

MIDWIVES' VALIDATION STUDY 1977

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CONTENTS

|  | <u>Page</u> |
|--|-------------|
| SUMMARY  | (i)         |
| RECOMMENDATIONS  | (ii)        |
| A. Introduction  | 1           |
| B. Materials and Methods                                 | 2           |
| C. Results   | 5           |
| D. Tabulations   | 16          |
| E. Discussion  | 31          |
| Including list of "validity" of variables                | 32          |
| F. References  | 37          |
| G. Acknowledgements                                      | 39          |
| <br>   |             |
| Attachment A - Midwives; Form                            |             |
| Attachment B - Suggested New Form Design for Discussion. |             |

SUMMARY

A validation study of the W.A. Midwives' Notification of Birth form has been carried out. This was done by:-

(i) comparing the frequency distributions for all variables against other known data sets, and

(ii) comparing the data from individual Midwives' forms with the individual labour ward records in the major Obstetric hospital.

The following variables were recorded accurately and can be used with confidence:

Marital status of Mother

Maternal age

Maternal height

Presentation of baby

Date of birth of baby

Sex of baby

Birthweight

Length of baby

Plurality

Gestational age and time to spontaneous respirations need improvement due to the large numbers of "unknown": this would have to be done by midwife retraining.

All the other variables, particularly maternal and neonatal morbidity, need to be improved before being used.

Recommendations:

1. Redesign the form (see Attachment B) ✓
2. Continual retraining of Midwives and Hospital Records Clerks in data collection and recording. ✓
3. The formation of a Committee with particular person(s) responsible for analysis, interpretation and publication of an annual Midwives' Report.
4. Feedback of the information to the Midwives, Obstetricians, Paediatricians, Hospitals and Public Health Department in a form useful to them. (This will help in retraining and keeping up the level of recording).

Perhaps a Midwife should be employed initially for 12 months (and then permanently) to introduce the new form, pilot and evaluate it after a certain trial period.

5. Consideration be given to the problems resulting from the present Midwives' Form being sent in after 48 hours and not being further updated in spite of continuing Neonatal problems. (e.g.: by not sending the form in until 7 days after birth; or by having 2 forms - one for obstetric and birth data and one for the Neonatal period which would later be linked).

## A. Introduction

The Midwives' Notification of Case attended (Form 2) exists in Western Australia as a statutory document, required to be completed by the attending midwife for all births occurring in the State.

It is a triplicate form, an example of which can be found in Appendix A. The top copy is forwarded to the Commissioner of Public Health within 48 hours of the birth, with as much data completed as can be in that time. The middle copy is forwarded to the Commissioner, along with the mother's HA22 (Hospital Morbidity Form), at the time of discharge of mother and/or baby, whichever comes last. The bottom copy is retained by the hospital (or midwife, if the baby was born outside of hospital) for their records.

Once the two copies have been forwarded to the Commissioner, the data are coded and transferred to the computer.

The form was introduced in July 1974 and data are currently available on all babies born between that time and December 31, 1976. This amounts to approximately 50,000 births. The data for 1974 are incomplete as only the last 6 months' births were collected and not all the data were punched.

Although in use for 3 full years (including 1977), no evaluation of the form has been made. It was felt that if the data collected on these forms were to be used for epidemiological research and planning purposes, an assessment of the validity of the forms as a data source should be carried out.

The results of a validation of the Midwives' Form are presented in this report.

B. Materials and Methods

The validation was performed using two different approaches.

1. Frequency distributions of all the important variables recorded on the Midwives' Form were obtained for the years 1974, 1975 and 1976. (Data for 1974, as mentioned, are preliminary and incomplete). These frequency distributions were then compared with those from other valid data considered to be comparable with births in Western Australia during the same period. Where data based on Western Australian births were available, these were used. However, for many variables, these data were not available, and therefore statistics from Tasmanian, U.K., U.S.A., and Norwegian birth data collections have also been used.

It is perhaps not legitimate to compare W.A. data with those from overseas. This is especially so when comparing variables such as height and weight, which vary so much between ethnic groups. Therefore, an attempt was made to use only other Australian data for comparisons of this nature.

With other characteristics/conditions it may be more reasonable to assume that women and their offspring are basically more comparable, even between different countries. Therefore some other countries' data have been used for certain characteristics/conditions, either to supplement Australian data or for which Australian data were not available,

and for which it was thought that comparisons could safely be drawn.

The Western Australian branch of the Australian Bureau of Statistics (1) publish annual reports on vital statistics, from which were obtained:- total number of live births, stillbirths and neonatal deaths, births by maternal age, previous issue, marital status, month of birth, sex of infant and plurality for the relevant years. These statistics were not always directly comparable with data obtained from the Midwives' Form although both were based on the same population. Bureau statistics are published by month of registration, as opposed to month of birth, as on the Midwives' Form, resulting in numerical discrepancies between the two data sources. Certain variables are only published for nuptial births (e.g. previous issue). In addition, previous issue is only recorded for the present marriage, thereby distorting the histories of the considerable number of women who have had illegitimate children, or children from previous marriages.

Also of concern is the apparent confusion between parity and gravidity in W.A. and the other data collections. Obviously parity is sometimes recorded after the birth, as including the index pregnancy, thereby inflating the parity by 1. Other recorders are confused about the definitions of parity and gravidity. This exists throughout the parity scale, but is most obvious when para 0 women (G1, PO) are recorded as being para. 1. As primigravidae tend to be higher risk mothers, this error is most worrying.

There are also delays in registration of births which lead to incomplete Demography data. Therefore this comparison is not ideal, but it is nonetheless the only

Western Australian data source available for many of the variables.

Percentiles of height and weight of women less than 40 years old were obtained from Busselton Health Survey data (13) and these were compared with percentiles calculated from the Midwives' Data.

Tasmanian data were obtained from the Obstetric and Neonatal Report of Tasmania, 1975 (2). Problems of comparability were encountered due to the (a) non-standard grouping of variables (e.g. gestational age), (b) use of non-ICD coding for morbid conditions and (c) collection of a different set of variables than those on the Midwives' form.

The limitations of the other data sets as comparisons are discussed under the individual tables, but they are similar in nature to those already mentioned.

2. A sample of all babies born at King Edward Memorial Hospital for Women on the 5th and 15th days of each month in 1976 was obtained from the Midwives' data and individually compared with the relevant entries in the Delivery Ward Register at K.E.M.H., and any discrepancies noted. Besides the advantage of having a large number of cases on which to work, it was also considered that being a specialist maternity hospital, the data collection would be of a high standard. However, it was pointed out that being a training hospital for midwives, the staff turnover at KEMH is high and so that a high standard of data collection might not have been maintained.

