PERINATAL MORTALITY: SELECTED DATA FROM A SURVEY

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SUMMARY

This paper describes the findings of a survey on perinatal cases in Kuala Lumpur. Information on the deceased infants and their deliveries were documented as well as selected social, demographic and anthropometric data on the mothers. This includes quality of the home environment in terms of presence of basic amenities. It was evident that the lower classes were better represented in the sample.

This paper also highlights a major problem in retrospective studies, that of successfully tracing eligible respondents. There were also cases of non-cooperation. Another problem which emerged, and one common to many developing countries, was the incompleteness of birthweight records.

INTRODUCTION

Reproductive outcome is determined not only by maternity care but by socio-economic attributes as well which, in a cumulative and interactive fashion, influence maternal health status and obstetric risk. Indicators frequently used as measures of obstetric performance are maternal and infant mortality, both of which have improved considerably in this country. However, as a percentage of total infant deaths, the proportion of first-week infant deaths has increased while that of late neonatal deaths has fallen.[1]

Like birthweights, perinatal mortality, i.e. stillbirths plus deaths within the first week after birth is a useful measure of reproductive efficiency.[2] In recognition of the perinatal problem, the British Perinatal Mortality Survey was launched[3] and reports arising therefrom highlight medical and sociological factors associated with perinatal death. Likewise, this study examines selected data on perinatal deaths obtained from a survey carried out on a sample of cases in Kuala Lumpur.

MATERIALS AND METHODS

According to the World Health Organization,[4] national perinatal mortality statistics cover deaths of foetuses or infants weighing 500g or more, or where birthweight is unavailable, the corresponding gestational age (22 weeks) or body length (25 cm crown/heel).

The data used in this analysis were obtained from a perinatal survey carried out in 1981. This retrospective survey was intended to capture all

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cases of registered perinatal death occurring in 1980 where residence was given as Kuala Lumpur. However, this was not possible due to problems in tracing all the respondents. Out of 355 cases found to reside within the city limits, 129 could be successfully traced. Of these, six had refused to co-operate. The survey population thus consists of 123 women whose pregnancies ended in perinatal death in the said year. These formed a 34.6% sample of the perinatal cases listed.

Information was elicited by personal interview with the mothers using a structured questionnaire. The main problems in data collection were false or incomplete addresses, change of residence with no forwarding address, difficulties in identifying squatter households with undefined postal addresses and un-cooperative respondents.

RESULTS AND DISCUSSION

The following are selected particulars on the sample cases of perinatal death and the mothers.

Characteristics of Infants

Most of the perinatal cases were delivered in large hospitals; less than 6% in private maternity homes. About 61% of the deliveries were attended by a physician and the rest by staff-nurses or government-trained midwives. Singleton births made up 93.5% while the remainder were twins. The male : female ratio of mortality in this sample was 12:10. On the type of deaths, about 58% were stillbirths and the rest were neonatal deaths. No information was available on the cause of death.

On the mode of delivery (Table I), the majority (72.7%) were spontaneous births, 14.9% were caesarean sections and about 6% were either forceps or vacuum extraction. Another 6.6% were breech deliveries. This and the above distribution need to be seen against that for all births in order to come to any conclusions.

From Table II, it can be seen that prematurity was highly represented in this population: 5% and 3% of the cases were term and post-term infants respectively. Amongst the neonatal deaths, more than 90% were premature. These findings support the fact that prematurity is associated with a low survival capacity in newborns.

A birthweight distribution by gestational age is drawn to illustrate the relationship between these two variables (Table III). Birthweight is a function of foetal development which, in turn, is influenced by its maturity. On this premise, lower birthweights were expected to predominate in view of the high degree of prematurity in the

TABLE I

PERCENTAGE DISTRIBUTION OF MODE OF DELIVERY

Mode of delivery	(%)
Spontaneous	72.7
Forceps	4.1
Vacuum	1.7
Caesarean	14.9
Breech	6.6
Total	100.00

TABLE II

FREQUENCY DISTRIBUTION OF BIRTHWEIGHT BY GESTATIONAL AGE

Birthweight (g)	Maturity (complete week)				Total
	⩽36	37–41	⩾42	n.a.*	
⩽1500	32	–	–	1	33
1501 – 2500	19	2	–	–	21
2501 – 4000	21	2	3	–	26
>4000	4	–	–	–	4
Not available	36	2	1	–	39
Total	112	6	4	1	123

*Not available.

