Infant Mortality in Transkei

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Declaration

I declare that the work presented in this dissertation is my own unaided work except where specific acknowledgement is made. It has not been submitted before, for any degree or examination, at any other university.

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Abstract

Infant mortality is generally regarded as an indicator of the standard of health and it is probably one of the best measures of the general socio-economic conditions in a society. There are indications world wide (including South Africa), of slowing down in the decrease of infant mortality rate, and a continued existence of wide variation in infant mortality levels. Conversely, it has also been noted that some relatively poor countries have managed to achieve low levels of infant mortality as often experienced by wealthier nations. The case for more attention to be paid to understanding the changing dynamics of infant mortality is compelling.

Using the Demographic and Health Survey, which was conducted in Transkei in 1987, this study has looked into levels and patterns of infant mortality in Transkei and factors influencing them. The accuracy of the data was determined by using the Myers' Blended Index and Life Table Model. Response errors usually arise in developing countries from omission of vital events and misstatement of dates and age.

A direct method of estimation was used to determine the level of infant mortality, in Transkei, during the period 1984-1986. Socio-economic and medical factors influencing infant mortality levels were identified using univariate analysis and multiple logistic function. The results of this study indicate that these factors significantly influence infant mortality in Transkei.

In particular, income, womens' employment, duration of breastfeeding , age of the mother when giving birth, spacing of births and vaccination are important factors influencing infant mortality in the region.

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Chapter 1 Introduction and Problem

1.1 INTRODUCTION

Demographic estimates, like other indicators which are frequently available, such as inflation rates, growth in Gross National Product, the values of import and export, are basic measures of welfare and development in society. Furthermore, they are the basis on which national planning and appropriate decisions may be made. But in many cases, demographic statistics are usually excluded from the regular flow of such indicators.

It has been observed that research techniques for estimating demographic parameters have lagged behind other scientific fields, especially in developing countries (Ntozi 1985:507). This is lamentable, since the quality of demographic data is poor in these areas. Traditionally, in Western societies, registration of vital events and censuses have been the main source of demographic data. In many developing countries, however, this registration system is either nonexistent or its quality is so poor that there are no reliable estimates (Ntozi 1985:507). Consequently censuses have been the major source of demographic data. Unfortunately, the reliability of these costly and time consuming undertakings have, in many cases, been questioned by analysts (Bradshaw cited from Wilson *et. al.* 1989:108). Moreover, censuses have been a subject of much political controversy. The 1962 and 1963 censuses in Nigeria (Gouws 1978) are examples of large sums of money

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that have been wasted in these undertakings. The Nigerian census, which cost US$4 million, engendered so much internal friction that the very survival of the federation was threatened: so much so that it was cancelled after a heated and prolonged controversy. A new count was ordered in 1963, but when the figures were made known they were rejected by the Government. More recently, the 1991 census in South Africa (costing R60 million) has been the subject of much political controversy even to the extent of being rejected outright by certain section of the population (Daily Dispatch 8/03/1991:1).

Infant mortality, in particular, besides being used as an excellent indicator of the standard of health, is increasingly being used as one of the best measures of the general socio-economic conditions in a society (Wilson *et. al.* 1989:107). Details of infant mortality in Southern Africa have been unavailable, as a result of the lack of a reasonably reliable and comprehensive set of data. Such data as are available, have in many cases, excluded homelands like Transkei (Klopper 1986). Attempts to analyze socio-economic factors influencing infant mortality in South Africa have been hampered firstly, by the non-availability of reliable data and secondly, by the omission of a number of variables that would make it possible to study socio-economic factors in detail (Klopper 1986). This happens when there is a great need for dissemination to policy makers of information on the factors affecting demographic trends.

1.2 The Problem

Generally, infant mortality rates vary across and within countries. Both direct and indirect estimates of mortality rates (see World Fertility Survey (WFS), 1984; U.S. Bureau of Census, 1979) show that some developing countries have achieved remarkably low levels of infant mortality (less than 50 deaths per 1000 live births). Examples may be found in many countries of Latin America, Asia and the Pacific Rim. However, there are many countries in the Third World, in which infant mortality is high (ranging between 70 and 230 deaths per 1000 births). Among the countries surveyed by the WFS high rates of death among children under one year are mainly found in Africa and some countries in Asia, the Pacific rim and in a few countries in Latin America. Africa's rates of infant mortality are generally the highest in the world. These deaths are but the "mortality tip of the morbidity iceberg" (Unicef 1991).

The general lack of socio-economic and medical development in African countries is one of the explanatory factors for the existence of such high and diverse infant mortality levels and patterns. The specific reasons are not well understood; and there are many changes that are associated with development which could be contributory. Until recently, there has been little concern with critically defining the specific determinants of infant mortality in developing countries since a downward course seemed to be

the rule worldwide, almost independently of the development strategies undertaken (see DaVanzo 1985:79). There is now evidence that the previous rapid decrease in infant mortality rates is slowing down, and there is a continued existence of wide variation in infant mortality rates. Conversely, it has also been noted that some relatively poor countries have managed to achieve low levels of infant mortality typically associated with wealthier countries (Table 1). The case for more attention to be paid to understanding the changing dynamics of infant mortality is compelling.

In South Africa infant mortality rates show a strong racial bias. In 1981, the infant mortality rate for whites was estimated at 13 deaths per 1000 live births which is one seventh of that for Blacks (Figure 1). Data from sample surveys over the period 1980-1985 give estimates of infant mortality rates for the Transkei ranging from 130 deaths per 1000 live births in 1980 (Irwig 1981:13), to 90.6 deaths per 1000 live births in 1985 (Donaldson 1988:21), suggesting a downward trend during the period. These estimates are higher than those for other countries in the Southern African region over the same period. For instance, in 1985 the national averages for both Botswana and Zimbabwe was 72 deaths per 1000 births and that of Zambia 84 deaths per 1000 live births (Wilson, *et. al.* 1989:108). These figures should, however, be treated with caution as Wilson *et. al.* (1989:107) observe - "The overall figures for mortality rates in South Africa (Transkei

TABLE 1

Comparison of Socio-Economic Status And Infant Mortality Rates (IMR) Across A Range Of Countries

Country	Economic status	Year	Group	IMR
Sweden	High	1979	Whole	7.5
Japan	High	1979	Whole	7.9
United States	High	1979	Whole	12.9
South Africa	High	1981	Whites	13.0
Cuba	Medium	1979	Whole	17.9
South Africa	Medium	1981	Indians	17.9
Uruguay	Medium	1979	Whole	39.6
Argentina	Medium	1979	Whole	47.9
South Africa	Medium	1981	Coloureds	51.9
Lesotho	Low	1979	Whole	92.0
South Africa	Low	1981	Blacks	94.0
Kenya	Low	1979	Whole	132.0
Senegal	Low	1979	Whole	152.6

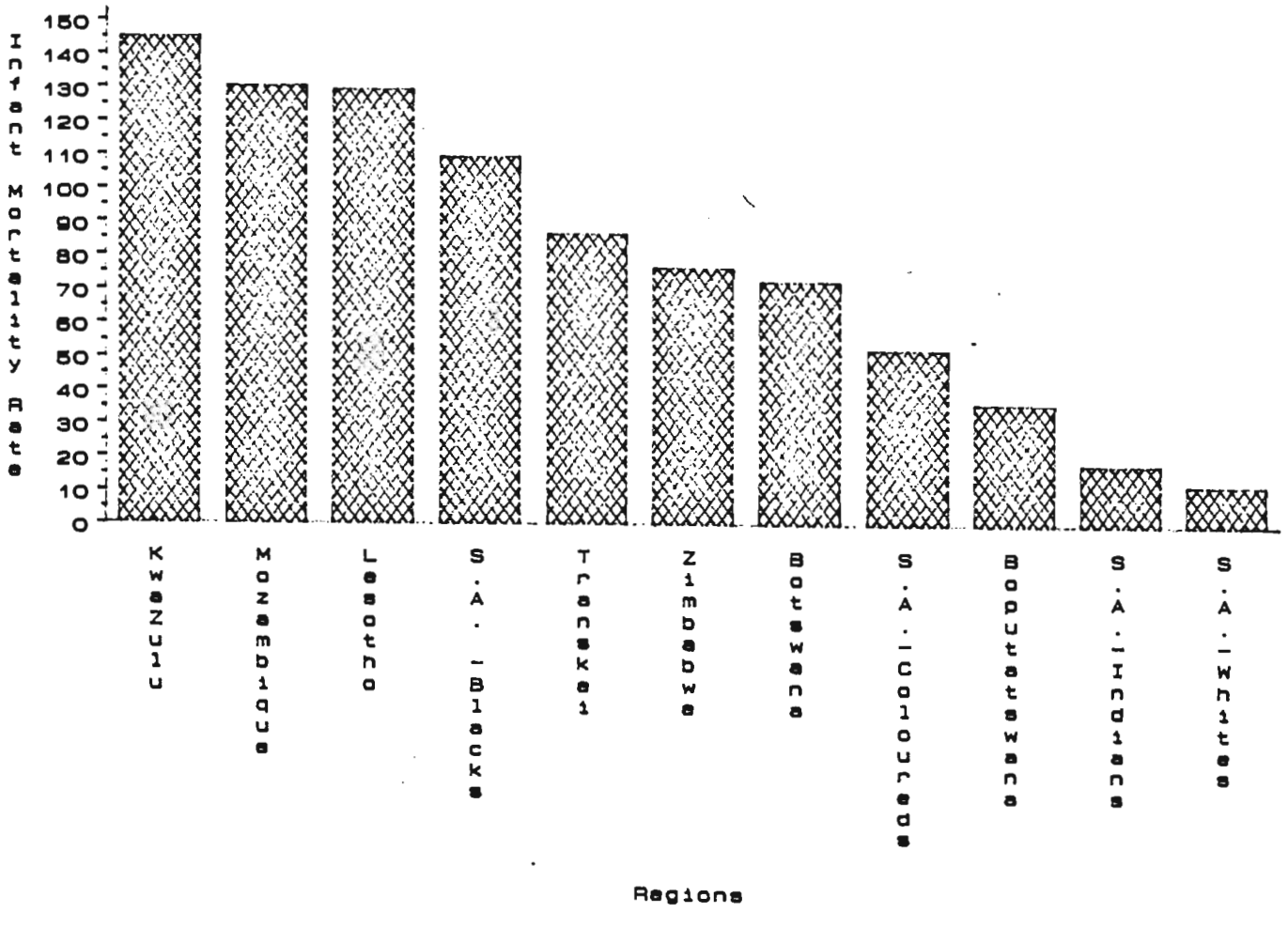
Note: The Economic Status of the above Countries was categorised according to their Gross National Product per head.

Source: South African IMR figures were obtained from Mostert, 1988; the remainder were obtained from Demographic Year book, 1982

inclusive) do not only cover wide variations between one area and another but are also based on very incomplete sampling"

Currently, there is very little consensus regarding the most cost effective strategies for reducing infant mortality in third world countries. One view, (Walsh, *et. al.* cited by Mosley 1987:189) generally supported by biomedical scientists, is that the limited resources should

Figure 1 : Infant Mortality Rates in Different Regions of Southern Africa



Note: IMR is measured as deaths in the first year of life per 1000 live births.

Source: Figures were taken from Wilson et al. (1989).

be invested in supplying a few selected technologies like vaccines and oral rehydration broadly to the entire population. Another view, (Caldwell *et. al.* cited by Mosley 1987:189) more commonly stated by social scientists, is that the major barriers to reduction mortality rate are essentially socio-economic factors. As Mosley (1987:189) says, "each starts with a different set of assumptions about the causes of ill health in populations, and their respective research framework generally ignore variables considered essential by the other".

1.3 OBJECTIVES OF THE STUDY

The purposes of this study are:

(i) to estimate rates of infant mortality in the Transkei using data from the Transkei Demographic and Health Survey (1987). Specifically, the study will examine errors that are associated with this instrument of data collection and will discuss the conventional procedures for estimating infant mortality with a view to finding a suitable estimation procedure for the conditions prevailing in the Transkei.

(ii) to examine the socio-economic and bio-social factors which influence the levels of infant mortality and differences in infant mortality found among various sub-populations.

(iii) to make recommendations concerning data collection, methods of estimation and methods of reducing infant mortality.

1.4 ORGANISATION OF THE STUDY

In the rest of chapter 1, the factors affecting mortality will be discussed. In the second chapter the region being researched will be reviewed while research methodology and procedures used will be discussed in chapter 3. The results will be presented in chapter 4. Finally, discussion, conclusion and recommendations will be in chapter 5.

1.5 FACTORS AFFECTING INFANT MORTALITY

Factors influencing mortality include, among others, morbidity, the environmental, nutritional, personal behaviour and socio-economic factors. There is a relationship between morbidity and mortality, "but because of the difficulties and uncertainties inherent in the measurement of morbidity, attempts to study the interrelationship of morbidity and mortality for national populations have been rare" (Kpedekpo, 1980). Follow-up studies by various researchers all over the world, undertaken at hospitals and clinics, do provide estimates of mortality of persons subject to specific risk factors in different parts of the world. The particular causes of deaths are difficult to ascertain; and the reported causes from hospital records are sometimes misleading. In the absence of pathological examination, analysis of the certified causes of death reveals a great variety in the diagnoses reported (Ncayiyana 1991a). The difference relates not only to registration practises, but also to the

methods of selecting and coding the underlying causes of death, which are often multifactorial. However, it is generally accepted that most infant deaths in Transkei (Ncayiyana 1991a) are associated with malnutrition, infectious diseases and gastro-enteritis. This study will look at some underlying socio-economic and medical causes, rather than the intermediate factors through which the resultant death is caused.

Nutrition is an important factor affecting mortality. It has been observed that undernutrition and overeating affect mortality through increased susceptibility to infection. In Asia and Latin America (Kalule-Sabiti 1991), there is a syndrome of marasmus which reflects insufficient intake of both calories and protein and is characterised by gross wasting of the body. In tropical Africa, kwashiorkor is a common syndrome particularly among people with a diet rich in calories but inadequate in protein. Kwashiorkor is characterized by anaemia, fatty enlarged liver, oedema and other syndromes severe in children. Malnutrition, infectious diseases and gastro-enteritis have a high incidence where there is poor nutrition. Income is, therefore, important in order to provide babies with a nutritious, balanced diet which prevents diarrhoea. Income is also associated with ability of an individual to buy adequate medical protection from diseases (Weeks 1984:136). Wilson *et. al.* (1989:106) further observe that as a consequence of hunger and malnutrition, which result from low income, there is a high death rate of young

children, although causal connection is often hidden. An inverse relationship between income and malnutrition has been found in Mpukunyoni (kwaZulu), a rural area with migrant workers, and at Esikhawini (also kwaZulu), a semi-urban area with better employment opportunities (Wilson *et. al.* 1989:105). It should then be expected that one would find an inverse relationship between income and infant and child mortality rates. Although death rates are generally known to be declining world-wide, it is possible that worsening malnutrition may be responsible for the raising of death rates in some regions. For example, India has been cited as an example where the crude death rate rose from 16,4 per 1000 in 1971 to 18,9 per 1000 in 1972 as a result of worsening nutrition (Weeks 1984). Another dimension to malnutrition is that it impairs the physical and mental development of children and the working and earning capacity of adults. Low income is therefore a cause as well as a consequence of poverty.

The role of breastfeeding in a society where poor nutrition is endemic, can be crucial. Besides its contribution to health by providing proper nourishment, mother's milk minimizes the exposure of infants to environmental contaminants and, in addition, provides some biological defence against various childhood infections (United Nations 1987). Traditionally every Xhosa mother was expected to breastfeed her child for a period of two to three years. Irwig (1981) has shown that both intensity and duration of breastfeeding has declined in Transkei.

In some cases, some babies have not been breastfed at all. Breastfeeding has been replaced by the use of milk powders and bottle feeding as commercial advertising make bottle feeding seem an attractive option. The risks of bottle feeding, are great for the bottle fed baby when the population is largely illiterate (Unterhalter, 1955). Expensive powdered milks are often overdiluted with unsafe water and fed to infants from unsterilized feeding bottles resulting in malnutrition and infection. Le Roux and Nyakaza (1984), in a study undertaken at Crossroads near Cape Town, found that breastfeeding is a major factor in preventing diarrhoea and malnutrition. They came to this conclusion after finding an inverse relationship between the period a mother has breastfed and the number of her children who had died.

Maternal education has been cited (United Nations 1973; United Nations 1985; Weeks 1984:135) as an important factor influencing the behaviour that impacts on infant mortality. Education gives knowledge and information, and may allow the mother to adopt alternatives in child care and therapereutic practices that become available in a rapidly changing society, and break with traditional child rearing practices that might adversely affect the child (Vankatachanga 1985:244). In this respect, maternal education is more important than that of the father. These practices can simply be knowledge of a few basic rules that would avoid unnecessary infant deaths. For instance, in a rural Indian village, umbilical cords were

often cut with instruments such as unsanitary farm implements, resulting in many deaths (Weeks 1984 :135). Knowledge is generally improved by school attendance both for the specific hygienic practices learned and for the general changes in outlook and the break with resistance to innovation. Unterhalter (1955), while agreeing that traditional child-rearing practices may contribute to some extent to infant mortality, (as, for example, the use of some traditional healing methods detrimental to health and unhygienic practices) is of the opinion that among Blacks in South Africa, these factors are not as important as socio-economic factors. It has been shown in Africa (United Nations 1985), that if the mother has had 10 years of continuous schooling, this directly reduces mortality by 34 per cent on average and the reduction would be larger still if the calculation took account of indirect effects. An inverse relationship between education and infant mortality rates, could then be expected.

Employment of women may be beneficial to children. A personal income can give a woman more opportunity to improve herself, and it keeps her in touch with technological innovation. Indeed, research in most African countries has shown that the death rate of children of women who are not in the labour force is higher than those who are not employed (United Nations 1985). Cock *et. al.* (1984), suggest however that the employment of Black women in South Africa in wage labour, is likely to have an adverse effect on infant and child mortality.

Economic necessity propels most of these women into wage labour immediately after giving birth. They note that the saying that "a woman when she becomes a mother should withdraw herself from the world and devote herself to her child", is clearly an option for white women who have access to cheap domestic servants. It is likely to be more detrimental to women in the homelands who engage in informal sector work, or in farm labour. In a national survey, conducted by Cock *et. al.* (1984) in South Africa, they found that 40 per cent of the working women were leaving their children with adult relatives, particularly grandmothers, and 10 per cent were leaving them with elder siblings. The most significant finding was that 50 per cent of these women in the sample were using forms of child care outside their family, suggesting that access to support in the form of extended family was declining.

Family planning is a controversial issue. There has been a growing trend to justify, at least partly, the effects of family planning by reference to the fact that it will also reduce infant mortality, even though it has been difficult to say how large the effect would be (Kluggman, 1991). Evidence available on the effect of family planning on infant mortality is far from conclusive. Trussel (1988 :176), suggests that the effect of family planning will, in most cases not be realised. Firstly, the infant mortality rate is a misleading measure of mortality when examining the effect of family planning because an increase in the incidence of first order births (which are generally

associated with higher death rate, and, as will be shown later, first order births have lower death rate in Transkei), is an inevitable result of the successful use of contraception. Secondly, an increase in the use of contraceptives is typically associated with an abandonment of traditional birth spacing practices, such as prolonged breastfeeding and sexual abstinence. Therefore, Trussel (1988 :176) concludes that in seeking evidence of the impact of family planning on infant mortality we should not expect to find that potential reductions in mortality are realised. On the other hand, Potter (1988 :181-2), while agreeing with the above strictures, identifies cases where the impact is likely to be realised. Its effect could be substantial when the population is at the early stages of fertility transition. This is the time when the population has already abandoned the traditional birth spacing methods, but have not replaced them with modern family planning methods. Another important area where family planning could be expected to bring about an impact is in reducing the proportion of children born to mothers whose reproductive health status is poor or impaired. Furthermore, when family planning results in reducing the size of the family, more care may be devoted to the surviving children. Another advantage of family planning is in the prevention of births among unmarried adolescents (Potter 1988:181-2).

In developing countries, extensive immunisation campaigns have greatly reduced child mortality. Immunisation, has

been the most dramatic public health success story of the last half century (Unicef 1991). Diseases like measles, which are preventable, *par excellence*, have been eradicated from many of the developed countries. For example, in England and Wales between 1861 and 1960 the infant death rate dropped from 160 per 1000 live births to 20, with more than two thirds of that decline due to the control of communicable diseases (Weeks 1984 :136). Henderson (1983) has observed that, in developing countries, "with each passing minute, ten children die and another ten children become lame, deaf, blind or mentally retarded from six diseases which can be prevented by immunisation. Diphtheria, whooping cough, tetanus, measles, poliomyelitis and tuberculosis". Exact figures on immunisation in Transkei are not available, but the indications are that many children in rural areas are not immunised. This is reinforced by a village study conducted by Muller and Tapscott in 1984, where it was found that "one tenth of the identified child deaths were attributed to tuberculosis and a fifth to measles" (Muller 1985a:85-6). Linked to widespread lack of immunisation of children is the nature of the arrangement of the health services in Transkei. In the light of technological advancement, the cost of totally immunising a child has been greatly reduced. Health services in Transkei are heavily weighted towards curative medicine. Gerber (1985 :38), found that 60 per cent of resources go to curative health care as against only 30 per cent to primary health care. This is the reverse of the allocation of resources ideally recommended for Third World

health services (Gerber 1985).

