INDICATORS OF MATERNAL CHILD HEALTH

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SUMMARY.

The introduction outlines the reasons for the priority of maternal and child health emphasizing the relatively simple resources required. The aims of such programmes must be identified and the results measured so that services can be monitored and evaluated.

Categories of measurement are defined and indicators of maternal and child health identified within these categories. A chapter is devoted to an outline of the principal non-medical determinants based on material from the Inter-American Investigation of Childhood Mortality.

The significance of the principal indicators viz. the perinatal mortality rate, the infant mortality rate, the maternal mortality rate and growth and development data are compared.

Chapter lV presents a report of a questionnaire study into local indices viz. Stillbirth rates, Caesarean Section rates and Maternal Mortality rates. The uptake of certain clinic services was also determined. Differences between groups and possible reasons for these are discussed.

The final chapter points out the need for accurate birth and death registration and a reliable health information system and suggests methods for achieving this. Recommendations are made for upgrading the collection of data and for improving maternal and child health by research and peripheralization of services.

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I INTRODUCTION.

a) REASONS FOR THE PRIORITY OF MATERNAL CHILD HEALTH.

It is axiomatic that the children of to-day are our country's future citizens and on this basis alone demand the best we are able to afford. This does not imply that maternal child health services need to be expensive to be good; on the contrary these services are amongst the most cost-effective.

Decisions on priority ranking are usually taken in the light of knowledge of the need or requirements, the resources available and the likely outcome.

Requirement.

What are the requirements of mothers and children that merit priority consideration?

The size of the group or community is essential knowledge and mothers and children form the majority of the population. In developing countries and among sections of our population in South Africa they constitute up to two-thirds of the total population.[1]

The patterns of disease, their prevalence and amenability to treatment are determinants of the priority.[2] Children are particularly vulnerable yet most of the diseases that cause death and illness in children, and those associated with pregnancy, are preventable.[3] During pregnancy and childbirth childhood beliefs and customs affect health and health care as at no other time in life.[4] As many of these practices have an adverse effect on health, the need for intervention is clear.

While Whites on the whole have good access to private medical practitioners the majority of Blacks, through financial or geographic constraints, do not share this ready access. If adequate maternal child health care is to be implemented it becomes imperative for the State to intervene, either directly, as in the Section 30 Services, or through agents, such as the local authority clinic services or Provincial hospital services.

Resources /...

Resources.

What resources are required for effective maternal child health care?

High technology, high cost medical care is not the hallmark of effective maternal child health services.

Manpower requirements can mostly be met by suitably trained nurses and partially met in the more sparsely populated areas by health workers from the community itself. Medical supervision and support is however considered essential.

Buildings and equipment need not be elegant and expensive but simple and practical.

The finances required to run these services are a mere pittance compared with the budgets of some of the larger hospitals. Official figures in recent years reveal that only 2 percent of the health expenditure is spent on preventive-promotive care, the remaining 98 percent on curative medicine.

Results.

What are the anticipated results of an effective maternal child health programme?

Better health through better health care is the principal objective of any health service and improvements in health can be measured and recorded as can the quality or standard of health care itself.

b) THE REQUIREMENTS FOR MEASUREMENT.

Statistics are not an end in themselves but a means to an end, namely the provision of better health care. While the components of care often cannot be accurately measured they can be guaged indirectly by client satisfaction with the service and by the use made of the service, amongst others.

More direct measurements on the health status of individuals or the community can be made. These are necessary for planning and evaluation of services, for research and teaching and especially for feedback on their achievements to those at the periphery who provide the services and the basic data or input

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to the health information service.

If the objectives of a health care programme are clearly defined one can measure whether these are reached and by how much the programme fell short of or exceeded the target. To travel 100 kilometers and consume X litres of petrol is a simple statement of work done but does not indicate whether this was the intention of the trip, how long the journey lasted and whether the destination was arrived at. To set out on a 100 km trip with X litres of petrol in the tank and plan to arrive at destination B at a particular time is a measurable objective. It presumes knowledge of the road and traffic conditions, the car's fuel consumption and performance and the driver's ability. It also involves analysis of these factors in initially determining the objectives. One is easily able to evaluate one's performance in terms of these objectives.

By simply putting in services and recording procedures one is similarly setting out on a trip of unspecified destination. If the aim is to improve health through better health care - one must measure health before and after and see indeed if one is improving health at all. One must likewise ensure that what one is offering is better health care.

To have meaning it is necessary to know, not only what measurements to make, but what they signify. Many factors influence results. Knowledge of the latter will lead to new strategies in health care.

c) CATEGORIES OF MEASUREMENT.