Note: Mean birthweight = 2,102.8g; S.D. = 999.0.
Mean gestational age = 32.3 weeks; S.D. = 5.1.

TABLE III
PERCENTAGE DISTRIBUTION OF MOTHERS BY AGE AND PARITY GROUPS

Age–group (yrs)	Parity				
	1	2–3	4–5	6	All
20 – 24	29.4	23.4	3.4	–	17.1
25 – 29	47.1	50.0	31.0	–	39.8
30 – 34	23.5	17.2	37.9	30.8	24.4
35 – 39	–	6.3	20.7	53.8	13.8
40 – 44	–	3.1	6.9	15.4	4.9
Total	100	100	100	100	100
All ages	13.8	52.0	23.6	10.6	100

Note: Mean parity : 3.2 S.D. = 1.9
Mean age : 29.5 yrs S.D. = 5.3
Correlation of variables Parity with ages : r = 0.56

population. This has been established in other studies.[3,5] The mean birthweight for the sample was 2,103g. The percentage of low birthweight (2,500g or less) was 43% and that of very low birthweight was 26%. However, these calculations were based on the number of cases with known birthweights only. These made up about 68% of the total number, the rest being unavailable. Incomplete birthweight data is quite a common occurrence in developing countries. The level of completeness in birth registration varies between and within countries, and tends to be worse where both birth and infant death rates are high. Data on maturity, on the other hand, was more complete in this sample but in estimations of gestational age, there is always the question of accuracy.

Characteristics of Respondents

The age distributions of the respondents, i.e. the mothers, are shown in Table III. The average age of the mothers at the time of perinatal death was 29.5 years. The highest proportion of mothers fell in the 25–29 years range. On a national level, this age-range also has the highest fertility rate.[6] Thus, the high risk age-groups, i.e. below 20 and over 35 years, did not feature prominently for this sample of perinatal cases; none of the mothers were below 20 years at time of perinatal death while 18.7% fell in the latter group.

Parity is closely correlated with maternal age; with successive pregnancies, age would obviously increase. The present survey findings also illustrate this (Table III): women of lower parities were more concentrated in the younger age-groups and those of higher parities were all above 30 years. Mean parity was 3.2 which is not regarded as a high value. Both increasing age and parity have been presented as factors underlying perinatal mortality.[3] As mortality rates per 1000 births by maternal age or parity could not be calculated, the link with these two variables could not be demonstrated from the survey results. Nevertheless, in this sample of perinatal cases, conventionally defined high-risk groups by maternal age and parity were not well represented in terms of frequency.

Anthropometric assessments show an average height and weight of 153.3cm and 55.5kg, respectively at the time of survey. Most analyses make use of pre-pregnant weights, i.e. maternal body weight prior to the pregnancy outcome under review. Since the present weight data were not pre-pregnant values and considering that individual weights may fluctuate widely within a period of months, it is felt that these weight measurements are of little use in further analyses. Height measurements, on the other hand, are stable for adults and generally reflect the nutritional history of an individual. While the genetic blue-print for maximum height achievement cannot be surpassed, the nutritional intake of the individual, particularly in the growing years, determines how far height potentials are achieved. More often than not, the quality of diet in any culture improves with higher socio-economic status. Hence, women from the higher classes may be expected to be taller than their lower class counterparts. Table IV illustrates the relationship between maternal height and social class for the group of mothers reviewed. As class declined from 1 to 5, so did the average height of the mother. The differences were highly significant. Yusof and Yusof[7] have also documented this trend by social class. The percentage distribution of mothers by height (Table V) that 18.7% were of small stature (< 150cm), a factor regarded as an obstetric risk. It is not known how this height distribution compares with the population at large as no reference standard for adult stature is available. Again, perinatal mortality rates by maternal height could not be calculated to note the variations; Thomson and Billewicz[8] found higher perinatal death rates among short women compared to taller ones.

