

## **Social Class and Morbidity Differences among Kuwaiti Children**

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*The impact of socioeconomic status (SES) on diarrheal and respiratory morbidity among children aged 5 or less was assessed through a survey of mothers in two administrative regions of Kuwait. Higher SES women reported child morbidity more frequently and utilized health care facilities more often. Differences between SES groups have disappeared for some types of morbidity. In the multivariate analysis, lower SES children had higher respiratory mortality but there was no difference in diarrheal morbidity.*

*Key words: Kuwait; child health; morbidity difference; diarrheal/respiratory morbidity; socioeconomic status; government policies*

### **Introduction**

Research from developed as well as developing countries typically shows that various indicators of socioeconomic status (SES) are inversely associated with infant and child mortality.<sup>1-7</sup> Findings pertaining to the relationship of SES with morbidity are less clear and comprehensive.<sup>8</sup> Several studies have shown the prevalence of various diseases to be higher among the more deprived sections of the population, or the health of deprived children to be poorer.<sup>9-14</sup> Furthermore, the utilization of health services such as visits to the casualty or admission to the hospital among children under 5 has been reported to be higher in the socioeconomically deprived districts in Glasgow,<sup>15</sup> and among children in New Zealand.<sup>16</sup> Contrary to the above findings, other studies have found no evidence of a relationship between socioeconomic status and childhood morbidity,<sup>17</sup> between asthma and social class in school children,<sup>18</sup> between indices of growth and socioeconomic status,<sup>19</sup> or mother's education and diarrheal episodes.<sup>20</sup>

In Kuwait, only limited information is available on childhood morbidity according to socioeconomic characteristics of parents. For diarrheal morbidity among children under 6 years of age in the two weeks prior to the interviews, according to mother's education in a nationally representative Child Health Survey conducted in 1987,<sup>21</sup> a curvilinear inverted U-shaped association was found. Illiterate mothers reported lower morbidity (3.3 percent) than those with intermediate education (5.4 percent), while those with secondary or higher levels reported the lowest morbidity (3.0 percent). Infant mortality among Kuwaiti nationals has declined from over 50 in 1965 to only 12 in 1994.<sup>22,23</sup> Various studies indicate that fetal and child mortality has been higher among less educated women<sup>24</sup> and those living in poorer households.<sup>22</sup>

Considering the discrepant findings pertaining to the association between socioeconomic status and childhood morbidity internationally and the limited knowledge on the subject in Kuwait, our objective is to assess this relationship in a rapidly developing oil-rich country with its multifarious policies aimed at reducing economic and social disparities. A general objective is to analyze whether the traditional indicators of SES that continue to identify high risk morbidity

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groups in several other countries also do so in Kuwait. The two specific questions we address are as follows: First, are there any morbidity differences between the more developed, higher SES sections, and the less developed, lower SES sections of the population? Second, are there any differences in the health seeking behavior of the two sections?

Several different indicators of morbidity were used. General morbidity was measured by sickness episodes and hospital admissions. Experience of fractures, poisoning, burns, and handicaps was also analyzed. Two specific types of morbidity, diarrheal and respiratory, were examined. Two to three decades ago, diarrheal morbidity was a major cause of infant deaths. Both the above types of morbidity still constitute important reasons for hospital admission as discussed in the last section.

To measure socioeconomic status, two different approaches were used. First, residential areas that are considered the most highly developed (Capital) were compared with those considered as the least developed (Jahra). Second, several traditional measures of SES such as parent's education, occupation, income, and type of housing were analyzed in relation to morbidity levels. A composite indicator of social class was also developed, as described later.

### **Data and Methods**

The study is based on interviews with mothers conducted during January to March 1994 of all children aged 5 years or less (N=781) in a sample of Kuwaiti households located in two of the five major residential areas (governorates). One governorate represented the most developed (Capital) and the other the least developed areas (Jahra) in the country. Women in each area were selected through a multi-stage stratified random sampling procedure, described below. Our survey included only Kuwaiti nationals who in mid 1994 constituted about 38 percent of the total inhabitants, numbering 1.75 million.<sup>25</sup> It should be emphasized that a large majority of the expatriates, originating in more than 100 different countries, consist primarily of male migrant workers who are in Kuwait without their wives and children, even though about 75-80 percent of them are married. Only those workers earning above a certain income (about \$ 1500 in the public sector, and \$ 2200 in the private sector) are allowed to bring their

families to Kuwait. Thus, the non-Kuwaiti children in the country are a select group, and therefore not easily comparable with the Kuwaitis.

The following multi-stage stratified sampling procedure was used. Each of the five major areas (governorates) in Kuwait is composed of sub-units known as districts (*mantaqas*), each of which is further divided into sub-districts (*qitaas*). A listing of all *mantaqas* and *qitaas* within the two governorates, Capital and Jahra, was obtained from the Public Authority for Civil Information (PACI) together with the number of households in each. Based on the above information, five *mantaqas* from the Jahra and four from the Capital were randomly selected in order to obtain a sample of about 350 households in each area.

