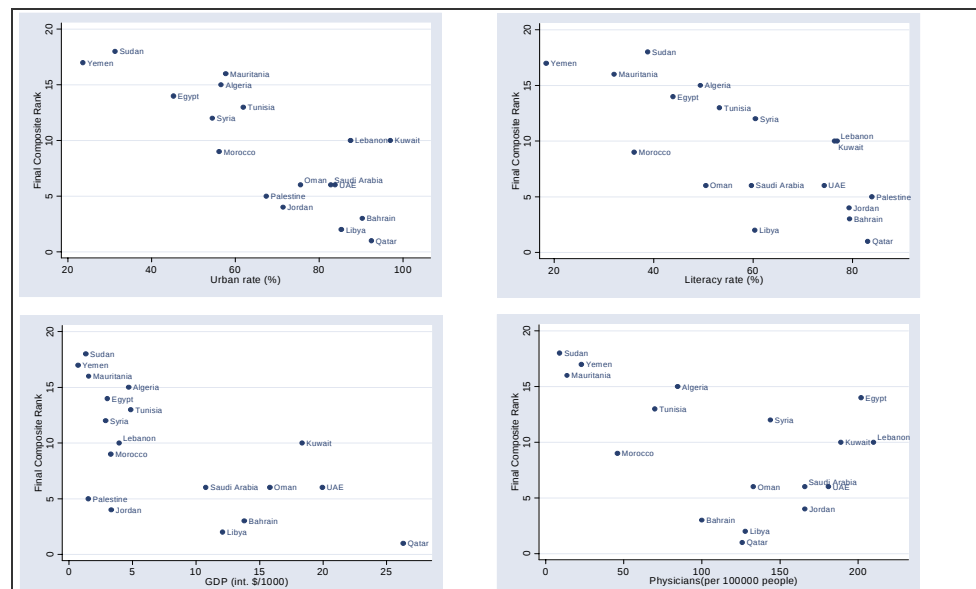
Figure 3. Bivariate associations between infant mortality and selected indicators: Arab countries



$rs_{Urban} = -0.842^{**}$; $rs_{Literacy} = -0.840^{**}$; $rs_{GDP} = -0.743^{**}$; $rs_{Physicians} = 0.683^{**}$.

****Correlation is significant at the 0.01 level.**

Figure 4. Bivariate associations between child health and selected indicators: Arab countries



$*rs_{Urban} = -0.733^{**}$; $rs_{Literacy} = -0.757^{**}$; $rs_{GDP} = -0.629^{**}$; $rs_{Physicians} = -0.386$.

****Correlation is significant at the 0.01 level (2-tailed).**

9. Conclusions

This chapter provided a descriptive portrait of child health in the Arab region during the 1990s using reliable data from national household surveys. Across and within-country disparities in the levels of child survival, nutritional status, disease, immunization coverage, and breastfeeding are assessed. To this end, a simple child health index consisting of various child survival and health indicators was constructed and analyzed with respect to various macro indicators of social development as well as with income. Income emerges worldwide as the most important determinant of child survival and well-being across and within countries (Mosley and Cowley 1991; Preston 1975; Spencer 1996). This is certainly the case in the Arab region overall as indicated by significant associations between income and child health. However, a closer look at the data reveals that more wealth does not necessarily bring better health. It was shown that eight of the Arab countries ranked lower on their child health than their income ranking. During the 1980s, Caldwell and others considered higher infant mortality as a measure of child health to the social inequality of gender roles due to Islamic influences (Caldwell, 1986; Obermeyer, 1992). In addition, Caldwell highlights the issue of religion- Islam- being common among all these “poor health achievers” which determines whether a country will be a superior or poor health achiever. For example, there is evidence that women’s enrollment in education is lower in most Muslim countries than in countries with similar income levels. However, the region is quite diverse in its demographic and socioeconomic structure, and such ‘essentialistic’ conceptions of the region’s culture cannot be helpful in disentangling intra and inter country differences in child health. Obermeyer (1992) refutes Caldwell’s claim that Arab countries do poorly as far as demographic indicators due to the role of Islam in these societies. Evidently, Caldwell’s claims no longer hold with regard to child survival in light of the remarkable decline in infant mortality across the Arab region, especially in the affluent Gulf States. “Current levels of infant and child mortality in Arab countries need to be assessed against very high past levels and the generally rapid pace of improvement” (UNDP 2002). This is not the case however for other indicators of child health, including morbidity and malnutrition. The chapter summarized evidence on the countries’ performance on other child-health related indicators, showing little or no associations with living standards or socioeconomic development. Furthermore, there is evidence of pervasive inequalities in child health, including child survival, across and within countries, calling into question the ‘global’ strategies adopted so far to improve child health in the Arab region. Unlike in the 1970s and 1980s, there

is currently no ‘magic bullet’ to improve child survival (Rutstein 2000), and mother’s education may no longer impact infant survival in urban areas (Aly and Grabowski 1990). Although infant mortality is a good indicator of population health (Reidpath and Allotey 2003), it is not so with regard to other aspects of children health. The evidence presented here pertaining to child health rather than merely survival has important implications for social and health policy at the regional and national levels. Policies which aim at improving access to public and private health services and reducing socio-economic disadvantage will certainly result in improved health status and reduced disparities in child health and well-being (Yount 2004). With current levels of infant mortality, attention should be directed at broader issues of child well being rather merely survival. Children’s well-being refer to all aspects of child’s life: physical, mental, social, emotional, and economic welfare, the child needs to lead a good life (Van Der Gaag).

The main conclusions of the chapter follow:

- Infant and child mortality in the Arab region declined rapidly over the past few decades, but the decline is not uniform across countries.
- Infant mortality is a misleading measure of child health, as it does not relate to other important indicators such as nutritional status, disease and preventive care at the national level.
- There are wide disparities in levels of mortality and child health indicators across and within countries
- Mortality levels are generally related to socio-economic development, but other indicators of child health are not associated with levels of income or development.
- Child health is strongly associated with social development indicators such as literacy and urbanization but weakly associated with income in the region.
- Rich countries can generally be considered poor achievers in child health as compared to their economic standing within the region.
- Contrary to common impressions, there is no evidence of gender bias in child health in the region. In fact, most indicators point to female advantage.
- There are wide socio-economic disparities in child health within countries, as demonstrated by rural-urban residence and maternal education. Rural residents and illiterate mothers are severely disadvantaged with regards to almost any outcome of child health used in this study. This conclusion holds in both prosperous and poor countries.

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