# ESTIMATED MORTALITY RATE BY SEX-AGE AND DEATH CAUSES IN KARACHI

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**Abstract**

An estimated mortality rate of encephalitides in Karachi was 37.0 per 100,000 population (male:42.0, female:31.4) for the death records survey in five big hospitals and one private clinic in District Ill The estimated mortality rates per 1000 population by sex and age were as follows: 15.9 in all males, 14.0 in all females, 34.7 in age group of 0-4 and 77.7 in age group of 70 and above. The mortality rate in age group of 5-49 was higher in females than in males. The estimated mortality rates per 100,000 population by death causes were as follows :208.8 for infections and parasitic disease, 96.5 for diseases of the nervous system, 361.0 for disease) of the circulatory system. (JPMA: 36: 174, 1986).

## INTRODUCTION

The comprehensive studies on encephali. tides in Karachi were carried out in 1982-1984 in cooperation with staffs of the Civil Hospital and KMC (Karachi Meteropolitan Corporation). One of the purposes of these studies was to determine the frequency of encephalitides in Karachi. However, data to estimate these frequencies was not available. Furthermore, our examination of death records which were registered in KMC by families of the dead revealed that those records were only a part of all deaths in Karachi and biased especially in younger age group and female group. So, the survey of death records in five big hospitals and one special clinic which are located in District, Ill Karachi, was carried out in 1984 in order to obtain mortality figures of encephalitides and other diseases.

## MATERIAL

Death records were obtained from hospitals and one private clinic in District III which are as follows: 3136 deaths for 1979 January to January 1984, 363 deaths in 1983 in B Hospital and 108 deaths in 1983 from four other medical institutions. From the quality of notation and manner of entry in death certificate, these appeared adequately reliable. So, 3607 deaths were analysed for sex, age at the time of death and causes.

## METHODS

The crude mortality rate in Pakistan was 15.0 per 1000 population in 1979 which was estimated from Pakistan Population Growth Survey and reported in U.N. Demographic Year book[1]. On the assumption that the sex-age distribution of 3607 deaths obtained in this survey would be similar to that of all deaths in Karachi, then:

Rij = 15.0 x 23681/3607 x Dij/Pij.

Rij: estimated mortality rate per 1000 population in sex (i) and age (j)

Dij: number of deaths in each group of sex (i) and age (j).

Pij: number of urban population in each group of sex (i) & age (j) which was reported in 1981 Census

in Pakistan.
5.0:crude mortality rate in Pakistan, 1979.
23681: total number of population in urban area of Pakistan reported from 1981 Census (in thousands).
3607: total number of deaths obtained in this survey and also, on the assumption that the distribution of 3607 deaths classified into seventeen groups according to the International Classification of Diseases would be similar to that of-all deaths in Karachi, then:
Si= 15.0/3607x lOOx Di
Si: estimated mortality rate per 100,000 population in each group (i) of death causes.
di: number of deaths in each group of 3607 death causes.

**RESULTS**

The sex-age distribution of 3607 deaths is shown in Table I.

## TABLE - I
## Sex-Age Distribution of Deaths in District III.

| death age | both sexes | male | female |
|---|---|---|---|
| 0 – 4 | 35.6% | 19.1 % | 16.5% |
| 0 | 26.7 | 14.7 | 12.0 |
| 1 | 3.7 | 1.8 | 1.9 |
| 2 | 2.3 | 1.1 | 1.2 |
| 3 | 1.8 | 1.1 | 0.7 |
| 4 | 1.1 | 0.4 | 0.7 |
| 5– 9 | 2.5 | 1.2 | 1.3 |
| 10–19 | 4.4 | 2.3 | 2.1 |
| 20–29 | 5.6 | 2.7 | 2.9 |
| 30–39 | 5.8 | 2.8 | 3.0 |
| 40–49 | 8.6 | 4.6 | 4.0 |
| 50–59 | 11.8 | 8.0 | 3.8 |
| 60–69 | 12.5 | 8.1 | 4.4 |
| 70–79 | 7.4 | 4.4 | 3.0 |
| 80 + | 4.0 | 2.4 | 1.6 |
| unknown | 1.8 | 1.1 | 0.7 |
| all ages | 100.0% | 56.7% | 43.3% |
| | (3607) | (2045) | (1562) |

Male/female ratio was 1 .31 which showed more deaths of males than females. The proportion under five years old was 35.6 percent and under one year old was 26.7 per cent. The estimated mortality rates by sex-age in Karachi is shown in Table II.

## TABLE - II
## Mortality Rate Estimated by Sex-Age in Karachi.

| death age | both sexes | Male | Female |
|---|---|---|---|
| 0–4 | 34.7 | 36.8 | 32.5 |
| 5–9 | 2.5 | 2.4 | 2.7 |
| 10–19 | 2.7 | 2.7 | 2.8 |
| 20–29 | 5.1 | 4.5 | 5.8 |
| 30–39 | 7.9 | 7.0 | 9.0 |
| 40–49 | 15.8 | 15.3 | 16.5 |
| 50–59 | 35.5 | 42.1 | 26.6 |
| 60–69 | 59.6 | 66.5 | 50.0 |
| 70+ | 77.7 | 82.1 | 72.1 |
| all ages | 15.0 | 15.9 | 14.0 |

in thousands population

The mortality rate under five years old was 34.7 per 1000 population in 1979 which was much higher than 1.8 in Japan;2.5. The mortality rate in males was 15.9. per 1000 population which was higher than 14.0 in female. In comparision of sexes in each age group, male mortality was higher than females in age group under five and above fifty. On the other hand, female mortality was higher than male in age group 5-49. The greatest difference in mortality rate between sexes was seen in age group of 50-59. The estimated mortality rate due to various causes classified into seventeen large categories according to the International Classification of Diseases is shown in Table III.