From each of the selected *mantaqas*, one sub-district (*qitaa*) was randomly selected for inclusion in the study. Thus, nine *qitaas* were chosen. Within each *qitaa* we selected every second household. After listing all members of the household, face to face interviews were conducted with all ever married women. The percentage of women who refused the interview was 2 percent in Jahra and 4 percent in the Capital. From each woman, a comprehensive set of questions was asked about the health and morbidity status for all children aged 5 or less. The households had 781 children aged 5 or less, of whom 156 were infants aged less than one, who form the focus of this paper.

### **Defining Social Class in Kuwait**

There is no universal consensus on indicators that best capture the relative ranking of individuals in a society. In the United Kingdom, a relatively precise definition of social class based on the general social standing of the occupation of persons suggested by the Registrar General is widely used.<sup>26</sup> In the United States, no 'official' definition exists. However, researchers use race, education, occupation, income, or some combination of the above to arrive at their own definitions.<sup>27</sup> The persisting health and mortality differentials between social classes has increased the intensity of debate on social class, and several suggestions have recently been made on ways to improve the measurement and data collection efforts.<sup>28-31</sup>

In Kuwait, no official definition of social class is present. Also, no consensus exists within the research community

on how to define social class in this state with one of the highest per capita incomes in the world. Individual researchers use their own experience to study socioeconomic differences in mortality or health status. Indicators such as mother's and father's education, their work statuses, family income and others have been used in various studies.<sup>22,24,21</sup> Kuwait is a city state and there are hardly any areas that might be defined as truly rural, in terms of accessibility to roads, water, electricity, and other development infrastructures. The transition in housing has been very rapid so that almost all Kuwaiti houses now have indoor plumbing, running water, electricity, and air-conditioning. Furthermore, in a national survey of all Kuwaiti households conducted in 1987, more than 99 percent of the households reported owning a television, a refrigerator, and a car.<sup>21</sup> Thus, some of the traditional measures, such as the ownership of durable items are not very meaningful indicators of social status in Kuwait. One indicator which might be a particularly sensitive measure of social status is the family to which a person belongs, since this represents the person's 'connectedness' (*wasta*) and significance in the social hierarchy. Unfortunately, no studies have measured the person's family name as an indicator of social class.

Philosophically, Kuwait that gained independence in 1961 is a welfare state. The country has made remarkable improvements in the fields of education, healthcare, and mortality decline. If one were to judge development in terms of changes in literacy, the percentage of illiterate Kuwaitis aged 10 and above declined from about 46 percent in 1965<sup>32</sup> to 21 percent in 1975 and 12 percent in 1985,<sup>33</sup> the male/female gap in literacy has narrowed remarkably. Over the last three decades, infant mortality, that is considered as a particularly sensitive indicator of socioeconomic development, has also witnessed a rapid decline, as mentioned above.

Kuwait's health and development policies have been recognized as some of the important correlates crucial to the above decline in mortality. An account of such policies is given elsewhere.<sup>34</sup> It might be sufficient to summarize here that all citizens are provided free or highly subsidized government housing, free healthcare, free education up to graduate and even post-graduate level, and subsidized water, electricity and food. Jobs are guaranteed by the government and almost 99 percent of the nationals are employed in the

public sector. There is no income tax. In addition, several other allowances are provided which are responsible for reducing income inequality in the country. In 1988, for example, the salary of professional and technical workers was only about 17 percent higher than that of the clerical workers (US \$ 1,850 and 1,430 per month).<sup>35</sup>

While rapid changes are occurring, marked differences in the ranking of individuals continue to exist. For example, some residential areas are considered as socially lower status than others. Residing in a villa represents a relatively higher social status (and prestige) compared to residing in a limited income house provided by the government. A villa is built upon the specifications and requirements of the owner while the limited income house is part of the government's scheme to provide housing. The number of rooms is, therefore, an important indicator of the relative status. Also, educational level differentiates people into higher and lower social class, as does occupation. The above indicators therefore constitute valid measures of social status differentiation in Kuwait.

As mentioned earlier, socioeconomic status was measured in two ways: 1) in terms of the area of residence (Jahra or Capital), and 2) in terms of a composite score consisting of the following 7 indicators: father's and mother's educational level, per capita total family income, father's and mother's occupation, type of housing, and number of persons per bedroom. A correlation matrix showing the relationship between the 7 indicators and the details of how the SES score was calculated are given in Appendix Table 1. It might be pointed out that several of the indicators were strongly correlated with each other. For example, the correlation coefficient exceeded 0.5 in case of the relationships between the father's and mother's education, mother's education and her occupation, and per capita family income and mother's education. After examining the frequency for the composite score, the children were divided into three roughly equal groups, with the low SES comprised of 36 percent, medium SES of 31 percent and high SES of 33 percent of the total.

