SECTION 17 SPECIAL REVIEW

TRENDS OF INFANT MORTALITY IN THE PAST TWO DECADES

This article analyses the trends and causes of infant mortality in Hong Kong over the past two decades.

SPECIAL REVIEW

TRENDS OF INFANT MORTALITY IN THE PAST TWO DECADES

I. *INTRODUCTION*

The purpose of this paper is to analyse the trends of infant mortality in Hong Kong over the past two decades. The risks to which the infant is inevitably subject can be affected significantly by environmental and social conditions. Consequently, in addition to its own intrinsic interest, infant mortality can provide an indication (amongst many others) of the state of health and social development in a community.

II. *INFANT MORTALITY RATE*

For the purpose of assessing the infant mortality situation, an infant mortality rate is commonly used. This rate is given by

$$\frac{\text{No. of deaths under the age of one year}}{\text{Total number of live births}} \times 1{,}000$$

By convention, infant mortality refers to deaths under the age of one year. However, even within the first year of life there is considerable variation in mortality. In the very early weeks of life the predominant risks are those associated with development of the foetus in the womb and the birth process itself—congenital malformation, prematurity and birth injury. Later, risks of infection, nutritional deficiency or accidents predominate.

To facilitate analysis, therefore, the infant mortality rate is divided into two:—

(i) Neonatal mortality rate

$$= \frac{\text{Number of deaths aged under 28 days}}{\text{Total number of live births}} \times 1{,}000$$

(ii) Post-neonatal mortality rate

$$= \frac{\text{Number of deaths aged 28 days to under one year}}{\text{Total number of live births}} \times 1{,}000$$

The following table shows the pattern of infant mortality in the past 20 years:—

17.1 INFANT MORTALITY 1957–1976

Year	No. of live births (adjusted)	No. of neonatal deaths (adjusted)	No. of post-neonatal deaths (adjusted)	No. of infant deaths (adjusted)	Neonatal mortality rate	Post-neonatal mortality rate	Infant mortality rate
	(1)	(2)	(3)	(4)= (2)+(3)	(5)= $\frac{(2)}{(1)} \times 1{,}000$	(6)= $\frac{(3)}{(1)} \times 1{,}000$	(7)= $\frac{(4)}{(1)} \times 1{,}000$
1957	97,834	2,362	3,066	5,428	24.1	31.3	55.5
1958	106,624	2,526	3,252	5,778	23.7	30.5	54.2
1959	104,579	2,253	2,795	5,048	21.5	26.7	48.3
1960	110,667	2,344	2,250	4,594	21.2	20.3	41.5
1961	110,884	2,311	1,795	4,106	20.8	16.2	37.0
1962	112,503	2,401	1,738	4,139	21.3	15.4	36.8
1963	114,550	2,208	1,602	3,810	19.3	14.0	33.3
1964	107,625	1,824	1,057	2,881	16.9	9.8	26.8
1965	101,110	1,575	860	2,435	15.6	8.5	24.1
1966	91,832	1,437	871	2,308	15.6	9.5	25.1
1967	88,215	1,417	851	2,268	16.1	9.6	25.7
1968	82,685	1,264	655	1,919	15.3	7.9	23.2
1969	82,482	1,199	541	1,740	14.5	6.6	21.1
1970	79,132	999	528	1,527	12.6	6.7	19.3
1971	79,789	964	451	1,415	12.1	5.7	17.7
1972	80,344	961	435	1,396	12.0	5.4	17.4
1973	82,252	891	460	1,351	10.8	5.6	16.4
1974	83,581	899	508	1,407	10.8	6.1	16.8
1975	79,790	816	376	1,192	10.2	4.7	14.9
1976	78,486	687	398	1,085	8.8	5.1	13.8

It will be seen that there has been a significant fall in the infant mortality rate, particularly during the early 1960's. In 1976, the infant mortality rate was only a quarter of that in 1957. The following table shows how Hong Kong compares with other places (on the basis of the latest available information):—

17.2 INFANT MORTALITY RATE

Number of infant deaths per 1,000 live births

Country	Year	Infant mortality rate
Hong Kong	1976	13.8
	1974	16.8
Japan	1974	10.8
Singapore	1975	13.9
Thailand	1973	21.8
France	1974	12.1
Italy	1974	22.6
United Kingdom	1974	16.3
England & Wales	1974	15.8
Canada	1974	15.0
U.S.A.	1974	16.7
Australia	1974	16.5
Sweden	1975	8.3

Source: Demographic Yearbook 1975, United Nations.