At the turn of the century, in Europe, infant and child mortality rates were higher in the urban areas, due to overcrowding and unsanitary conditions. But, in many Third World countries today, higher infant and child mortality rates have been found in rural areas (Weeks 1984:141). Harrison (1972 :146-148) points to the fact that many diseases resulting in the death of children and infants are associated with the discrimination in allocation of resources, in these countries. For instance Muller (1985b :24) states that 80 per cent of households in rural Transkei lived more than 1,5 km from the nearest water supply, usually unprotected shallow wells in the veld. Collins and Maluleke (1984) found in Lebowa, rural areas usually have no latrines, and even when pit latrines do exist, holes are usually too big or they have been built at a wrong place and therefore become a place for the breeding of mosquitoes. Pillay (1984) while looking at the distribution of medical facilities in South Africa and its homelands, found that medical facilities are concentrated towards the urbanised areas of South Africa, for instance "only 5,5 per cent of South African doctors practise in rural areas where 50 per cent of the population live". Little wounder then, that studies in South Africa have shown a wide gap between survival in urban and rural areas.

Summary

Infant mortality rate (IMR) is one of the basic measures of

welfare and development in society. Unfortunately, reliable estimates of IMR have not been available in many African countries. Among African countries where such figures exists, a diverse infant mortality levels and patterns have been found. This trend has also been found in South Africa, where there is a wide variety among people of different races and regions. The study of specific determinants of infant mortality in developing regions has therefore become imperative.

Among factors which have been found in many studies to influence infant mortality are:- income, breastfeeding, maternal education, employment of women, fertility patterns, immunisation and the residence status of the mother. This study looks at methods of measuring infant mortality in Transkei and some of the factors influencing mortality levels.

Chapter 2 Review of the Background of the Region being Researched

2.1 Country and Regional overview

Transkei is situated between latitudes 30°S - 33.5°S and 27°E - 30°E in southern Africa. It borders on the Indian Ocean in the east and south-east, the Province of Natal in the north and north east and the Cape province in the west and north west. In addition, it has two "islands" - one in Natal and the other in the Cape Province. Topographically, the Transkei has a broken landscape characterized by mountain ranges and eroded valleys. Three quarters of the surface is hilly to mountainous and only eleven percent is flat or undulating. Mean summer temperatures vary around 22°C and drop to 18°C around Matatiele. Mean winter temperatures near the coast are usually above 15°C, but inland they drop to 7°C (Development Bank of Southern Africa, 1987a).

The people of Transkei (Carter *et. al.* 1967) originate from 12 Cape Nguni tribes, often referred to as AmaXhosa. They mostly speak dialects of Xhosa, and their culture exhibits a remarkable uniformity. Annexation by the British and the imposition of direct colonial rule to the areas which today constitute Transkei began in 1879, with the incorporation of territories of Fingoland, Idutywa and Griqualand East into the Cape Colony and ended with the annexation of Pondoland in 1894.

By the early years of the twentieth century (see e.g. Hey *et. al.* 1989:27; Muller 1984), an increasing number of its African inhabitants sought employment outside the territory. At that time occurred the discovery of the gold and diamonds in South Africa, and the mining industry needed many people to work these deposits. In order to coerce men from the Transkei to join the labour force, special taxes were introduced (e.g. poll tax and stock tax) by the then Colonial government (Giliomee 1985). Cash cropping was also deliberately neglected by the Colonial government. Moreover, as a result of both the natural increase in the population, and the forced removal of masses of people who were resident outside the reserve, the population density increased dramatically. As a result there was an increase in competition for meagre resources, especially land. The need for income then forced many employable members of the population, usually 'able bodied' young men, to seek employment as migrant labourers. The recruitment of labour for the mines, was almost exclusively for men. In addition, the South African government passed the Land Act of 1913, which, together with its 1936 amendment, embodied the concept of territorial segregation of black reserves for exclusive occupancy by blacks. Outside these areas blacks were not permitted to acquire or hire land. Furthermore, the Native Urban Areas Act of 1923, amended in 1937, severely restricted women and children from leaving the reserves (Giliomee *et. al.* 1985:2-3). The 'Black' Reserves became mere labour reservoirs for white areas. The Transkei, one of the

reserves, became a "self governing territory" in 1963, and attained "independence" in 1976, although this is not recognised by the international community. Transkei is one of the nine "homelands" within South Africa. The three other homelands with "independence" status are: Bophuthatswana, Venda and Ciskei. The other five "self-governing" homelands are: KwaZulu, KwaNdebele, Qwaqwa, KwaNgwane and Gazankulu (Giliomee 1985).

Family patterns in Transkei are complex. The reasons for such patterns may be associated with a combination of socio-economic, cultural and development factors prevalent in the region.

2.2 Family Background

The family and household constitute a basic unit, which is of vital importance to many aspects of human life. It is through the family that each generation is replaced by the next. Through the family, children are brought into the world and cared for until they can assume their own responsibilities in society. It is also through the family that each generation fulfils a major portion of its responsibilities to the sick and dependant, as well as the aged of the preceding generations. A household usually occupies a single housing unit (which may be made up of a number of huts) and is therefore the most relevant population unit for use in the analysis of statistical enumeration (see United Nations, 1973).

The concepts of the "family" and "household" are often confused because of their close relationship to each other and because of the lack of unambiguous definitions. In general terms, a household is defined as people who "live and eat together", and generally, the family is referred to as relationships which pertain to, or arise from, reproductive processes and which are defined by law or custom. There is no uniform and universally acceptable definition of the family as a sociological concept. This is partly due to differences in the structure and function of family units in various parts of the world and partly due to the wide variety of approaches taken by different demographers and sociologists (United Nations 1973).

The United Nations (1973) provide comprehensive definitions of both household and family. A household is defined as an arrangement made by persons, individually or in groups, for providing themselves with food or other essentials for living. A household may be either a one person household, that is, a person who makes provision for his own food or other essentials for living without combining with any other persons, or a multiperson household, that is, a group of two or more persons who make common provision for food or other essentials for living. The persons in the group may pool their incomes and have a common budget to a greater or lesser extent; they may be related or unrelated persons or a combination of both. However, problems might arise in applying this definition. The "pooling of incomes and common budget" criterion might be vague in some

situations, consequently making it difficult to identify a household with the same membership on a second visit by the same or different enumerator.

The family is defined as those members of the household who are related, to a specific degree, through blood, adoption or marriage. In a Western sense, a nuclear family usually includes two adults who maintain a socially approved sexual relationship with or without minor children, who are either their own or adopted. Such a family is called a nuclear family. In the Transkei, as in many African cultures, in addition to a couple and minor children it usually includes their married children and their families, grandparents and other relatives as well. Such a family is an extended family. They may be spatially scattered or may live together and share a housing unit. In conformity with the United Nations definition, the family can be interpreted in a limited sense as a group of two or more persons mutually related who live together and share some housing unit. This definition is the most logical when the data are going to be used for statistical purposes, although it artificially divides a group of persons who, on the basis of other criteria, would have constituted one family. In a study of this nature, to interview a spatially scattered family as one unit, might be very expensive, and in some cases it would be impossible to trace some members. There is also a problem of a definition that would clearly identify members of a family across households.

Traditionally, among AmaXhosa (Peires 1981; Hammond-Tooke 1956-7; Philips 1953), the family has been the basis of social organisation. Firstly, the extended family directly influences employment opportunities for its members. Among AmaXhosa, each family produced most of its own consumption requirements and each allocated its labour resources independently. The family-head decided what and when to plant, supervised the herding and milking of the cattle, and chose whether to hunt, trade or stay at home (Peires 1981:33). Thus, the family is the medium through which status and prestige are assigned in the larger community. The family is also the source of expressive satisfaction. The family, through marriage, helps to create meaningful alliances with other families in the community, a fact which largely explains the practice of arranged marriages in the society.

A typical Xhosa homestead consisted of three or four huts built in a row (Hammond-Tooke 1956-7:68). The homestead-head was the senior male of his lineage in the homestead. He lived with his wife, his unmarried children, and possibly one or two impoverished or aged relative. Most families among AmaXhosa were monogamous. This is supported by a census undertaken in 1848 among AmaXhosa under Chief Sandile, which found that 47.3 % of all adult men were monogamous, there were also 32.4% of adult men who had no wives and only 20.3% were polygamous. Of the polygamous men, 76.3% had two wives, 17.8% had three wives, 3.4% had

four and the remaining 2.4% had five to seven (Lewis 1984:5). As Alberti (1807:68) puts it :-

> The number of women that a man lives with simultaneously in a state of matrimony is not limited by any law, and simply depends on his wishes and foremost on his resources. Those with least resources, must be satisfied with one woman, others have two, and rarely more. Only the chiefs are enabled by their greater wealth, to own a greater number, and one finds some among these who have seven to eight.

The number of wives did not necessarily mean a greater number of children that are dependent on the household head. Alberti further explains (1807:69):-

> The kaffir women are very prolific (in having children). However, one finds that those who do not share the possession of their husbands with rivals, have the most children. Such women sometimes have eight to ten children, whilst others, whose husbands have several wives, bring far fewer children into the world ... Altogether the population does not seem to benefit as greatly (i.e. increase so much) from the polygamous practice as one might be led to believe.

Division of labour within the homestead went strictly according to sex and age. The men looked after the cattle and erected the permanent structures, the women cared for the gardens, prepared the meals and maintained the dwellings (Peires 1981:41).

The migrant labour system (Hey *et. al.*, 1989; Philips 1953) disrupted traditional family life among the AmaXhosa. In many cases the husband went away for long periods at a time. In the economic sphere, the husband's manpower had been indispensable in two contradictory directions. He earned wages to supply the household with those necessities

that are bought with cash, and he ploughed the ground for the family to grow its food supply. Formerly, a man's relatives would have done the work for him after they had ploughed their own fields. But as more men went away, fewer were left to undertake this extra work, and it had to be done by women and children. This is one of the reasons why children dropped out early from school. It could be argued that the migrant labour helped to bring much needed cash to the rural areas. Indeed, migrant labourers did send remittances to rural areas, but the low wages paid to most migrant workers have not been an adequate impetus for rural development (Hey *et. al.* 1989:28). Insufficient suitable adult labour and capital are contributory reasons for the rapid decline in agriculture. In addition to these external factors retarding development, there are also factors which are internal to the traditional way of life. For instance, among AmaXhosa, commodity production and trade were relatively underdeveloped, and were usually undertaken to supplement rather than to replace the normal pursuits of a family (Peires 1981:33).

As a result of migration, Transkei today has an extra-ordinarily high rate of female-headed households, estimated to be 67 percent (Hey *et. al.* 1989:28). In other cases (Philips 1953), although migration of men might not result in marriages being dissolved, it might cause problems in family life. For instance, men may send remittances irregularly, causing a great economic burden to women left behind. Whereas, the nuclear family is developing among the

elite in the urbanised areas, (Steyn 1991) this is not the norm amongst people of the lower socio-economic level, who represent, by far, the majority of the urban population. Amongst people of the lower socio-economic level in urban areas, the percentage of illegitimate births is extremely high, resulting in family structures other than the nuclear family. The one-parent family, for example, is emerging but in the case of illegitimate births it is often found that the mother with her illegitimate child will remain in the household of her parents, or in the case of an absent father, in the household of her mother. This results in a high incidence of multigeneration families, of which a high percentage is of the matrifocal type (Steyn 1991).

Only ten percent of households produce enough from their farms to feed themselves and two thirds of all food consumed comes from outside the Transkei (Hey *et. al.* 1989). Sources of cash income within the Transkei are almost non-existent. In the meanwhile, jobs for unskilled migrants have become less available as South African industry becomes increasingly capital-intensive and as a result of the policy of externalizing Transkei as an 'independent' territory (Hey *et. al.* 1989). In the early part of this century a serious problem in rural areas was the scarcity of young men to help cultivate the land, but today it is the ever rising number of young people who are unemployed.

2.3 Child Care Within The Family

Births among the traditional Xhosa family were almost exclusively to married women. Although women did engage in sexual intercourse before marriage, it usually excluded intercrural sex and as Maclean (1807:64) puts it :-

> The birth of children does not, however so frequently follow from this kind of (premarital) intercourse as one would suppose.

Traditionally, (Junod 1927:36-51; Philips 1953:10-23; Tyani 1991), the birth of a baby took place within the household. A woman of some experience, in the village, acted as a midwife. During the whole labour, it is taboo for the mother to eat or drink anything. No males are allowed to be around the place of delivery. The room where delivery is going to take place is made very hot. The midwife does not interfere with the whole process, unless there is some problem being experienced by the mother. If there is some difficulty, the midwife will bind the mother tightly around the stomach, in order to assist the process. As soon as the child has made his or her appearance, the midwife ties the umbilical cord near the navel and cuts it with a sharp instrument. If the bleeding does not stop, cowdung might be used to seal it off. From the day of birth until the moment when the umbilical cord falls, a period of about seven days, the mother is confined to one place. During that time, the mother is restricted to a special diet of maize porridge. This is said to aid breast feeding. The child is nursed by the mother, who allows him or her to breastfeed at anytime. After a period of about four

months, this diet is sometimes supplemented with maize porridge. From the time of the child's birth to the time it is weaned, the woman may reside in her parents' home, especially during her first birth. Among AmaXhosa, spacing of children was closely observed by couples. As Alberti (1807:68) says :-

> Until then (the child being weaned), all sleeping together is completely discontinued. ... In this way, the child profits by the mother's milk, which is the most wholesome nourishment and is available for a protracted period. The mother's constitution is also not thereby compelled to divide its strength in providing nourishment for the child, coupled with a rapid succession of confinements, to the possible detriment of both.

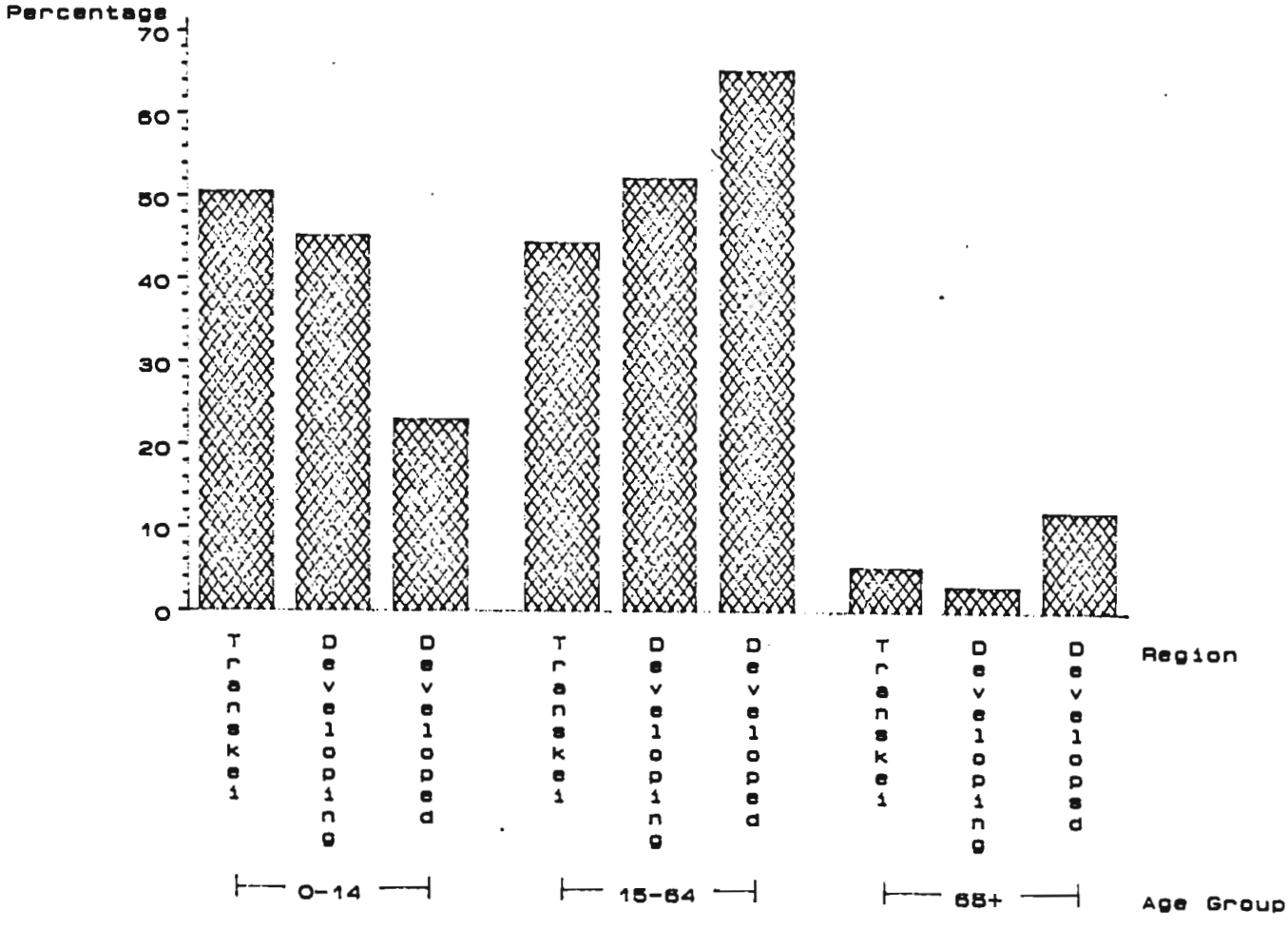
In cases where an unwanted pregnancy happened, an abortion was usually undertaken, although it was not socially accepted. Maclean (1906:64) explains:-

> The procuring of abortion, although almost universally practised by all classes of females in kaffir society, is nevertheless a crime of considerable magnitude in the eyes of the Law; and when brought to the notice of the chief, a fine of four or five head of cattle is inflicted.

2.4 Demographic Background

According to the 1985 census, Transkei had a *de facto* population of about 2 876 122, and a *de jure* population of 3 553 481, with 677 359 being migrants. The population occupied a surface area of 43 653 square kilometres. The average population density for the territory as a whole is 69 persons per square kilometre. This figure is higher than that found in most developing countries, but lower than that found in developed countries. For example the density of Botswana is 1; of Kenya, 31 and that of the United Kingdom 229 per square kilometre (United Nations, 1982). Table 2 presents changes in population size and

Figure 2 : Comparison of Age Structures in Different Parts of the World



growth rates in Transkei between 1904 and 1985. The figures are not adjusted for the boundary changes that came about with "independence" in 1976. All these censuses are generally regarded as grossly incomplete (Kalule-Sabiti 1991). The wide fluctuations in the annual rate of population growth between censuses strongly suggests the presence of errors in the methods of estimation.

Table 2: Population Size and Rate of Growth: 1904-1985

Year of Census	Size of Population	Rate of Growth
1904	897 603	
1911	967 373	1.06
1921	1 026 071	0.58
1936	1 262 450	1.88
1946	1 369 092	0.81
1951	1 390 922	0.31
1960	1 546 552	1.17
1970	1 983 266	2.48
1980	2 623 110	2.79
1985	2 876 122	1.84

SOURCE: Rates of growth as percentage per annum, computed from census data, obtained from Central Statistics Office, Transkei Government,1988.

Reliable estimates of both crude birth and crude death rates prior to 1985 are unavailable for Transkei. The crude birth rate for 1985 was 33 births per 1 000 females. In 1986 (Development Bank of Southern Africa 1987c) an estimated 50.5 per cent of the *de facto* population was in the age-group of 0-14 years (compared to 45 per cent, for less developed countries and 23 per cent for developed countries), 44.2 per cent in the economically active age-group, 15-64 years (compared to 52 per cent for less developed countries and 65 in developed countries), and 5.3 per cent in the age group above 65 (developed countries have 12 per cent and less developed have 3 per cent). During 1986 the labour force constituted 74 per cent of the estimated potentially economically active population. The local economy provided salaried employment to about 14 per cent, and 20 per cent were either in subsistence farming or the informal sector, compelling the larger part of the labour force to seek employment in neighbouring South Africa as commuters and migrants. Estimates of per capita Gross National Income (Table 3) show that Transkei has one of the lowest per capita income in the region.

Table 3 The Per Capita Gross National Product of Regions in Southern Africa in 1988 (in current prices U.S. dollars).

Region	Per Capita income
South Africa	2 290
Namibia	1 200
Botswana	1 050
Boputatswana	950
Swaziland	790
Zimbabwe	660
Ciskei	490
Transkei	470
Lesotho	410

Source : Encyclopedia Britannica Inc.

Summary

Transkei is a part of South Africa, which was annexed by Britain in the late nineteenth century. From then, Transkei became part of South Africa until it attained a nominal "independence" in 1976. The major source of income of Transkeian households have been remittances from migrant labourers, although this is declining due to the fact that fewer people get jobs on the mines in South Africa than before.

The extended family is the most predominant type in Transkei as in most African cultures. A special feature in Transkeian families is the high degree of those which are headed by females. This could partly be ascribed to the migrant labour system.

Transkei has a density of 69 persons per square kilometre, which is higher than that of most developing countries.