## **Results**

It is necessary to describe briefly the socioeconomic differences between the two areas before proceeding with an analysis of the relationship between SES and morbidity. Table 1 shows the SES profile of the two areas. In terms of housing, roughly the same percentage of children in the

Capital and Jahra lived in a villa or part of a villa, and both seemed to have fairly adequate housing facilities in terms of bedrooms and bathrooms even though the number of persons per bedroom and bathroom was higher in Jahra than in Capital. In terms of income, education and occupation there were substantial differences between the two areas. The per capita total family income as well as the husband's per capita income was much higher in the Capital than in Jahra. Regarding education, almost none of the mothers (or fathers) in the Capital were illiterate while the percentages of illiterate mothers and fathers in Jahra were about 30 percent and 15 percent, respectively. Among the mothers, more than half (51 percent) in the Capital had completed post-secondary education compared with only 14 percent of the Jahra women. Consistent with the very different educational accomplishments, the economic activity of the mothers and fathers in the two areas differed markedly. Among the mothers, only 14 percent of the Jahra women were economically active compared with 57 percent of the Capital women. Among the fathers, a majority of the Capital men were in professional/technical/administrative jobs while more than half (54 percent) of the Jahra men were in general government service or the army.

As a result of the very different socioeconomic profiles of mothers and fathers in the two areas, their SES scores varied markedly. About 54 percent of the Jahra children were in low SES households compared with only 6 percent of the Capital children. On the other hand, only 18 percent of the Jahra children were in high SES households compared with 60 percent of the Capital children (Table 1). Thus, a much larger percentage of the Jahra children could be considered to reside in households where they might be at a relatively disadvantaged position compared to children in Capital, judging by the criteria we used for defining social class.

### Area of Residence and Morbidity among Children Aged 5 or Less

Our initial expectation was that in view of the lower development level of Jahra, morbidity among children in that area would be higher. Higher morbidity would also be likely to result in greater utilization of healthcare services, assuming that accessibility to health services was the same in the two areas. Table 2 provides a comparison of general morbidity, as well as diarrheal and respiratory morbidity in the two areas. Diarrhea was defined in terms of 3 or more

**Table 1** Socioeconomic Status (SES) of Households in which Children Aged 5 or Less were Living in Capital and Jahra

SES indicators	Capital	Jahra
<b>Type of housing (%)</b>		
Villa	35.8	32.7
Government house/Flat/others	64.2	67.3
<b>Average Number of:</b>		
Persons per household*	8.6	12.2
Domestic servants per household	1.97	1.38
Bedrooms per household	5.1	6.1
Bathrooms per household	4.1	4.0
Average no. of persons per bedroom*	1.7	2.0
Average no. of persons per bathroom*	2.1	3.0
<b>Income (K.D.)**</b>		
Total family income $\bar{x}$	1640.4	1580.3
Total family income per person*	190.7	129.5
Husband's income $\bar{x}$	1053.3	861.3
Husband's income per person*	122.5	70.6
<b>Education level of mother (%)</b>		
Illiterate	0.0	30.5
1-8 grades	19.7	33.6
9-12 grades	29.0	21.5
>12 grades	51.4	14.3
<b>Education level of father (%)</b>		
Illiterate	0.3	14.6
1-8 grades	22.1	42.8
9-12 grades	31.7	21.6
>12 grades	45.9	21.0
<b>Occupational status of mother (%)</b>		
Non-working	43.1	86.1
Clerical workers & others	26.2	3.9
Professional /technical	30.7	10.0
<b>Occupational status of father (%)</b>		
Unemployed/handicapped	2.4	1.2
Sales/production work/agriculture	10.0	5.3
Clerical workers	31.4	24.2
Service and army	19.7	53.9
Professional/technical/administration	36.6	15.4
<b>SES Score***</b>		
Low	5.7	54.1
Medium	34.1	28.5
High	60.2	17.5

\* Excluding domestics

\*\* 1 K.D.(Kuwaiti Dinar)= US \$ 3.4

\*\*\* See appendix for the calculation of SES score.

watery stools in 24 hours which is the standard international definition, and the mother was asked to report whether the child had suffered from diarrhea at least once during the 3 months prior to the survey.<sup>36</sup> Similarly, the mothers were asked to report whether the child had suffered from any respiratory illness and if so, to report on the type of illness.

Contrary to our expectation, the percentage of children reported to have had at least one episode of diarrhea or respiratory illness was significantly higher in the more developed area. For example, 38 percent of the children in the Capital had suffered from a respiratory illness compared to 28 percent in Jahra. Similarly, the percentage of children whose last visit to a healthcare facility was for treatment of asthma or other respiratory illness was significantly higher in Capital than in Jahra (59 percent and 47 percent, respectively). Also, the utilization of health centers was higher in Capital than in Jahra; a larger percentage of the children in the former area had been taken to a health facility during the previous three months, and among those who had visited a health facility the average number of visits was significantly higher among the Capital children.