The sample contained details of:- gestational age, previous issue, morbid conditions of the mother during pregnancy, duration of labour and the baby's condition at birth (i.e. alive or stillborn), sex, birthweight, length, presentation, plurality, Apgar score and whether the baby received special nursing care after birth.

Some of the details being examined, notably Apgar score and morbid conditions of pregnancy were very incompletely recorded in the Delivery Ward Register, and since checking through individual case notes was made prohibitive by the size of the sample, any meaningful comparison of these variables became impossible. Analysis of maternal morbidity was thus abandoned. The comparison of Apgar scores is biased in that on the whole, only in those cases warranting special attention (difficult labour, prematurity, etc.), was the Apgar score entered in the Delivery Ward Register.

## C. Results

### (a) Table 1 - Numbers of Births

The numbers of Midwives' live births for each year are different to those published by the Bureau of Statistics, although in 1975 this difference was small. This is best explained by the fact that the Bureau's figures represent total live birth registrations for that year, and so might not be expected to tally exactly with total live births. Even so, a difference of 466 (for 1976) is substantial.

The stillbirth totals tally well, although the figures probably do not concern exactly the same stillbirths. Variations in definition of stillbirths, and again, between

births and registrations could easily explain the small discrepancies involved.

There is, however, a large discrepancy between Bureau and Midwives' Data for neonatal deaths. In theory, the Midwives' form should accompany any baby transferred to another hospital and be updated until the time of the baby's discharge. In reality, this probably does not occur to any great extent and so many babies who died in the neonatal period are simply listed as having been transferred.

(b) Table 2 - Maternal Age

The figures for maternal age distribution obtained from the Midwives' data compare favourably with those published by The Australian Bureau of Statistics. In Tasmania however, the percentage of mothers less than 20 years old is nearly twice that occurring in Western Australia. The reasons for this are not clear. The percentage of unknown ages in the Midwives' data is low.

(c) Table 3 - Marital Status of Mother

Midwives' data compares very well with both 1975 Bureau statistics and Tasmanian data. The percentage of unknowns in the Midwives Data is very low.

(d) Table 4 - Race of Mother

Over 5% of births in Western Australia are Aboriginal (fullblood and half-caste). From the 1966 Census, 2.6% of the W.A. population were Aboriginal. However other data (Moodie, 1973 (15), and Lancaster Jones, 1970 (16)) have shown that the Aboriginal birth rate is considerably greater than that of the white population. Thus, the figure of 5% is within expectations.

(e) Table 5 - Maternal Weight

Weight percentiles for Midwives' data are higher than those calculated for Busselton Survey women. However, women in the Busselton Survey were not pregnant. In all likelihood the weights recorded on Midwives' forms are the pregnant weights, and recorded when the women first attended for antenatal care (which can be at any time during pregnancy), or when they presented in labour. The distribution therefore will be skewed towards heavier women compared with Busselton. Data from other countries are not comparable due to ethnic differences. Some weights which were recorded in the Midwives' data were obviously inaccurate (e.g. 16 kg, and 652 kg), perhaps due to confusion over British and metric measurements (e.g.: ? 16 stones) or to decimal point placement (e.g. ?65.2kg).

(f) Table 6 - Maternal Height

Height percentiles for the Midwives' data appear to be reasonably accurate when compared to those from Busselton data, with the exception of the 75th percentile, which is somewhat high for the Midwives' data. This however, appears to be decreasing with time, possibly reflecting an improvement in the way this variable is recorded. Again some ridiculous values were recorded but it is obvious that as the percentiles correlate so well, only a few values are outlying.

(g) Table 7 - Previous Issue

The Midwives' distribution does not agree well with figures supplied by the W.A. Branch of the Bureau of Statistics, especially in the primigravidae and high-parity mothers, so-called 'at risk' parities. However, Bureau figures represent only the issue from present marriages for

nuptial confinements, and not total issue of mothers. This would produce a shift towards low parity mothers.

The same sort of problem is encountered with a comparison with Tasmanian data, although the discrepancies are not as large.

Also confusing is the very real problem of definition of parity. As stated previously, there is a tendency to mistake parity for gravidity, and, in so doing, to increase the recorded number of previous issue of any mother by one. This is most noticeable in para 0 women who are recorded as para 1. Even the published tables for Tasmanian data incorrectly labelled para 0 as para 1, and so on.

Indeed, the recording of previous illegitimate children in either of the two Western Australian data sources may be questionable. Birth registrations are often completed by the father, and Midwives' Forms indirectly by both parents, and so it is quite understandable that many previous illegitimate children would not find their way on to the records.

(h) Table 8 - Presentation

The Midwives' data compared well with other data sources. There were differences in the percentage of breech deliveries recorded, but this is probably due to variations in definition, or real differences in incidence.

The percentage of unknowns is possibly due largely to Caesarian sections, where presentation is often not noted. Even so the percentage of unknowns is much less than that recorded for the U.S. Collaborative Perinatal Study (14).

(i) Table 9A - Duration of Labour

It soon became apparent when Part 2 of the validation was commenced that this variable was being recorded as total duration of labour (i.e. 1st, 2nd and 3rd stages). Since there are no comparable data for this, because all other studies record the distribution of individual stages of labour, it is not possible to validate the accuracy of the Midwives distribution.

These data are probably also inaccurate, due to the difficulties involved in assessing the 1st and 2nd stages of labour.

(j) Table 9B - Method of Delivery

There is no specific question on the Midwives form relating to mode of delivery and therefore the midwives might be understandably confused as to where to record this important variable. All other obstetric forms clearly specify the different codes of this variable. A special computer programme was required to extract the Caesarian sections, forceps and Ventouse deliveries which had been recorded under either "current pregnancy complications (ICD) or "operations" or under both. Even so the percentage Caesarian section rates are very similar to the Tasmanian data, although the Midwives current pregnancy (ICD) numbers for 1975 are obviously incomplete. The Ventouse and forceps rates vary between years and quite markedly from other sources, particularly Tasmania. It is difficult to assess whether this difference is due to variations in Obstetric practice or to inaccuracies in recording of data.

(k) Table 10 - Month of Birth

This has been compared against W.A. Demography data which refer to month of registration, rather than birth, and so the discrepancies observed were expected. It would appear that birth registrations are received in batches from many hospitals - most likely small rural hospitals which don't handle many births. There is therefore a quarterly pattern to the Demography data not present in the Midwives' data, the latter being more evenly spread, as would be expected.

(l) Table 11 - Sex

1975 births were compared because of the closer agreement between total numbers than in 1976.