Chapter 3 Research Methodology and Procedures

3.1 Problems Of Demographic Estimation In Developing Countries

Demographic estimation is the process by which values are assigned to the basic demographic parameters (e.g. birth rate, the death rate or the level of total fertility) using such data as are available. Demographic parameters indicate the way in which a population will change, in size and age structure, as a function of time, and the socio-economic status of the population. The special difficulties of estimating demographic parameters in developing countries comes from their socio-economic structure (Casley *et. al.* 1968). These countries are in a period of rapid transition, demographically, economically and culturally. They normally have high, but changing birth and death rates.

The most commonly used method of demographic estimation, in developing countries, is the use of a survey (Central Statistics office 1991). Unfortunately this method has many shortcomings. For example, if census figures were used in drawing the sample, then the survey might already be biased because of errors in the census. There is also a problem in differentiating *de* jure from *de facto* population. A *de facto* member of a household included at

the time of household listing may not be found at the time of the interview and may thus be excluded from the sample. This happens particularly when there has been a time lag between enumeration and interview (Central Statistics Office 1991). In many villages, houses are not numbered so it is often difficult for an interviewer, other than the one who made the listing on the ground, to identify a particular household, solely on the basis of a map of the area.

Availability of skilled personnel is another essential ingredient in the successful collection of demographic data (Central Statistics Office, 1991). Apart from efficient administration of the whole process, the skills required are specific and exacting. These skills are of more value in a third world country, where a regional data base may be non-existent. For instance, the geography of the region might not be well known and the boundaries between villages might not be clear cut.

In questions which deal with family matters (Central Statistics Office 1991; Chanazarian 1989) it is advisable to direct them to women, who are usually directly involved with the family, preferably asked when privacy and confidentiality are assured. Although insisting on a private interview might in itself be culturally insensitive, it is usually beneficial, in terms of data quality (Randall 1988:124). What is known by a person and what they will discuss in private differs from what they

are prepared to disclose in public. Cultural rules generate a well-defined concept of shame which forbids mention of anything that pertains to bodily functions, including sexual relations, or a woman pronouncing the names of her in-laws. Such naming taboos are not uncommon, but usually there are ways around them. The demographer has to be sensitive to the possible circumlocution which can be utilized as a result of knowing the local norms (Randall 1988:123).

Questions on infant mortality have generally performed badly (Chanazanian 1989 :see section 1.1:47). Death rates obtained from surveys were almost invariably too low. The failure of questions on death was explained by arguing that people do not like to talk of these events, they wish to forget them. In some cases, live births might be overestimated, due to some women reporting foster children. Such foster children could be born of the woman's relative. Another type of error in live birth reporting could be in the omission of children who died shortly after birth and were reported as stillbirths or miscarriages.

According to the United Nation's definition, any baby that showed any sign of movement at birth should be regarded as a live birth. This can only be strictly observed if all births take place in a hospital under the supervision of trained personnel, as Barclay (1958:137) says "even expert medical opinion is troubled by the question of separating infant deaths, stillbirths and abortion". Omission of

these live births results in an underestimation of infant mortality. Use of pregnancy history, and questioning about the signs of life for each pregnancy reported to have ended in a non-live birth, does result in some reduction of this error. Older women are more likely to omit some of their living children, possibly those living away from their households (Chazarian 1989). These omissions can be eliminated by asking separately after sons and daughters, those living away and those remaining with the mother. In addition, young and unmarried females may not want to report their children or their parents may be reluctant to report such children as belonging to their daughters; women may be reluctant to report children who were born before the first marriage (Central Statistics Office, Transkei 1991).

Errors relating to age reporting and dating of demographic events appear to be the most intractable of problems that demographic researchers are faced with (Central Statistics Office 1991). Age reporting, especially for the older generation, is usually erratic. For instance, the age of old people in Transkei during the 1985 sample census was estimated using national events. Therefore age reporting, especially of old people, should be used with caution. Missing dates of demographic events are another source of error. This will result in the omission of that particular event.

A further reason for the poor response to these questions is the existence of a misconception on the part of the respondents of the length of the time period being alluded to. For instance, if the time period is vaguely expressed as "the preceding year", it might not be viewed as exactly twelve months preceding the interview, but instead as a longer or shorter period depending on cultural factors (United Nations 1983:270). The period being considered should be specified as exactly as possible, preferably by quoting dates that have special relevance for the population being interviewed e.g. fixing the reference period from the last christmas day to the date of the interview. These dates might not necessarily coincide with calendar year. The systematic errors resulting are easier to correct than those arising from incorrect responses. Experience has also shown that omission of vital events would be larger for a shorter reference period (United Nations 1983:270). With all precautions taken, it should still be understood that nowhere in the developing countries have demographic data been collected with high levels of accuracy. It is therefore advisable to be able to assess the level of misstatement error before using it to estimate demographic parameters.

3.2 Sources of Data

Data for this study come from the Demographic and Health Survey, conducted in November, 1987 jointly by the Human Science Research Council, Pretoria and the Central

Statistics Office, Government of Transkei. A representative sample of 1 550 women between ages 15 and 49 was interviewed. Of these, 1 200 were rural and 350 were urban. Cluster sampling was used, by dividing Transkei into a number of regions, within which a particular village was randomly selected. Within each village, households were also randomly selected. The number of the selected households were proportional to the size of the region. Transkei is divided into 28 districts, each of which has its own urban area, with the exception of Maluti (refer to the map of Transkei, Appendix A). In addition, Ezibeleni and Ilinge near Queenstown in the district of Lady Frere, were also regarded as urban areas. Population figures from the 1985 sample census were used for sample allocation. The urban areas were divided into five areas namely, Umtata, Butterworth, Ezibeleni, Ilinge and other smaller towns. Rural areas, were divided into five areas namely, South East (Umtata, Willowvale), South West (Nqamakhwe, Engcobo, Lady Frere), North West (Tsolo, Mt Fletcher), North East (Ngqeleni, Ntabankulu, Lusikisiki) and peri-urban, which are villages in Butterworth, Umtata, Libode and Ngqeleni, so-called because they are next to two large urban areas, viz. Umtata and Butterworth. Local field workers, who were generally females, conducted the interviews after being trained by the Human Research Council officials. The survey dealt with socio-economic, medical, reproductive and mortality aspects of households.

3.3 THE QUESTIONNAIRE

The Demographic and Health Survey (DHS) questionnaire (refer to DHS Questionnaire, Appendix B) has allocated twenty sets of questions for twenty possible live births to a woman. For each set of questions, the birthdate of the child is asked, and whether he or she is still alive at the time of the interview. If he or she has died, the age at death is recorded. If the child is still alive, his or her current age was asked.

The DHS survey has three questions concerning breastfeeding, which were directed at the last and the penultimate children. The first is whether these children were ever breastfed. Secondly, whether at the time of the interview the mother is still breastfeeding, and lastly the number of months she breastfed them. The questionnaire also had questions directed at determining the type of area where the woman's dwelling is situated. Four kinds of places were given as options, that is, a rural concentration, scattered rural, an urban white area or urban non-white area. The highest school standard passed by the mother and father was also asked. The number of times the father is able to go home, the employment and the marital status of the mother, current use of contraceptives, and knowledge of oral rehydration method were also asked in the questionnaire. The vaccination status of the last and penultimate child were also examined.

The assessment of the effects of breastfeeding on infant mortality poses censoring problems which can bias the estimate. This occurs because the length of the time a child breastfeeds is subject to two competing risks of being either weaned and death. Regardless of the strength of the relationship, the average duration of breastfeeding among those who die before a certain age is shorter than among those who survive beyond that age. Since death truncates breastfeeding, there will always be an artificial association between breastfeeding duration and mortality. To counter this bias, in this analysis, the duration of breastfeeding is categorised into four classes. The first category is when the duration of breastfeeding is three months or less, the second is when it is more than three months but less than six, the third is when it is greater than six but less than nine and the last category is when it is more than nine months, irrespective of whether the baby stopped breastfeeding because of weaning or death.

Spacing between children is another factor which needs to be clarified. Definitions of spacing range from the interval between two consecutive live births (the interbirth interval), to the interval between the outcome of the pregnancy and the conception of the next (the birth-to conception interval), to the number of births within a given time frame (the average birth interval). An apparently better way of arriving at the estimates of the period a woman "waited", when she was exposed to conception would be to measure the birth-to-conception interval as

opposed to interbirth interval, as the latter has to include the unknown element of the period of time lost due to pregnancies that do not end in a live birth (Al Tohamy *et. al.* 1979). It is clear though, that conception time cannot be estimated with any accuracy. It has been customary (Al-Tohamy et. al. 1979) in analyses of the effect of interbirth interval on infants to focus on a specific child of interest (the index child) and to examine his or her risk of death associated with the length of the immediately preceding (i.e. previous) birth. There is clearly a minimum period below which the interval between any two live births cannot be shortened. For example, no interval will, be shorter than nine months as this is the usual gestation period for a conception that leads to a live birth. A few months post-partum period are added by the fact that the woman will not be in a susceptible state and not every act of sexual intercourse will lead to conception, even when a woman is susceptible. The post-partum period can vary considerably as a result of fluctuations in its components. Its duration (Al-Tohamy et. al. 1979) is usually associated with the prevalence and intensity of breastfeeding. It is shortest (around one and a half months) where breastfeeding is hardly practised and longest (about twelve months) where breastfeeding is common and is the sole form of feeding for a long time. It should also be noted that the death of a previous child might cause the couple to make a decision to replace him or her sooner. The death of the previous infant also interrupts breastfeeding, lending to an early return of

ovulation and, in the absence of contraceptives, an increased likelihood of an early subsequent conception. In that case infant mortality is the cause of a shorter spacing rather than vice-versa.

3.4 METHODS OF ESTIMATION

Most mortality parameters extracted from census data were indirectly estimated, based on models developed by Brass, Sullivan and Trussell (Sullivan et. al. 1982). The most important assumptions of these models are:-

(1) that the respondents could accurately report on all the children ever born by a woman and children surviving at the time of the census.

(2) knowledge of the shape of fertility and mortality schedules, namely, in a particular population follow a pattern, by age similar to those embedded in the models;

(3) stationary demographic conditions namely, that fertility and mortality rates have been constant for the past 15 or 20 years; and

(4) homogeneous mortality conditions namely, that the children born to women of different age group are exposed to the same risks of mortality.
(Note that the last assumption will be shown to be untrue in this study; see section 5.1 below).

It is clear that the assumptions of these models are never met completely. This has raised questions "about whether part of the mortality differentials found were not a result of the indirect estimation procedures used" (Ariaga 1980). On the other hand, direct estimation, mostly based on surveys requires the collection of simple reference period data (the number of deaths and the population at risk to death by age for a defined time period). Mortality rates are estimated as the ratio of the former to the latter. Direct estimation is based on the rationale that such data could be estimated with reasonable accuracy for a specified reference period. (Refer to section 3.1 about problems of reporting demographic events within a specified reference period.)

Recent information available for 41 countries from the World Fertility Survey (WFS) allows for the direct estimation of infant mortality rates for particular population groups. In 1987/88, for the first time in history, South Africa (including the homelands) undertook Demographic and Health Surveys along the lines of the World Fertility Survey, which will make direct estimation of infant mortality possible. In Transkei the Demographic and Health Survey was conducted in November, 1987.

Because of possible random fluctuations, infant mortality for the three year period will be calculated before analysing their relationship to selected socio-economic and

medical factors. The choice of a three year period has other possible implications. It minimizes the effect of random fluctuations, and provides a larger number of births and deaths for analyzing infant mortality differentials than annual data. Calendar years will be used rather than years before the interview date. This was decided on to enable the comparison of estimates between other areas in southern Africa and other African countries for similar periods of time and to be able to examine the yearly trends in infant mortality. The reference period will then be taken as one to four years before the year of the interview. In other words as the survey was taken in November 1987, infant mortality will be analysed for the period from January 1, 1984 to December 31, 1986. This period represents the most recent three calendar years selected since most of the births for the year 1986 would have been exposed to the probability of dying for a full year by the interview date (i.e. November 1987). The above choice of analysing infant mortality for an approximate one to four year period before the year of the survey is likely to introduce a downward bias or influence on the estimated level. This may be caused by:

(a) Women aged 15-49 at the date of the survey were younger for the three year interval of study.

(b) Infant mortality for women in the older child bearing ages tends to be higher than total infant mortality. The exclusion of the older women (and their associated

higher infant mortality) as Ariaga (1980) noted, by looking at a period of several years before the survey date may result in an underestimation of the "true" level of infant mortality. However, the bias is likely to be small as births to mothers at the end of their childbearing years represents a small proportion of births.

3.5 METHODS OF ANALYSIS

The multiple logistic function (Khaln *et. al.* 1989:148-159; Freeman 1987) is to be used to investigate the relationship between selected socio-economic variables and the rate of infant mortality. This function was first used by Cornfield *et. al.* (1961). It analyses a categorical data set. A categorical data set has one or more response variables, each of which takes on only a few distinct values. The independent variables can either be categorical or continuous. For each continuous variable, it will be tested as it is in the logistic regression, and when it has been categorised into logical units. Logistic regression is the most appropriate technique especially when the response variable is binary, as is the case in this study. The response variable is given the value one, if the baby died, or zero if the baby survived up to the end of the first year. Logistic regression is also useful for investigating whether an observed relationship between a particular variable and another, say infant mortality, was real or was due to a mutual association with another

confounding variable. The logistic function has the form:-

$$Y= \frac{1}{1+EXP[-(a+b(1)x(1)+...+b(n)x(n))]}$$

$$Y= \frac{1}{1+exp[-f(x)]}$$

where Y is the response variable, and x1,...;xn are the independent variables. The regression estimates are the coefficients a, b(1), b(2),.....,b(n). Although a multiple regression could have been used, the logistic function is most appropriate since it can assume values that are between 0 and 1 inclusive. When $f(x) = -\infty$ then y becomes 1; and when $f(x) = \infty$ then y becomes 0. Thus if the exponent is very large and positive the risk is close to 1, if the exponent is very large and negative the risk is close to zero.

This function assumes multivariate normality of the independent variables within the population of the babies who died and those who survived, together with equal variances and covariances in the two populations. If there is some interaction between independent variables, say x(1) and x(2), then equal variance and covariance cannot be assumed. Then the logistic function would have to contain the independent variables such as b(3).x(1).x(2). If a *priori* knowledge points to the presence of interaction between variables, product terms should be included.

The independent variables that are to be included in the model are only those which are significant at the five per cent level. Another point of interest is which of the independent variables have the most effect on the infant mortality. This effect can be determined by comparing the b(i).S(i) values, where S(i) refers to the standard deviation. The x(i) variable with the highest value of b(i).S(i) has the greatest effect. The constant (a) accounts for the average risk.

Procedure **CATMOD** of the Statistical Analysis Systems (SAS) package has been used (SAS Institute Inc. 1985). **CATMOD** is a procedure for categorical data modelling. It fits linear models to functions of response variables and can be used for linear modelling, log linear modelling, logistic regression and repeated measurement analysis.

3.6 CHECKS ON DATA ACCURACY

The DHS questionnaire does not ask about pregnancies, making it impossible for the interviewer to probe whether each pregnancy resulted in either a stillborn baby or death immediately after birth. This would also have ascertained whether the child was a foster child or the mother's own. If a date of the occurrence of the death of the child was included, it would have enabled us to check the reporting of age *vis-a-vis* dates. The accuracy of the age reporting is to be examined using Myers' Index, which reflects preferences and/or dislike for each of the ten digits from 0 to 9 (Kpedekpo 1973 :42). Preference for certain digits

is common where age is not being reported accurately. A life table model is to be employed to provide the age-specific risks of death in a population, by providing estimates of the chances of dying or survival as a function of age and the comparison of these risks in different population groups. Sex ratio is another important measure of the data accuracy. It determines the accuracy in reporting of births.

3.6.1 SEX RATIO

The sex ratio is defined as the number of males per 100 females. Sex ratio (especially at birth) serves an important analytical purpose (Shyrock et. al. 1976:105). It is often used to evaluate the quality of the census or survey data, since the expected proportion of the sexes can often be independently determined within a narrow range. From an examination of the sex ratios of registered births, for a wide variety of countries, it is apparent that the component of births tends to bring about or to maintain an excess of males in the general population. The biological reasons for this pattern are not well known (Ncayiyana 1991a). The sex ratios, at birth, are above 100 for all countries for which a relatively complete data set is available: it is usually between 104 and 107 (Shryock *et. al.*, 1976). Any marked difference in the sex ratio at birth may be associated with omissions in reporting some births, since sex misstatement is not suspected.

3.6.2 The Age Reporting

(see Shyryock *et.* al. 1976; Kpedekpo 1973)

The Myers' blended method specifically examines whether there were any preference for each terminal digit. The method determines the proportion of the population whose ages have been reported to be ending in a given digit as the proportion of the entire population. The method thus yields an index of preferences for each terminal digit. A summary index of preference for all terminal digits is derived as one-half the sum of the deviations, each taken without regard to sign. If age heaping is non-existent, the index would approximate zero. The theoretical range of Myers' index is 0, representing no heaping at all, and 90 which would result if all ages were reported at a single digit. In reality, in places where age reporting is good, this index has been reported to be below 5; and where it is bad it has been reported to be above 20.

The method assumes that any single year of age is equal to one tenth of the ten year age group centering around the age, after the weighting has been done which takes cognisance of the gradual decline in the number of persons from the youngest to the oldest age in a broad group, due to the effect of mortality. Another underlying assumption is that there are no systematic irregularities in the reporting of age.

In short the exact formula is as follows:-

Step (1) Sum the populations ending in each digit over the whole range, starting with the lower limit of the range i.e. 15,25,35; 16,26,36; ... 24,34,44.

Step (2) Ascertain the sum excluding the first population combined in the step (1) i.e. 25,35; 26,36; ... 34,44.

Step (3) Weight the sums in Step (1) and (2) and add the results to obtain a blended population. (i.e. weights 1 and 9 for the 5 digit; 2 and 8 for 6 digit; ...; and 10 and 0 for the 4 digit).

Step (4) Convert the distribution in Step 3 into percentages.

Step (5) Take the deviation of each percent in step 4 from 10.0, the expected value for each percent.

Step (6) Add all the deviations to get the total A.

Step (7) The Myers' index is taken to be the half of A.

3.6.3 The Life Table Model

(see e.g. Kpedekpo, 1973; Polland *et. al.* 1974; Shryock et. *al.* 1976:249-271).

Mathematical models are often used in demographic analysis. As Brass(1981) stated, the specific model is designed to offer a rational but easy to comprehend abstraction of the typical variations that occur in the underlying and complex biological phenomenon. The model is usually based on a sufficiently large body of observations and is developed according to some well defined but rather arbitrary assumptions. The answers it provides are therefore conditioned within the bounds of its structural limitations. Nevertheless, models constitute an extremely useful tool of demographic analysis, for they help in establishing logical conclusions, in spite of the fact that the average approximations they provide cannot be duplicated exactly.

In particular, the life table model, a measure superior to the crude or the age specific death rates on which it is based (Shyrock 1976:249). Furthermore, the existing large body of national life tables from different countries of the world, covering almost the entire range of variations, provides enough ground for a generalization of the patterns and trends of human mortality (Kpedekpo 1973 :109). Life tables are, in essence, one form of combining mortality rates of a population at different ages into a single statistical model. They are principally used to measure the level of mortality, survivorship and life expectation of the population under study. One of the main advantages the Life Table model has over other methods of estimating mortality is that it does not reflect the effects of the age distribution of an actual population and does not require the adoption of a standard population before making comparisons of levels of mortality (Shyrock 1976 :249). Symbols used in the Life Table are :-

n - the number of completed years over which the interval extends.

x - the exact age at which the interval commences.

Qx - the number of persons alive at the start of the age interval, x as a proportion of births assumed as the radix of the table.

nQx - The number of persons who would survive within the indicated age interval (x to x+n) out of the total number of births assumed in the table.

nDx - The number of persons who would die within the indicated age interval (x to x+n) out of the total number of births assumed in the table.

nLx - The number of person-years that would be lived within the indicated age interval (x to x+n) by the initial cohort of 100,000 births.

Tx - The total number of person-years that would be lived after the beginning of the indicated age interval by the cohort of initial 100,000 births.

Ex - The average remaining lifetime (in years) for a person who survives to the beginning of the indicated age interval.

Lx - The survivors of a cohort of live born babies to the exact age x.