While the level of reported morbidity was apparently higher in Capital than in Jahra, there were no differences between the two areas with regard to hospitalization that may be considered to be reflective of relatively serious ill health. The percentage of children who had ever been admitted to the hospital, or been admitted for specific ailments such as diarrhea or respiratory illness was not significantly different in Capital and Jahra. Similarly, the average number of times the sick children had been treated in the two areas was not significantly different. Finally, there were no significant differences in the percentage of children who had suffered from fractures, poisoning or burns in the two areas. The percentage of mentally or physically handicapped children was also reported to be the same in the two areas.

#### Area of Residence and Factors Related to Health of Infants

For children aged less than one year, several factors that are relevant to their health are shown in Table 3 for the two areas. With the exception of the time when prenatal care was initiated, there were no significant differences between the women in the two areas. A significantly larger percentage of the Jahra women started prenatal care late, i.e. during the fourth month of gestation or later, compared to the women in Capital. However, it is worth noting that almost all women in both the areas did obtain prenatal care. Also, the percentage of women who got anti-tetanus shots was not statistically different in the two areas. Other behaviors of mothers such as smoking and breastfeeding were also

similar in the two areas. Only about two percent of the women reported smoking, and about three-fourths said that they had breastfed, or were currently breastfeeding the baby.

**Table 2** General Morbidity Pattern of Children Aged Five Years or Less in Capital and Jahra

Morbidity Indicator	Capital	Jahra	p
<b>Number</b>	<b>290</b>	<b>491</b>	
<b>General Morbidity</b>			
% remain occasionally or usually sick.	35.1	38.1	N.S
% taken to health facility during the past 3 months	92.8	87.8	<0.001
If visited, average no. of visits during the past 3 months	3.7	2.7	<0.05
% ever admitted to hospital	20.3	19.8	NS
<b>Diarrheal Morbidity</b>			
% who had diarrhea 3 months prior to the survey	35.9	28.3	<0.05
If suffered, average number of diarrheal episodes during the past 3 months	2.2	2.0	NS
If treated, average number of times treated for diarrhea during the past 3 months	1.7	1.6	NS
% ever hospitalized for diarrhea	3.1	2.3	NS
<b>Respiratory Morbidity</b>			
% who had respiratory illness during the past 3 months	37.6	28.2	<0.01
% who had asthma attack during the past 3 months	16.6	14.8	NS
% whose last visit to health facility was for respiratory illness or asthma.	59.3	47.0	<0.05
% ever hospitalized for respiratory illness.	7.9	7.1	NS
% whose last admission to hospital was due to respiratory illness	7.6	6.3	NS
If ever treated, average number of times treated for respiratory illness	3.7	3.1	NS
<b>Other Morbid Conditions</b>			
% ever had:			
Fractures	3.8	1.6	NS
Poisoning	0.7	1.4	NS
Burns	5.9	4.1	NS
% having mental or physical handicap.	1.0	1.0	NS

NS = Not Significant

All of the infants were delivered in a government or private healthcare facility. More of the Capital women delivered in private hospitals, although the difference between the two areas was not statistically significant. In terms of mother's health problems such as hypertension, about one-fifth of the Jahra women and one-tenth of the Capital women had

such a problem. Also, more of the Capital than the Jahra women had induced abortions and cesarean section deliveries, even though the differences were not significant. Finally, more of the Capital babies had low birth weight than the Jahra babies. It should be pointed out that one of the reasons for the lack of statistical difference in some conditions (e.g. hypertension) that apparently are quite different in the two areas may simply be due to the small number of infants in our study.

**Table 3** Health Seeking Behavior and Factors related to Health of Live Infants Aged Less than One Year, Capital and Jahra (percentages)

	Capital	Jahra	p
<b>Number of Infants</b>	<b>55</b>	<b>101</b>	
Place of Birth			
Government hospital/clinic	61.8	72.3	
Private hospital	38.2	27.7	NS
Mother had hypertension during pregnancy	20.0	9.9	NS
Labor was induced, not spontaneous	32.7	23.8	NS
Delivery was vacuum, breach or CS	29.1	21.8	NS
Obtained prenatal care	100.0	98.0	NS
Started prenatal care during 4th month or later	21.8	42.7	<0.05
Average number of prenatal visits	10.9	9.7	NS
Got anti-tetanus shot	64.2	65.3	NS
Smoke cigarettes	1.8	2.0	NS
Never breastfed baby	25.5	27.7	NS
Birthweight was <2500	14.5	7.0	NS

NS = Not Significant

### Socioeconomic Status Score and Morbidity

In order to refine the analysis beyond a comparison of the area of residence, a score of SES was developed for each child, as mentioned earlier (see Appendix Table 1 for definition). The relationship between SES and morbidity among all children (living in Capital as well as Jahra) is shown in Table 4. We found an unexpected positive association between SES and general morbidity, as well as diarrheal morbidity. More of the children in the higher SES group were reported to remain usually sick and had been taken to health facilities. Among those taken to a health facility, the ones in the higher SES group had been taken more frequently. With regard to diarrheal morbidity, the low SES group reported the lowest morbidity.

