Mortality among children in Basrah

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ABSTRACT

Background: **Childhood mortality is a sensitive indicator of the health and socioeconomic status of population. Differential figures across populations and/or over time suggest variation in the quality of health, health care and standard of living. During the last three decades, all indicators of childhood mortality showed declining trend but a great variation does exist between developed and developing countries with some countries, mostly African have the highest rates.**

Objectives: **The present study was conducted to estimate the mortality rate among children aged less than 15 years in Basrah over a 6-year period and to identify the major causes of childhood mortality.**

Methods: **A retrospective, record-based study using all official records of deaths among children during the years 2008-2013.**

Results: **The study demonstrated that overall childhood mortality rate for the years (2008-2013) in Basrah governorate was within the international pattern with a tendency towards lower figures among various countries. Infant mortality (22.4/1000 live births) is still high as compared to many countries. Regarding the sex distribution an excess of male specific mortality rate is seen. Mortality among male children was 3.26/1000 males and 2.85/1000 female children. No explanation is verifiable but excess exposure to risk factors, such as outdoor activities could be implicated. The five leading causes of childhood death; perinatal causes, bacterial infections, congenital anomalies, accidents and diseases of the respiratory system accounted for 72.8% of all registered childhood deaths in Basrah governorate during the years.2008-2013. Most of these conditions are amenable to prevention.**

Conclusions: **A substantial proportion of deaths among children were related to causes of death that are amenable to prevention.**

Key words: Childhood mortality, Basrah, Retrospective, Death

الوفيات بين الأطفال في البصرة

خلفية: تعتبر الوفيات بين الأطفال مؤشرا حساسا للحالة الصحية والاجتماعية والاقتصادية للسكان. و تدل المعطيات المتاحة على وجود تغاير بين السكان وعبر الزمن في مستوى الصحة والرعاية الصحية ومستوى المعيشة. ومع ان المؤشرات في العقود الثلاثة الماضية أشرت انخفاضا في جميع معايير الوفاة بين الأطفال إلا إن فروقا كبيرة ما زالت تسجل بين الدول المتقدمة والدول النامية ومازالت أعلى النسب تسجل في الدول الأفريقية.

الأهداف: تهدف الدراسة الحالية إلى تقدير نسبة الوفيات بين الأطفال دون الخامسة عشرة من العمر والى تحديد الأسباب الرئيسة لتلك الوفيات.

الطرائق: دراسة استرجاعية اعتمدت على البيانات الروتينية المسجلة الكترونيا في دائرة صحة البصرة للسنوات ٢٠٠٨–٢٠١٣.

النتائج: أظهرت النتائج ان نسبة الوفيات العامة بين الأطفال في محافظة البصرة ضمن المدى العام في العالم وكانت نسبة الوفيات بين الرضع دون السنة من العمر بحدود ٢٢ لكل ١٠٠٠ ولادة حية وهي عالية نسبيا بالمقارنة مع دول عديدة. كانت نسبة الوفيات أعلى بقليل بين الذكور مقارنة بالإناث دون معرفة التفسير لهذا الفرق. كانت الأسباب الرئيسية للوفاة هي عوامل ما حول الولادة والخمج البكتيري و العيوب الولادية والحوادث وأمراض الجهاز الوعائي وقد مثلت ٧٣% تقريبا من مجموع وفيات الأطفال وغالبية الأسباب قابلة للوقاية.

الاستنتاج: تعكس وفيات الأطفال في محافظة البصرة حزمة من الأسباب القابلة للوقاية في معظمها .