The current or period life table is to be constructed. The current life table is based on the experience of mortality over a short period of time. The alternative life table, the generation life table, is based on the mortality rates experienced by a particular birth cohort. According to this type of life table, the mortality experience of the persons in the cohort would be observed from moment of their birth until all of them die (Shyrock 1976:249). This current life table, therefore, represents the combined mortality experience, by age, of the population in the period of interest. It is an excellent summary description of mortality in a short period. The age-specific mortality rate (Mx) in a particular year, which is the basic measure on which a life table is based, has been generated by dividing the number of deaths in that age-group during the whole year by the size of the population at the midyear of the same age group. Since it would be difficult to get mid-year population figures, they have been estimated from the number of people recorded during the period of the year corresponding to the time of the year when the interviews were made (i.e. during November). Separate estimates for 1984, 1985 and 1986 were made, and the average was then used in the life table. The values

of nQx, the proportion dead in the interval x to x+n, was then computed. The relationship between nQx and nMx is an important one. The ratio nQx represents the total effect of the mortality pressure in terms of those who fail to survive the whole interval from x to x+n without reference to its variations over the course of the interval; the ratio nMx represents the average risk to which the population is subjected during its passage through the interval x to x+n. Greville's model was used to convert age specific mortality rates into probabilities of dying. This model was chosen because it is simple, it does not require precompiled tables for conversion and it does not make the assumption that deaths between exact ages x and x+1 occur on the average, at age x+0.5, as, for example when deaths at age x in a given year are rectangularly distributed by age and time interval. The formula for this model is

$$nQx = \frac{nMx}{1/n + nMx\,(0.5 + n/12\,(nMx - \log_e c))}$$

where c comes from an assumption that the nMx values follows an exponential curve. Empirically the value of c has been found to be between 1.08 and 1.10, the log c could be assumed to be about 0.095.

Since the death rates were taken from death history of children born by women in the age group 15-49; the lifetable is to be constructed up to the age of 30. Thus Ex will reflect the average remaining years before reaching the age 25.

Table 4: An example of a Life Table for the total population of the United States 1959-61

(Shyrock 1976 :253)

Age	nQx	Lx	nDx	nLx	Tx	Ex
0	0.02593	100000	2593	97815	6989030	69.89
1-4	0.00420	97407	409	388649	6891215	70.75
5-9	0.00240	96998	233	484361	6502566	67.04
10-14	0.00221	96765	214	483342	6018205	62.19
15-19	0.00456	96551	440	481746	5534863	57.33
20-24	0.00618	96111	594	479098	5053117	52.58
25-29	0.00641	95517	612	476075	4574019	47.89
30-34	0.00802	94905	761	472709	4097944	43.18
35-39	0.01147	94144	1080	468200	3625235	38.51
40-44	0.01812	93064	1686	461407	3157035	33.92
45-49	0.02869	91378	2622	450814	2695628	29.50
50-54	0.04557	88756	4045	434264	2244814	25.29
55-59	0.06630	84711	5644	410224	1810550	21.37
60-64	0.10017	79067	7920	376487	1400326	17.71
65-69	0.14463	71147	10290	330985	1023839	14.39
70-74	0.20847	60857	12687	273484	692854	11.38
75-79	0.30297	48170	14594	204984	419370	8.71
80-85	0.44776	33576	15034	129532	214386	6.39
85+	1.00000	18542	18542	84854	84854	4.58

Summary

Data for this study came from the Demographic and Health Survey, which covered the whole of Transkei. It was conducted in November, 1987 jointly by the Human Science Research Council, Pretoria and the Central Statistics Office, Government of Transkei.

Demographic data from many developing countries usually contain reporting errors such as omissions of deaths, misstatement of age and dates of events. In order to check the accuracy of data, the sex ratio have been checked. The Myeres Blended method was used to check the level of accuracy in age reporting, whereas the Life Table Model evaluated the accuracy in reporting of deaths.

A direct method of estimation have been used to determine the level of infant mortality in Transkei. In order to identify socio-economic and medical factors affecting infant mortality , a univariate analysis and a multiple logistic function were fitted.

Chapter 4 Results

In this chapter, the results from procedures described in chapter 3 are presented. First, the accuracy of reporting is investigated, using the sex ratio, Myers' index and the Life Table methods. Then, the level of infant mortality is examined. Finally, the socio-economic characteristics of Transkei, together with selected factors influencing infant mortality are presented.

4.1 Sex Ratio

Sex ratios from the whole Demographic and Health Survey have been found from this study to be 103.005 (95% confidence limits: 97.037-108.973); 101.270 (95% confidence limits: 95.12-107.81) and 111.890 (95% confidence limits: 96.88-129.37) for rural and urban areas respectively (Fig. 3). The sex ratios estimated here, do not show a marked difference from those found in almost every country where there is complete data, i.e. 104 - 107 (refer to section 3.6.1). Because of the relative small numbers in urban areas, it could not be established whether the male sex ratio is significantly higher in the urban areas (chisq test gives probability > 0.05).

Figure 3 : Sex Ratios in the Whole Sample, Rural Areas and Urban Areas Compared with Expected World-Wide Ratios

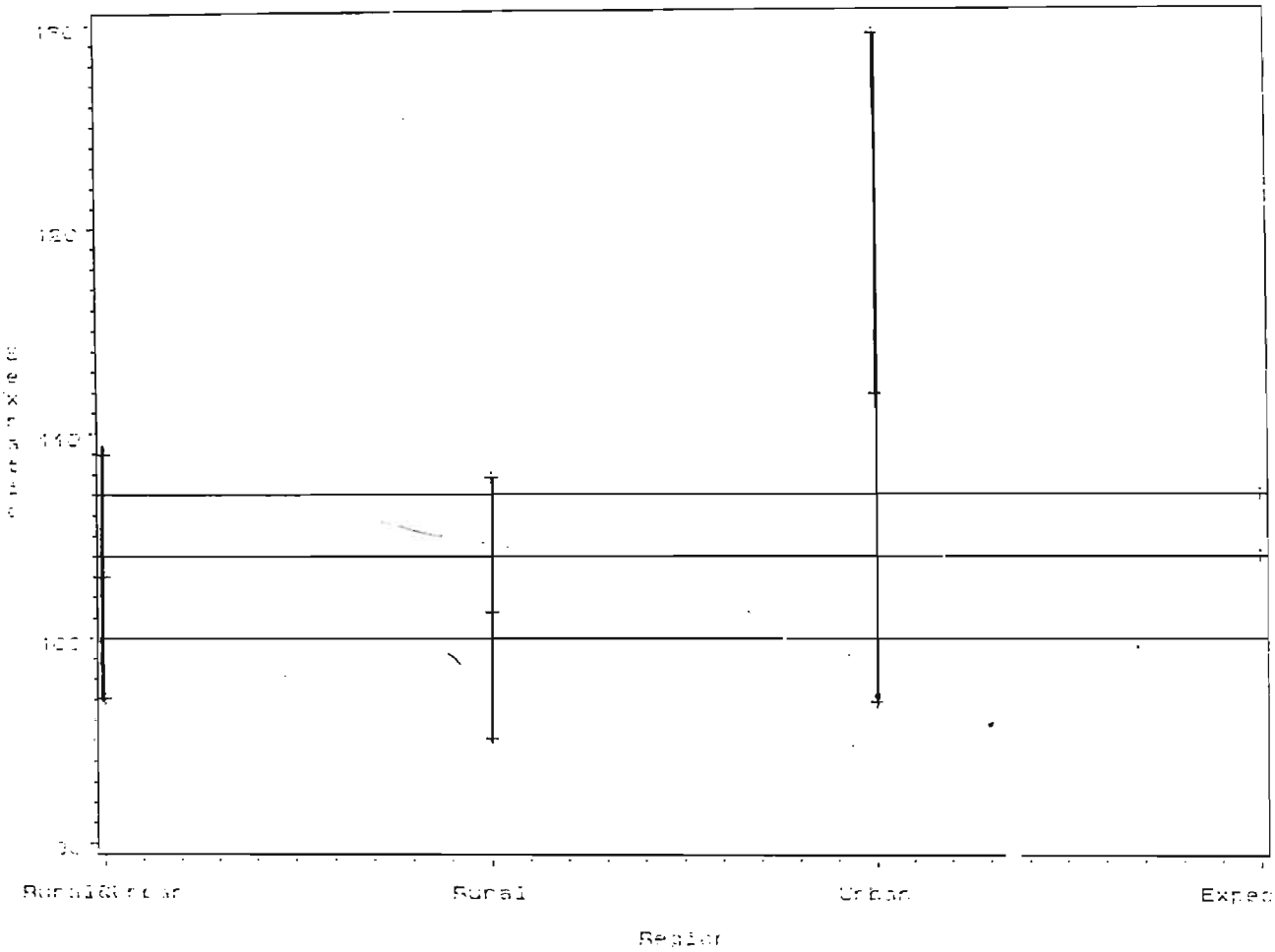


Table: 5

MYERES BLENDED INDEX

a	b	c	d	e	f	g	h	i	j
Terminal digit	Sum of the Population	Sum excluding first population	Weights (1)	Weights (2)	(b)x(d)	(e)x(c)	(f)+(g)	% Distribution	Deviation Frequency from 10.0
0	139	87	6	4	834	348	1182	10.156	0.156
1	141	60	7	3	987	180	1167	10.027	0.027
2	159	80	8	2	1272	160	1432	12.304	2.304
3	133	53	9	1	1192	53	1250	10.740	0.740
4	131	65	10	0	1310	0	1310	11.256	1.256
5	127	122	1	9	127	1098	1225	10.525	0.525
6	90	66	2	8	280	528	708	6.08	3.92
7	121	93	3	7	363	651	1014	8.712	1.288
8	132	87	4	6	528	522	1050	9.022	0.978
9	159	101	5	5	795	505	1300	11.170	1.170

TOTAL = A = 12.364

MYERES = $A/_2$ = 6.182

. For the explanation of methodology refer to section 3.6.2

. The table has been computed from the DHS Data for Transkei. 1987.

4.2 Age reporting

This section examines the accuracy of age reporting using the Myers' Blended Method (refer to section 3.6.2 and Table 4). The general deviation of each digit from the expected value (0), is not outside what can be reasonably expected (Table 4, column J). Preferred digits have been reported to have deviation of over 5 in African surveys (Kpedekpo 1973:50). It is also significant that both the digits "zero" and "five" digits show low deviations, since both of them are usually preferred when the age is not reported accurately (Kpedekpo 1973:42). The summary index is 6.182 (less than 20; see section 3.6.2). This figure is compared with Myeres' Index found in other parts of the world.

TABLE 6 : COMPARISONS OF MYERES' INDEX

(from censuses conducted in 1960 (Kpedekpo 1973))

Turkey	22.3	(reflects a significant misreporting of age)
Ghana	15.7	(A good reporting of age)
Senegal	6.7	
RSA: African	11.3	
Coloured	3.6	
Indian	1.7	
White	0.6	

TABLE : 7

Childhood Life Table

AGE GROUP	Lx	Qx	Px	Dx	Lx	Tx	e°x
0	100 000	0.0721	0.9279	7210	94953	1764387	17.64
1 - 4	92790	0.0365	0.9635	3387	362015	1669434	17.99
5 - 9	89403	0.0262	0.9738	2342	441160	1307419	14.62
10 - 14	87061	0.0055	0.0945	479	434107	866259	9.95
15 - 19	86582	0.0035	0.9965	303	432152	432152	4.99
20 - 29	86299	0.0029	0.9971	205	-	-	-

NOTE: 1) This table is based on survey data of persons up to age 29 only and so the further expectation of life (Eox) is truncated.

2) Refer to section 3.6.3 for the methods and formulae used.

4.3 The Life Table

Table 8 Age-Specific-death-Rates

Age Group	No. of People	Deaths	Deaths/persons	Prob
0	901	60	0.0665	0.0721
1-4	2 343	22	0.0093	0.0365
5-9	2 249	12	0.0053	0.0262
10-14	1 767	2	0.0011	0.0055
15-19	1 391	1	0.0007	0.0035
20-29	1 463	1	0.0006	0.0029

Table 9 Comparison of Age-Specific Mortality Rates, Mx Between three Countries

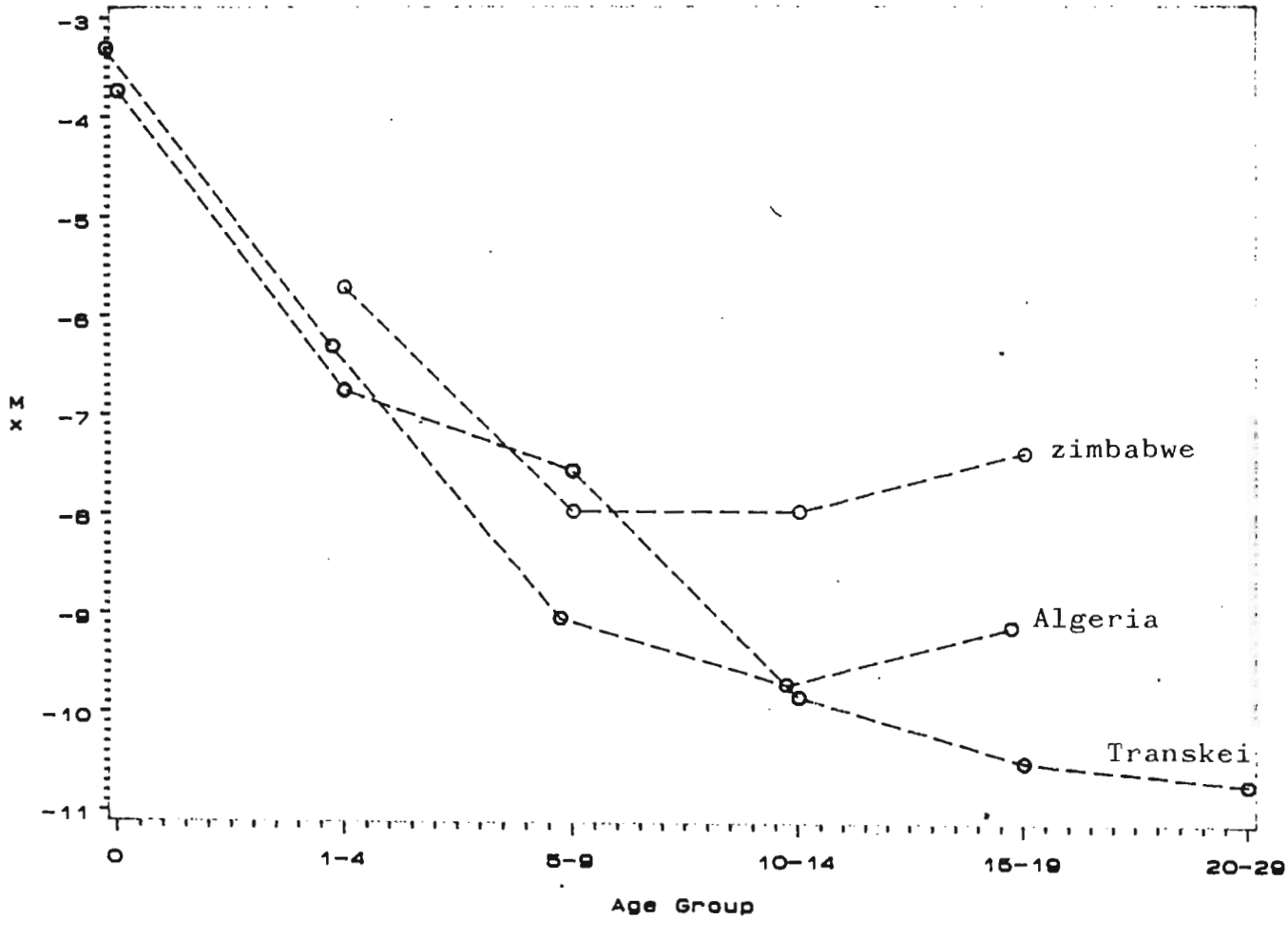
Age Group	Transkei	Algeria	Zimbabwe
0	0.0749	0.1002	
1-4	0.0093	0.0126	(0-4) 0.019*
5-9	0.0053	0.0019	0.004
10-14	0.0011	0.0012	0.004
15-19	0.0007	0.0018	0.006
20-29	0.0006	-	-

* - This is an aggregate figure for 0-4 age group.
(1) Transkei figures compiled from DHS Data
(2) Other figures taken from United Nations, 1984.

Using Life Table data (table 7) it is possible to compute estimates for the two age-specific-death rates, nMx, nQx (see formula in section 3.6.3) for the six age classes, up to age 29 (Table 8). These mortality rates are higher than those in Zimbabwe, but lower than those in Algeria (Table 9, Fig. 4).

A noteworthy feature of the age-specific death-rate in Transkei is that it continues to drop for persons 20 and over (Figure 4), in sharp contrast to the trend found virtually in every country, both less developed and

Figure 4 : Comparison of age-specific Mortality Rates in different countries



developed (see Demographic year book tables 1972-1989). The death rate usually starts increasing in the age group 15-19. The expected additional number of years to be lived during the first 29 years of life is shown in Table 7, e°x column. This means that at birth a baby can be expected to live an average of 17.64 years during the first 29 years of life. (Life expectancy at birth for the population of Transkei is estimated at 58; Central Statistics Office, Transkei Government 1991). Because of high infant mortality, the expectation of life increases after the first birthday (table 7).

4.4 Rates of Infant Mortality

Using the direct estimation procedures described in Chapter 3, the level of infant mortality was estimated as 86 (95% confidence limits: 72,1 - 109,4) deaths per 1 000 live births for the period 1984-1986. This estimate is comparable with that of 90 deaths per 1 000 live births provided by Donaldson (1988) from a sample survey conducted in 1985. Both these figures suggest a decline from the level estimated by Irwig (1981) for 1980, which was 130 deaths per thousand live births. This estimate could be compared with those found in other parts of Southern Africa in the same period (Figure 1).

The distribution of deaths within the first year shows that deaths in the first four weeks of life (neonatal deaths) constituted 32.89 per cent of the total infant deaths, and

Figure 5 : Distribution of Mortality within a Year

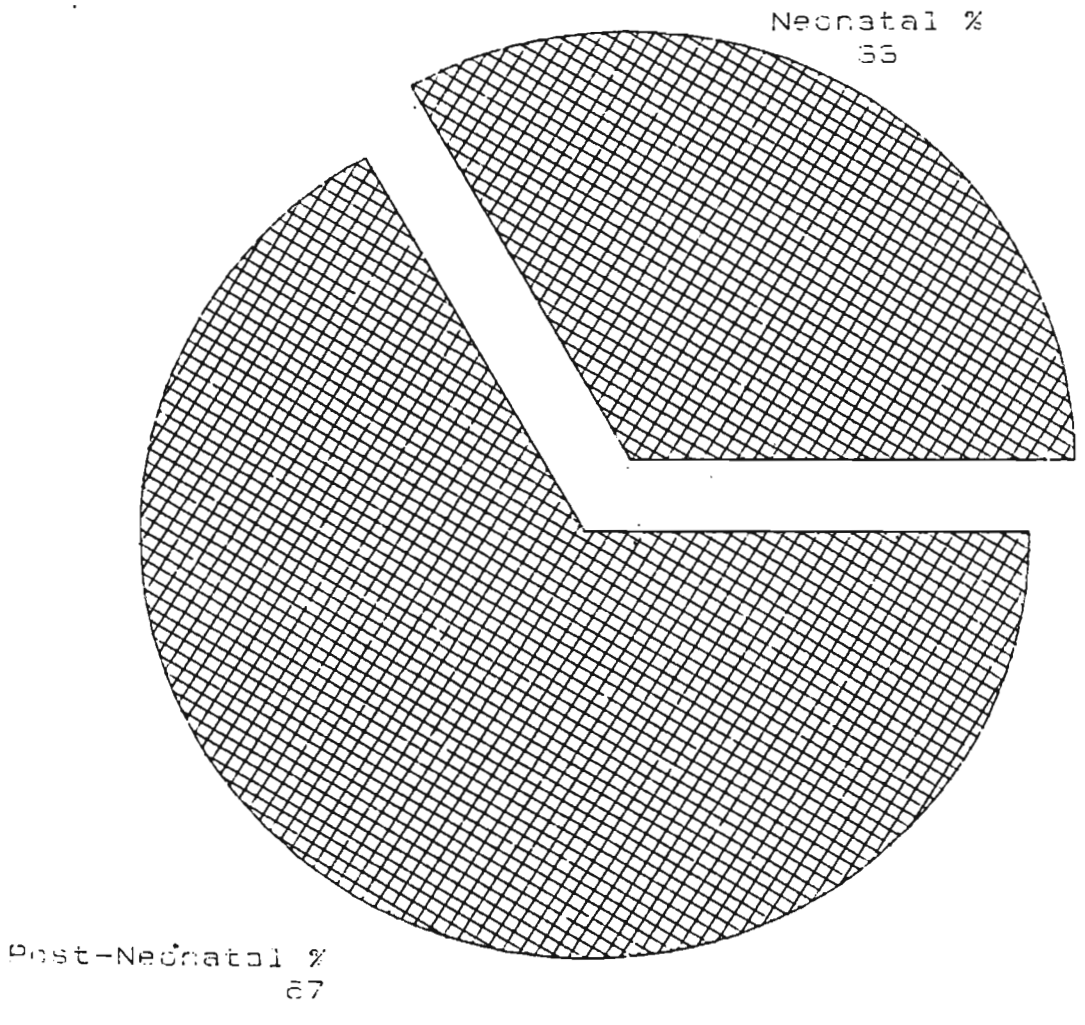


Table 10 Infant Mortality Rate (IMR) per day per 1000 live births during the first month

Days	No. At Risk	No. of Infants Died	IMR/Day
1	853	0	0
2-7	853	1	0.195
8-14	852	9	1.509
15-21	843	15	2.541
22-28	828	0	0

Table 11 Infant Mortality Rate Per Month During The First Year Of Life

MONTHS	NO. OF INFANTS	NO. DIED	IMR/MONTH	IMR/DAY
1	853	25	29.308	1.046
2-3	828	18	10.869	0.388
4-6	810	12	4.938	0.176
7-9	798	11	4.594	0.164
10-12	788	10	4.230	0.151

Source : The tables above have been computed from the data from the Demographic and Health Survey for Transkei. 1987.