Paradoxically, health status is conventionally measured by its opposites: disease and death. Mortality data are the most reliable, but are relatively insensitive, especially in developed communities where the expectation is that a child once born, will survive to adulthood. Morbidity data are scarce and poorly standardized and therefore cannot be used for comparisons between areas and countries.[5] Notifications relate to death and disease from a defined list of specific causes and remain a useful measure, particularly for surveillance in a country. They have little application on an international

level /...

level.

Growth and development data provide sensitive indicators specific to child health and can be used as positive indicators of the outcome of pregnancy and child health.[6]

Health-related indices such as vital statistics and demographic and social characteristics are likewise essential information to complete the history and enable a diagnosis of the health status of a community.

11 IDENTIFICATION OF MATERNAL CHILD HEALTH INDICATIORS.

MORTALITY DATA.

From mortality data a number of rates can be calculated, using total births or live births only, as the denominator. These include the stillbirth rate, the perinatal mortality rate, and the neonatal mortality rate, the post neonatal mortality rate and the infant mortality rate. The two indices singled out for most studies and used in international comparisons are the perinatal mortality rate and the infant mortality rate.

The perinatal mortality rate is the number of stillbirths plus the number of deaths of infants within the first week of life, per thousand births.

The infant mortality rate is the number of deaths of infants under one year of age per thousand live births.

Dogramachi points out the difficulty in reaching consensus on the definition of live birth.[7] It may be defined by minimum weight, by vital signs or a combination.

MORBIDITY DATA.

Morbidity data are not currently suitable for comparisons internationally as strict diagnostic and classification criteria will be required as well as fairly sophisticated information systems.

GROWTH AND DEVELOPMENT DATA.

Growth and development data have their simplest application in the use of birth weight as an indicator. "Birth weight is a reliable indicator of maturity and is one of the simplest measurements that can be made with reasonable accuracy under different conditions throughout the world."[8]

Many criticisms have been made on this assumption and several workers have listed criteria of use in estimating gestational age, but for country-wide and international studies, birth weight will remain the single most important measurement. It provides both a measure of the outcome of pregnancy and a prognostic sign of future survival or death.

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During childhood, weight-for-age measures as exemplified by the Boston percentile charts and simplified in the Road to Health charts have been found to be almost universally applicable,[9] and at the very least are an universal reference standard. Their validity in the Black community has been demonstrated locally by studies done by Coovadia et al.[10] They form a useful tool for identifying both individuals and communities at risk and allow for relatively easy assessment of the prevalence and degrees of malnutrition in communities.

SOUTH AFRICAN INDICES.

What values might be expected for these rates in developed and developing areas and how do South African rates compare?

Table I has been compiled from several different sources and the scores are therefore not comparable. It has been drawn to illustrate trends which are evident even if the margin of error is great. The estimate of the Black infant mortality rate is 80 - 120 and compares with 97 which Loening obtained by surveying 500 households in four Black communities in Natal and Kwa Zulu. The rate obtained for urban Blacks in Kwa Mashu was 53.5 compared with 134.1 for rural inhabitants of Inanda. (Unpublished data)

The principal difficulty encountered in drawing up reliable rates is the non-notification and non-registration of deaths.[11,12] Loening calculated an overall death non-notification rate of 49 percent.

Rates varied between 14.5 percent and 73.2 percent in the areas surveyed by Loening. The problem is not exclusive to Blacks and is compounded by the lack of standardization of terms such as stillbirth and live birth, even in developed communities.

Various South African studies on perinatal and maternal mortality have been made.[13,14,15] These reports all relate to hospital populations and not the community and the results cannot be compared, either between institutions or between race groups within a single institution. The proportion of Whites delivering in hospitals and maternity homes is almost 100 percent,[16] and hospital perinatal and maternal mortality rates closely reflect

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the total community situation but the proportion of Blacks delivering at home varies greatly between areas and the hospital indices cannot be taken as a reflection of the true situation. Additionally many Black patients are discharged within 24 to 48 hours of delivery and deaths outside the hospital are not recorded in hospital statistics. Thus the actual perinatal mortality rates, even for hospital deliveries is certain to be higher in all groups, but particularly so amongst the Blacks.

Information relating to morbidity and to growth and development data are not routinely collected (with the exception of notification data) and therefore can only be obtained from special studies. They represent results from specific communities in defined areas and relate to particular points in time, and as such have limited application.

For Black children over one year of age surveys over the past eight years reveal that between 20 percent and 57 percent are malnourished which can be defined as weight-for-age below the third percentile.[17,18,19,20,21]
Surveys of Indian children of all ages show rates of malnutrition between 30 percent and 60 percent.[22.23]

The wide discrepancies in mortality rates between communities are a reflection of the varying life-styles of the different communities and, as such, are not capable of instant resolution. At the turn of the century, countries now considered developed had rates equal to those of present-day developing countries. The decline to present levels was due to a combination of factors affecting many aspects of life.[24] (see FIGURE I)

III DETERMINANTS OF MATERNAL CHILD HEALTH INDICATORS.