III. *NEONATAL AND POST-NEONATAL MORTALITY*

It can be seen from Table 17.1 that post-neonatal mortality has shown a greater decrease than neonatal mortality. In 1976, the post-neonatal mortality rate was only 16% of that in 1957 as compared with 37% for the neonatal mortality rate. Neonatal mortality has declined steadily over the past twenty years whereas post-neonatal mortality showed a more marked reduction in the earlier years—from 31.3 to 9.8 per thousand, or 69%, between 1957 and 1964. Overall, of the decrease of 75% in the infant mortality rate between 1957 and 1976, 47% was due to the decline in post-neonatal mortality and 28% to the decline in neonatal mortality.

Prior to 1960, neonatal deaths accounted for less than 50% of infant deaths; this gradually increased to 63% in 1964. Subsequently, this percentage has fluctuated between 60%–70%, the 1976 figure being 63%. Thus, neonatal mortality has accounted for a larger share of infant mortality in recent years.

IV. *CAUSES OF INFANT DEATHS*

The following table shows the sex-cause-specific infant mortality rates in the period 1957–1976.

17.3 SEX-CAUSE-SPECIFIC INFANT MORTALITY RATES 1957–1976

Number of infant deaths per 1,000 live births

Year	Diarrhoeal disease and immaturity unqualified		Broncho-pneumonia unspecified		Pneumonia† unspecified		Gastro-enteritis and colitis, except ulcerative, of non-infectious origin		Congenital anomalies		Birth injury without mention of cause		Anoxic and hypoxic conditions not elsewhere classified		All other causes		All causes		
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Both Sexes
1957*	11.5	10.1	17.8	17.2	3.5	3.4	10.1	10.5	1.3	1.3	0.6	0.4	3.1	2.2	9.7	8.1	57.6	53.3	55.5
1958*	9.5	9.1	17.0	18.4	4.9	3.9	9.9	8.9	1.6	1.2	0.5	0.4	3.7	2.5	9.1	7.7	56.2	52.1	54.2
1959*	8.4	7.4	16.2	15.7	3.8	2.6	9.2	8.5	1.9	1.4	0.5	0.2	3.5	2.0	8.2	7.0	51.6	44.7	48.3
1960*	10.6	8.7	12.5	11.7	4.8	3.6	6.0	5.8	1.6	0.8	0.3	0.2	1.6	1.2	7.2	6.2	44.6	38.2	41.5
1961*	12.2	10.7	8.5	8.2	2.5	1.8	5.0	3.8	1.7	1.1	0.4	0.4	1.6	1.0	7.9	6.9	39.9	33.8	37.0
1962*	12.4	10.4	7.3	6.9	2.9	2.4	3.5	3.6	1.5	1.3	0.6	0.4	1.4	1.3	10.0	7.2	39.7	33.5	36.8
1963*	11.7	10.1	6.3	5.9	3.0	2.6	3.6	3.6	1.9	1.3	0.5	0.3	1.2	1.0	7.4	5.8	35.5	30.7	33.3
1964*	9.7	7.5	4.6	4.7	2.8	2.4	1.4	1.3	1.9	1.5	0.5	0.5	1.8	1.1	6.7	4.7	29.4	23.7	26.8
1965*	8.2	6.1	4.5	4.0	2.0	1.8	1.0	0.8	2.2	1.7	0.7	0.4	1.6	1.0	7.0	4.9	27.1	20.7	24.1
1966*	6.9	5.8	4.7	4.0	2.4	2.0	1.0	0.9	2.0	2.4	0.9	0.5	1.3	1.2	8.1	5.8	27.4	22.5	25.1
1967*	7.3	5.1	4.1	4.1	3.0	2.8	1.2	0.6	2.3	1.7	0.9	0.4	1.9	1.5	8.1	5.9	28.7	22.3	25.7
1968*	6.9	5.5	3.5	3.3	2.9	2.6	1.0	0.4	2.8	2.9	0.7	0.3	1.8	1.4	5.7	4.3	25.3	20.8	23.2
1969	7.2	5.5	3.6	3.0	0.9	0.6	1.4	1.1	3.3	3.1	0.5	0.3	1.7	1.2	4.8	3.7	23.3	18.6	21.1
1970	6.0	4.0	3.2	2.6	1.0	1.2	0.6	0.4	3.2	2.8	0.3	0.1	1.8	1.3	5.7	4.1	21.7	16.5	19.3
1971	6.1	3.1	2.4	2.4	1.3	1.2	0.8	0.7	3.1	2.9	0.4	0.4	1.7	1.4	4.5	2.9	20.2	14.9	17.7
1972	4.7	4.0	2.6	2.2	1.3	1.1	1.0	0.6	3.6	3.4	0.5	0.3	1.4	1.2	3.5	2.7	18.6	15.6	17.4
1973	4.9	3.1	1.8	2.0	1.3	1.0	1.0	0.7	3.5	3.4	0.3	0.3	1.6	1.5	3.4	2.8	17.8	14.8	16.4
1974	3.9	2.8	2.0	1.6	1.1	1.2	0.7	0.5	4.3	3.5	0.7	0.4	2.2	1.6	4.2	3.3	19.0	14.8	16.8
1975	3.3	2.5	1.1	1.0	0.8	0.7	0.2	0.2	4.4	3.7	0.7	0.4	1.9	1.6	3.8	3.0	16.2	13.0	14.9
1976	3.0	2.3	1.3	1.0	0.6	0.4	0.4	0.4	4.1	3.3	0.7	0.5	2.1	1.3	3.6	2.9	15.7	11.8	13.8