كلمات مفتاحية دالة: وفيات الأطفال، البصرة، دراسة استرجاعية، الوفاة

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INTRODUCTION

A child, for the purpose of this study, is a person whose age is between birth and just under 15 years. [1] Children in this age range may be termed as infants aged less than one year, children aged 1-4 years or under-fives including all ages from birth up to but not including 5 years. Another category is school aged children including children aged 5-14 years. Consequently mortality among children may be calculated according to the above groups as infant mortality, mortality among children 1-4 years, the under-5 mortality and childhood mortality among under 15 years old. [2] Childhood mortality is a sensitive indicator of the health and socioeconomic status of population. Differential figures across populations and/or over time suggest variation in the quality of health, health care and standard of living. During the last three decades, all indicators of childhood mortality showed declining trend but a great variation does exist between developed and developing countries with some countries, mostly African still have the highest rates.[3-5] It is important to stress at this point that variation in various components of death rates in children particularly infant mortality are likely to occur due to errors in registration. Death registries exist in most of the World countries which use international classifications and codes[6] but a great number of inaccuracies, particularly in undeveloped nations, in the statistics related to infants death do occur.[7] In 2001, about 10·8 million children died at global level, 99% of whom lived in low-and-middle-income countries particularly sub-Saharan countries.[8] More than half of child deaths in 2001 were attributable to acute respiratory infections, measles, diarrhoea, malaria, and HIV/AIDS and accidents.[9] in 2010, the total number of deaths was much less (7,614 million) but within countries a great variation in infant and childhood mortality did occur also.[10,11] Poverty, conflict, lack of education and inadequate health and water and sanitation infrastructures all contribute to the unacceptably high levels of under-five mortality.[12] Children are at greater chance of dying when mothers do not know how to recognize and treat basic illnesses, cannot afford medicines or the trip to the nearest health centre is costly. [12] Under-nutrition remains the leading risk factor for health loss including substantial contribution to mortality in children.[13] The under-5 year mortality is an important indicator of population development, health and health care. According to the UNICEF Report on the state of the World's Children 2008[14], it measures an outcome of development of a nation, it is the product of multiple factors and it only reflects a broad development at society level. Globally, about 45% of under-five deaths are linked to under-nutrition.[15] In one study, it was found that **c**hildren affected with infectious diarrhea, with relatively late presentation are at higher risk of death also even after being cared as inpatient cases.[16] It is very difficult to draw a clear picture on childhood mortality in Basrah. Few studies could be identified that presented data on infant mortality in southern Iraq. A household- based study carried out in two quarters in Basrah city (Hay-AL-Hussain and AL-Jazair) during the period 1985-1989 reported an infant mortality rate of 41.7/1000 live birth with neonatal mortality rate of 21.0, and post-neonatal mortality rate of 20.7 both per 1000 live birth.[17] Ajeel (2003)[18], in a household follow up study reported an infant mortality of 41.6 per 1000 live births. Similar figures for neonatal mortality were also reported by another study.[19] The present study was conducted to estimate the mortality rate among children aged less than 15 years in Basrah over a 6-year period and to identify the major causes of childhood mortality using routine mortality registry.

METHODS

The data used in this study were obtained from the Statistical Unit of Basrah Directorate General of Health Services. This unit collects all the data related to mortality of all age groups from all hospitals of the governorate. The data are stored electronically using a special software programme designed by the Ministry of Health. The study is a descriptive retrospective record-based study covering all causes of death registered in Basrah for the years 2008-2013 inclusive. A request was submitted to the Research Committee at the Directorate General of Health services in Basrah to approve the study and facilitate the acquisition of mortality related data available with the Statistical Unit of the Directorate. An electronic file was available for the years 2008-2013 and was supplied to the researchers. This file was transferred to an Excel file for editing, then to an SPSS file for the purpose of data analysis. A total of 63325 deaths were recorded in Basrah governorate during the reference period (2008-2013). Of these, 19735 were among children aged less than 15 years. The latter figure was used in the presentation of the results in this article. Basic data on each death were compiled including age, sex, cause of death and year of death. The causes of death were classified according to the WHO International Classification of Disease and related health problems-Version 10. [6] The summarized data were entered, compiled, tabulated and presented as tables and diagrams using Excel and SPSS programme (Statistical Package for Social Science -version 15). Rates were calculated as age-specific, sex-specific and cause-specific per 1000 population by dividing the Average annual number of deaths in each specific group by the mid-period estimated population of that group. In addition, infant mortality and under-five mortality rates were calculated in the same way but using annual live births as denominators. As for the population denominators, Data on Basrah population are based on figures obtained from various sources. The main and most reliable sources are based in the Ministry of Planning and Developmental Cooperation- Central Office for Statistics [20] and figures estimated by Basrah Cancer Research Group [21] using extrapolation from 1997 population census. For obtaining the share of children, we used the best figures obtained from multiple local household surveys in Basrah and also from the data of previous census and from age and sex breakdown given by the Ministry of planning and Developmental Cooperation. Children aged less than 15 years represent between 38-43% of the total population.

RESULTS

Table-1, shows the mortality rates for children by age, sex and year. The overall mortality rate among children is 3.06 per 1000 per year.

Age: The bulk of deaths occurred in children aged less than five years with an average annual mortality rate of 7.24 per 1000. The average annual rates for the other two groups are very low.

Sex: An excess of male-specific mortality rate (3.26 per 1000 male children) is seen compared to 2.85 per 1000 female children.

Year of death: In all the years covered in the study, no major variation could be noticed in the number of deaths in children except in the year 2009 when a clear excess was noticed. the annual mortality rates were very similar in magnitude except for the year 2009, the mortality rate was relatively high (4.42 per 1000) compared to any other year.

Table 1. Average annual mortality rates per 1000 population by age, sex and cause of death.

Variable	Estimated population	No. of deaths	Average annual mortality rate /1000
Age*			
<5	401730	17450	7.24
5-9	352871	1299	0.61
10-14	320298	986	0.51
Sex			
Male	557872	10907	3.26
Female	517027	8828	2.85
Year			
2008	1004210	2670	2.66
2009	1034334	4571	4.42
2010	1061038	3030	2.86
2011	1088759	3032	2.78
2012	1117508	3146	2.82
2013	1151033	3286	2.85
Mid-period population	**1074899**	**19735**	**3.06**

Estimated infant mortality rate is approximately 20.4 per 1000 live births.

Estimated under five mortality rate is approximately 26.4 per 1000 live births.