MULTIPLE CAUSE APPROACH.

Until recently, most studies on infant mortality had been undertaken in developed areas. In the early 1970's the large scale Inter-American Investigation of mortality in childhood committee conducted research in ten countries with thirteen teams in developing and two in developed areas. They employed multiple cause analysis and their findings have opened the way towards a better understanding of the causes and associated factors of infant mortality.[25]

This study determined underlying causes, intermediate and terminal diseases and contributory causes. The authors defined the underlying cause as the disease or injury which initiated the train of morbid events leading directly to death. Contributory cause was defined as any other significant condition which unfavourably influenced the course of the morbid process and thus contributed to the fatal outcome, but which was not related to the disease or condition directly causing death.

An example would be death from renal failure (terminal disease), the end result of acute nephritus (intermediate disease) following impetigo (underlying disease) and complicated by pneumonia (contributory cause). Certain social characteristics would likely be found to be associated with the underlying disease eg. low socio-environmental circumstances which through poor personal hygiene and overcrowding would predispose to the occurrence of scabies and impetigo.

Only through the multiple cause approach is it possible to measure the real magnitude of serious health problems which have remained hidden in studies based only on single causes. Their results high-lighted the seriousness of immaturity and malnutrition. Nutritional deficiency coupled with low birth weight was the underlying or associated cause of death in 57 percent of the 35,000 deaths among children under five years of age in the population studied. This study confirmed the synergism between malnutrition and infection. This was emphasized locally in the study on Black childhood mortality patterns over a sixteen year

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period at King Edward Hospital.[26]

The leading causes of death under one year include infections such as diarrhoea, respiratory tract infection and infectious diseases, birth injuries, congenital anomalies and accidents.[27] The rank order varies, especially between developed and developing countries and the latter have actual mortality rates up to twenty times as high as some developed countries.

The Inter-American Study identified personal and social characteristics associated with higher infant mortality rates, enabling identification of groups and individuals at risk and thereby pointing the way to paths of intervention.

Weight.

A measure of the outcome of pregnancy but likewise the most important determinant of survival or death is the weight of the baby.

In the New York City study of live birth in 1967, the optimum weight for survival was found to be 3.5kg - 4.0kg. The infant mortality rate of low birth weight babies i.e. those weighing 2.5kg or less, was 25 times as high, at 140 per thousand, while those between 2.5kg and 3.0kg had a doubled chance of death in infancy. Puffer and Serrano called this group weight-deficient.

Maternal Characteristics.

Apart from maternal medical conditions and the complications of pregnancy, the mother's age and parity, the birth order and birth interval all correlate with the birth weight and the chances of survival or death. These attributes in turn are associated with certain socio-environmental circumstances.

It thus becomes possible to construct profiles of groups and individuals in which conditions are favourable or unfavourable for survival.

Nutrition.

The mother's nutritional state is significant in determining the birth weight of the infant and it has been shown that food supplementation in certain communities results in a lowered

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frequency of low birth weight babies.[28]

Low birth weight infants surviving the first month of life are at greater risk of developing a superimposed nutritional deficiency.

Age of Mother.

This was found to have a direct correlation with neonatal and infant mortality and with the incidence of low birth weight. The highest death rates occured in infants of mothers under 20 years and the lowest rates in infants of mothers aged 25 - 29 years.

Birth Order.

Infant death rates for first births were found to increase from low rates for first births to high rates for those of fifth and higher births - where the rate was at least double. Where it was possible to analyse infant mortality by birth order according to maternal age and by inference to take into account the birth interval it was found in each age group that the mortality increased with birth order to high rates for third birth order in the age group under 20 years, for fifth birth order in the age group 20 - 24 years, and higher orders for those of 30 years and over.

Breast Feeding.

Breast feeding assumes dual significance. The birth interval is extended by breast feeding and malnutrition and gastro-intestinal infections in early infancy are largely prevented.

Socio-economic Determinants.

Moving outwards from the mother to the father and family, the father's income and occupation are indicators of socio-economic status; which state affects mortality rates directly and indirectly. The size of the family also influences survival chances.

Rural/urban Factors.

Differences in rural/urban mortality rates do not always follow anticipated trends. Urban overcrowding with inadequate provision of basis services affects mortality rates unfavourably but where

improved sanitary conditions and health services are provided the urban infant mortality rate drops below the rural rate.

Gross National Product.