† Figures for 1957–1968 refer to "Primary atypical pneumonia", "Pneumonia of newborn" and "Pneumonia, other and unspecified".

* Data grouping according to International Statistical Classification of Diseases, Injuries and Causes of Death, Seventh Edition.

In 1957, the main cause of death was bronchopneumonia, accounting for about one-third of total infant deaths; next was diarrhoeal disease & immaturity which accounted for a further 19%. In 1976, the first three leading causes of death were congenital anomalies, immaturity and anoxic & hypoxic conditions, amounting to 26%, 19% and 12% of total infant deaths respectively.

Over the past two decades, there has been a considerable drop in infant deaths due to infectious diseases and nutritional deficiency. However, the number of infant deaths due to congenital anomalies has been increasing in spite of the decrease in the overall infant mortality, the rate increasing from 1.3 per thousand overall in 1957 to 4.1 for males and 3.3 for females in 1976.

As congenital anomalies are the major cause of neonatal mortality, their increase has no doubt accounted for the slow decline in the neonatal mortality rate described above.

V. *SEX DIFFERENTIAL IN INFANT MORTALITY RATE*

It can be seen from Table 17.3 that the mortality rate for male infants has always been higher than that for female, and has declined at a slightly slower rate. Between 1957 and 1976, the male infant mortality rate has dropped by 73%, compared with 78% for the female.

With the exception of one or two years, more males than females were to be found amongst all major causes of infant deaths. In particular, the number of male infant deaths due to birth injury significantly outnumbered those of females, and on several occasions was more than double.

VI. *CONTRIBUTING FACTORS OF REDUCTION IN INFANT MORTALITY*

Generally speaking, the decline in infant mortality may be seen in the light of the following influences, operating separately or jointly and in the context of improvement in social/environmental conditions generally:—

(*a*) the development of the Maternal & Child Health Services (now the integrated Family Health Service) of the Medical & Health Department;

(*b*) development of medical and health services generally, in particular improved obstetric care/technique and success in the immunization programmes for the newly born; and

(*c*) health education.

In illustration of particular points, the number of Maternal & Child Health Services centres has increased from 26 (6 full-time and 20 part-time) in 1957 to 37 (22 full-time and 15 part-time) in 1976. The number of new attendances in ante-natal sessions in 1976 (28,000) was nearly double that for 1957, and the number of new attendances in infant welfare sessions in 1976 (79,000) was more than three times that in 1957 and represented over 95% of total births in a year.

The low incidence rate of infectious diseases is clearly associated with the immunization campaigns which have been conducted, and there has been a considerable drop in infant deaths due to such diseases. For example, there were 154 infant deaths due to tuberculosis in 1957 but none in 1976; in 1976 98% of the newborns were given B.C.G. compared with 36% in 1957. Tetanus killed 53 infants in 1957 but had almost disappeared by 1976.