69.11 per cent happened after the first four weeks (post neonatal) (figure 5, Tables 10 and 11).

4.5 Socio-economic characteristics

Before starting an analysis of factors influencing infant mortality, it is necessary to look at the socio-economic conditions in Transkei, which may influence the level of infant mortality rate.

Figure 6 : Types of Houses

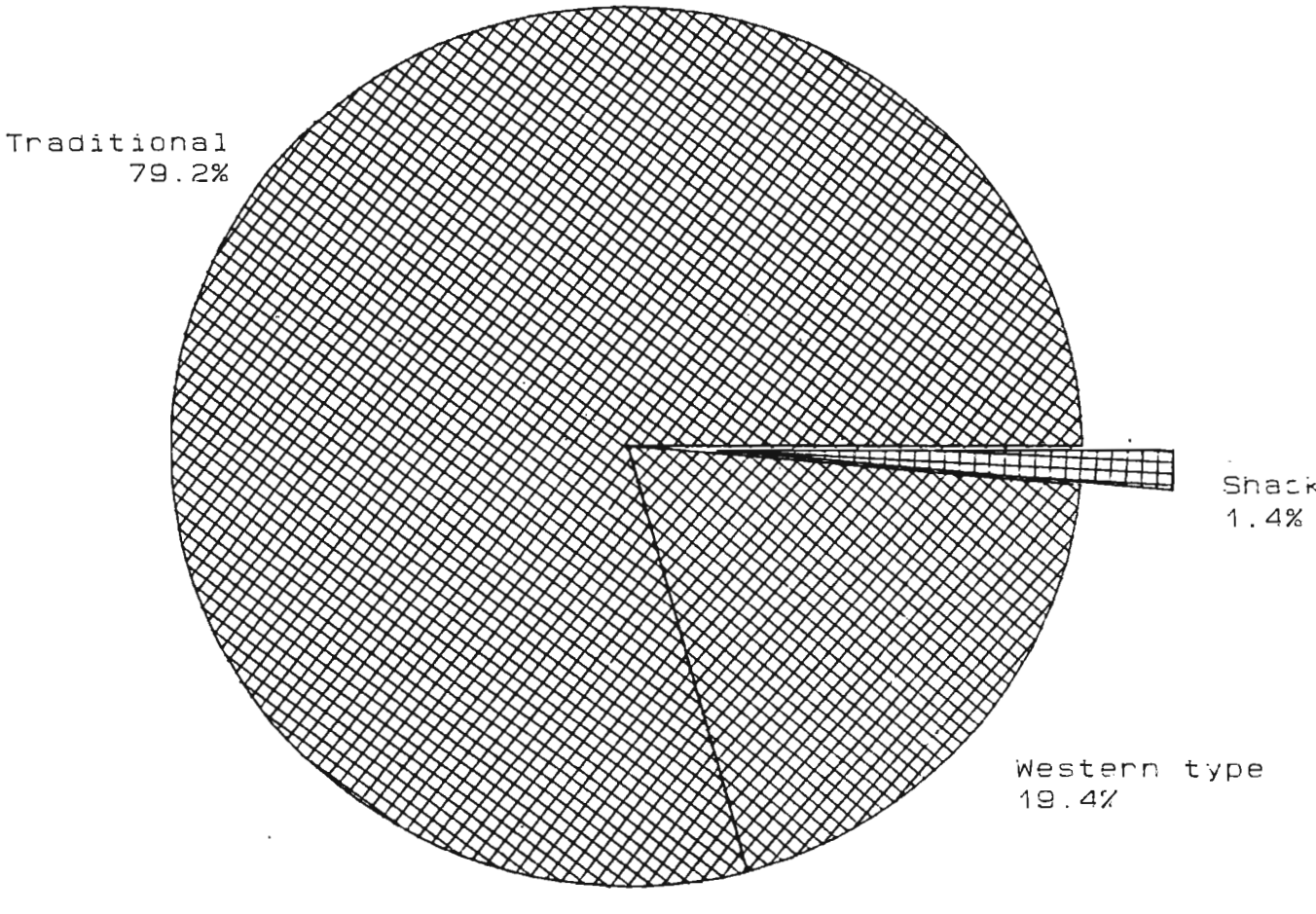


Figure 7 : Sanitation

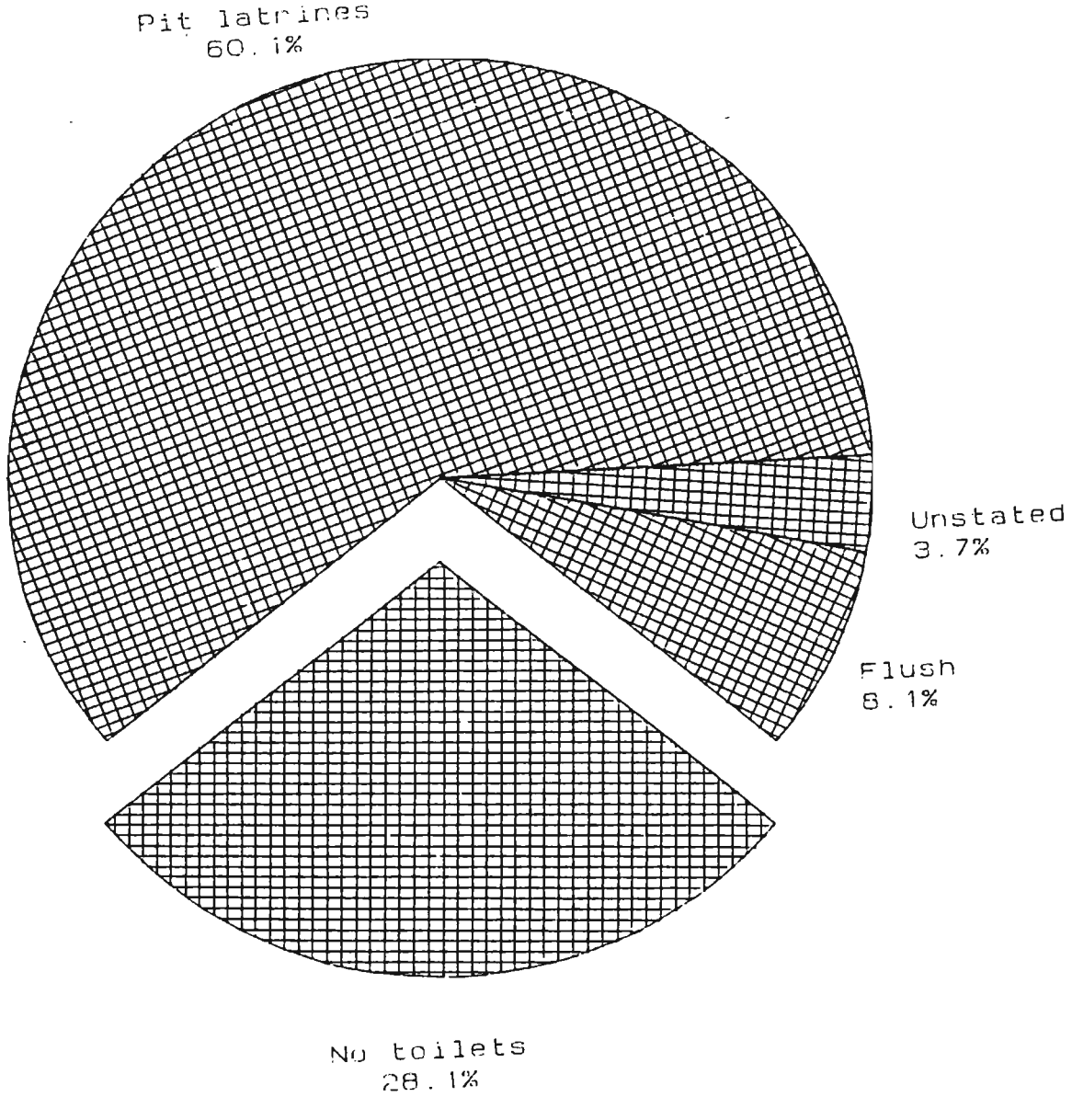


Figure 8 : Sources of Water

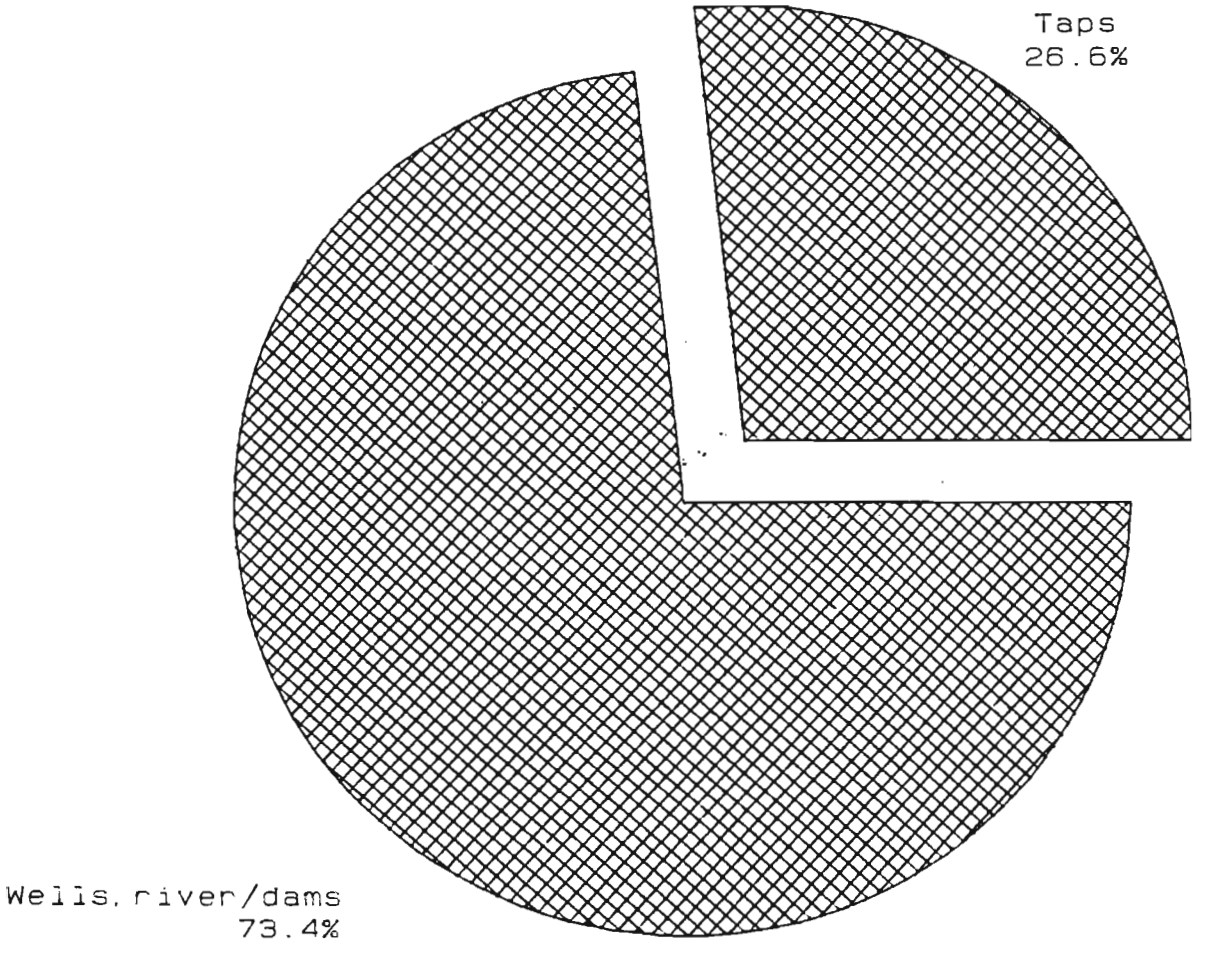


Figure 9 : Mother's level of Education

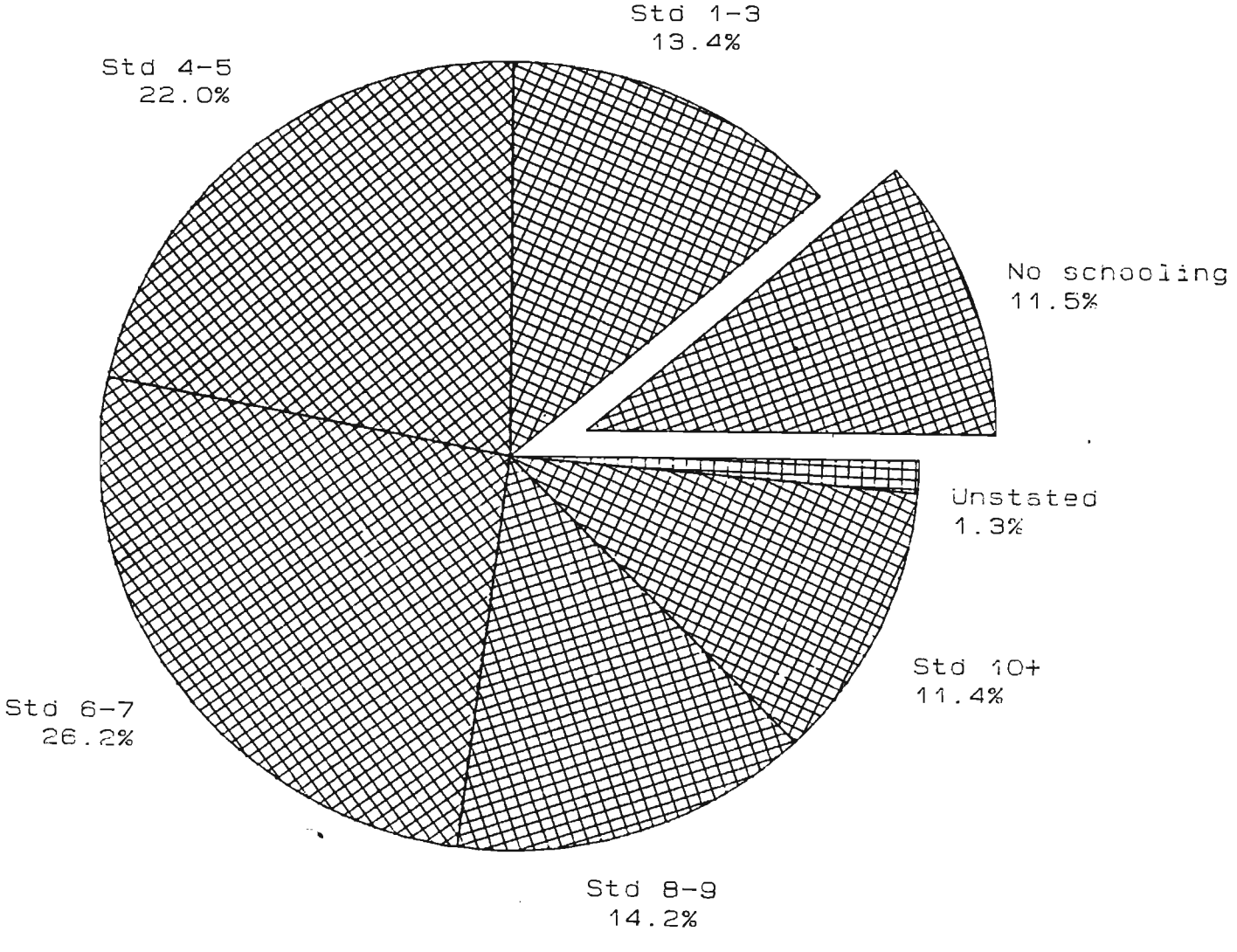


Figure 10 : Sexual Abstinence during Breastfeeding

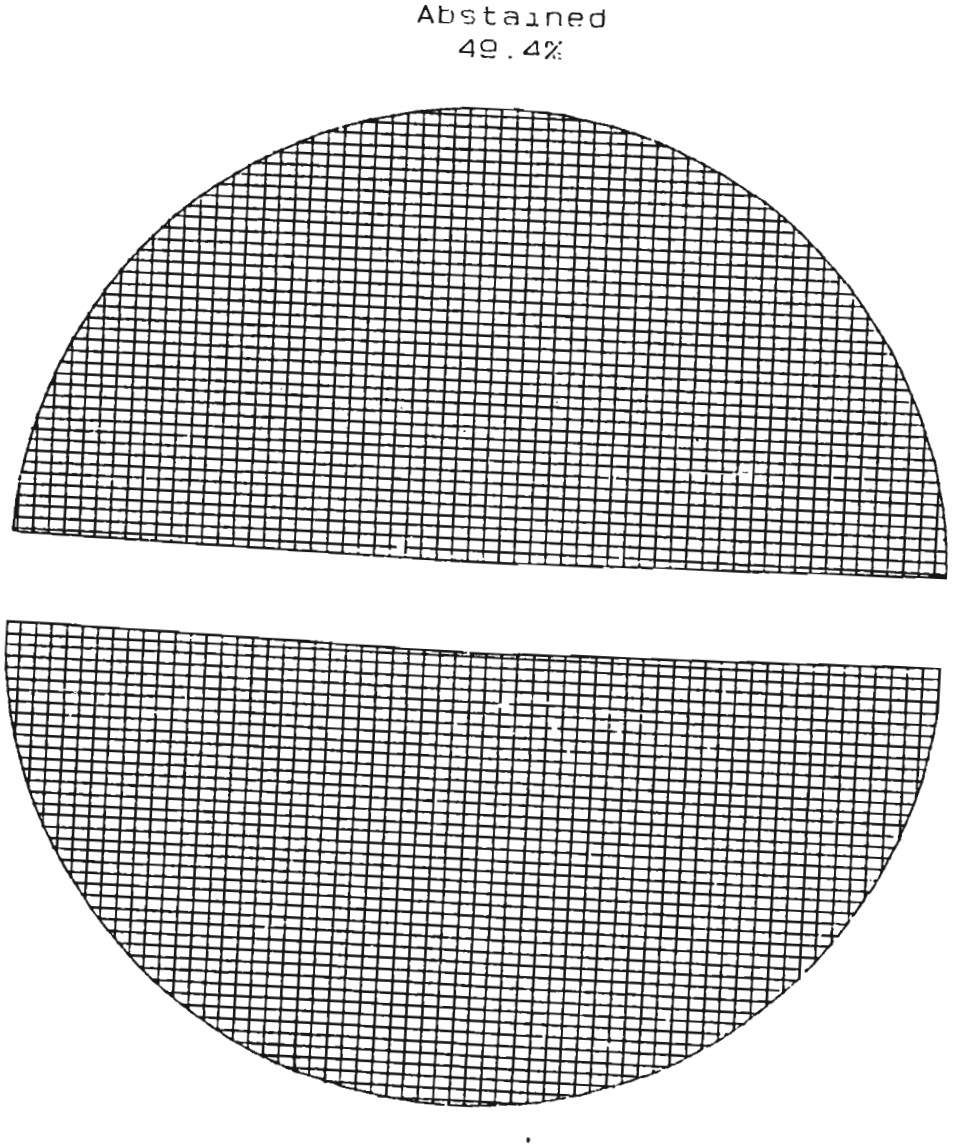


Figure 11 : Use of contraceptives by Women

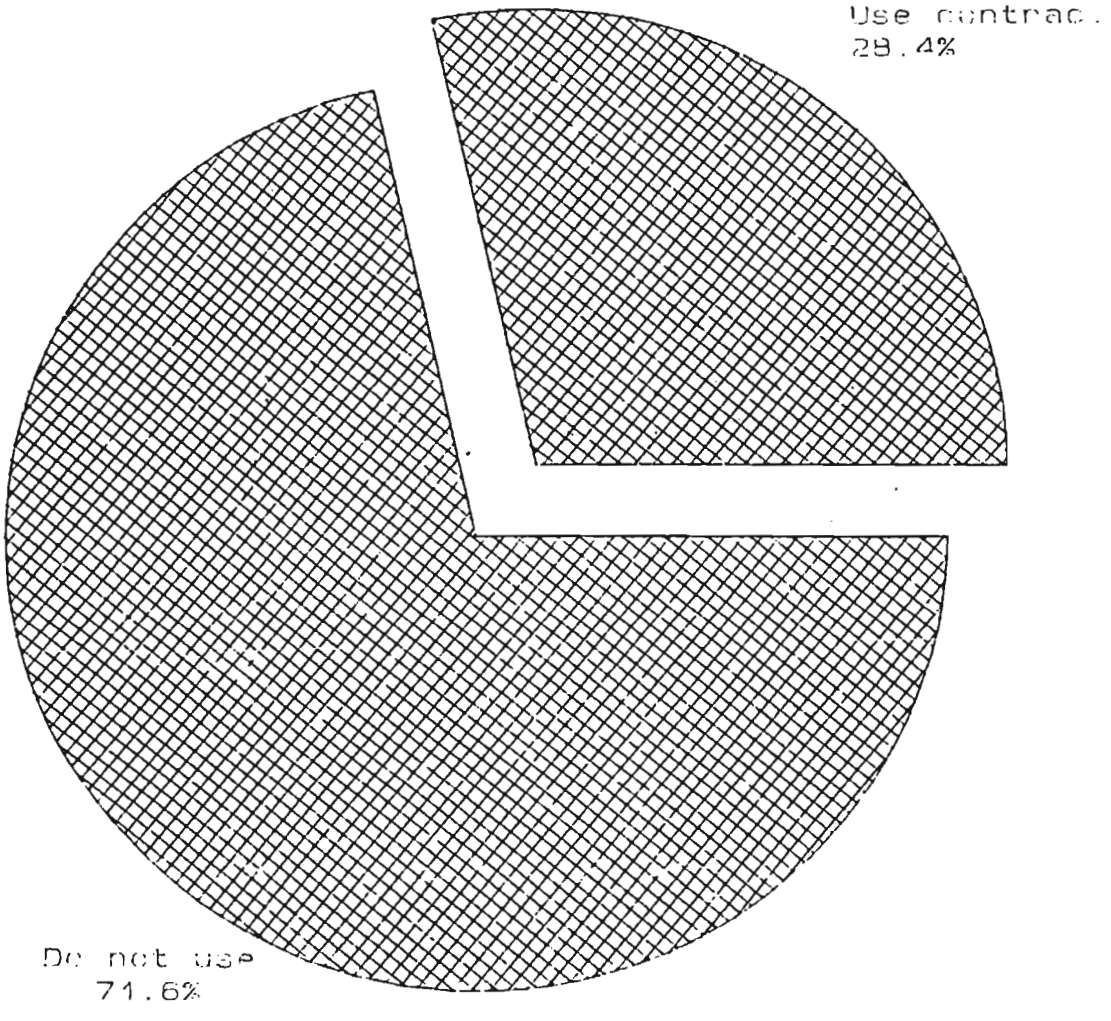


Figure 12 : Marital Status of Women

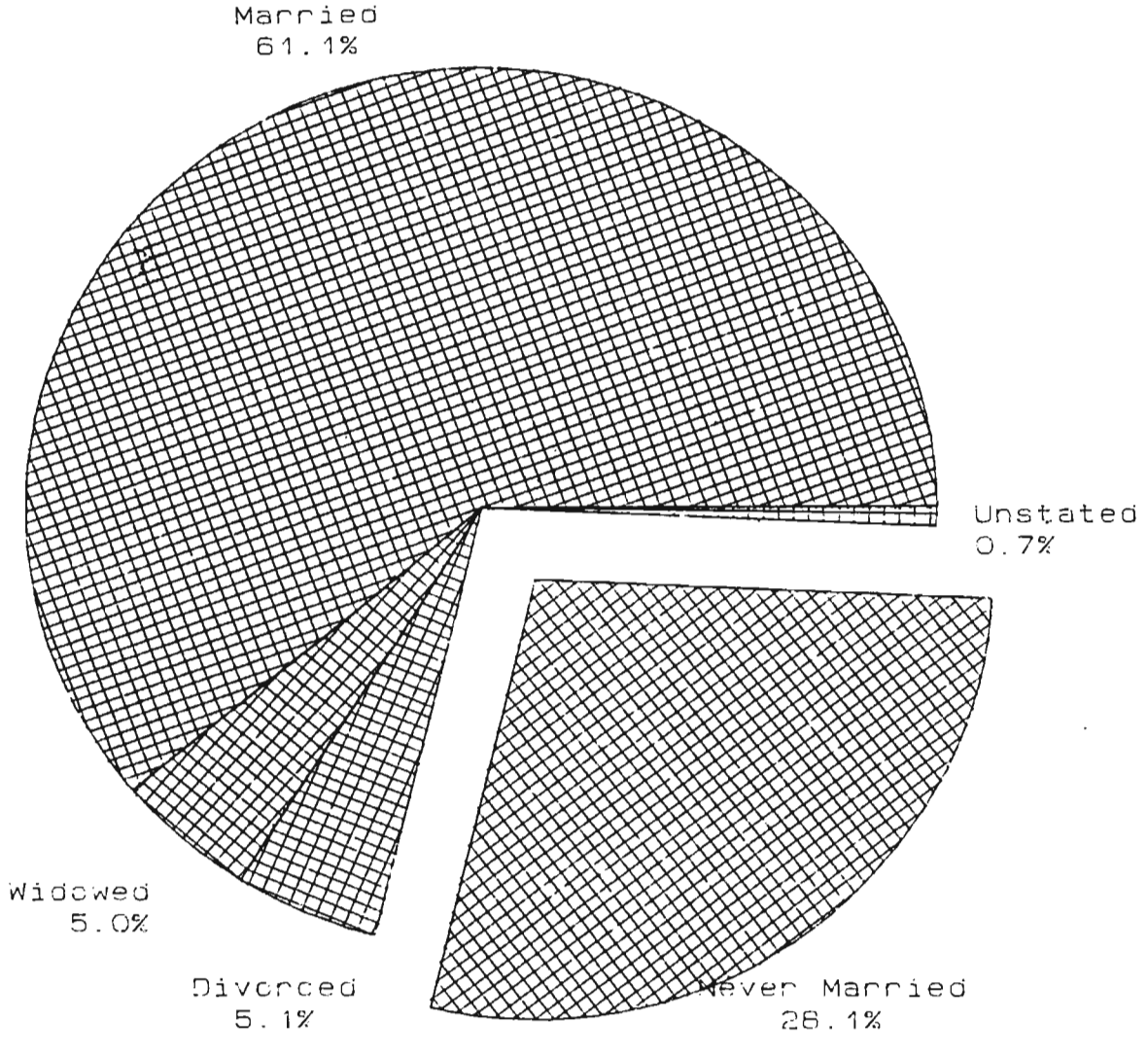


Figure 13 : Ante-Natal care during the last Pregnancy