Logan presented a series of comparative maps, including gross national products and crude death rates and he illustrated the gross differences in demographic and social characteristics, in vital statistics and in resources of medical manpower and hospital beds between major areas of the world.[29] Dogramachi used the same technique, but further refined it and similarly through maps has indicated the negative correlation between gross national product and infant mortality rates.[30]

Considerable space has been devoted to determinants of infant mortality as elucidated by the Inter-American Study. For the perinatal mortality rate and the growth and development indicators the determinants are the same but the relative weighting differs. Breast feeding for instance, is of little significance in determining perinatal mortality but will significantly affect the infant mortality rate of some communities.

IV THE RELATIVE SIGNIFICANCE OF THE PRINCIPAL INDICATORS.

The difficulty of obtaining reliable and therefore comparable mortality rates has already been mentioned. This stems from the lack of registration of births and deaths and the lack of universal acceptance of definitions.

The distinction between the significance of the perinatal mortality rate compared with the infant mortality is becoming blurred. Neonatal intensive care units have prolonged the survival of small pre-term babies beyond the first week but many of these babies will die nonetheless. The effect is artificially to reduce the perinatal mortality rate and to inflate the infant mortality rate. Similarly, through ante-natal screening, such as for neural tube defects, certain foetal abnormalities may be detected and pregnancy terminated. This will again artificially reduce both the perinatal mortality rate and the infant mortality rate. Factors such as these must contribute to the rate of decline of perinatal mortality rates in developed countries, which rate of decline is still greater than that in developing countries - despite significant advances in the latter.[31]

THE PERINATAL MORTALITY RATE.

In developed countries this is a useful indicator of factors such as placental insufficiency and asphyxia which may account for deaths before, during or soon after delivery. More broadly, it may be used as an indicator of the availability and quality of ante-natal and obstetric care. However, in developing countries maternal malnutrition and intra-uterine infections - frequently the result of socio-environmental factors - play a significant role influencing the perinatal mortality rate by increasing the incidence of pre-term delivery, low birth weight babies and neonatal infections. The effect of quality care during labour is diluted by these factors.

INFANT MORTALITY RATE.

The infant mortality rate has traditionally been the most valuable indicator of the effects of social change (including health care) on health and at the outset it was intended to review the

South African literature, concentrating on the Natal scene. Küstner had attemped a literature survey on infant mortality rates in South Africa. In compiling this section of his thesis he recorded that "No recent publications could be found on the infant mortality rates of South African populations."[32]

MATERNAL MORTALITY.

Maternal mortality rates are often regarded as indicators of the availability and quality of obstetric services. However, factors such as multiparity and the health status of women influence rates and in turn are influenced by socio-environmental and other factors.

GROWTH AND DEVELOPMENT DATA.

Growth and development data are sensitive indicators and reveal the effects of both acute and chronic malnutrition. Their use is currently limited because they are not available as routine indicators.

No single indicator can relate exclusively to one or other determining factor. Even when accurately and completely recorded these indicators represent the interplay of many socio-environmental factors and agents on man, the host.

1V INDICATORS OF MATERNAL CHILD HEALTH IN NATAL.

In compiling this review it was hoped that local material would be available to allow for comparative study. As very little published matter was available, a simple questionnaire study was undertaken. This chapter presents that study in the form of a report.

DEFINITION OF THE PROBLEM.

Indicators of community need in respect of Maternal Child Health in Natal are not known.

DEFINITION OF OBJECTIVES.

These were:

1) to identify stillbirth, caesarean section and maternal mortality rates

and 2) to determine the uptake of ante-natal, family planning and well baby clinic services.

COLLECTION OF DATA.

a) Definition of Criteria.

The stillbirth rate is the number of stillborn infants per 1OCO total births.

The caesarean section rate is the number of caesarean sections per 1OO total births.

The maternal mortality rate is the number of maternal deaths per 1OO,OOO births.

A mixed hospital is one which admits Whites and non-Whites, contrasting with exclusively White or non-White hospitals.

b) Selection of Sample and Control Groups.

All Natal Provincial hospitals except Wentworth and Hillcrest hospitals were included in the survey.

Those Private and Aided hospitals thought to admit maternity cases were included.

Excluded were Kwa Zulu hospitals and clinics and hospitals falling under the Department of Co-operation and Development.

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It was thought unreasonable to expect replies from these within the barrier dates set.

Local Authority, Welfare Organization and State Health Clinic services were included but Development and Services Board Clinic Services were excluded as the relevant file was missing. There were no control groups.

c) Determination of Methods of Data Collection.

Questionnaires were mailed to the hospitals and clinics included in the study.

For State Health Services figures were extracted from a register at Regional Office.

d) Elimination of Variables.

Standardized questionnaires requiring only numerical data were used.