TABLE IV
AVERAGE HEIGHT OF MOTHERS BY SOCIAL CLASS

Social class	Mean height (cm)
1 and 2	157.5
3	153.6*
4	152.6*
5	151.1*

*Significantly different at 0.5% from means of the social class immediately above.

TABLE V
PERCENTAGE DISTRIBUTION OF MOTHERS BY HEIGHT

Height (cm)	%
< 150	18.7
150 – 154.9	38.2
155 – 159.9	33.3
⩾ 160	9.8
Total	100

Note: Mean height : 153.3 cm; S.D. = 5.5.

Details of pregnancy histories revealed that most (86%) had never experienced a previous perinatal fatality. With regards to pregnancy wastage, spontaneous or induced, a majority, 72% and 93%, respectively had never undergone such trauma.

Antenatal care has the purpose of monitoring maternal and foetal well-being. Studies have shown that adequate care is associated with reduced infant mortality.[9,10] The WHO recommends a minimum of eight to ten visits for optimal prenatal care. Amongst the women in this sample, the response for attendance at antenatal care was positive of 88%. However, the information was coded in the form of either a positive or negative response on the basis of a minimum of two antenatal visists, i.e. actual numbers of visits were not recorded. Thus, while 88% of the mothers had at least two visits, no data is available on the adequacy of these prenatal visits. Nevertheless, in a study on urban poor populations, Fong[11] found an attendance rate of "some form of ANC" of 88.8% which is comparable to the above findings. These compare less favourably with the 98% attendance found amongst FELDA settlers.[12] FELDA rural land development schemes include an organised health delivery system readily accessible to the settlers. The lower attendance rates, cited above, among low income urban women

suggest that health facilities may not be that accessible to certain groups, despite an urban location where such facilities abound. Proximity to antenatal services was mirrored in the survey findings; for those who had prenatal care, the majority, i.e. 90% lived 10km or less from their source of care and for 70% of mothers, the distance was 5km or less. Other factors therefore operate to discourage or prevent use of antenatal services in the group; for example, financial or time costs or quality of service. Amongst those who had no ANC at all or less than two visits, nearly all were from classes 3, 4 and 5.

Social background of Respondents

All of the respondents were married at the time of perinatal death. On account of the multi-ethnicity of the population, ethnic group was documented using the race of the infant's father. Although inter-racial marriages are becoming more common, none were found in this group. Table VI shows ethnic distribution. Unfortunately, mortality rates by race could not be presented. More complete figures were available from published sources for 1982 and these are included for comparison. Within the surveyed population, the majority of cases were Malay and Chinese in equal proportions, followed by Indians. The percentage distribution for 1982 showed a similar pattern for the Malays but a smaller percentage for the Chinese and a higher one for the Indians. It would seem that the survey captured more Chinese and fewer Indians if the 1982 breakdown is considered a representative reference. Perinatal mortality rates per 1000 births for 1982 were included to illustrate ethnic differentials in mortality.

Social class, as defined by the husband's occupation, showed a distribution predominated by classes 3, 4 and 5, to a total of 89% (Table VII), with classes 4 and 5 making up nearly 50%. This highlights the low rank background of perinatal cases. By social class, it was found that most of the classes 1–3 mothers were Chinese whereas the majority in classes 4 and 5 were Malays. Any inference from this distribution is hampered by not knowing how representative this sample is, and particularly its ethnic proportions. In the preceding paragraph, it was indicated that the racial breakdown may be biased based on a comparison with 1982 figures.