**Table 4** General Morbidity Pattern of Children Aged Five Years or Less by SES group

Morbidity Indicator	Low	Medium	High	p
<b>Number*</b>	<b>276</b>	<b>232</b>	<b>252</b>	
<b>General Morbidity</b>				
% remained occasionally or usually sick.	28.6	43.1	40.5	<0.01
% taken to health facility during the past 3 months	83.7	90.9	94.4	<0.001
If visited, average no. of visits during the past 3 months	2.5	3.1	3.1	<0.01
% ever admitted to hospital	21.0	19.8	18.7	NS
<b>Diarrheal Morbidity</b>				
% who had diarrhea 3 months prior to the survey	25.7	34.5	32.1	NS
If suffered, average number of diarrheal episodes during the past 3 months	1.7	2.5	1.6	<0.01
If treated, average number of times treated for diarrhea during the 3 months	1.5	1.9	1.4	NS
% ever hospitalized for diarrhea	1.4	4.7	1.2	<0.05
<b>Respiratory Morbidity</b>				
% who had respiratory illness during past 3 months	30.4	35.8	26.6	NS
% who had asthma attack during past 3 months	14.9	15.1	16.3	NS
% whose last visit to health facility was for respiratory illness or asthma	40.2	54.3	59.9	<0.001
% ever hospitalized for respiratory illness.	6.9	9.1	5.6	NS
% whose last admission to hospital was due to respiratory illness	31.0	34.0	32.6	NS
If ever treated, average number of times treated for respiratory illness	2.8	3.3	4.0	<0.05
<b>Other Morbid Conditions</b>				
% ever had:				
Fractures	2.5	2.6	2.4	NS
Poisoning	1.8	0.9	0.8	NS
Burns	3.3	7.8	3.6	<0.05
% having mental or physical handicap	1.1	0.0	2.0	NS

\* excluding 21 cases where information on any of the 7 variables to create the SES score was missing.

With regard to respiratory morbidity during the 3 months prior to the survey, however, a relatively larger percentage of the low and medium SES children had suffered than the high SES ones, even though the differences were not statistically significant. In case of those children who had received treatment for respiratory illness, the ones in the higher SES group had received more care, i.e. the average number of times the child had been treated for respiratory

illness among the higher SES groups was 4 compared with only 2.8 times for the low SES children.

While reported morbidity was significantly higher among those in the higher SES groups, there were no significant differences in the percentages of those who had ever been hospitalized, or hospitalized for a respiratory illness. The above findings indicate that the relationship between SES level and morbidity is not the same for various types of morbidity. While a positive association was reported for general health and diarrheal morbidity, an inverse association was present between SES level and respiratory morbidity. In terms of healthcare sought, high SES children had visited a health facility more frequently than low SES ones. However, the percentage of those who had ever been admitted to the hospital was relatively higher among the low SES children. Thus, the bivariate association of SES level with morbidity indicated a mixed picture.

### **Multivariate Analysis of Diarrheal Illness and Respiratory Illness**

In Tables 2 and 4, episodes of diarrhea and respiratory illness were defined in a bivariate sense without controlling for various demographic factors that might influence the occurrence of the given disease: factors such as the age and sex of the child, and his or her birth order in the family, which might be an influence on the occurrence of an illness, or the mother's perception and reporting of such illness. For example, illnesses may be perceived and recalled more accurately for boy babies than girl babies, or for first births. Also, the age of the baby is likely to affect the occurrence of a disease, especially in case of diarrhea. It is well documented that diarrheal episodes increase as breast feeding is stopped and the baby is weaned and exposed to new foods, or is teething.<sup>37</sup> In order to ascertain the net impact of SES on the morbidity of children after controlling for the relevant demographic variables, we analyzed the occurrence of diarrheal illness and respiratory illness during the three months prior to the survey by using logistic regression. These two variables were selected for further analysis since they were found to be statistically significant in the bivariate analysis (Table 2). The dependent variables were defined as binary, taking the value 1 if the child had suffered from diarrhea or respiratory illness, and 0 otherwise. Two different models were run for each type of illness, using the following explanatory variables:

### **Model 1**

#### *Demographic*

- Age of the child, defined in three groups (< 12 months, 12-24 months, > 24 months)
- Sex of the child (male or female)
- Birth order, defined in three groups (first, second to fifth, sixth or higher)

#### *SES*

- Mother's education, defined in four groups (illiterate, 1-8 grades, 9-12 grades and >12 grades)
- Mother's work status, defined as two groups (working, and non-working)
- Mother's age at marriage, defined as three groups (< 16, 16-19, and 20 or more)
- Place of residence, (Capital or Jahra)

### **Model 2**

Mother's socioeconomic characteristics (i.e. education, work status and age at marriage) were replaced by the SES score that has been defined earlier. The three demographic variables and place of residence were also included in this model.

