LOW BIRTH WEIGHT NEONATES AND SURROUNDING FACTORS: A SITUATION STUDY IN COMMUNITIES OF 11 HEALTH REGIONS OF THE PHILIPPINES (1983-85)

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ABSTRACT

The Low Birth Weight (LBW), defined as birth weight of 2500 grams and less, is recognized as a priority health concern globally, but particularly in developing countries. Data and information on its incidence and associated problems has been a felt need and countries are urged to report on observations and researches on the subject. The present study is an attempt to respond to this call by a developing country and was carried out through 160 Maternal and Child Health-Family Planning Clinics in 47 provinces of 11 Health Regions of the Philippines (1983-1985).

Among 2211 neonates recently observed in the same setting, 219 weighed 2500 grams and less, or an incidence of 14.5%. The incidence reported for Asia is 20%.

Salient observations were morbidity of 14% and mortality 3%. Multiparity was an important factor. Smoking and drinking are not frequent contributory findings. Maternal age and height were not pertinent factors. Among favorable factors for the LBW are the education and attainment of the mothers, their fairly good health, and frequency of prenatal consultations assisted by trained health workers. Unfavorable factors were low incidence of breastfeeding, insufficient health education, lack of medical facilities, economic difficulties and poor or no transportation facilities.

Importance and Rationale of the Study

In recent years, with justifiable reasons, significant attention and concern have been directed to low birth weight (LBW). Even in developed countries, the frequency of LBW has increasingly become an acceptable indicator of the status of health of general groups. It is also a very sensitive indicator of socio-economic conditions. LBW points to the health and nutritional status of the mother. Furthermore, it is the strongest factor that determines survival of the newborn as well as healthy growth and development of the child.

In 1979, the overall global statistics reported 21 million LBW which accounted for 17% of births in that year, the vast majority occurring among the poorest of developing countries. By geographic distribution, the incidence ranged from 31% in middle South Asia and 20% in Asia to 15% in Africa, 11% in Latin

America, 8% in Europe and 7% in North America (World Health Statistics January 1981).

It has been reported that LBW babies are almost 40 times more likely to die in the neonatal period than average weight babies. In the USA, they account for considerable financial losses as almost all require intensive care. The LBW could be highly relevant indicator of social development. Hence, the US Surgeon General, recognizing the importance of the problem, called attention in 1980 to the need for making the reduction of the LBW as one of the nation's major health objectives.

It is commonly observed that the LBW who survive, run the risk of childhood and developmental difficulties. They are susceptible to lower respiratory diseases, behavioral difficulties, slow learning and other neuro-developmental problems like cerebral palsy. Increased emotional and financial problems are very common among their families.

Health authorities, particularly those in the World Health Organization, deplore the shortage of adequate data especially in the developing world. There is need to pay greater attention to adequate collection of statistics of LBW for planning and evaluation of health care at all levels.

The present study, simple and inadequate as it may be, is an attempt to answer this call for cooperation in solving an important and priority health problem in many countries today. Although many of the areas included were underserved and difficult, this study was carried on anyway, to start a response to a need.

The objectives of the study are as follows:

General:

- To study the problem of low birth weight (LBW) among neonates in a developing country, as in the Philippines.
- To observe morbidity and mortality among the LBW in the study group.
- To seek etiologic or possible contributory factors associated with low birth weights.
- To contribute to world health literature data or information on LBW obtained in a developing country.
- To focus attention to mothers of LBW as a factor in the overall problem of this group.

Specific:

- To determine the incidence of LBW as obtained in a situation study of neonates in health regions of the Philippines (1983 to 1985).
- To observe circumstances and conditions surrounding low birth weight in different communities of a developing country.
- To look into health facilities available to LBW in different areas of the Philippines.
- To determine the maternal factors in the morbidity and survival of LBW in this study group.

Methodology

In 1983 to 1985, a study on the situation of neonates (births under 28 days old) in 11 health regions of the Philippines gave an opportunity to conduct a research on low birth weights (LBW). The definition of LBW is that given by the World Health Organization -- a birth weight of 2,500 grams or less.