RESULTS.

Data Capture.

There was an overall data capture rate of 57 percent.

The hospitals have been grouped according to whether they are rural or urban institutions and whether they serve Whites and non-Whites, or are exclusive within each group.
There are separate returns for Whites and non-Whites.

Caesarean Section, Stillbirth and Maternal Mortality Rates.

The aggregated results and calculated rates of caesarean section, stillbirth and maternal mortality are conveniently tabulated.

(see TABLE 11)

The overall White stillbirth rate was 8.8 per thousand, the caesarean section rate was 23.5 and the maternal mortality was nil. This compares with an overall non-White stillbirth rate of 33.4 per thousand, caesarean section rate of 17.1 percent and maternal mortality rate of 81.3 per hundred thousand.

Within each hospital group the caesarean section rate for Whites is higher than for non-Whites, being almost double, at 21 percent, in the urban mixed hospitals and only marginally higher, at 11

percent /...

percent, in the rural mixed hospitals. The highest rates for both Whites and non-Whites are in the urban segregated hospitals. The non-White caesarean section rate varies from 9.4 percent in the rural hospitals to 21.1 percent in the urban Black hospitals; all of which are situated in Durban and include King Edward Hospital, the teaching hospital attached to the Natal University Medical School.

Amongst Whites and within the urban hospitals there is a negative correlation between stillbirth and caesarean section rates, which does not apply to the rural White group. Comparing urban mixed and urban White hospitals, an increase of 8.5 percent in the caesarean section rate parallels a drop of 3 per thousand in the stillbirth rate. This simplifies to a saving of one stillbirth at a cost of 28 caesarean sections, but ignores all other variables.

Amongst the Blacks the stillbirth rate is almost the same, between 33 per thousand and 36 per thousand, irrespective of the grouping or the caesarean section rate.

Deliveries were also undertaken at most of the welfare organization clinics submitting returns. The stillbirth rate of 15 per thousand and caesarean section rate of 2.5 percent mean little without knowledge of those patients referred to the larger centres.

Local Authority clinics do not undertake deliveries; apart from Kwa Dabeka the State clinics do not admit maternity cases, as this is a Provincial function except in Trust areas.

Ante-natal, Family-planning and well baby clinic attendances.

The figures relating to the uptake of ante-natal, family-planning and well baby clinic services are tabulated. (see TABLE lll - Vl)

Approximately 90 percent of all these services at clinics and hospitals are in respect of non-Whites.

The hospitals are responsible for 84 percent of White and 73 percent of non-White institutional ante-natal attendances, 15 percent and 18 percent of family planning and 1 percent and 4 percent of well baby clinic attendances for Whites and non-Whites respectively.

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The local authorities in turn are most active in the fields of family planning and well baby clinics, accounting for 64 percent of total family planning and 58 percent of well baby clinic attendances. The State Health fixed and mobile clinics are particularly active in the field of child health, accounting for 31 percent of total well baby clinic attendances.

Table Vll illustrates the proportion of first to total visits for Whites and non-Whites in respect of ante-natal and family planning services at hospitals and clinics. It is usually anticipated that the non-White first to total ratio is high. This is illustrated in all cases except the local authority family planning attendances where only eight percent are first attendances, the same as for Whites.

The population denominators for these attendances are not known and likewise no figures are available for the number of private general practitioner consultations in respect of these services.

DISCUSSION.

Caesarean Section, Stillbirths and Maternal Mortality.

In the large urban White and non-White hospitals where facilities exist for intervention in labour, including caesarean section, it is surprizing that the caesarean section rate for Whites is higher than for non-Whites. Several possibilities exist:

1) The groups are not comparable i.e. the maternal age, parity and incidence of medical, pregnancy and obstetric complications need to be standardized for.

2) The non-White caesarean section rate is unacceptably low i.e. there are more indications for caesarean section than there are sections performed and if caesarean section were performed for the same obstetric indications in Whites and non-Whites, the rate would be higher. As the bulk of caesarean sections (78 percent) in this hospital group are accounted for by King Edward hospital, a large teaching hospital, this is unlikely as the sole explanation.

3) The White caesarean section rate is unduly and unnecessarily high. Many of the White patients in this category are private

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or medical-aid patients and it is possible that unnecessary caesarean sections are performed, either for gain or convenience, or for a combination of these.

4) Any or all of these factors may contribute in varying degrees.

The positive correlation between caesarean section and maternal mortality in the non-Whites suggests there are life-threatening situations in this group which call for intervention in the form of caesarean section. No maternal deaths in the Whites suggests two conclusions; they are not faced with the same life-threatening situations and the operation does not carry an increased risk of maternal death. In support of the latter is the fact that the group with the highest caesarean section rate has a nil mortality rate.