The numerical differences between Midwives and Demography births occurred again, for the same reasons, but the distribution was exactly as expected in both cases. This variable is recorded well on the Midwives' form.

(m) Table 12 - Gestation

The Midwives percentage of unknown values for gestational age was unacceptably high (>20%), when compared to data from the U.K. However the U.K. data were from an ad hoc study and so the collection was probably more thorough than with the ongoing Midwives collection, but the number of unknown values in the Midwives' data is, nevertheless, undesirable. Among low gestational age births, the two sources correlate fairly well. There is less agreement around higher values, due in part, probably, to the large proportion of births which were being induced at term in the U.K. at that time (in 1970) - as a result U.K. figures for 37-39 weeks are higher than ours, while figures for 40-42, and 43 weeks and over are lower.

Tasmanian data were grouped in such a way as to make direct comparisons impossible in all but 43 weeks and over, where their value was much lower than in any of the other groups.

(b) Table 13 - Plurality

Midwives' data were well recorded and agreed well with W.A. Demography and Tasmanian data.

(o) Table 14 - Birthweight

Birthweight distribution from the Midwives' Data compared well to those from other sources, with no serious discrepancies amongst any of the groups. The percentage of unknown birthweights is acceptable and less than the value quoted by the Australian Bureau of Statistics special print out of birthweights for 1974.

(p) Table 15 - Length of Baby

The Midwives' data agrees fairly well with those taken from growth charts supplied by K.E.M.H.

The percentage of unknown cases (7.0% in 1975, 6.4% in 1976) in the Midwives' data was disturbing in view of the fact that baby length is usually always measured. On the whole, however, it was well recorded.

(q) Table 16 - Time to Spontaneous Respirations

The T.S.R. distribution for Midwives' data correlates closely with U.K. figures.

However, the percentage of unknown values varies with hospital, (in one hospital 51% were recorded as unknown). This could obviously be improved.

(r) Table 17 - Apgar Score

Recording of Apgar Scores appears to be very inaccurate in the Midwives' data. A distribution of Apgars similar to the Tasmanian data was expected - i.e. more babies with lower Apgars, rather than the favourable conditions assessed and recorded by W.A. Midwives. Good Apgar scores indicate healthy babies which are a reflection on the standards of obstetric care provided by the hospital and the midwife. This has possibly skewed the distribution of Apgar scores towards higher values.

Other studies have shown that 5 minute Apgar Score (Drage et al.<sup>18</sup>) or time to spontaneous respirations (Chamberlain et al.<sup>3</sup>) if accurately assessed and recorded are both extremely good predictors of later neurological abnormality. Some workers (e.g. Chamberlain) now claim that T.S.R. is probably both more accurate (easier to do) and a better predictor than 5 minute Apgar score.

(s) Table 18 - Medical Morbid Conditions of Mothers

Certain of the more common and important medical diseases which may be present during pregnancy were chosen for comparison with other data. Because no diseases were actually specified on the Midwives' form, it was felt that there was probably under-reporting of these conditions; the midwives were obviously confused as to where to record certain conditions, as many "illegal" codes were observed.

The Midwives' incidence rates for Diabetes (around 2/1000) for both years are similar to the Tasmanian figure, but differ markedly from those of white women in the U.S. Collaborative Study. The rates for Heart, Circulatory, and Genito-urinary diseases, however, are more difficult to interpret. The rates

and 1976 in the Midwives' data; and they differ quite markedly from the Tasmanian rate for heart disease (which is remarkably low compared with other studies) and from the white U.S. figures. The rates from Tasmania are based on only 6,000 total births and may be less reliable than the Midwives' data. No medical diseases are individually specified on their form and so the same under-reporting of conditions may also be occurring there.

The U.S. data is based on nearly 30,000 white births but they were sampled from centres of excellent obstetric care which may well have biased the sample towards a sicker group of mothers. The large discrepancy between Midwives and U.S. data in genito-urinary conditions is probably due to vaginitis being recorded in the U.S. and not in W.A. As vaginitis and urinary tract infections are not treated in hospital, the W.A. Midwife would have had to ask specific questions about these and other conditions to have included them on the form.

(t) Table 19 - Selected Morbid Complications of Pregnancy & Delivery

Selected important conditions related to the current pregnancy from the Midwives' data were compared to the other data sources. It was very difficult to obtain other Australian community (non-hospital based) data on the incidence rates of most of these conditions. This is astonishing in view of the importance of most of them in neonatal mortality and morbidity. Therefore doubtful comparisons were made also with white U.S.A. and U.K. data.

Maternal bleeding and all eclampsia and pre-eclampsia rates compare well with Tasmanian data, but it may be that both data sets are under-reporting these conditions, as neither specify the conditions individually on their forms. Anaemia compares well

with U.K. but not U.S.A. Urinary Tract Infections, (U.T.I.) figures are only available for U.S.A. and these tend to be much higher than our Midwives' figures. From clinical experience one would have expected that more than 2% of pregnant W.A. women have U.T.I. at some time, but all may not be treated at a hospital nor reported to the midwife. It is impossible to draw any conclusions from the other rates presented, as either the definitions vary or no adequate comparable data exist.

(u) Table 20 - Selected Neonatal Morbidity

Much lower rates for total Respiratory Distress Syndrome (Hyaline Membrane Disease and RDS) were observed from the W.A. Midwives' data than from both Tasmania and U.K. This may be due to some of the babies who develop respiratory problems after 48 hours, not getting into the Midwives' collection because their forms were not later sent in when they were discharged home, and no amendment of their diagnoses could be made.

The large discrepancy between the jaundice rates from the Midwives and U.K. data were investigated further by obtaining some Neonatal hospital notes and comparing morbidity recorded and that written in the notes - (this was done whilst going through Neonatal notes of high risk infants in W.A. as part of a follow-up study). In many of these charts there were discrepancies between the Midwives form and the hospital notes. A representative sample is shown in Table 20a. The Midwives' diagnoses tended to markedly under-estimate morbidity as recorded in the hospital notes. It should perhaps be stated here that many of the Midwives' forms are apparently filled in by Medical Records Clerks in the hospitals, who may not know which diagnoses to record, and often only the ICD numbers are filled in. Jaundice

tended to be almost avoided on the Midwives' form, and many of the complications of other conditions (e.g. P.D.A. in a preterm babe) were not recorded. Many of these conditions, especially jaundice, may not develop until after 48 hours when the first copy of the Midwives' form is sent in, and unless updated, no amended diagnosis will appear. That a diagnosis of encephalocoele was missed, is worrying.