The sites of the study were 47 provinces which had Maternal and Child Health-Family Planning Clinics or Stations (MCH-FP). There was a total of 160 such clinics, each with 2 to 3 nurses and midwives. Only Health Region 8 was not included as the MCH-FP clinic was not functioning during the period of the study. These clinics were distributed as shown in Fig. 1. All together, 48 nurses and 241 midwives were involved and were trained by the project staff and the regional nurse supervisors to observe and interview, using questionnaires, to obtain precise and accurate data.

When a delivery occurred in a hospital, center or clinic, the newborn was weighed in the scale that was available. For those deliveries in the home or in sites without a regular scale, the neonate was weighed in an improvised portable cloth hammock with an attached tape measure hanging from a spring scale (Fig. 2).

Pregnant women who had pre-natal consultations in the MCH-FP clinics were included in the study. Pregnant women who were in households in their last month of gestation, or who had just delivered were visited and interviewed and the neonates were followed-up between birth and 28 days of age. Sick neonates who were confined in hospitals were also visited for the diagnosis and outcome of the case.

For more precise reporting as to the causes of morbidity and mortality, cases were referred to the doctor of the MCH-FP clinic. On quarterly basis, the clinic supervisors submitted their reports on the progress of the study. On the some quarterly intervals, the regional supervisors of involved health regions checked the completed questionnaires, submitted data collected to headquarters, with reports on the problems of the study.

The health of mothers of this group of LBW as well as the surrounding environmental and social conditions were observed closely to determine possible circumstances affecting the neonates in this study, in an effort to seek possible etiologic and preventive factors.

Results and Discussion

In accordance with the accepted definition of low birth weight as being 2500 grams and less, there were 219 LBW in a recent study group of 2211 neonates in communities of eleven (11) Health Regions of the Philippines. The incidence of 14.5% is high but is lower than the reported LBW incidence of 20% in developing countries of Asia.

On close evaluation of the 219 LBW, only 154 gave data to allow their inclusion in a study of the situation of LBW in our communities today.