The fact that the non-White stillbirth rate is the same, irrespective of the location of delivery i.e. rural or urban, and irrespective of the caesarean section rate, suggests that factors other than pure obstetric complications play a significant role. These are likely to include maternal malnutrition and intrauterine infections as a result of poorer socio-environmental conditions, as well as medical complications.

There is scope for further research in unravelling the role played by the factors responsible for the disparate rates, so that suitable preventive and interventive measures may be taken.

Ante-natal, Family planning and well baby clinic attendances.

Total non-White, local authority, well baby clinic attendances of 332,425 compare with hospital ante-natal attendances of 140,443. It appears that where local authority services are provided non-Whites do use them.

For King Edward and its clinics in 1980 the incidence of low birth weight babies was 10.4 percent and the perinatal mortality was 54 per thousand. These figures are high and together with the high stillbirth rate, reflect a need for better care.

In view of both of the above it would seem sensible in certain areas to extend ante-natal care through the local authority clinics.

Supporting /...

Supporting the effect of ante-natal care, Dr Larsen of the Department of Obstetrics and Gynaecology at Natal Medical School compared an overall perinatal mortality rate at King Edward hospital of 45 - 50 per thousand with a rate of 35 per thousand for ante-natal clinic attenders only. Good ante-natal care does not require sophisticated equipment or specialist medical care - the dividends seem well worth the cost.

RECOMMENDATIONS.

1. Recommendations based on this study are incorporated into the recommendations which appear at the end of the review.

V CONCLUSION.

HEALTH DATA.

The overwhelming conclusion reached while attempting to gather data for this review from local sources was that there is almost nothing routinely available.

Registration of the events - life and death - provides the basic core of any vital statistics system. These data are of immediate concern to health personnel, both at service and administrative levels, more than any others. The midwife or obstetrician is the usual birth attendant in developed countries. The onus for registering births and deaths should rest on the attendant or the institution where delivery takes place as he/she is the person most able to provide additional data such as birthweight, age and parity of the mother, on which analyses of the nature and extent of problems may be made. Local registrars should then be responsible for checking whether these birth and death certificates are filed. Küstner advocates a system whereby local authority notifications and governmental registrations be combined. Peripheral combination of these sources is preferred because of the critical time factor relating to the local authority service, where the nurse, to render effective post-natal care, must be notified of a birth within 24 hours. Details of this proposal are outlined in the chapter dealing with infant mortality.[32]

Additionally this information would be used to identify areas with no services and those with the worst infant mortality rates and other indices, so that scarce resources could be directed to priority areas.

Many local authorities use Road to Health charts in their child health clinics. The usefulness of this information is restricted to individuals. It should be easy to collect and aggregate this data routinely so that growth trends in communities can be monitored. This data will relate only to clinic attenders but the reliability of the data as a community indicator can be checked from time to time by ad hoc surveys. When births and deaths are more completely recorded it will be possible to determine what proportion of infants in fact attend the clinics and therefore how representative

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of the community the clinic data are.

SERVICE AND RESEARCH.

Available information illustrates big differences in mortality rates between Whites and Blacks; the Coloureds and Asian indicators ranking between the two. The need is clear for both service and research - research into the multiple factors unfavourably affecting outcomes especially amongst the Blacks; and service to provide better care.

Care must be provided at all levels. At the first level Larsen demonstrated the beneficial effect of ante-natal care on the perinatal mortality rate, and a study from Edendale hospital illustrated a similar effect on maternal mortality.[33] Crichton and Knobel undertook a study of maternal deaths at King Edward and commented that "The development of peripheral ante-natal clinics and the provision of resident staff in peripheral hospitals could contribute more than any other single factor to a reduction of the maternal mortality rate."[34]

New approaches in health education need to be explored so that use may be made of knowledge gained from research, to modify behaviour and customs to those conducive to a favourable outcome for mother and babe.

Obstetric services need to be peripheralized. Maternity and curative services are the responsibility of the Province but, with a network of local authority and State Section 30 Services, it seems possible, through liaison and co-operation between those authorities, to extend the services without undue costs to these areas which are presently inadequately served.

Health services are but one dimension of development, and it is through socio-environmental changes that the greatest impact on maternal and child health will be made.

RECOMMENDATIONS.

1. Through liaison and co-operation between all tiers of Government an effective system of births and deaths registration should be initiated so that health planners and others have access to basic mortality data.

2. Standard definitions, preferably W.H.O. , be adopted for live birth, stillbirth, low birth weight and other relevant terms.

3. Growth data be aggregated and analysed so that trends can be monitored.

4. Research be undertaken into the multiple factors prejudicing the chances of survival of mothers and babies in our South African communities as evidenced by the high non-White stillbirth and maternal mortality rates.