***Cause of death**:* Perinatal causes represent the leading cause of death in children aged less than 15 years as shown in, (Table-2). This group as a cause of death accounted for 28.9% of all causes of death and an average annual mortality rate of 0.88 per 1000 (About 9 per 10000 children). The next important causes were those related to bacterial infections 3427 (17.4%), congenital anomalies 2118 (10.7%), injuries/accidents 1616 (8.2%) and diseases of the circulatory system 1490 (7.6%). These five groups of causes accounted for about 72.8%. All the details are shown in, (Table-2).

Table 2. **Mortality rate in children aged < 15 years by cause: Basrah 2008-2013.**

Cause of death	Deaths		
	No. in 6 years	%	Average MR/ 1000 per year*
Perinatal causes	5705	28.9	0.88
Infections	3427	17.4	0.53
Congenital anomalies	2118	10.7	0.33
All types of injuries-accidents	1616	8.2	0.25
Diseases of the circulatory system	1490	7.6	0.23
Unclassified causes	1486	7.5	0.23
Diseases of the respiratory system	1072	5.4	0.17
Diseases of the nervous system	874	4.4	0.14
Malignant diseases	710	3.6	0.11
Diseases of the genito-urinary system	329	1.7	0.05
Nutritional and endocrinal diseases	284	1.4	0.04
All other causes	624	3.2	0.10
Total	**19735**	**100.0**	**3.06**

***Estimated mid period population for the years 2008-2013 was 1074899**

DISCUSSION

Despite the fact that Millennium goal 4 aimed to reduce child mortality by two thirds by 2015 and that childhood mortality has declined during the recent decades, mortality rates remained very high in the African countries in the sub-Saharan region which have the highest rates. The under 5 mortality rate actually increased in 14 countries across the world, nine of them are in sub-Saharan region.[4,5,22] Such differential figures across nations, must reflect variation in health care and standard of living as childhood mortality is an important indicator of population development, health and health care. According to the **UNICEF** report on the state of the world's children 2008 childhood mortality as a measure of outcome of development of a nation, is the result of a wide range of factors and conditions such as the nutritional status and health knowledge of mothers, the coverage rate by immunization and oral rehydration therapy and reflects abroad development at society level.[14] These facts reflect how important it is to study childhood mortality in any population and to monitor trends and mix over time. The cause of death in children is somewhat different in different age groups. These variations reflect the underlining package of conditions and risk factors as well as the availability of effective health care. The pattern in Basrah, according to the present study results, was not different but two features are clearly demonstrated in this study in Basrah. The first is that perinatal conditions and infections are major killers. The second is that the probability of child death in the first year and first five years is substantial, some of which may be preventable. A substantial proportion of deaths in Basrah governorate were seen in children particularly the group aged less than five years. Perinatal conditions, bacterial infection, congenital anomalies, injuries and diseases of the circulatory system were the five leading causes. These five causes accounted for 72.8% of all deaths in children over the period 2008-2013. At least two groups are preventable causes; infection and injuries but unfortunately these two major causes still operating. Regarding the magnitude of mortality, it is clear that childhood mortality in Basrah is lower than countries which are classified as high mortality countries such as sub-Saharan countries and some Asian countries also. The under-five mortality rate in Basrah is however within the pattern seen in most regional countries like Syria, Jordan, Saudi Arabia, Turkey, Iran and Egypt but much higher than the rate in Kuwait, Bahrain, Japan and the UK.[11,12] These figures are limited by possibility of errors and incompleteness of death registration. This is not unique to Basrah but a defect which was encountered in most of the world countries particularly in under developed nations decades ago and still operating.[7,23] Thus the true mortality burden in children might be even higher than what we documented in the present study. We are not in any position to validate the results but they can be considered the best estimate available yet on childhood mortality at the governorate level. In all age groups but infants cancer and injuries are emerging two killers in Basrah. We did not find studies to compare our results with but the numbers obtained are sufficient to look at injuries and cancer as two serious and might be increasing problems in children. The high proportional mortality among young children in Basrah particularly infants and in association with perinatal conditions is a reflection of still inadequate responsiveness of the health care system. [11,24] Early childhood mortality is a good indicator of poor prenatal and obstetric care.[25] No doubt that low socioeconomic status, relative poverty and inadequate health care services are among other factors, that contribute to childhood mortality.[13] An excess of male–specific mortality rate 3.26 per 1000 male children is seen compared to 2.85 per 000 female children. The excess could reflect excess exposure to risk factors and the result supports

an ongoing phenomenon since decades in Basrah.[17] Regarding time trend the annual mortality rates were very similar in magnitude over years except for the year 2009 when mortality rate was relatively high (4.42/1000) compared to any other year. No explanation could be found. It is possible that delayed registration of some childhood deaths in the years prior to 2009 were registered in 2009 but this is not verified. The pattern of childhood mortality as presented in the present study indicates a clear shift of causes of deaths from infection and malnutrition to causes of modern life. The two conditions (injuries and tumours) both deserve care by policy makers and researchers.

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