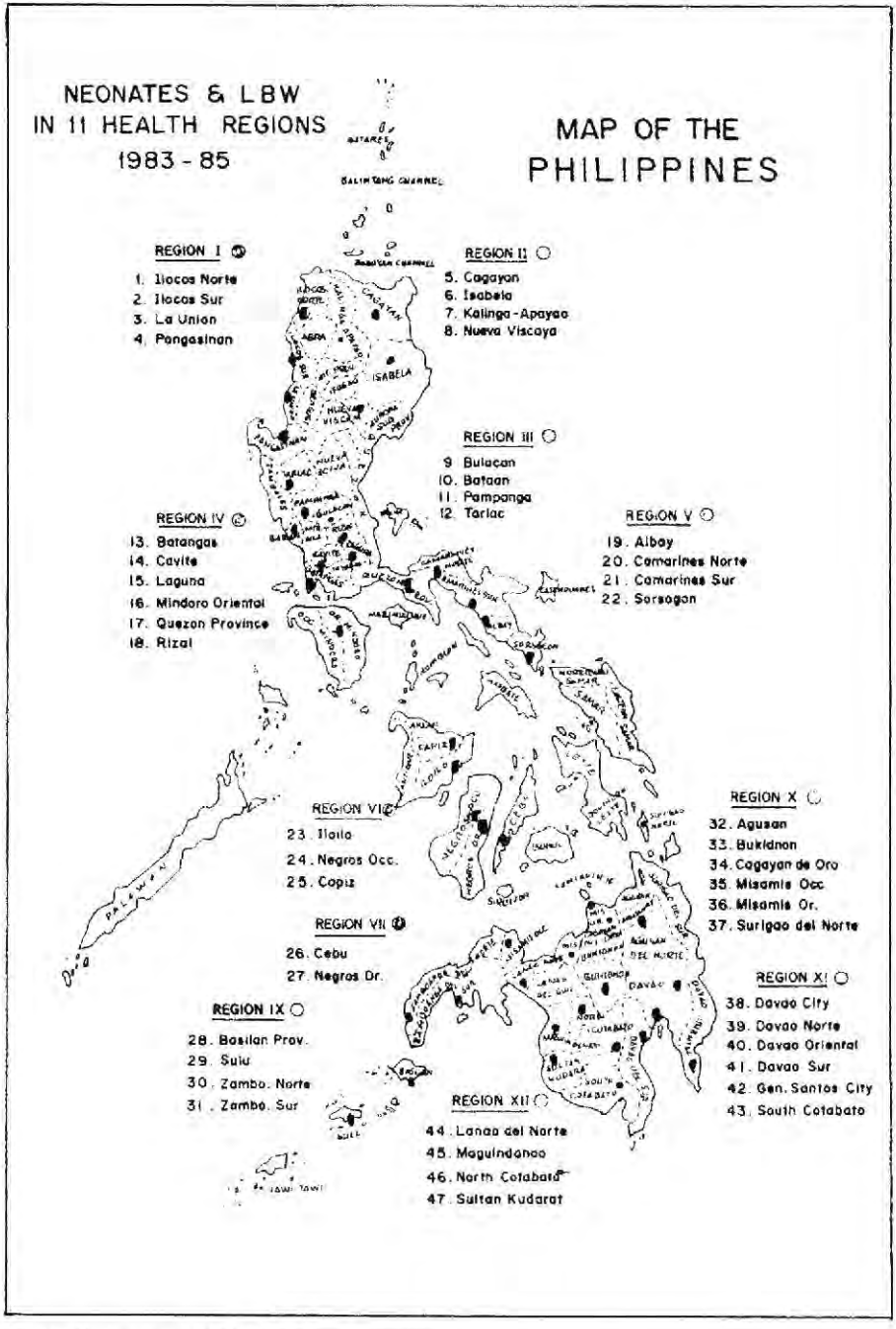

Fig. 1. Neonates and LBW in 11 health regions.

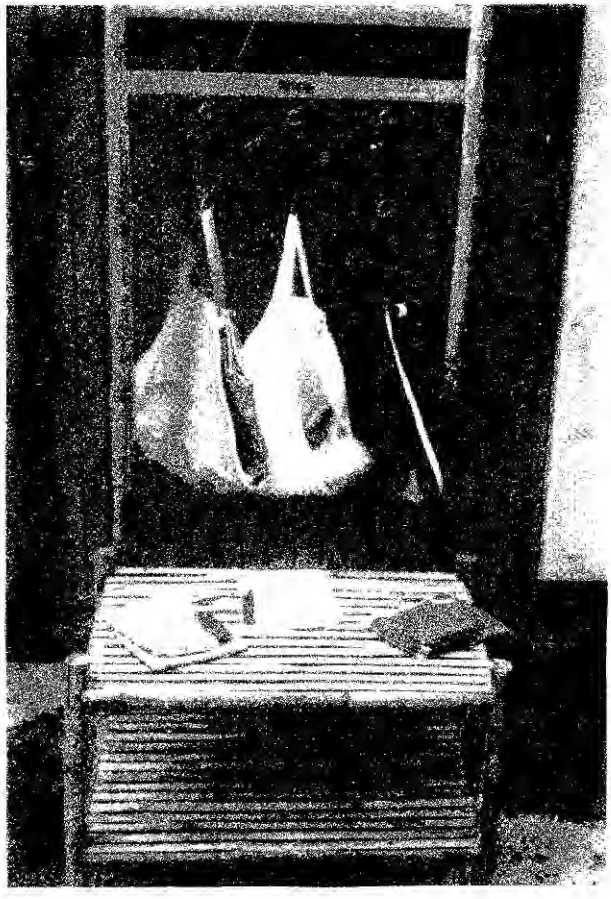

Fig. 2. Cloth scale with tape measure.

Accordingly, the statistical data presented in this report are those of the 154 LBW neonates.