5. Further studies are required to investigate means of interception at all levels of medical care, particularly the first level of prevention.

6. The reasons for the high caesarean section rates in Whites should be determined.

7. Ante-natal services should be extended into the community, possibly by using local authority clinics staffed either by suitably trained local authority or Provincial nurses.

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LIST OF TABLES.

FIGURE 1

INFANT AND PERINATAL MORTALITY

A TREND GRAPH OF A DEVELOPED EUROPEAN COUNTRY.

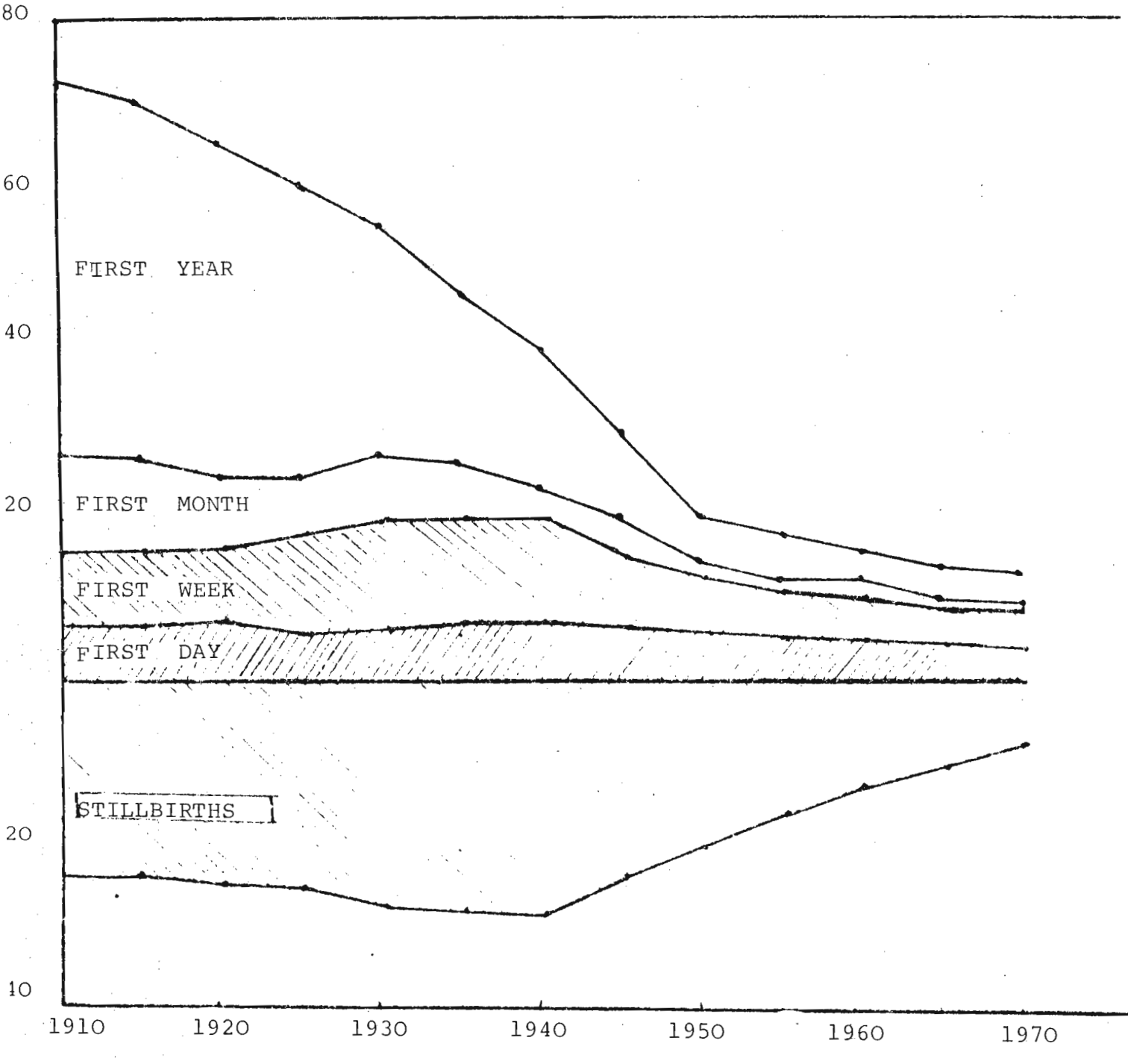

TABLE I.