#### *Diarrheal Morbidity*

The results of the multivariate analysis are shown for diarrheal morbidity in Table 5. Of the seven variables examined in Model 1 of Table 5, only the child's age was significant at the 5 percent level, while mother's age at marriage was marginally significant. In Model 1, none of the socioeconomic variables were significant predictors of diarrheal morbidity during the three months prior to the survey. Also, the net impact of residing in Capital or Jahra was not significant in terms of diarrheal morbidity, even though the Jahra children were reported to have somewhat lower morbidity than the Capital children. In Model 2, where the maternal SES characteristics were replaced by the SES score, the results were very similar to the first model. Age of the child was a significant variable. Also, the odds of having had diarrhea were higher in case of first births relative to the sixth or higher order births. The SES score was not a significant predictor of diarrheal morbidity. Similarly, none of the other demographic variables or place of residence were significantly associated with diarrhea.

**Table 5** Odds Ratios of Diarrheal Morbidity during the 3 Months Prior to the Survey

Explanatory Variables	Model 1	Model 2
<b>Age of child</b>		
<12 months	1.5376*	1.5350*
12-24	2.2906**	2.2090**
24+	Ref.	Ref.
<b>Sex of child (male=1)</b>		
	1.1735	1.2048
<b>Birth order</b>		
First child	1.3874	1.8758*
2nd-5th child	1.2313	1.5474
Sixth or higher child	Ref.	Ref.
<b>Mother's education</b>		
Illiterate	0.7800	-
1-8 grades	1.3632	-
9-12 grades	1.3972	-
12 + grades	Ref.	-
<b>Mother's work status (no=1)</b>		
	0.7758	-
<b>Mother's age at marriage</b>		
<16	0.9208	-
16-19	0.6479*	-
20+	Ref.	-
<b>Place of residence (Jahra=1)</b>		
	0.9130	0.7986
<b>SES Score</b>		
Low	-	1.0476
Medium	-	1.2594
High	-	Ref.

- not included in the model

Ref.= Reference category

\* $p < 0.05$ ; \*\*  $p < 0.01$

Diarrheal morbidity was significantly higher among children aged 2 years or younger compared with children aged above 2 years. It was especially higher among children between the ages of 12 to 24 months. The above findings are consistent with expectation since the child is weaned off breast milk during these ages and is most prone to diarrhea episodes.

### Respiratory Morbidity

About 32 percent of all children were reported to have suffered from a respiratory illness during the three months prior to the survey. Table 6 shows two models designed to ascertain the net impact of SES on respiratory morbidity, defined in the same way as the models in Table 5. Of the other variables, the place of residence was significantly associated with the occurrence of respiratory illness in both

models. As in the bivariate analysis, Jahra mothers reported significantly lower morbidity than Capital mothers, a finding that is contrary to expectation. Also, in Model 1 where the mother's characteristics were entered, women with 1-8 grades of education were significantly more likely to report respiratory illness compared with the ones who had more than 12 grades of education. In Model 2, the SES level was found to have a strong, inverse association with the occurrence of respiratory illness during the three months prior to the survey. Children in the low as well as medium SES groups were about twice as likely to have suffered from such illness than the children in the high SES group.

**Table 6** Odds Ratios of Respiratory Morbidity during the 3 Months Prior to the Survey

Explanatory Variables	Model 1	Model 2
<b>Age of child</b>		
<12 months	1.0112	1.0177
12-24	1.2475	1.2021
24+	Ref.	Ref.
<b>Sex of child (male=1)</b>		
	1.0255	1.0945
<b>Birth order</b>		
First child	0.9712	1.1655
2nd-5th child	1.3854	1.5922*
Sixth or higher child	Ref.	Ref.
<b>Mother's education</b>		
Illiterate	1.3044	-
1-8 grades	1.9369*	-
9-12 grades	1.5494	-
12 + grades	Ref.	-
<b>Mother's work status (no=1)</b>		
	1.3113	-
<b>Mother's age at marriage</b>		
<16	1.0018	-
16-19	1.0118	-
20+	Ref.	-
<b>Place of residence (Jahra=1)</b>		
	0.5433**	0.5674**
<b>SES Score</b>		
Low	-	2.0831**
Medium	-	1.8640**
High	-	Ref.