(v) Table 21 - Selected Major Congenital Malformations

Selected congenital malformation rates from the Midwives' data were compared with certain other Australian data and overseas rates. Some of these other data are based on birth collections only, and others on births plus later morbidity combined. In those congenital malformations diagnosable at birth, rates calculated from either sort of collection may be expected to be similar to the Midwives' data. However, many congenital anomalies are only picked up later and then rates would be expected to differ.

The rates for most congenital malformations from the Midwives' data are encouragingly similar to those from other W.A. and total Australian sources. It is perhaps not legitimate to compare incidence rates between Australian and overseas sources, especially for malformations such as Anencephaly and Spina Bifida which are known to vary markedly in different countries. Also, congenital dislocation of the hip (CDH) rates depend rather on the incidence of tests done at birth, and may vary with differing levels of paediatric assessments etc. These comparisons should therefore not be made. However, valid comparisons against other Australian data seem to compare well.

MIDWIVES VALIDATION STUDY - 1977TABLE 1BIRTH NUMBERS

|                   | Midwives Data |        | W.A. Demography <sup>1</sup> |        |
|-------------------|---------------|--------|------------------------------|--------|
|                   | 1975          | 1976   | 1975                         | 1976   |
| Total Live Births | 20,297        | 20,204 | 20,338                       | 20,670 |
| Stillbirths       | 236           | 236    | 236                          | 242    |
| Neonatal Deaths   | 111           | 103    | 186                          | 176    |

TABLE 2ALL BIRTHS BY MATERNAL AGE (% DISTRIBUTION)

| Age in Years | Midwives Data |      |      | Other Data             |                      |
|--------------|---------------|------|------|------------------------|----------------------|
|              | 1974          | 1975 | 1976 | W.A. 1975 <sup>1</sup> | Tas. <sup>2(a)</sup> |
| <20          | 10.5          | 8.8  | 8.1  | 11.2                   | 14.2                 |
| 20-24        | 34.7          | 34.0 | 33.4 | 36.0                   | )                    |
| 25-29        | 35.4          | 37.4 | 37.7 | 35.0                   | ) 69.6               |
| 30-34        | 14.2          | 14.4 | 15.6 | 13.0                   | )                    |
| 35-39        | 4.2           | 4.4  | 4.2  | 3.9                    | ) 15.2               |
| 40-44        | 0.9           | 0.9  | 0.9  | 0.8                    | )                    |
| ≥ 45         | 0.0           | 0.1  | 0.1  | 0.1                    | ) 1.0                |
| Unknown *    | 3.7           | 0.3  | 0.1  |                        |                      |

(a) Live births only.

\* All unknown values are expressed as a percentage of total births; all other values are expressed as a percentage of total minus unknown births.

MIDWIVES VALIDATION STUDY - 1977TABLE 3ALL BIRTHS BY MARITAL STATUS OF MOTHER (% DISTRIBUTION)

| Marital Status | Midwives Data |      |      | Other Data           |                      |
|----------------|---------------|------|------|----------------------|----------------------|
|                | 1974          | 1975 | 1976 | W.A. <sup>1(a)</sup> | Tas. <sup>2(b)</sup> |
| Never Married  | 9.0           | 9.4  | 8.8  | 12.4                 | 7.9                  |
| Separated      | 0.7           | 0.8  | 0.7  |                      | 1.2                  |
| Divorced       | 0.2           | 0.1  | 0.4  |                      | 0.3                  |
| Widowed        | 0.2           | 0.1  | 0.2  |                      | 0.3                  |
| Nuptial        | 89.9          | 89.6 | 90.0 |                      | 87.6                 |
| Unknown *      | 0.5           | 0.2  | 0.0  |                      | 0.1                  |

(a) Nuptials Only

(b) Live births only

\* All unknown values are expressed as a percentage of total births; all other values are expressed as a percentage of total minus unknown births.

TABLE 4ALL BIRTHS BY RACE OF MOTHER  
(% DISTRIBUTION)

| Race                       | Midwives Data |      |      | Other Data |
|----------------------------|---------------|------|------|------------|
|                            | 1974          | 1975 | 1976 |            |
| White                      | 92.8          | 92.2 | 92.1 |            |
| Aboriginal<br>(full-blood) | 1.4           | 1.7  | 1.7  |            |
| Aboriginal<br>(caste)      | 3.2           | 3.6  | 3.4  |            |
| Other                      | 2.5           | 2.5  | 2.8  |            |
| Unknown *                  | 0.3           | 0.0  | 0.0  |            |

\* All unknown values are expressed as a percentage of total births; all other values are expressed as a percentage of total minus unknown births.

MIDWIVES VALIDATION STUDY - 1971TABLE 5ALL BIRTHS BY MATERNAL WEIGHT (PERCENTILE RANKING)Weight (kg)

| Percentile | Midwives Data |      |      | Other Data            |                       |
|------------|---------------|------|------|-----------------------|-----------------------|
|            | 1974*         | 1975 | 1976 | W.A. <sup>13(a)</sup> | W.A. <sup>13(b)</sup> |
| 25         | 61            | 63   | 63   | 56                    | 54.2                  |
| 50         | 68            | 69   | 70   | 62                    | 59.0                  |
| 75         | 76            | 77   | 77   | 69.4                  | 65.8                  |

\* Range = 16 - 652 kg  
 (a) Females, age 30-39  
 (b) Females, age < 30

TABLE 6ALL BIRTHS BY MATERNAL HEIGHT (PERCENTILE RANKING)Height (cm)

| Percentile | Midwives Data |      |      | Other Data         |
|------------|---------------|------|------|--------------------|
|            | 1974*         | 1975 | 1976 | W.A. <sup>13</sup> |
| 25         | 158           | 158  | 158  | 159.4              |
| 50         | 164           | 163  | 163  | 163.7              |
| 75         | 174           | 170  | 169  | 167.0              |

\* Range = 9 - 954 cm.