On the whole, based on actual observation and interviews, the health of this group was altogether favorable. According to general health, the group was classified as follows:

Table 1. Health condition of LBW neonates

Healthy	145	94%
Sickly	9	6%

The environment and health facilities surrounding these neonates were observed and reported. A priority concern was their feeding. Although breast-

feeding is accepted as most advantageous for babies, only 53% (Table 2) were given the benefit of what is now accepted as the best and most suitable milk for neonates and infants. It is likely that the parents were not properly motivated or they may have been misinformed about the feeding of the LBW, or the mothers were not in a position to breastfeed because of certain circumstances.

Table 2. Feeding of LBW in the study group

Breastfeeding	81	53%
Artificial	48	31%
Mixed	25	16%

The water supply and toilet facilities are shown in Tables 3 and 4. A water source was available in 52% of homes of the study group and water sealed toilets were noted in 81%, which may be beyond expectations for poor communities. The environment of these neonates was quite favorable as shown in Table 5.

Table 3. Water supply in the study areas

Water System	73	52%
Wells	68	48%
No data	13	–

Table 4. Toilet facilities

Water sealed	125	81%
No toilet	29	19%

Table 5. Environment of LBW

Favorable	139	90%
Unfavorable	15	10%

The location of deliveries and birth attendance of 154 LBW in this group are shown in Tables 6 and 7. In both aspects, a change for the better was noted.

Table 6. Birth attendance (1983-85)

Hilot	45	29.8%
Midwife	49	31.8%
Nurse	2	1.3%
Physician	57	35%

Table 7. Place of birth (1983-85)

Home	87	56.5%
Health Center	15	9.7%
Private Clinic	3	1.9%
Hospital	49	31.8%

There is an evident increased involvement of midwives in the care of and service for neonates which used to be almost always or traditionally, the role of the TBA or hilot. (Fig. 3) This recent trend perhaps is only about a decade old. Although deliveries in the home are still the most frequent (56%), in this study (Table 7), hospital deliveries showed an encouraging incidence of 31%, whereas the 1982 national statistics show hospital deliveries to be 24.8%. (Fig. 4)

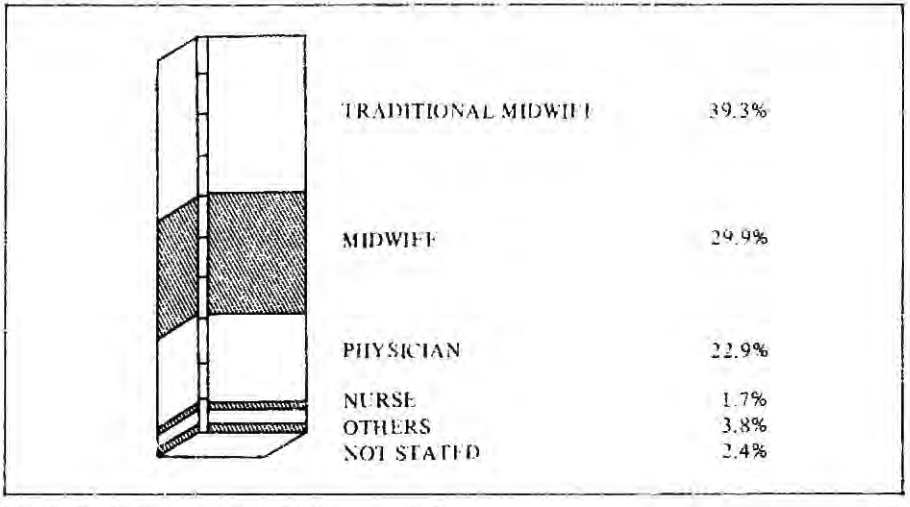

Fig. 3. Births by attendance, Philippines, 1982.