- not included in the model

Ref.= Reference category

\* $p < 0.05$ ; \*\*  $p < 0.01$

### Discussion

The first important point that emerges from the analysis of morbidity among Kuwaiti children belonging to supposedly different SES groups is that once we controlled for the

relevant demographic factors, the effect of SES on morbidity varied for diarrheal and respiratory illness. There were no significant differences in the reported morbidity due to diarrheal illness in either the two areas or the various SES groups. The initial bivariate analysis had shown that a significantly larger percentage of mothers in the more developed area (Capital), and in higher SES groups, reported occurrence of diarrheal morbidity. The second important point is that in case of respiratory illness, we found an inverse association between SES level and morbidity. This inverse association was maintained in the multivariate analysis, and children in the low and medium SES groups had higher respiratory morbidity than those in the high SES group, net of several demographic factors. Thus, respiratory morbidity followed the 'expected' inverse association between SES and health, while there was no significant difference in case of diarrheal morbidity.

A possible reason that might explain the unexpected finding pertaining to higher morbidity reported by the mothers in the two areas (and mothers in higher SES groups) may consist of differences in morbidity perceived and reported by mothers. A larger percentage of the Capital mothers reported their children to remain usually sick. It is possible that such mothers perceived and reported illnesses more frequently than the Jahra mothers. The Capital mothers are the more educated women, many of whom are economically active. It is more likely that the responsibility for child care is shared in their case by housemaids. The mother may therefore be more vigilant in observing the health of the child to ensure that the housemaid is taking adequate care of the child. Furthermore, maids may over-report the discomfort of the child resulting in further heightening the mother's response. As shown in Table 1, households in the Capital had an average of 2 domestic servants while those in Jahra had 1.4 servants. It may be noted that 82 percent of the households in our survey had at least one housemaid, while 28 percent had 2 or more housemaids. No studies are available on the extent to which child care is actually left to housemaids, and whether this affects the child's health. However, general observation and media reports do indicate a concern about the social impact of housemaids on children.

Another result that needs further explanation is the relatively higher healthcare utilization reported for the higher SES children and those residing in the more developed area

(Capital). Significantly larger percentages of children in the Capital, and those residing in the higher SES households had been taken to a health facility during the three months prior to the survey. The above pattern could again be a result of the mother's response to illness. The higher SES mothers may seek healthcare earlier than the lower SES mothers who might first try home remedies for various illnesses before seeking help at a clinic. Furthermore, the higher SES women may seek more healthcare for well-baby visits. It is also possible that the higher SES women had greater accessibility to health care facilities, even though services in the government sector (that provides about 90 percent of all services) are provided free of cost to all Kuwaitis. Research on non-urgent utilization of emergency rooms in Kuwait, for example, showed that the patient's level of education had a significant, positive effect on utilization, implying greater accessibility to facilities in case of such patients.<sup>38</sup>

The reported percentages were not significantly different among the various socioeconomic groups in terms of children who had ever been hospitalized, had suffered fractures or poisoning, or were mentally or physically handicapped. Also, there were almost no significant differences in the health seeking behavior of mothers who had delivered during the one year prior to the survey. All the births in both areas occurred in a medical facility, and almost all women obtained prenatal care, even though a larger percentage of the Jahra women initiated care later than the Capital women. The breastfeeding and smoking behavior of the women was also similar. In case of infants, a possible reason for lack of difference could be the small number of cases.

In view of the mixed results, the important question to be answered is: why have the differences in diarrheal morbidity of children in different social classes been eliminated, while an inverse association is present in case of respiratory morbidity? Perhaps the most important reason for the reduction of morbidity differences is the general level of development. The living conditions of the Kuwaiti children are relatively good in both the least developed and the most developed areas. The infrastructure in terms of roads, sewage, running water and electricity is well developed in both types of areas. In terms of personal income, a differential is present in the two areas and the per capita

income is substantially higher in the Capital. However, the cost of living is highly subsidized. It has been estimated that the government supplements each dinar earned by a Kuwaiti national with another 1.25 dinars through its various benefits from public sector activity programs.<sup>39</sup>

Among the services that are provided free of charge to citizens, one that is especially significant for infant and child health consists of healthcare. Each neighborhood has a primary healthcare clinic designed to cover about 30,000 persons.<sup>40</sup> Basic preventive services such as maternal health, and immunizations are provided through a network of primary care clinics. If needed, referrals are made by the primary care doctor to the secondary or tertiary levels. Kuwait is a small country and a clinic is usually within 10-15 minutes drive from most homes. Thus, preventive as well as curative services are easily accessible and available to all citizens. Among the behavioral factors that might affect diarrheal morbidity among children, the mother's breastfeeding pattern is especially important. We found the breastfeeding behavior of the mothers in the two areas to be very similar. It has also been reported in a national survey that the breastfeeding behavior of illiterate and university educated women was almost the same in terms of ever having breastfed the last live birth during the five years prior to the survey, with 86 percent and 88 percent women having ever breastfed; the mean duration of breastfeeding was, however, smaller for the university educated mothers.<sup>21</sup>