MIDWIVES VALIDATION STUDY - 1977TABLE 7ALL BIRTHS BY PREVIOUS ISSUE (% DISTRIBUTION)

| Parity  | Midwives Data |      |      | Other Data           |                      |
|---------|---------------|------|------|----------------------|----------------------|
|         | 1974          | 1975 | 1976 | W.A. <sup>1(a)</sup> | Tas. <sup>2(b)</sup> |
| 0       | 33.4          | 33.0 | 31.9 | 39.7                 | 37.8                 |
| 1       | 32.4          | 32.2 | 33.1 | 34.8                 | 33.9                 |
| 2       | 17.7          | 18.5 | 19.5 | 16.8                 | 16.2                 |
| 3       | 8.6           | 8.3  | 8.9  | 5.5                  | 6.7                  |
| 4       | 7.9           | 8.1  | 7.5  | 3.1                  | 5.4                  |
| Unknown | 0.1           | 0.0  | 0.1  |                      |                      |

(a) Nuptials only

(b) Live deliveries

TABLE 8ALL BIRTHS BY PRESENTATION (% DISTRIBUTION)

| Presentation | Midwives Data |      |      | Other Data       |                    |                      |
|--------------|---------------|------|------|------------------|--------------------|----------------------|
|              | 1974          | 1975 | 1976 | Tas <sup>2</sup> | UK <sup>3(a)</sup> | USA <sup>14(b)</sup> |
| Unstable lie |               | 0.3  | 0.1  |                  | )                  | )                    |
| Vertex       |               | 95.4 | 95.6 | 96.0             | 97.6               | 95.7                 |
| Brow/face    |               | 0.2  | 0.3  | 0.3              | )                  | )                    |
| Breech       |               | 3.8  | 3.7  | 2.8              | 2.5                | 3.8                  |
| Other        |               | 0.3  | 0.2  |                  |                    | 0.1                  |
| Unknown      |               | 1.1  | 1.1  |                  |                    | 5.7                  |

(a) Live births only, excluding Caesarian section &amp; unattended births.

(b) White population only.

MIDWIVES VALIDATION STUDY - 1977TABLE 9AALL BIRTHS BY DURATION OF LABOUR ( % DISTRIBUTION)

| Duration of labour (hrs) | Midwives Data |      |      |
|--------------------------|---------------|------|------|
|                          | 1974          | 1975 | 1976 |
| ≤ 2                      |               | 12.0 | 12.7 |
| 3 - 5                    |               | 32.2 | 32.7 |
| 6 -11                    |               | 37.3 | 37.2 |
| 12 -24                   |               | 16.3 | 15.8 |
| 25.-48                   |               | 2.1  | 14.1 |
| > 48                     |               | 0.1  | 0.1  |
| Unknown                  |               | 6.9  | 7.7  |

TABLE 9BMETHOD OF DELIVERY

## Midwives' Data

|                   |   | 1975 |              | 1976 |              | Tas  | UK   |
|-------------------|---|------|--------------|------|--------------|------|------|
|                   |   | ICD  | (Operations) | ICD  | (Operations) |      |      |
| Caesarian section | N | 927  | (1321)       | 1390 | (1345)       | 444  | 757  |
|                   | % | 4.6  | (6.5)        | 6.8  | (6.6)        | 6.4  | 4.5  |
| Ventouse          | N | 1375 | (175)        | 1662 | (1792)       | 134  | 114  |
|                   | % | 6.8  | (0.9)        | 8.1  | (8.8)        | 1.9  | 0.7  |
| Forceps           | N | 1555 | (283)        | 2317 | (2525)       | 1570 | 1331 |
|                   | % | 7.7  | (1.4)        | 11.3 | (12.3)       | 22.6 | 7.9  |

MIDWIVES VALIDATION STUDY - 1977TABLE 10ALL BIRTHS BY BABY'S MONTH OF BIRTH

| Month of Birth | Midwives' Data |      |      | Other Data                |
|----------------|----------------|------|------|---------------------------|
|                | 1974           | 1975 | 1976 | W.A. 1975 <sup>1(a)</sup> |
| January        | -              | 1622 |      | 1372                      |
| February       | -              | 1679 |      | 1492                      |
| March          | -              | 1777 |      | 1516                      |
| April          | -              | 1695 |      | 2185                      |
| May            | -              | 1731 |      | 1686                      |
| June           | -              | 1663 |      | 1592                      |
| July           | 1654           | 1782 |      | 1942                      |
| August         | 1692           | 1662 |      | 1446                      |
| September      | 1698           | 1741 |      | 1718                      |
| October        | 1783           | 1688 |      | 1795                      |
| November       | 1617           | 1595 |      | 1775                      |
| December       | 1338           | 1662 |      | 1819                      |
| Unknown        | 3              | -    |      | -                         |

(a) Month of registration

MIDWIVES VALIDATION STUDY - 1977TABLE 11ALL BIRTHS BY BABY'S SEX

|        | Midwives Data | Other Data                |
|--------|---------------|---------------------------|
| Sex    | 1975          | W.A. 1975 <sup>1(a)</sup> |
| Male   | 10,441        | 10,460                    |
| Female | 9,856         | 9,878                     |
| Total  | 20,297        | 20,338                    |

TABLE 12ALL BIRTHS BY GESTATIONAL AGE (% DISTRIBUTION)

| Gestational age<br>(weeks) | Midwives Data |      |      | Other Data           |                  |
|----------------------------|---------------|------|------|----------------------|------------------|
|                            | 1974          | 1975 | 1976 | U.K. <sup>3(b)</sup> | Tas <sup>2</sup> |
| < 30                       |               | 0.9  | 0.8  | 0.7                  |                  |
| 30-33                      |               | 1.6  | 1.4  | 1.2                  |                  |
| 34-36                      |               | 4.6  | 4.8  | 4.1                  |                  |
| 37-39                      |               | 27.5 | 28.6 | 32.1                 |                  |
| 40-42                      |               | 57.8 | 57.5 | 52.3                 |                  |
| ≥ 43                       |               | 7.6  | 6.9  | 4.4                  | 2.2              |
| Unknown                    |               | 21.4 | 20.2 | 5.1                  |                  |

(b) Singletons only

MIDWIVES VALIDATION STUDY - 1977TABLE 13ALL BIRTHS BY PLURALITY (% DISTRIBUTION)

| Plurality | Midwives' Data |      |      | Other Data             |                  |
|-----------|----------------|------|------|------------------------|------------------|
|           | 1974           | 1975 | 1976 | W.A. 1975 <sup>1</sup> | Tas <sup>2</sup> |
| 1         | 98.0           | 97.9 | 98.2 | 98.0                   | 98.3             |
| 2         | 1.9            | 2.1  | 1.7  | 2.0                    | )                |
| ≥ 3       | 0.1            | 0.0  | 0.1  | 0.0                    | ) 1.7            |
| Unknown   | 0.0            | 0.0  | 0.0  | 0.0                    | 0.0              |