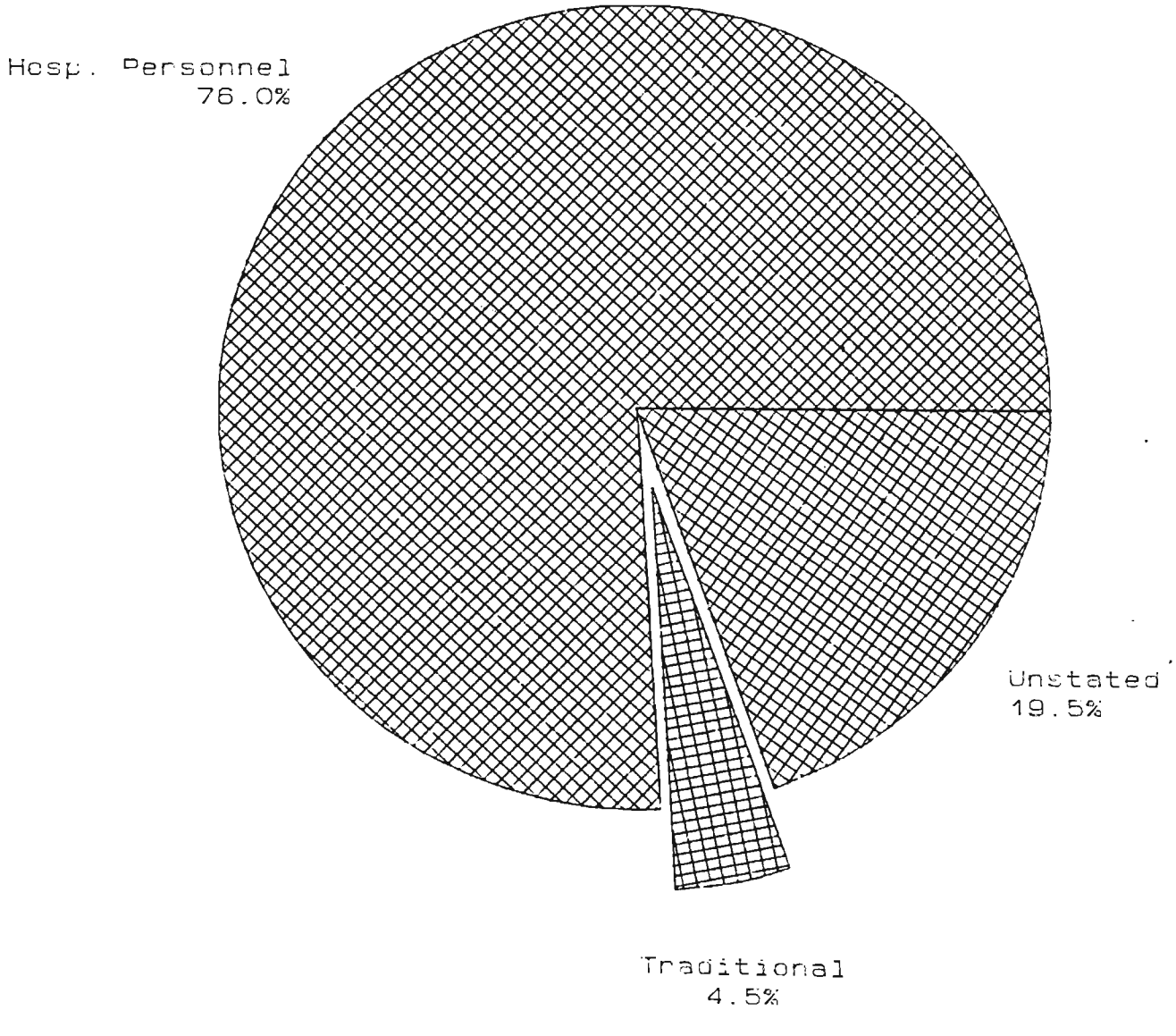


Figure 14 : Registration Status of the Last Birth

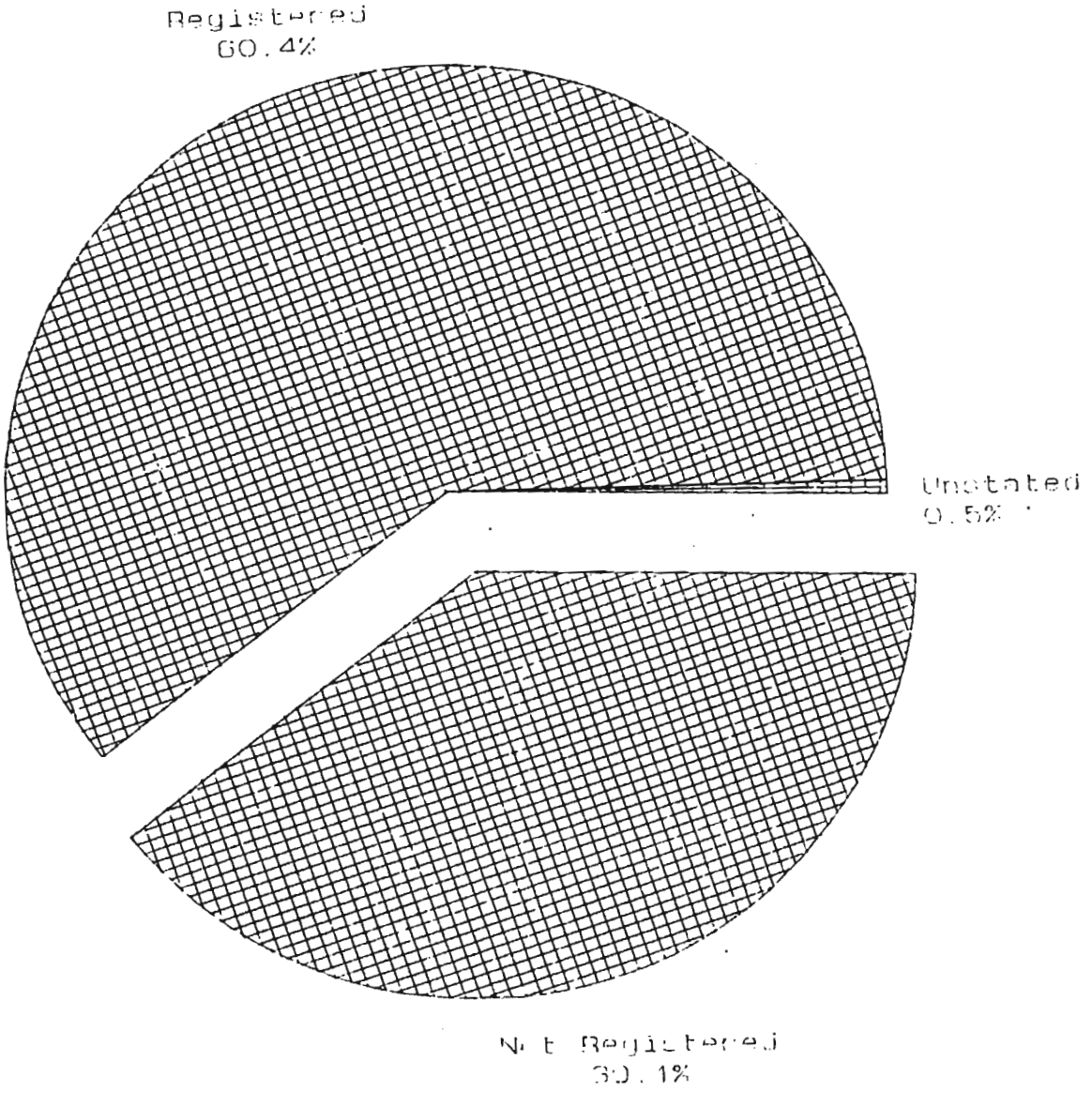


Figure 15 : Duration of Breast feeding

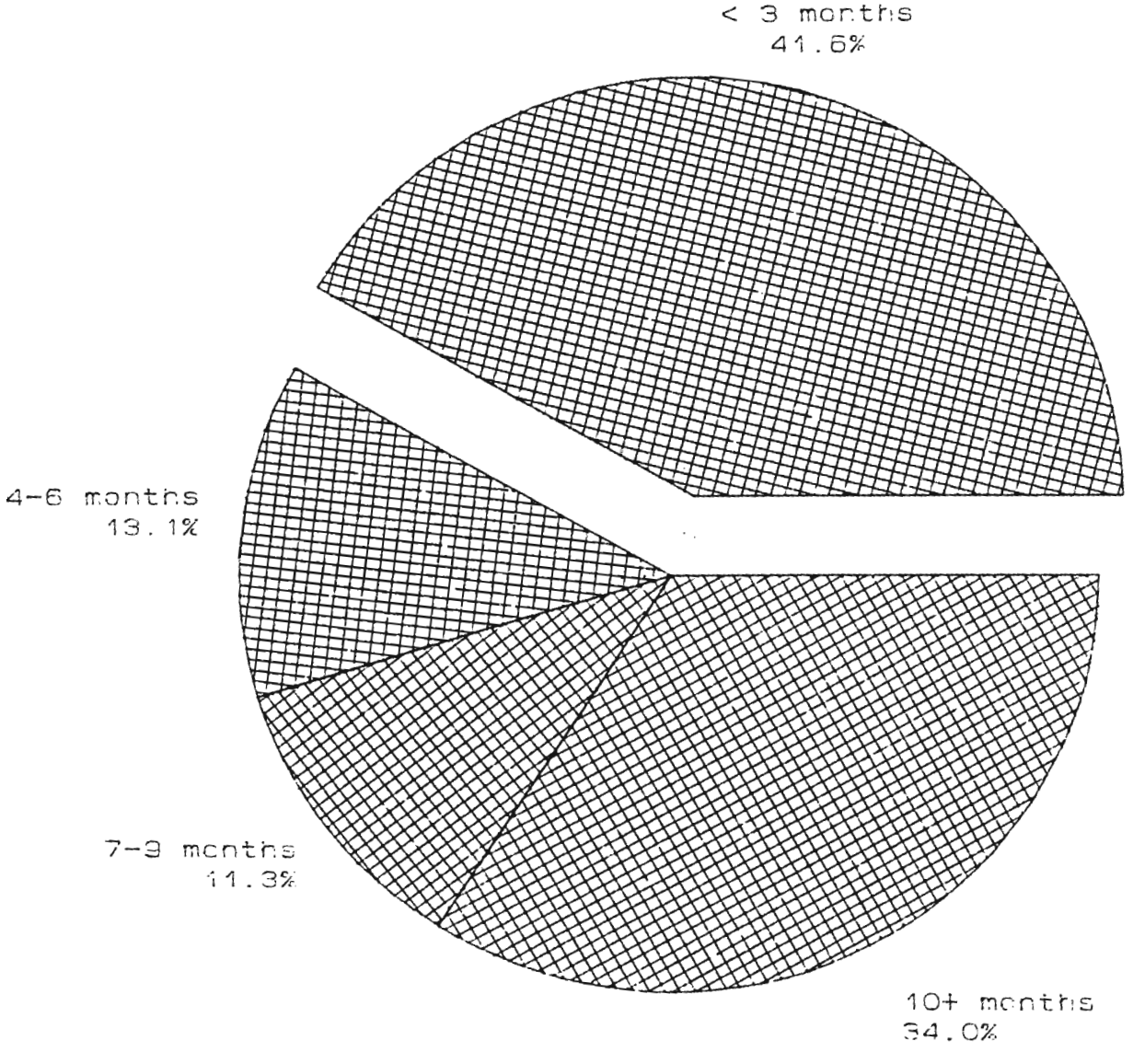


Table 12 : Variation in Infant Mortality by Age of the Mother

	Survived	Died	I.M.R.
15 - 19	126	12	86.95
20 - 24	466	36	71.71
25 - 29	512	56	98-59
30 - 34	314	18	54.21
35 +	234	28	106.87

Chi-Square = 11.93
Probability = 0.036

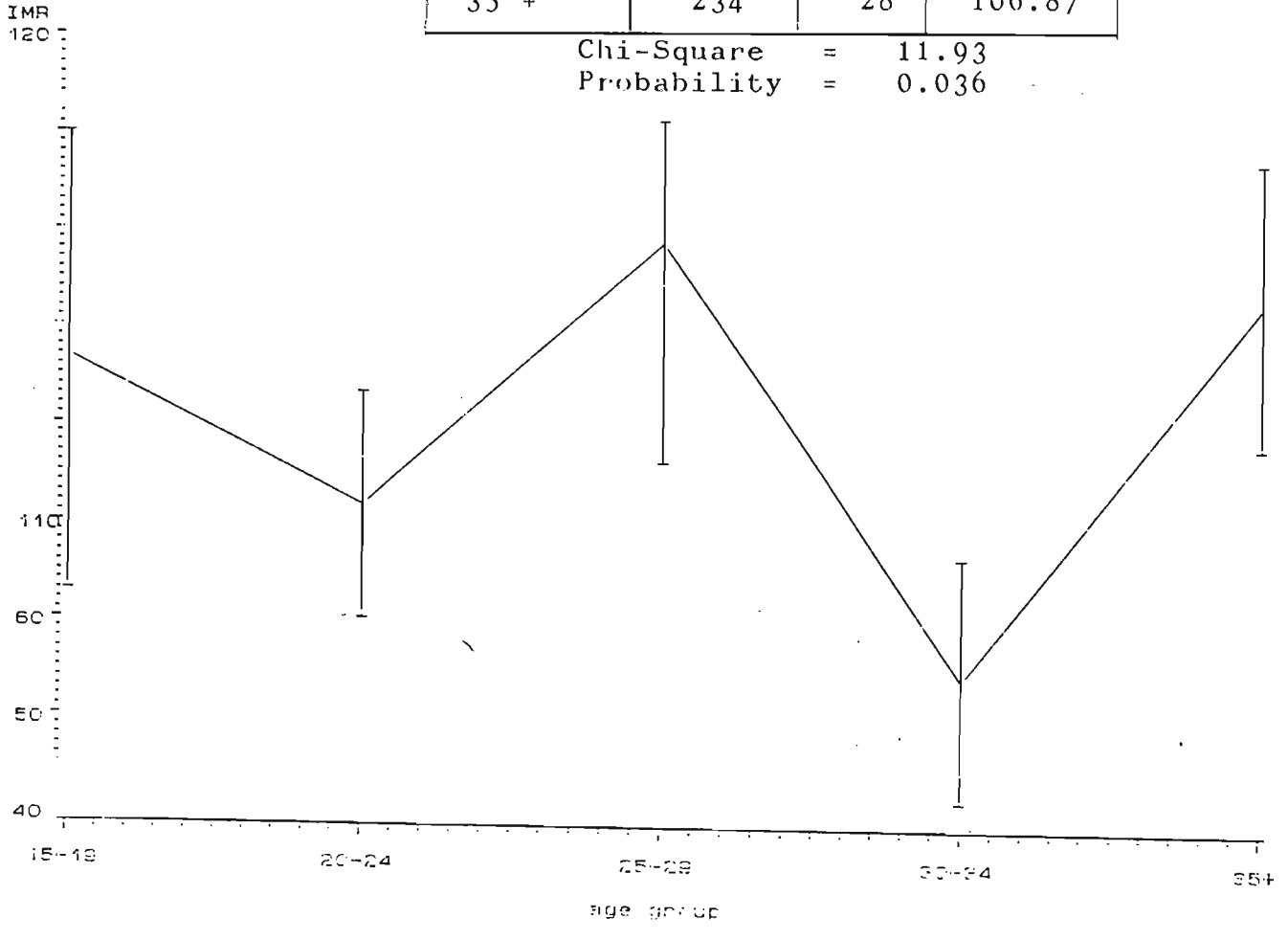


Figure 16 : Variation in Infant Mortality by Age of the Mother

Table 13 : Variation in Infant Mortality by Marital Status of the Mother

	Survived	Died	I.M.R.
Married	1044	112	96.88
Single	540	38	65.75

Chi-Square = 4.72
Probability = 0.03

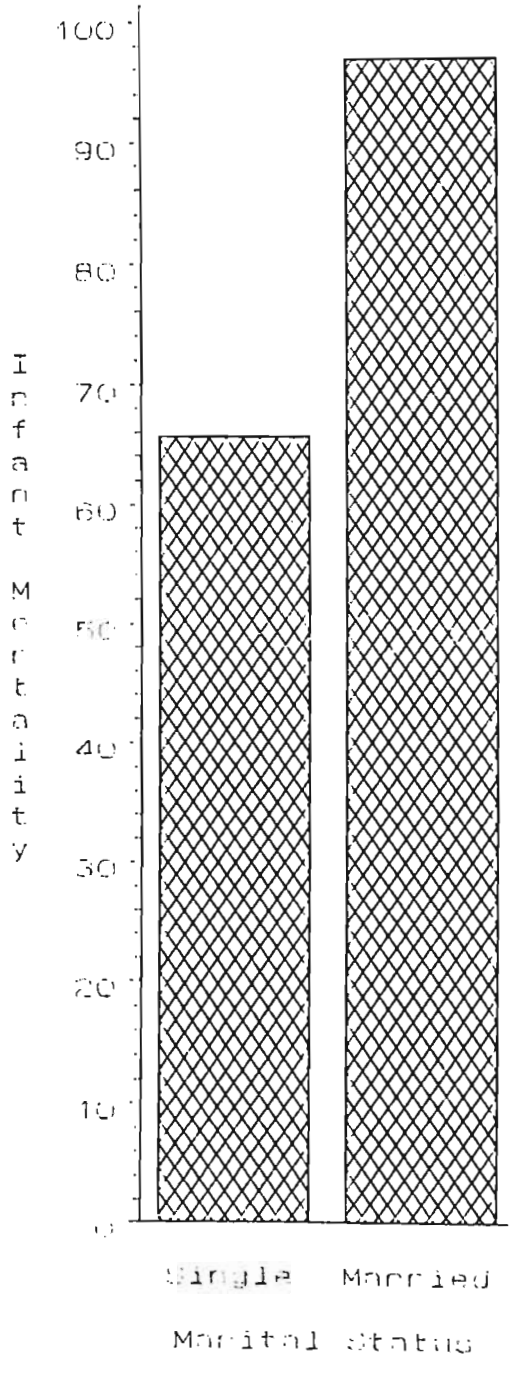


Table 14 : Variation in Infant Mortality by Migrancy Status of the Father

	Survived	Died	I.M.R.
Daily	245	32	115.94
Weekly	88	12	120.00
Monthly	82	4	46.51
Less often	676	68	91.39