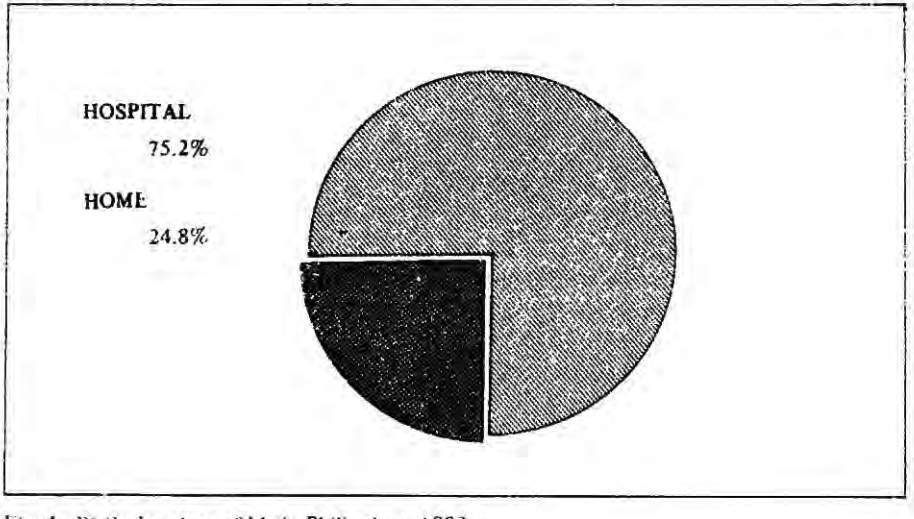

Fig. 4. Births by place of birth, Philippines, 1982.

Illness among LBW neonates

Among 154 neonates who were classified as LBW, 22 or 14% were observed to have some illness and pertinent observations are described (Table 8). The age of onset was mainly in the first 2 days after birth (41%); it is evident that during this period close and adequate care are required.

Table 8. Age at Onset of Illness

0 – 48 hrs.	9	41%
48 – 72 hrs.	1	4%
3 – 7 days	3	14%
7 – 14 days	5	23%
15 – 21 days	4	18%

Breastfeeding was rather low (36%) for these underprivileged areas and particularly as the neonates were LBW and sick (Table 9). About the same number of ill LBW were breastfed as the artificially fed, for varied reasons. On the whole, this may have been an unfavorable factor to the sick LBW. Details on the kind of milk and their preparation were not determined.

Table 9. Feeding of sick neonates

Breastfeeding	8	36.4%
Artificial	8	36.4%
Mixed	5	22.7%
Not stated	1	

A physician was attending in 95% of the 22 ill neonates (Table 10) and only one was not treated.

Table 10. Medical attendance

Physician	21
Nurse	0
Midwife	0
Hilot	0
Not treated	1

Half of the sick LBW were attended to in the house where proper and adequate care could not be assured (Table 11). A hospital was availed of in 41% of the cases which is a good trend. Transportation difficulties and inaccessibility of hospitals were the usual obstacles to hospitalization.

Table 11. Where treated

Hospital	9	41%
Private Clinic	2	9%
Home	11	50%

Respiratory infections and respiratory difficulties topped the list of illnesses among LBW, just as they do in any age level. Ailments were frequently diagnosed by symptoms due to lack of facilities and expert examinations.

Table 12. Nature of illness

Respiratory infection	9	41%
Breathing difficulties	5	23%
Congenital defect (imperforate anus, congenital bone defect Doll-like hand, left hand)	3	14%
Diarrhea	1	4.4%
Fever	1	4.4%
Meningitis	1	4.4%
Omphalitis	1	4.4%
Sepsis	1	4.4%

Under the circumstances prevailing in the study areas and considering inadequate facilities and unfavourable socio-economic factors, it should not be surprising that 28.6% of LBW neonates died (Table 13).

Table 13. Outcome of illness

Recovered/Improved	15	71.4%
Died	6	28.6%
Not stated	1	—

Mortality among LBW

Of the 154 LBW neonates, 6 died within 28 days of age (3.8%). Some details of the circumstances around death were determined. These included the age of gestation, place and manner of delivery, attendance at birth, place attended during illness, kind of treatment, age of death and possible cause of death.