TABLE 14ALL BIRTHS BY BIRTHWEIGHT (% DISTRIBUTION)

| Birthweight<br>(grams) | Midwives' Data |      |      |                     | Other Data          |                    |                    |  |
|------------------------|----------------|------|------|---------------------|---------------------|--------------------|--------------------|--|
|                        | 1974           | 1975 | 1976 | WA <sup>12(a)</sup> | Tas <sup>2(b)</sup> | UK <sup>3(c)</sup> | UK <sup>4(c)</sup> |  |
| ≤ 500                  | 0.3            | 0.2  | 0.2  | 0.3                 | )                   | )                  | )                  |  |
| 500- 999               | 0.6            | 0.5  | 0.5  | 0.7                 | )                   | ) 0.5              | ) 0.3              |  |
| 1000-1499              | 0.6            | 0.6  | 0.6  | 0.7                 | 0.6                 | 0.6                | 0.6                |  |
| 1500-1999              | 1.2            | 1.0  | 1.1  | 1.2                 | )                   | 1.2                | 1.0                |  |
| 2000-2499              | 3.5            | 3.7  | 3.6  | 3.5                 | )                   | 5.4                | 4.7                |  |
| 2500-2999              | 17.4           | 16.7 | 15.4 | 17.2                | )                   | 18.9               | 18.0               |  |
| 3000-3499              | 38.3           | 38.2 | 37.9 | 37.3                | )                   | 58.7               | 39.1               |  |
| 3500-3999              | 28.8           | 29.4 | 30.2 | 28.8                | )                   | 26.8               | 27.0               |  |
| 4000-4499              | 8.1            | 8.3  | 9.0  | 8.6                 | )                   | 34.9               | 8.3                |  |
| ≥ 4500                 | 1.2            | 1.5  | 1.5  | 1.5                 | )                   | 0.1                | 3.6                |  |
| Unknown                | 1.8            | 1.4  | 1.8  | 3.4                 |                     |                    |                    |  |

(a) Births registered in 1974

(b) Live births only

(c) Singletons only

MIDWIVES VALIDATION STUDY - 1977TABLE 15ALL BIRTHS BY LENGTH OF BABY (CMS) (PERCENTILE RANKING)

| Percentile | Midwives' Data |      | Other Data         |
|------------|----------------|------|--------------------|
|            | 1975           | 1976 | KEMH <sup>17</sup> |
| 25         | 49             | 48   | 48                 |
| 50         | 50.5           | 50   | 49                 |
| 75         | 52             | 52   | 50.5               |

MIDWIVES VALIDATION STUDY - 1977TABLE 16ALL BIRTHS BY TIME TO SPONTANEOUS RESPIRATIONS (% DISTRIBUTIONS)

| T.S.R. (mins) | Midwives Data |      |      | Other Data           |
|---------------|---------------|------|------|----------------------|
|               | 1974          | 1975 | 1976 | U.K. <sup>3(a)</sup> |
| 0             |               | 12.9 | 11.7 | 95.7                 |
| 1             |               | 71.0 | 74.1 |                      |
| 2             |               | 7.8  | 7.3  |                      |
| 3             |               | 2.8  | 2.4  |                      |
| 4-10          |               | 5.0  | 4.0  |                      |
| > 10          |               | 0.5  | 0.5  | 4.3                  |
| Unknown       |               | 6.6  | 6.4  |                      |

(a) Singleton survivors only, excluding BBA's.

TABLE 17ALL BIRTHS BY APGAR SCORE (% DISTRIBUTION)

| Apgar   | Midwives Data |      |      | Other Data          |
|---------|---------------|------|------|---------------------|
|         | 1974          | 1975 | 1976 | Tas <sup>2(b)</sup> |
| 0       |               | 1.0  | 0.1  | 5.1                 |
| 1       |               | 0.3  | 0.2  |                     |
| 2       |               | 0.2  | 0.2  |                     |
| 3       |               | 0.3  | 0.3  |                     |
| 4       |               | 0.4  | 0.4  |                     |
| 5-6     |               | 2.2  | 1.7  | 7.0                 |
| 7-10    |               | 95.6 | 96.0 | 87.9                |
| Unknown |               | 1.8  | 1.6  |                     |

(b) Live births only

MIDWIVES VALIDATION STUDY - 1977TABLE 18MEDICAL MORBID CONDITIONS OF MOTHER - RATES/1000 BIRTHS

| Condition & I.C.D.<br>Code        | Midwives Data |       | Other Data       |                      |
|-----------------------------------|---------------|-------|------------------|----------------------|
|                                   | 1975          | 1976  | Tas <sup>2</sup> | USA <sup>14</sup>    |
| Diabetes (250)                    | 1.82          | 2.00  | 3.0              | 6.6                  |
| Heart (390-399,<br>405-429)       | 4.23          | 2.93  | 0.8              | 14.4 <sup>(a)</sup>  |
| Circulatory (400-404,<br>430-458) | 5.46          | 10.76 | -                | 3.8 <sup>(b)</sup>   |
| Genito-urinary<br>(580-629)       | 6.25          | 13.50 | -                | 168.0 <sup>(c)</sup> |

- (a) organic heart disease  
(b) phlebitis/thrombosis  
(c) vaginitis

## MIDWIVES VALIDATION STUDY - 1977

TABLE 19

## MORBID CONDITIONS OF PREGNANCY &amp; DELIVERY (RATE/1000 BIRTHS)

| Condition & I.C.D. Code                              | Midwives Data        |       |                      | Other Data        |                          |                          |
|--|----------------------|-------|----------------------|-------------------|--------------------------|--------------------------|
|  | 1975                 | 1976  | Tas. <sup>2</sup>    | U.K. <sup>6</sup> | U.K. <sup>4</sup>        | USA <sup>14</sup> (d)    |
| Maternal bleeding (632,651)                          | 33.8                 | 37.0  | 34.0 <sup>(a)</sup>  | -                 | -                        | 280.6 <sup>(g)</sup>     |
| Pre-eclampsia (637.0)                                | 78.4                 | 85.7  | -                    | 72.6              | ) 129.0 <sup>(b)</sup> ) | ) 282.0 <sup>(f)</sup> ) |
| Eclampsia (637.1)                                    | 0.4                  | 0.6   | -                    | 2.1               |                          |                          |
| Toxaemia NOs (637.9)                                 | 14.0                 | 13.6  | -                    | -                 |                          |                          |
| Anaemia of pregnancy (633)                           | 26.8                 | 18.1  | -                    | -                 | 26.0                     | 125.4 <sup>(j)</sup>     |
| U.T.I. of pregnancy/puerperium (635)                 | 21.0                 | 20.3  | -                    | -                 | -                        | 104.4 <sup>(i)</sup>     |
| Renal disorders of pregnancy/puerperium (636)        | 1.9                  | 4.1   | -                    | -                 | -                        | -                        |
| Hyperemesis gravidarium (638)                        | 6.1                  | 8.2   | -                    | -                 | -                        | 16.4                     |
| Retained placenta (652)                              | 6.2                  | 14.6  | 14.2                 | -                 | -                        | -                        |
| Difficult labour due to disproportion, etc (654-657) | 90.1                 | 88.6  | 196.0 <sup>(c)</sup> | -                 | -                        | -                        |
| Suture of cervical os (707)                          | 3.7                  | 5.0   | -                    | -                 | -                        | 3.4 <sup>(e)</sup>       |
| No complications of delivery (680)                   | 172.6 <sup>(h)</sup> | 810.3 | -                    | -                 | -                        | -                        |

(a) APH, placenta praevia, abruptio placenta only

(b) Total "pure toxaemias"

(c) Includes breech, transverse lie, etc.