## TABLE - III
## Mortality Rate Estimated by Death Causes in Karachi.

| death causes | | mortality rate |
|---|---|---|
| I | infectious and parasitic diseases | 208.8 |
| II | malignant neoplasms | 38.3 |
| III | endocrine, nutritional and metabolic diseases | 58.6 |
| IV | diseases of the blood and blood-forming organs | 15.0 |
| V | mental disorders | 0.4 |
| VI | diseases of the nervous system and sense organs | 96.5 |
| | encephalitides | (37.0) |
| VII | diseases of the circulatory system | 361.0 |
| VIII | diseases of the respiratory system | 82.3 |
| IX | diseases of the digestive system | 94.0 |
| X | diseases of the genitourinary system | 43.7 |
| XI | complication of the pregnancy childbirth and the puerperium | 59.5* |
| XII | diseases of the skin and subcutaneous tissue | 3.3 |
| XIII | diseases of the musculoskeletal system and connective tissue | 0.8 |
| XIV | congenital anomalies | 4.2 |
| XV | certain conditions originating in the perinatal period | 223.7 (1280.0*) |
| XVI | symptoms, signs and ill-defined conditions | 203.8 |
| XVII | injury and poisoning | 44.5 |

in 100,000 population
*in 100,000 births

There were 208.8 deaths per 10,000 population due to infectious and parasitic diseases which was much higher than 9.8 in Japan; 38.3 due to all malignant neoplasia, 96.5 due to diseases of the nervous system, 361.0 due to diseases of the circulatory system, 82.3 due to diseases of the respiratory system, 94.0 due to diseases of the digestive system, 43.7 due to diseases of the genitourinary system, and 44.5

due to injuries and poisonings. The mortality rate in complication of the pregnancy, childbirth and the puerperium was 59.5 per 100,000 births. The mortality rate of certain conditions originating in the perinatal period was 223.7 per 100,000 population and 1280.0 per 100,000 births.
The number of deaths due to encephalitides was 8.9 (male 54, female 35). The mortality rate of encephalitides was estimated as 37.0 per 100,000 population which was much higher than 0.3 in Japan. The male/female ratio of mortality under flv&year old was 47.2 per cent. The seasofial variation showed some increase in March, May and August-November.

## DISCUSSION

There are mainly three problems which need to be discussed on the reliability of estimation of mortality rate in this paper. One is the reliability of mortality rate of 15.0 which was basis for all estimation of mortality rate by sex, age and causes of death obtained from the Pakistan Population Growth Survey[2]. The trend of crude mortality rate in Japan showed 16.0 per 1000 population in 1941 when the mortality rate under five years old in Japan was 35.7 which was very similar to 34.5 in Karachi as shown in Table II. In other countries around Pakistan crude mortality rates were 14.4 in Saudi Arabia , 14.6 in Turkey and 18.6 in Oman. These similarities seem to support the reliability of 15.0 in Pakistan in some range of fiducial probability. Second is the reliability of two as~umptions; that sex-age distribution of deaths would be similar between 3607 deaths in this paper and all-fraths in Karachi,and that distribution of death causes classified into large seventeen groups would be similar between 3607 deaths and all deaths in Karachi. Some evidences which seem to support the reliability of these two assumptions are as follows: (1) most of deaths in a big hospital in District III were obtained; (2) District III is the biggest district in Karachi and includes all of social classes which seem to represent the population in Karachi; (3) sex-age distribution of 3607 deaths in table I is not likely to be biased in comparison with that in around 1940 in Japan when the mortality rate under five years old and of infectious diseases were extremely high. However, it is usual that most of poor population has a less chance of visiting hospitals before their deaths and death causes of poor people are different from those of the rich which is about two per cent of all population in Pakistan. We had another observation from death. registration survey in KMC. 45 per cent or more of these death registrations had no diagnosis of death causes made by doctor and 63 percent or more died in their homes. This evidence suggests the necessity of another detailed survey on deaths with data based on population in Karachi.
Third problem is the reliability of diagnosis of death causes in these hospitals. General condition in Karachi is that the hospitals donot have enough examination facilities and time for diagnosis of patients and the lack of autopsy facilities in Pakistan result in failure to obtain the exact cause of death. In spite of these limitations most reliable death records were obtained in District III. The judgement of ‘reliable’ was given by senior physicians in Health Department and these records also appeared by quality of notation to be one of the most reliable on death causes in Karachi.
On these assumptions, the estimated mortality rates per 1000 population by sex, age, death causes were obtained as shown in tables II and III. These rates of deaths would be available for development of public health/medicine and governmental administration of health in Karachi. We also estimated mortality rate of encephalitides in Karachi as 37.0 per 100,000 population which is extremely high in comparison with those in developed countries. This is not based on the intensive neurological assessment of symptoms in medical record of deaths due to encephalitides.

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## REFERENCE

1. Demographic Yearbook United Nations 1981; 33, P. 179.
2. Statistical Pocket Book of Pakistan Federal Bureau of Statistics, Pakistan, 1983, P. 52.