The number of pre-term newborn was double those born at term (Table 14). It is a great risk for a neonate to be born before term, particularly when its weight is low. Hence, there were twice as many deaths among pre-term LBW as those born at term. In this group, the number of deaths per day of age is about equal (Table 15).

Table 14. Age of gestation

Pre-term	4	67%
Term	2	33%

Table 15. Age of death

1 day	2
2 days	2
7 days	2

The number of those who died was about the same, irrespective of the place of delivery (Table 16). As regards birth attendance (Table 17), no one of those who died was attended by a TBA or hilot, possibly because the precarious or critical condition of the neonate prompted parents to seek medical attendance rather than the services of a TBA.

Table 16. Place of delivery of those who died

Home	2
Health Center	2
Hospital	2

Table 17. Birth attendance

Hilot	0
Midwife	3
Physician	3

The causes of death were classified and diagnosed without benefit of facilities or adequate and thorough examinations (Table 18). It is very likely that the main presenting manifestation became the diagnosis.

Table 18. Causes of mortality

Prematurity (with respiratory problem)	4	67%
Congenital bone defect	1	16%
Meningitis	1	16%

All those who died were taken to a hospital, in an effort to save them. The trip by itself is usually risky but it is evident that people even in underserved areas have become hospital conscious (Table 19).

Table 19. Attendance of LBW

Physician	5
Nurse	0
Midwife	0
Hilot	0
Not treated	1

The maternal factor in a study of low birth weights

Mother and offspring are considered one biologic unit. To a large extent, survival of the neonate as well as his favourable development and well-being depend on the health and circumstances of the mother. In fact, this influence starts even in a mother's younger days, long before she became pregnant. Thus, such childhood diseases as rheumatic heart disease, urinary tract infections, tuberculosis, malnutrition and others, have been observed to be very relevant factors in the incidence of LBW including health and development.

In recent years, a number of maternal factors have been observed to have some bearing on the condition of neonates, both immediate and remote, particularly among the LBW. The general remark ot that is that the incidence of LBW is a sensitive indicator of the health and nutrition of the mother.

Besides gestational age, there are numerous studies that show that birth weight depends on factors related to the mother's weight, height, age, parity, socioeconomic status, nutritional status, smoking habits and others. Pathological factors related to complications during pregnancy may also influence the birth weight such as toxemias and anemias. Some of these factors have been considered in the present situation study of LBW, in a developing country.

The mothers of this group of 154 LBW were assessed and described as apparently healthy (Table 20). More than half of the mothers (56%) were between 20 to 24 years of age. Presently, this is considered a young group unlike in past years when most marriages were among those below 20 years of age.

Table 20. Maternal age

Age	*Number*	*Percentage*
15-19 yrs.	11	7%
20-24 yrs.	57	37%
25-29 yrs.	46	29.8%
30-35 yrs.	31	20%
36-40 yrs.	9	5.84%
41 and above		

The effect of height on birthweight of newborns did not appear impressive (Table 21). The majority of mothers measured over 145 cm (91.8%) which is about average for adult women in these areas.

Table 21. Material weight

Height	*Number*	*Percentage*
145 cm	10	8.19%
145 cm	112	91.8%
Not known	12	

The educational attainment of mothers in the study group are enumerated in Table 22. The majority have obtained elementary and high school education and some reached or even finished college.

Table 22. Educational attainment of mothers

Attended elementary school (not graduated)	20	13.0%
Elementary school graduates	40	26%
Attended high school (not graduated)	21	13.6%
High school graduates	32	20.7%
College (not graduated)	18	11.6%
College graduates	23	14.9%

The majority of the mothers were not employed outside the home. They did casual work in the home, such as sewing, embroidery work or even farm work, particularly in rice growing regions (Table 23).

Table 23. Occupation of mothers

Housewives	58	85.3%
Employees	10	14.7%

Smoking is not a common habit among women in these localities, except in some northern communities where tobacco is grown or in some small areas in the south where smoking is commonly observed during leisure hours, since there are no TVs, movie houses or recreations (Table 24). On the whole, it is not an alarming factor.