(d) White population only

(e) Incompetent cervix

(f) Toxaemia, eclampsia

(g) Vaginal bleeding, placenta praevia, abruptio placenta

(h) Greater than 50% of cases had nothing recorded about the delivery

(i) Kidney/urinary bladder infection

(j) Hb &lt; 10g/100ml.

MIDWIVES VALIDATION STUDY - 1977TABLE 20SELECTED NEONATAL MORBIDITY RATES/1000 BIRTHS

| Syndrome                                    | Midwives Data <sup>(a)</sup> |      | Other Data          |                      |                       |         |
|---|------------------------------|------|---------------------|----------------------|-----------------------|---------|
|   | 1975                         | 1976 | Tas <sup>2(a)</sup> | USA <sup>10(a)</sup> | UK <sup>3(b)</sup>    |         |
| Hyaline Membrane<br>Disease (776.2)         | 2.11                         | 2.05 | ) 16.54             | 2.73                 | ) 20.1 <sup>(c)</sup> |         |
| Respiratory<br>Distress Syndrome<br>(776.2) | 5.66                         | 6.26 |                     | )                    |                       | )       |
| Jaundice<br>(774-775. 785.2)                | 3.30                         | 4.25 |                     | )                    |                       | ) 190.3 |

(a) From birth data only

(b) Singleton live births only

(c) Those babies with "respiratory difficulties".

MIDWIVES VALIDATION STUDY - 1977TABLE 20(a)Neonatal Morbidity: Midwives and Hospital Records

| CASE | Midwives Form                               | Hospital Notes   |
|------|---|--|
| 1.   | Respiratory Distress Syndrome (RDS) (776.2) | Preterm; HMD; Pneumothorax; Jaundice with exchange transfusion, and Phototherapy.        |
| 2.   | RDS (776.2)                                 | HMD; Jaundice with phototherapy.   |
| 3.   | RDS (776.2)                                 | Pneumothorax.  |
| 4.   | Immaturity (777.9)                          | Preterm; Skin infection-E. coli; Jaundice - no treatment<br>clicky hip; CDH; Oral thrush |
| 5.   | RDS (776.2) and Strabismus (373.9)          | Encephalocoele.  |
| 6.   | Haemorrhagic disease of newborn (778.2)     | Small for dates; Jaundice with phototherapy.   |
| 7.   | Immaturity (777.9)                          | HMD; SFD and preterm; Patent ductus; Sepsis; Clicky hip - CDH.                           |
| 8.   | Haemorrhagic disease of newborn (778.2)     | U.T.I.; Jaundice - no treatment.   |
| 9.   | Immaturity (777.9)                          | Jaundice - ABO incompatibility<br>HMD.   |

MIDWIVES VALIDATION STUDY - 1977

TABLE 21

SELECTED CONGENITAL MALFORMATIONS (RATES/1000 BIRTHS)

| Syndrome                  | Midwives' Data (b) |      |          |                     | Other Data (a) or (b) |              |              |            |
|---------------------------|--------------------|------|----------|---------------------|-----------------------|--------------|--------------|------------|
|                           | 1975               | 1976 | W.A. (a) | Australia (ref) (b) | Tas. 2 (b)            | Norway 7 (b) | U.S.A. 8 (b) | U.K. 9 (b) |
|                           |                    |      |          | Sydney              |                       |              | Overseas     |            |
| Anencephalus (740)        | 0.88               | 1.32 | 0.85     | )                   | -                     | 0.51         | 0.52         |            |
| Spina bifida (741)        | 1.28               | 0.97 | 0.90     | )                   | -                     | 0.61         | 0.72         |            |
| Hydrocephalus (742)       | 0.49               | 0.58 | -        | 1.09                | 3.0                   | 0.42         | 0.47         |            |
| Heart (746)               | 1.03               | 2.10 | -        | 2.34                | 0.9 (c)               | 1.6          | 1.1          | 1.1        |
| Cleft lip/palate (749)    | 1.28               | 1.22 | 1.31     | 1.09                | -                     | 1.89         | 1.5          | 1.4        |
| Alimentary tract (750-51) | 1.42               | 1.56 | -        | 1.25                | 0.3                   | -            | 0.52         | 0.7        |
| Hypospadias (752.2)       | 1.33               | 1.85 | -        | 1.72                | -                     | 0.77         | -            | 4.2        |
| Hydrocoele (752.4)        | 0.59               | 0.83 | -        | -                   | -                     | -            | -            | -          |
| Club foot (754)           | 4.92               | 6.01 | -        | 1.87                | -                     | -            | 2.94         | -          |
| C.D.H. (755.6)            | 3.30               | 4.79 | -        | 1.48                | -                     | 7.6          | 0.96         | -          |
| Downs (759.3)             | 0.83               | 0.58 | 1.6 (d)  | -                   | -                     | 1.0          | 0.83         | 0.8        |

(a) from birth plus later morbidity data combined

(b) from birth data only

(c) total cardiovascular defects

(d) Downs Syndrome incidence in 1975; in 1973, 1.3; in 1974, 1.0; and 1.14, 1966-75 inc.

MIDWIVES VALIDATION STUDY - 1977

Comparison of Midwives sample with K.E.M.H. Delivery Ward Register.

Total Number of Cases = 281.