COMPARATIVE RATES FOR CERTAIN MATERNITY AND CHILD HEALTH INDICATORS

		Perinatal Mortality Rate	Infant Mortality Rate	Maternal Mortality Rate
World*	Best	12-15	8-10	5-10
	Worst	120	200	1000
South African	Whites	17.2+	15-20&	3+
	Asians	31.6+	25-35&	60+
	Coloureds	48.1+	60-100&	60+
	Blacks	54.4?	80-120&	121-

*W.H.O. estimates.

+official R.S.A. figures.

&Estimates calculated by Küstner.

?Natal University Dept of Obstetrics and Gynaecology Hospital population.

-Derived from information from questionnaire study.

TABLE II.

CAESAREAN SECTION, STILLBIRTH AND MATERNAL MORTALITY BY HOSPITAL LOCATION AND RACE GROUP.

HOSPITAL LOCATION AND RACE GROUP	DELIVERIES	CAESAREAN SECTION		STILLBIRTHS		MATERNAL DEATHS	
	NUMBER	Per 100 DELIVERIES	NUMBER	Per 1000 DELIVERIES	NUMBER	Per 100,000 DELIVERIES	NUMBER
URBAN MIXED							
WHITE	2244	21	473	9.8	22	0	0
NON-WHITE	14088	11	1549	35.8	505	70	10
URBAN WHITE	1023	30.5	312	6.8	7	0	0
URBAN NON-WHITE	30027	21.1	6352	32.9	989	106	32
URBAN							
ALL-WHITE	3267	24	785	8.8	29	0	0
NON-WHITE	44115	17.9	7901	33.8	1494	95	42
RURAL MIXED							
WHITE	127	11	14	7.8	1	0	
NON-WHITE	4721	9.7	460	34.5	163	21	1
RURAL NON-WHITE	364		0	10.9	4	0	0
RURAL							
ALL-WHITE	127	11	14	7.8	1	0	
NON-WHITE	5085	9	460	32.8	167	19	1

TABLE III.

NON - WHITE ATTENDANCES

TYPE OF SERVICE	ANTE - NATAL Percent	ANTE - NATAL Number	FAMILY PLANNING Percent	FAMILY PLANNING Number	WELL - BABY Percent	WELL - BABY Number
LOCAL AUTHORITY CLINIC	4.3	8110	61.3	208736	52.5	332425
WELFARE ORGANI-SATION CLINIC	11.8	22518	2.5	8664	7.9	49708
STATE HEALTH CLINIC	10.3	19783	18.2	61884	35.4	224336
HOSPITALS	73.6	140443	18	61061	4.2	26840
TOTAL	100	190854	100	340345	100	633309

TABLE lV.

WHITE ATTENDANCES

	ANTE - NATAL Percent	ANTE - NATAL Number	FAMILY PLANNING Percent	FAMILY PLANNING Number	WELL - BABY Percent	WELL - BABY Number
LOCAL AUTHORITY CLINIC	16	1349	85	31411	99	86085
HOSPITAL	84	7014	15	5524	1	858
TOTAL	100	8363	100	36935	100	86943

TABLE V.

TOTAL ATTENDANCES WHITES AND NON-WHITES

	ANTE - NATAL		FAMILY PLANNING		WELL - BABY	
	Percent	Number	Percent	Number	Percent	Number
WHITES	4.2	8363	9.8	36935	12	86943
NON - WHITES	95.8	190854	90.2	340345	88	633309
TOTAL	100	199217	100	377280	100	720252

TABLE Vl.

TOTAL ATTENDANCES BY SERVICE PROVIDER

	ANTE - NATAL		FAMILY PLANNING		WELL - BABY	
	Percent	Number	Percent	Number	Percent	Number
LOCAL AUTHORITY	5	9459	64	240147	58	418510
HOSPITAL	74	147457	18	66585	4	27698
STATE HEALTH	10	19783	16	61884	31	224336
WELFARE ORGANISATION	11	22518	2	8664	7	49708
TOTAL	100	199217	100	377280	100	720252

TABLE V11

FIRST TO TOTAL VISITS:
ANTE-NATAL AND FAMILY PLANNING CLINICS

	NON - WHITES			WHITES		
	TOTAL VISITS	FIRST VISITS		TOTAL VISITS	FIRST VISITS	
	Number	Number	Percent	Number	Number	Percent
LOCAL AUTHORITY CLINICS						
Ante-Natal Attendances	30628	9481	31	1349	128	9.5
Family Planning Attendances	217400	18360	8.4	31411	2776	8.8
HOSPITALS						
Ante-Natal Attendances	131326	29873	23	7014	1032	14.7
Family Planning Attendances	66124	24858	37.5	5524	964	17
TOTALS						
Ante-Natal Attendances	161954	39354	24.3	8363	1160	13.8
Family Planning Attendances	283524	43218	15.2	36935	3740	10