Chi-Square = 4.59
Probability= 0.20

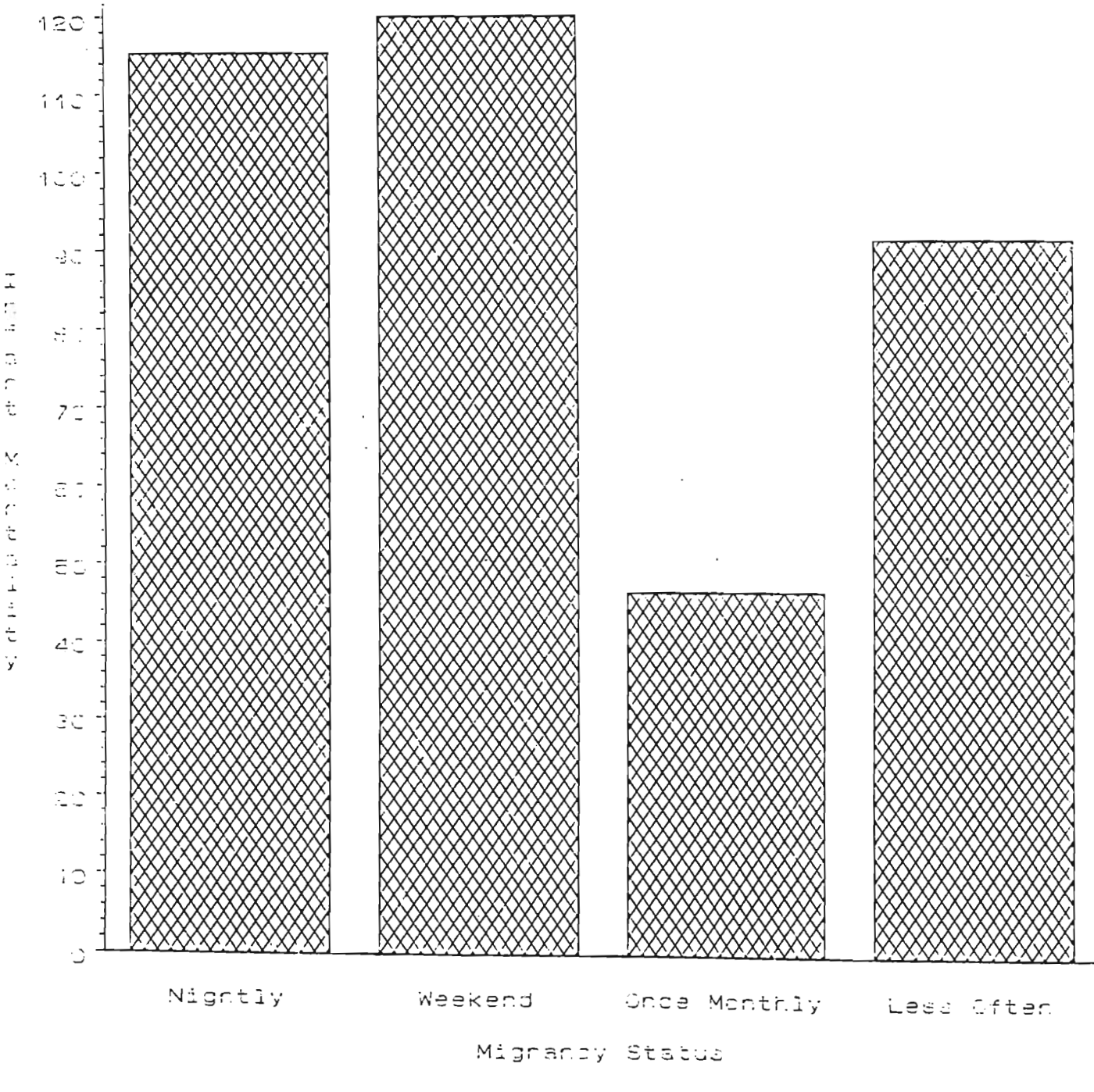


Figure 18 : Variation in Infant Mortality by Migrancy Status of the Father

Table 15 : Variation in Infant Mortality by Duration of Breastfeeding

	Survived	Died	I.M.R.
0 - 3 months	364	78	176.47
4 - 6 months	122	18	128.57
7 - 9 months	104	16	133.33
10 + months	344	18	49.72

Chi-Square = 30.00
Probability = 0.00

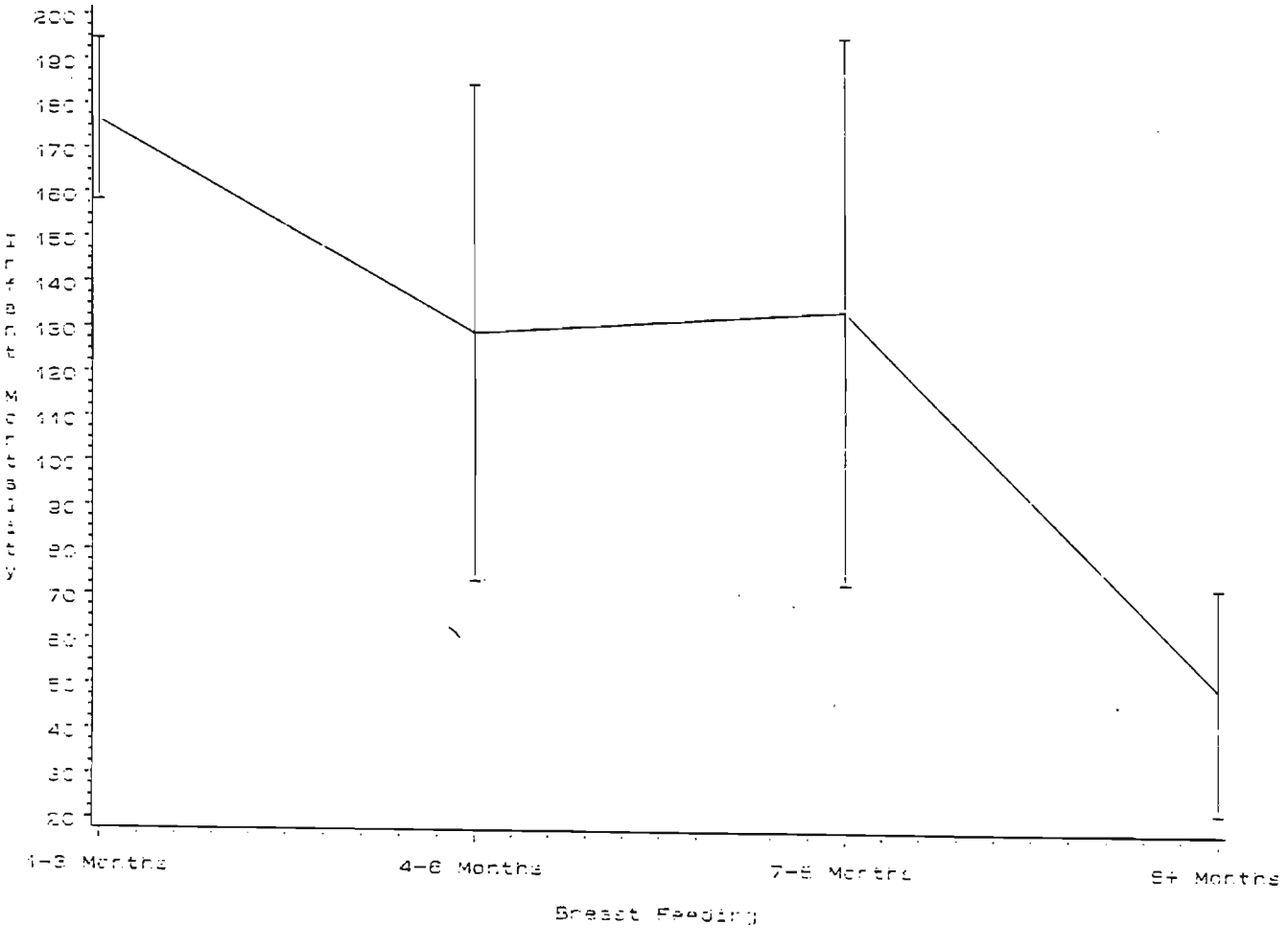


Figure 19 : Variation in Infant Mortality by Duration of Breastfeeding

Table 16 : Variation in Infant Mortality by Employment Status of the Mother

	Survived	Died	I.M.R.
Employed	394	32	75.14
Not Employed	1164	118	92.04

Chi-Square = 1.14 Probability = 0.28

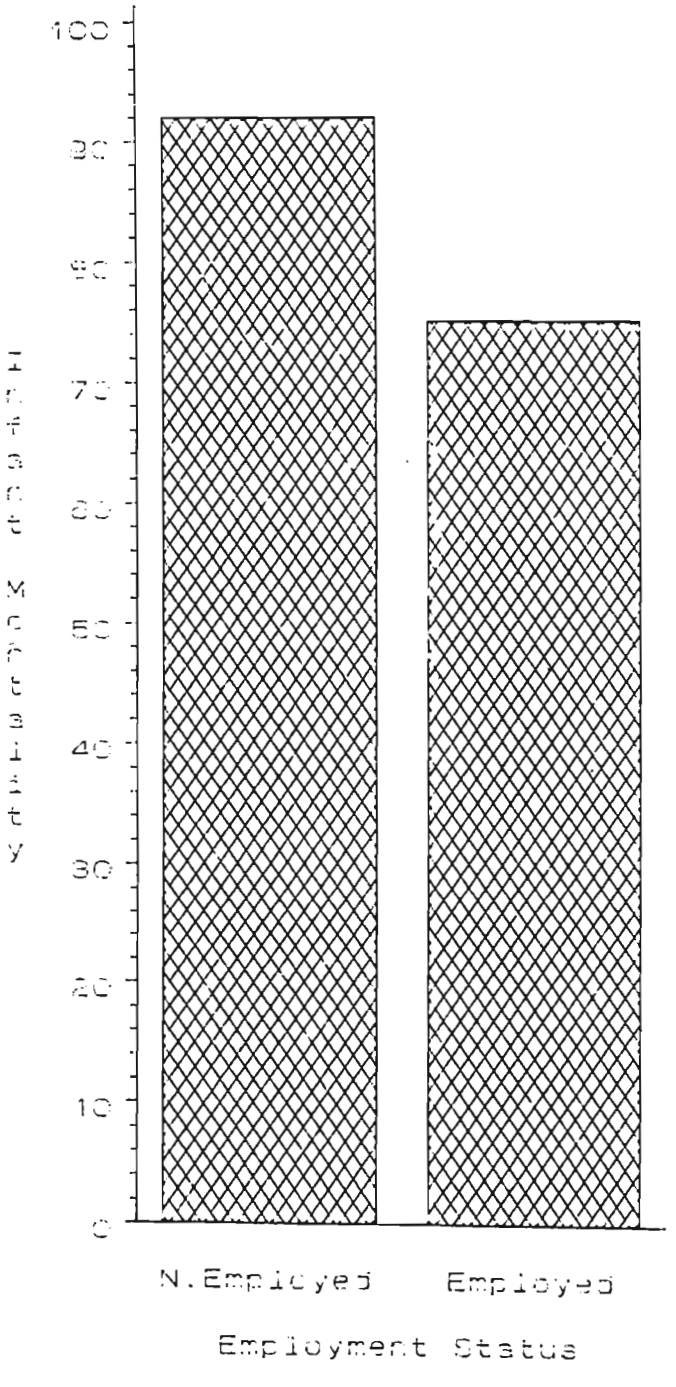


Figure 20 : Variation in Infant Mortality by Employment Status of the Mother

Table 17 : Variation in Infant Mortality by Spacing of Births

	Survived	Died	I.M.R.
3 years	458	64	122.60
3 or more years	566	38	62.91

Chi-Square = 12.11
Probability = 0.001

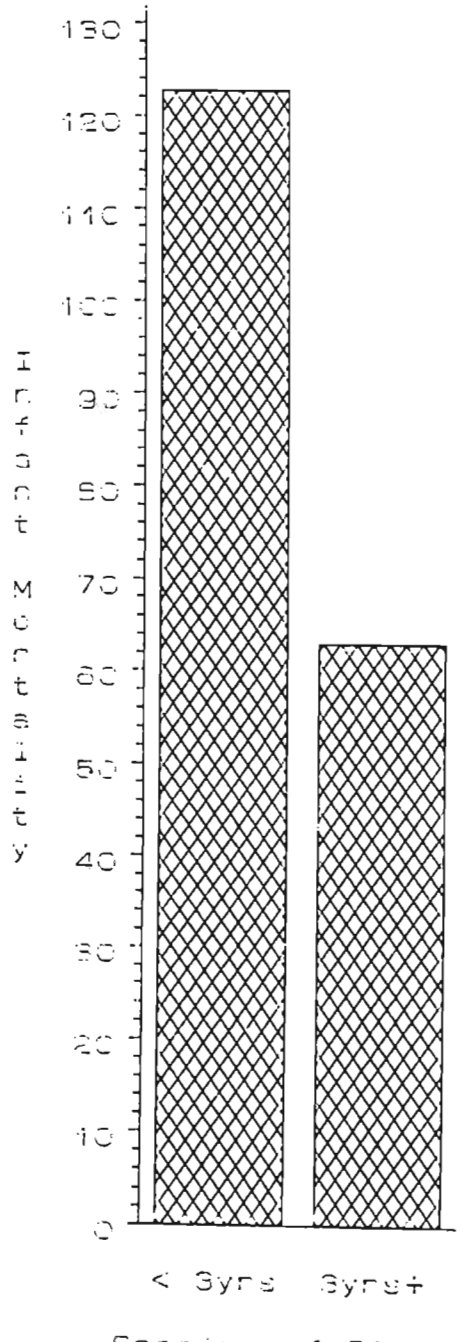


Figure : Variation in Infant Mortality by Spacing of Births

Table 18 : Variation in Infant Mortality by Vaccination Status of the Baby

	Survived	Died	I.M.R.
Vaccinated	1344	78	54.85
Not Vaccinated	154	46	230.00

Chi-Square = 76.18
Probability= 0.00

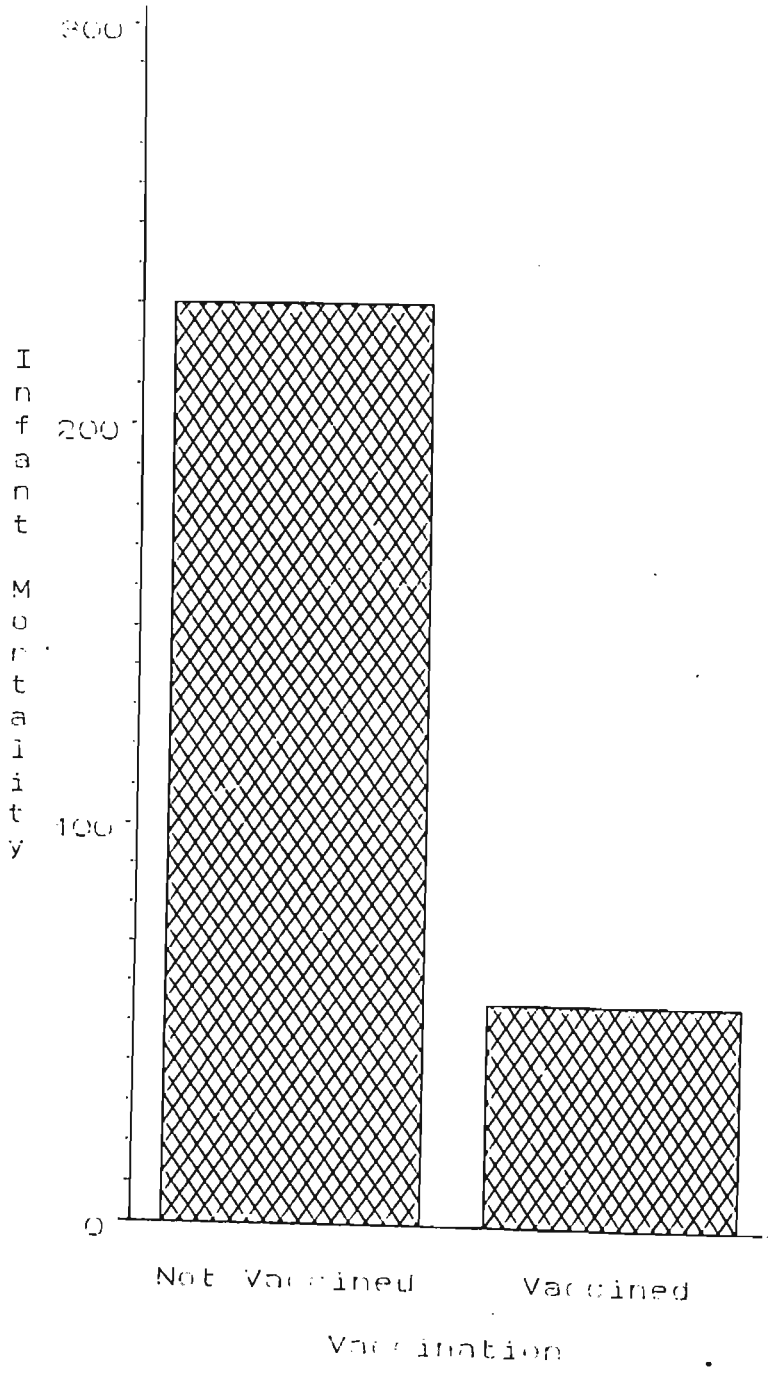


Figure 22 : Variation in Infant Mortality by Vaccination Status of the Baby

Table 19 : Variation in Infant Mortality by Residence Status of the Mother

	Survived	Died	I.M.R.
Rural	1318	134	92.28
Urban	240	16	62.50

Chi-Square = 2.41
Probability = 0.121

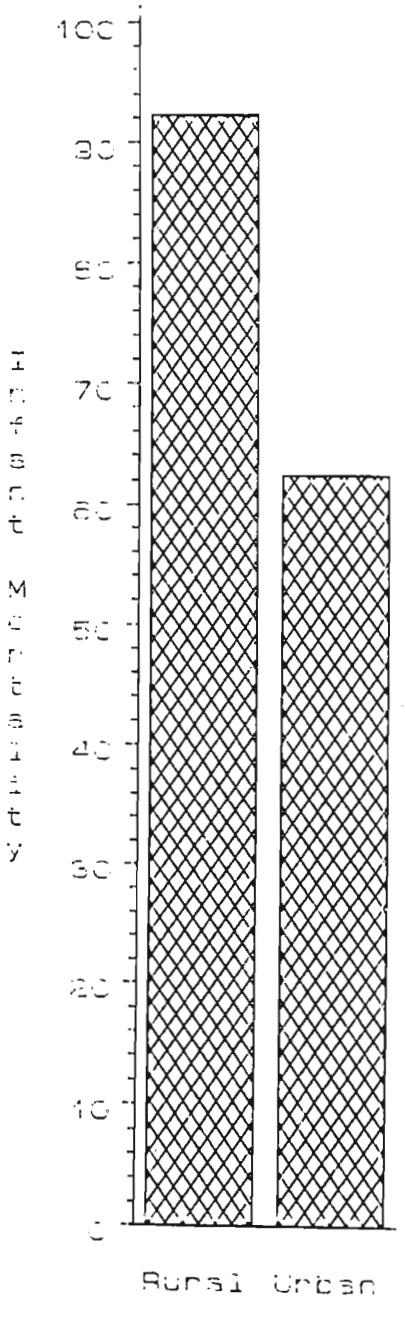


Figure : Variation in Infant Mortality by Residence Status of the Mother

Table 20 : Variation in Infant Mortality by Knowledge of O.R.T.