Unlike diarrheal morbidity, SES differences were significantly and inversely associated with respiratory morbidity. Thus, despite the government efforts at equitable distribution of resources, children who belong to lower SES households still face a greater risk of ill health due to respiratory illness. At the same time, they are likely to receive less healthcare attention in case they do suffer from a respiratory illness. Thus, differences in morbidity and utilization of services still persist. These findings confirm the results of a national survey of child health conducted in 1987 which showed that the percentage of children who were fully immunized was 84 percent among illiterate mothers compared to 96 percent among mothers with secondary or higher education.<sup>21</sup>

In situations where disadvantaged children have higher levels of morbidity this effect may work through several pathways, such as inadequate housing, inadequate nutrition

and feeding patterns, delay in seeking healthcare, poor knowledge of healthy behaviors, or risky behavior of parents (e.g. smoking). Our survey did not collect information about the father's smoking behavior which may be an especially strong correlate of respiratory illness among children. The reasons for higher respiratory morbidity among the lower SES children need to be investigated further.

Finally, a word of caution about the limited nature of our measurement is in order. First, we relied completely on the mother's reporting of morbidity and did not validate the occurrence of morbidity from any independent source such as clinic or hospital records. The latter would have been very difficult in view of the non-computerized nature of the medical records. The mother's reporting may suffer from perception, recall and reporting biases, as discussed already. However, other studies that have relied on mother's reporting of the child's health conclude that self-assessed health status is highly correlated with clinically evaluated health status, and the use of healthcare services. It is an important, widely used general summary measure of health.<sup>14</sup>

Second, we examined only three types of morbidity, i.e. general, diarrheal, and respiratory morbidity. Intestinal infections used to be a major killer of children and the leading cause of hospitalization among children until a few years ago. This picture has changed rapidly. In 1975, intestinal infections accounted for 28 percent of all infant deaths.<sup>41</sup> In 1994, this cause accounted for less than 3 percent of all deaths and was not among the ten leading causes of death.<sup>23</sup> However, intestinal infections are still a relatively important cause of hospitalization among children, and accounted for about 7 percent of all hospital admissions among children aged less than 1 in 1994. Similarly, respiratory illnesses such as asthma and bronchitis are other leading causes of infant morbidity and accounted for 11.5 percent of all hospital admissions among infants in 1994.<sup>23</sup> We therefore focused our inquiry of morbidity on these two conditions. In future, the relationship of SES level with other types of morbidity should also be examined.

## **Conclusion**

In conclusion, we found that morbidity differences between SES groups have disappeared for diarrheal illness but not for respiratory illness. In case of the latter, an inverse association between SES level and morbidity is present.

Kuwait is a society in transition. Among the Gulf countries it has achieved the lowest infant mortality level.<sup>42</sup> However, there is much room for further reduction of infant mortality for the country to reach the level of Western nations. Causes of death and morbidity are changing. Morbidity differences between social classes have not been eliminated fully. In

order to achieve the above, a vigorous policy to ensure that all segments of the population continue to have access to health and other resources will need to be maintained. The health needs of those in the lower SES levels will need closer attention in order to reduce, and eliminate the morbidity gap found in this study.

**Appendix Table 1** Correlation Matrix of Variables Used for Creating the SES Score

Variables	House	PPB	Father's Occ.	Mother's Occ.	PCI	Mother's Edu.	Father's Edu.
House	1.000	0.3487	0.0018	0.0799	0.1741	0.2204	0.2119
PPB		1.000	-0.0022	0.2403	0.3858	0.3209	0.1958
Father's Occ.			1.000	0.0684	0.0333	0.0589	-0.0037
Mother's Occ.				1.000	0.4914	0.5620	0.2896
PCI					1.000	0.5184	0.4571
Mother's Edu.						1.000	0.5832
Father's Edu.							1.000

**House:** Government house/flat/others=1, Villa=2

**PPB =Persons Per Bedroom:** >2 =1, 1.5 to 1.9 =2, <1.49 =3

**Father's Occ.=Father's Occupation:** unemployed/handicapped =0, sales, agriculture etc=1, clerical=2, service and army=3, professional/technical/administration=4

**Mother's Occ.= Mother's Occupation:** unemployed =0, sales, agriculture etc. =1, clerical=2, professional/technical/administration=3

**PCI= Per Capita Income (K.D.=US \$ 3.4) :** <149.9 =1, 150 to 199.9 =2, 200 to 249.9 =3, 200+ =4

**Mother's Edu.=Mother's Education:** Illiterate/read & write =1, 1 to 8 =2, 9 to 12 =3, 12+ =4

**Father's Edu.= Father's Education:** Illiterate/read & write =1, 1 to 8 =2, 9 to 12 =3, 12+ =4

*Note: The above coding scheme was used to construct a socioeconomic score for the mother of each child. The minimum possible score was 5 while the maximum possible was 24. Those with a score of 5-12 were grouped as low SES, those with 13-16 as medium SES, and those with 17-24 as high SES. The figures pertaining to SES in Tables 4-6 are based on the above grouping.*

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