Table 24. Smoking and alcohol drinking habits

Cigarette-smoking	3	1.9%
Non-smoking	151	98%
Alcohol drinking	1	0.64%
Non-alcoholics	153	99.33%

Drinking alcohol has hardly been a threat to the health of women except in rare cases, such as those with emotional or mental problems (Table 24). In general, it is not a factor of significance, particularly in the countryside.

Frequent pre-natal check-ups were with the midwife followed by the physicians (Table 25). Again, this is a recent trend with the greater availability of midwives in remote areas of the country through a government program. On the whole, the people are physician-inclined for health consultations. The frequency of pre-natal check-ups were encouraging as shown in Table 26.

Table 25. Pre-natal consultations

Hilot	42	27.3%
Midwife	55	35.7%
Nurse	4	2.5%
Physician	53	34.4%

Table 26. Frequency of pre-natal check-up

Frequency	*Number*	*Percentage*
0	8	5.8%
1-3	42	27.3%
4-8	51	33.1%
9-12	52	33.7%

From 4 to 8 and again from 9 to 12 pre-natal consultations were reported among 33% of mothers (Table 26). This was a surprising observation for underserved or less privileged communities, particularly on these days of insecurity and economic difficulties.

The frequency of term babies is 84%, a favorable finding and this may be a factor for the low morbidity and mortality in the study group.

Table 27. Period of gestation

Pre-term	23	14.9%
Term	130	84.4%
Post-term	1	0.64%

Summary and Conclusions

The Low Birth Weight (LBW) defined as birth weight of 2500 grams and less, is recognized as a priority health concern globally, but particularly in developing countries.

Data and information on its incidence and associated problems have been a felt need and countries are urged to report observations and researches on the subject. The present study is an attempt to respond to this call, from a developing country.

This situation study was carried out through 160 Maternal and Child Health-Family Planning Clinics in 47 provinces of 11 Health Regions of the Philippines (1983-1985).

Out of 2211 neonates who were included in a situation study recently, 219 weighed 2500 grams and below, or an incidence of 14.5%. The incidence reported from Asia is 20%. Salient findings are as follows:

1. Birth attendance of LBW was mostly by the midwife (31.8%), then the physician (37%), and thirdly by hilots (30%). This is a more favorable trend than that about a decade ago.

2. The LBW were born mostly in their homes (56.5%) and 30% in the hospital which depicts an increase in hospital deliveries.

3. In this group of LBW, 85% were born at term and 14% pre-term which is a favorable observation.

4. As regards maternal age of LBW, the highest incidence was among mothers 20 to 24 years of age (37%), decreasing with increasing mothers' age.

5. Most mothers (91.8%) were 145 inches tall, which height is about average for adult women in these localities.

6. A significant number of mothers of this study group finished elementary and high school. Some reached or even finished college. This is a favorable factor to the LBW neonate.

7. Majority of mothers had frequent prenatal consultations of four or more visits and the check-ups were conducted mostly by midwives (35.7%) followed by physicians (34.4%). It appears that services of TBAs are now less sought than in the past.

8. Altogether the mothers of LBW infants were described as healthy.

9. Smoking and alcohol drinking did not appear significant factors as causes of LBW as only 1.9% of mothers smoked and only 0.64% took alcohol.

10. Multiparity was a relevant factor to LBW.

11. Favorable factors for the LBW were the education of mothers, their fairly good health and an increase in frequency of pre-natal consultations by trained health staff.

12. Salient unfavorable factors were low incidence of breastfeeding, insufficient health education, economic difficulties and lack of facilities and transportation problems.

Acknowledgment

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Gratitude is extended to the staff of the Institute of Maternal and Child Health (IMCH) Philippines, for their patience, persistence and determination to finish their research, amidst difficulties and obstacles in the field. It is hoped that all these efforts and the financial assistance of NAST have not been in vain and that through this cooperative endeavor, it may be possible to contribute to Philip-

pine and world literature on the subject of newborns and low birthweights, presently considered priority health problems anywhere.

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