By residence status, respondents were classified into two categories: squatter and non-squatter. This classification is highly relevant for Kuala Lumpur as about a quarter of its population are squatters. Due to the lack of basic amenities, the quality of the environment may be deemed lower than in planned residental areas. In the sample of perinatal cases reviewed, 32% lived in

TABLE VI
PERCENTAGE DISTRIBUTION OF PERINATAL DEATHS BY ETHNICITY

	Malay	Chinese	Indian	Others	Total
Survey population 1980 (%)	42	42	15	1	100
Kuala Lumpur 1982* (%)	46	32	22	10.5	100
(Rates per 1000 live births)	27.3	18.4	38.3	14.1	25.0

***Source** Vital Statistics, Peninsular Malaysia, 1982
Department of Statistics, Malaysia, 1984.

TABLE VII
PERCENTAGE DISTRIBUTION BY RACE AND SOCIAL CLASS

Race	Social Class			
	1 & 2	3	4	5
Malay	23.1	27.1	58.3	52.2
Chinese	61.5	54.2	30.6	30.4
Indian	15.4	16.7	11.1	17.4
Others	–	0.02	–	–
Total	100	100	100	100
All races	10.8	40.0	30.0	19.2

squatter areas. These traversed the entire social class spectrum and were not confined to the lower classes, although the majority were in classes 4 and 5. The provision of basic amenities in squatter households compared with non-squatters is presented in Table VIII. As expected, squatter households were less well served with basic amenities like piped water and sanitation facilities. Only about 20% of all squatter houses, for example, had a sanitary means of human waste disposal, i.e. flush, bucket or pit toilet and only about 17.5% had an in-house piped water supply.

Taken as a whole, the households of perinatal cases were not too deprived in terms of basic amenities; almost 90% had electricity, 69% had piped water and 65% had toilet facilities. Thus, perinatal mortality in this case did not seem to be particularly associated with the lack of such items. Puffer and Serrano[13] found a diverse range in the percentages of households with piped water and flush toilets amongst cases of neonatal deaths in 22 areas; it would seem that the environment has a greater impact on mortality in post-neonatal periods of infancy mediated primarily via artificial infant feeding practices.[14]

CONCLUSION

The perinatal survey described in this paper illustrates a major shortcoming in retrospective

TABLE VIII
PERCENTAGE OF HOUSEHOLDS WITH BASIC AMENITIES BY RESIDENCE STATUS

Amenities	All households with amenity (%)	Residence status	Households with amenity (%)
Electricity	89.2	Non-squatter	100.0
		Squatter	70.0
Piped-water (in-house)	68.6	Non-squatter	100.0
		Squatter	17.5
Flush toilet	47.1	Non-squatter	74.7
		Squatter	2.5
Pit/bucket	17.7	Non-squatter	14.4
		Squatter	17.5

Note: Non-squatter households – 67.5% and Squatter households – 32.5%. Percentage of squatters by social class: 1 and 2 – 2.6%; 3 – 28.9%; 4 – 39.5%; 5 – 28.9%.

studies; the success in tracing respondents from address listings was quite low despite a lapse of only one year between the perinatal outcome under study and the timing of the survey. Addresses that were falsified may be indicative of the stigma attached to pregnancy wastage or infant death, causing a reluctance to divulge true facts. On the other hand, it could well be that people have moved leaving no forwarding address. Some of the cases may have resided in the city temporarily for the specific reason of delivering their babies either because they perceive better care or were referral cases.

Nevertheless, some interesting findings transpired from the small sample of perinatal cases. It was evident that most of the respondents were of lower social class backgrounds and many were also squatter residents. In contrast to expectations, highly multiparous women were not common in the group. The age distribution of the mothers did not appear to be skewed to the high risk groups, i.e. under 20 years or over 35. Height assessments showed significant differences between women from different social classes but due to lack of a local standard reference, the findings could not be compared.

As the survey only interviewed mothers who had suffered perinatal death, and only a fraction of all cases, analysis of the data was limited. Rates per 1000 births, for example, could not be calculated and any differentials by race, social class, maternal age and height also could not be examined. This information would be useful in the risk-approach to preventive perinatal medicine.

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