- (a) Sex, birthweight, length, plurality (4 sets twins) were recorded correctly in all cases.
- (b) Date of birth, whether the baby went into the Special Nursery, condition of baby at birth (SB/Alive) were recorded incorrectly in 1 case each.  
Unit Record No. was wrong in 2 cases.  
These can be assumed to be simple errors.
- (c) Parity was recorded incorrectly in 24.9% of cases (70).  
 (i) wrong by 1 = 17.1% (48) Overstated = 23.8% (67)  
 (ii) wrong by 2 = 5.7% (16) Understated = 0.8% (2)  
 (iii) wrong by >2 = 1.8% (5)  
 (iv) stated incorrectly as unknown = 0.3% (1)
- \* Seems to be confusion of parity with gravidity; parity often appears to be taken from after completion of current pregnancy, as is the practice with Delivery Ward Register.
- (d) Gestational Age recorded incorrectly in 35.5% of cases (100)  
 (i) wrong by 1 week = 12.8% (36) Overstated = 14.6% (41)  
 (ii) wrong by 2 weeks = 3.9% (11) Understated = 7.4% (21)  
 (iii) wrong by 2 weeks = 5.3% (15)  
 (iv) stated incorrectly as unknown = 13.5% (38)
- (e) Duration of labour was recorded incorrectly in 20.3% of cases (57)  
 (i) wrong by 1 hour = 14.6% (41) Overstated = 13.2% (37)  
 (ii) wrong by 2-5 hours = 3.5% (14) Understated = 5.7% (16)  
 (iii) wrong by 5 hours = 0.8% (2)  
 (iv) stated incorrectly as unknown = 1.1% (3)  
 (v) given a value when actually unknown = 0.3% (1)
- Duration of labour appeared to be total - i.e. 1,2,3rd stages.
- (f) Presentation was recorded incorrectly in 1.8% of cases (5).
- (g) Apgar was recorded correctly in all cases examined (>30), but only those cases warranting special attention had an Apgar score recorded in the Delivery Ward Register - therefore open to bias.

E. Discussion

As an essential first step to using the W.A. Midwives' data, an attempt has been made to validate it by comparing frequency distributions with other data sources, and by comparing a sample of Midwives' forms with the original data in a Hospital Delivery Ward Register.

Most developed countries now have an ongoing, standard collection of data on total births for use in monitoring Obstetric and Neonatal Care, as birth defects registers, as a sampling frame for further epidemiological and clinical research, and for planning Maternal and Child Health Care. The usefulness of such data does not have to be justified in this report, but it should be realised that data are only of use if they are -

- (1) accurate, and
- (2) published as soon after collection as feasible.

Listed below are the most important variables from the Midwives' form and an assessment from this study of their validity (and therefore their usefulness for the abovementioned purposes).

(over page)

SUMMARY OF VALIDATION REPORT1. Poorly Recorded and Not Worth Improving

These are variables which we felt were inherently inaccurate or were not really of interest to analyse. They are:-

Maternal weight

Duration of labour

2. Poorly Recorded and Improved only with Difficulty

Apgar score

Only one variable fulfilled these criteria. We felt that only with continual education of Midwives could accuracy in this variable be achieved.

3. Poorly Recorded and Easily Improved

These are variables which we felt could and should be improved, for example simply by changing the format of the Midwives' form.

Previous pregnancies

Maternal Morbid Conditions - not related to pregnancy

- pregnancy

- operations

- complications of labour & delivery

Neonatal Morbidity

- birth trauma

- congenital malformations

- other

4. Recorded Reasonably Well (i.e. room for improvement by the previously mentioned methods).

Race

LMP/gestation

Time to Spontaneous Respirations (minutes)

5. Accurately Recorded (i.e. no need to change either format nor to re-educate midwives)

Marital status

Maternal age

Height

Presentation

Date of birth

Sex

Birthweight

Length

Plurality

It can be seen from this list that the data recorded best are those variables which the Midwife normally records for hospital purposes. These data, especially birthweight, are very valuable and unique in Australia and should be published. Those variables relating to morbidity of mother and baby are poorly recorded. Re-designing the form, with diseases being clearly specified, could overcome this problem. Also, if the data to be recorded were laid out in the same order and appearance as the Midwives use routinely in labour ward, it would be easier for them to fill in and will be more accurately recorded.

It was thought (after discussion with Obstetricians) that Maternal weight and total Duration of Labour were variables which were poorly recorded and probably not worth attempting to change. Maternal weight is very variable within individuals; on the Midwives' form it is certainly not pre-pregnant weight being recorded, and there is not enough information to calculate weight gain during pregnancy, which might be the only meaningful weight related variable to obtain. The weight being recorded is probably the weight on admission, i.e. at term or whenever before that the mother presented, and the data are therefore meaningless. We have a well-recorded variable which relates better to stature and outcome - i.e. height. Total Duration of Labour is also rarely used in any analyses relating to either maternal or neonatal outcome. Even if the individual stages could be accurately assessed (and they rarely are), one usually is more interested in a description of the labour or delivery, e.g.: precipitate, prolonged due to disproportion etc. We feel quite happy therefore in suggesting that duration of labour be removed. Alternatively, if it was felt strongly that some assessment of length of labour was required, then a new and more accurate variable could be created, e.g.: from the onset of 5 minutely contractions to the birth of the baby.

We also feel that the terms gravidity and parity are too confusing and should be dropped (they do not appear on the present Midwives' form); previous pregnancies should be clearly defined (i.e. includes all previous miscarriages, ectopics and births); the problem of obtaining illegitimate previous issue remains. Some midwives have mentioned to us that they prefer the term miscarriage to abortion when interviewing mothers, so that if this is to be included on a form, perhaps

"miscarriage" should be used.

If the Midwives' form is to be used to calculate accurate incidence data, then the recording of both Maternal and Neonatal Morbid Conditions must be improved. We feel that the important and common conditions should be specified (e.g. PET, APH, Jaundice, RDS), with provision for "other conditions" to be recorded.

Although Race, last menstrual period (LMP) and Time to Spontaneous Respirations (TSR) were recorded reasonably well, this varied between hospitals (particularly the latter two variables). These could only be improved by stressing to the Midwives the need for accurate recording of the variables (as with Apgar Score). In some hospitals, well over 50% of infants did not have TSR recorded, and this could no doubt be considerably improved. This is important as Apgar and TSR are the only objective assessments we have of the condition of the baby at birth, and both need to be improved. LMP is renowned for its inaccuracy, but usually only 5-10% of women are unsure of their dates, and often for fairly good reasons (e.g. bleeding in early pregnancy, having been on the contraceptive pill or irregularity of periods). These are usually a group of special interest anyway. The rest of the inaccuracy in this variable arises from transcription errors on to the form, and this could perhaps also be improved by re-educating the Midwife.

With all these comments in mind, a new format for the Midwives' Notification of Birth was designed. It has the following characteristics and is attached to this report (Appendix B):-

(i) it follows the routine Obstetric data collection of Midwives,

(ii) it clearly specifies important conditions/disease/complications and leaves space for those "others" not so specified,

(iii) it has clear instructions on the form as to what should appear in the spaces following. With rapid turnover of Midwives it is important that the form can be understood without any need for a long list of attached instructions.

(iv) it is still simple and could fit on one page. It is far better to obtain complete data on a few important variables than incomplete, and perhaps inaccurate data on many. If a simple form is filled in well, then it can be used as a trustworthy sampling frame for further in-depth study.

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