	Survived	Died	I.M.R.
Know	794	60	70.25
Do not know	764	90	105.38

Chi-Square = 6.57
Probability = 0.01

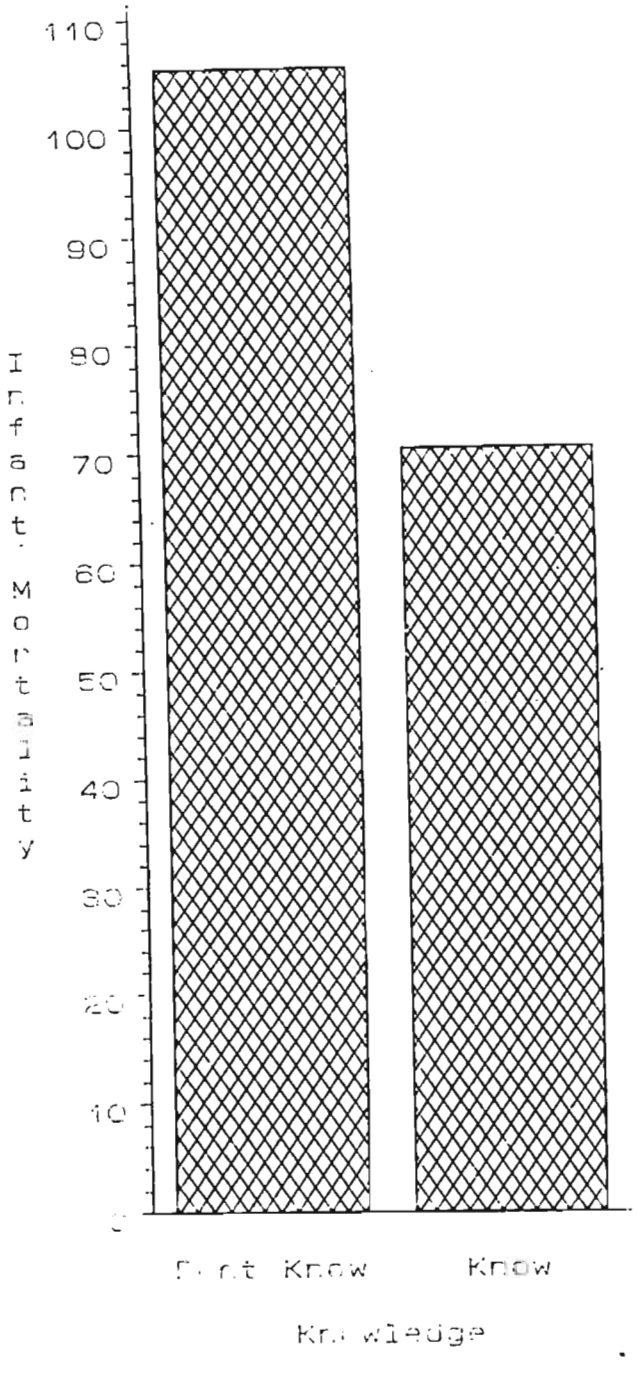


Figure 24 : Variation in Infant Mortality by knowledge of O.R.T.

Table 21 : Variation in Infant Mortality by Father's Education Status

Std Passed	Survived	Died	I.M.R.
Std 2	262	46	149.35
Std 3 - 7	434	56	114.29
Std 8 +	158	8	48.19

Chi-Square = 12.68
Probability = 0.005

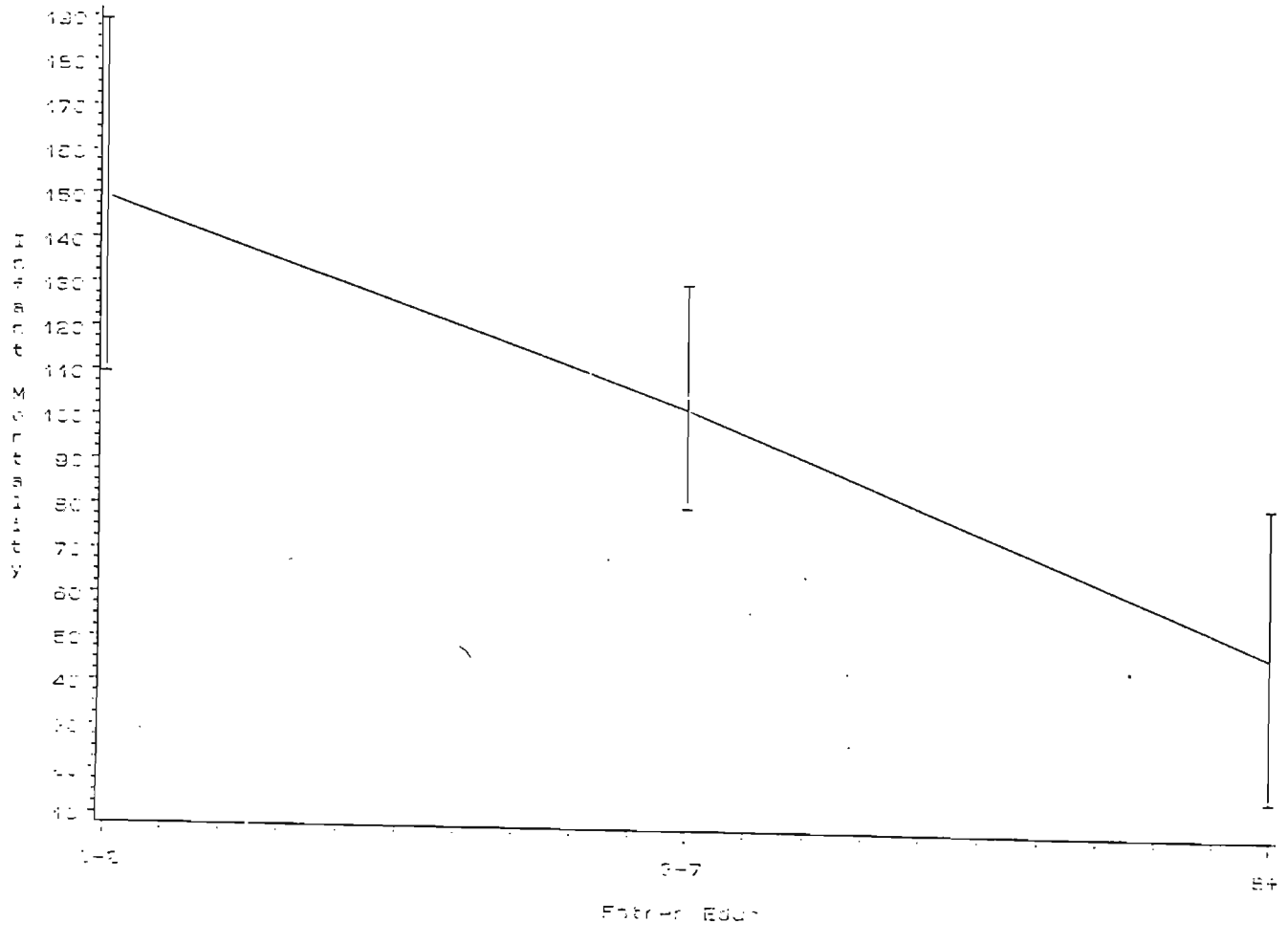


Figure 25 : Variation in Infant Mortality by Father's Education Status

Table 22 : Variation in Infant Mortality by Mother's Education Status

Std	Survived	Died	I.M.R.
0 - 3	250	28	100.71
4 - 6	580	62	96.57
7 - 8	402	32	73.73
9 +	172	12	65.93

Chi-Square = 3.36
Probability = 0.33

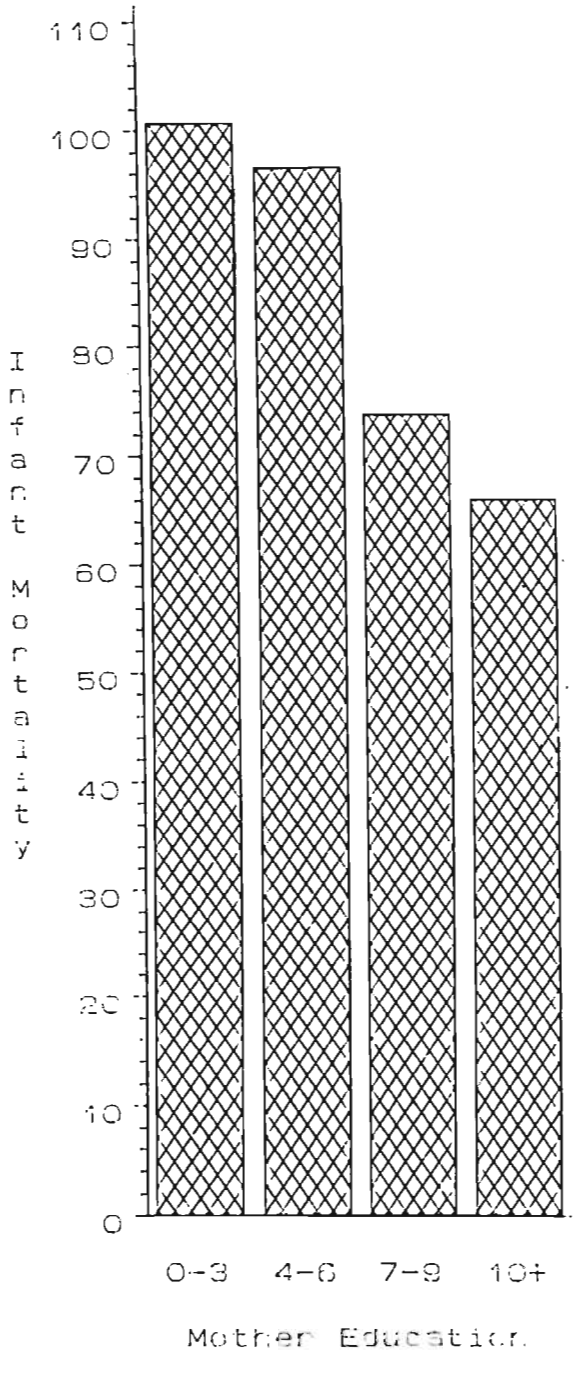


Figure 26 : Variation in Infant Mortality by Mother's Education Status

Table 23 : Variation in Infant Mortality by Birth Order

	Survived	Died	I.M.R.
1st Born	358	8	21.97
2nd Born	420	38	82.96
3rd Born	222	28	112.
4th Born	198	32	139.13
5th Born	136	16	105.26
6th Born	80	12	130.43
7th Born	148	16	97.56

Chi-Square = 32.32 Probability = 0.0

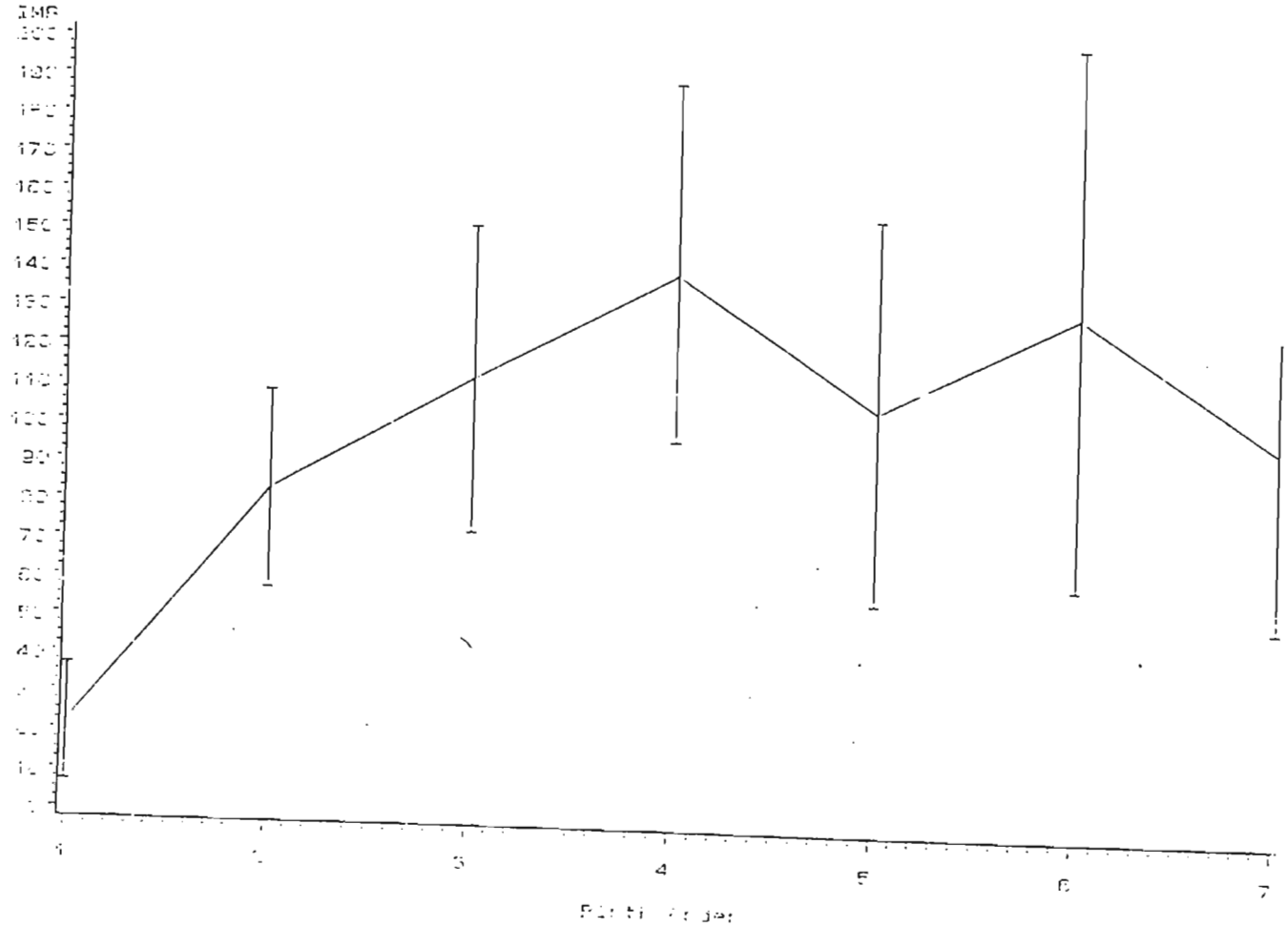


Figure 27 : Variation in Infant Mortality by Birth Order

TABLE: 24 : Relationships between the rate of Infant Mortalit and Socio-Economic Factors from the Logistic Mode

INDEPENDENT VARIABLE	PARAMETER ESTIMATE Bi	STANDARD ERROR Si	CHI-SQUARE	PROBABILI
SPACING	0.8750	0.3084	8.5	0.00
AGE OF MOTHER	1.0123	0.2686	14.2	0.00
FEMALE EMPLOYMENT	-0.7351	0.3759	3.83	0.05
VACCINATION	1.7099	0.2916	34.38	0.00
FATHER'S EDUCATION	1.4412	0.7569	3.63	0.05
BREAST-FEEDING	0.4138	0.113	13.26	0.05

4.6 Analysis of socio-economic and bio-social factors

Table 24 The Significance Table of Factors Tested

	Univariate Analysis	Logistic Function
1) Vaccination Status	sig.	sig.
2) Spacing Between Births	sig.	sig.
3) Duration Of Breastfeeding	sig.	sig.
4) Father's Education	sig.	sig.
5) Mother's age	sig.	sig.
6) Mother's Employment Status	n.s.	sig.
7) Birth order of the child	sig.	n.s.
8) Knowledge of O.R.T.	sig.	n.s.
9) Mother's Marriage Status	sig.	n.s.
10) Mother's education	n.s.	n.s.
11) Mother's Residence Status	n.s.	n.s.

Note sig. means that the factor is significant at 95% level of significance.
n.s. means that the factor is not significant at 95% level.

In this section, the relationships between the socio-economic factors and infant mortality will be described.

The mother's employment status at birth, which was not significant when univariate analysis was done, is the only factor with a negative parameter estimate, showing that employment of the mother has a negative effect on the survival of infants. Vaccination and breastfeeding were each found to be correlated at a high level of significance ($Po < 0.001$).

TABLE 26: Test of Survival status of Previous child on the spacing of the Index Child

	Sample Size	Mean Number of Months of spacing	Standard Deviation
Survived	994	39.12	28.30
Died	174	30.95	24.31

1) Variances are equal
2) t-test : Po = 0.012 ✱

TABLE 27: Current Use of Contraceptives by Abstinance During Breastfeeing after Last Birth

Abstained?	Sample Size	Use Contraceptives	Do not use Contraceptives
Yes	818	272 (33.25%)	456 (66.75%)
No	838	320 (38.19%)	518 (61.81%)

Chi-Square Test : Po = 0.036

✱

TABLE 28: Test of whether educated mothers are more Likely to abstain from sex during Breastfeeding

Abstained During Breastfeeding	Less than 10 years of Education	10 or more years of Education
Yes	624 (71.72%)	246 (28.27%)
No	604 (76.45%)	186 (23.54%)

Chi-Square = 4.815
Probability = 0.028

TABLE 29: Test of Whether mean Duration of spacing between births influences the parity of women over 34 years old

MEAN SPACING	5 CHILDREN	5 OR MORE CHILDREN
3 years	172 (32.95%)	350 (67.04%)
3 or more years	222 (36.75%)	382 (63.25%)

Chi-Square = 1.782
Probability = 0.182

TABLE 30 : Test of Whether the Level of Father's Education Influences the number of children he will have

Number of Children	10 years of education	10 + years of education
4 or less children	1056 (80.5%)	252 (19.4%)
5 or more children	380 (92.7%)	30 (7.3%)

Chi-Square = 33.08

Probability = 0.0

Table 31 The Average Level Of The Significant Factors influencing Mortality using The Logistic Model

Factor	Average
Age of the mother	0.7845
Female employment	0.2494
Spacing of births	0.5364
Vaccination status	0.8766
Father's education	0.1651
Breastfeeding	2.3778

Table 32 The Contribution Of Each Significant Factor To The Survival Of Each Baby

When age of the mother < 20 :
Probability of survival = 0.9060
When age of the mother => 20
Probability of survival =0.9637
Difference in survival = 5.77%

When mother not employed :
Probability of survival = 0.9625
When mother is employed
Probability of survival = 0.9247
Difference in survival = -3.78%

When inter-birth space < 3 years :
Probability of survival = 0.9302
When inter-birth space => 3 years
Probability of survival = 0.9672
Difference in survival = 3.7%

When baby is not vaccinated :
Probability of survival = 0.8271
When baby is vaccinated
Probability of survival = 0.9634
Difference in survival = 13.63%

When father with < std 8 education :
Probability of survival = 0.9439
When father with => std 8 education
Probability of survival = 0.9861
Difference in survival = 4.22%

We can then deduce that the chances of a baby surviving are enhanced by 13.63% if vaccinated. An index chid born at least 3 years after the previous birth, have a 3.7% better chance of survival.

Summary

The infant mortality rate for Transkei for the period 1984-6 has been found to be 86 deaths per 1000 live births. The majority of these deaths (69.11%) were during the post-neonatal period. It is possible that this figure is an underestimation of the actual infant mortality rate, since there is evidence that deaths have been significantly under reported. No significant misreporting of age has been found.

When a Univariate analysis is applied, factors which have a significant impact on child survival are:-

a) The vaccination of the child.
b) Longer spacing between births.
c) Children whose mothers are not married.
d) Children whose fathers are more educated.
e) Children whose mothers know about Oral Rehydration Therapy.
f) Children born to mothers who are beyond teen ages.

Factors which are not significant :-

a) The level of education of the mother.
b) Migrancy status of the father.
c) The type of residence.
d) Employment status of the mother.

When a logistic function is fitted, factors which are significant :-

a) Spacing between births.
b) Age of the mother when giving birth.
c) Employment status of the mother.
d) Educational status of the father.
e) Duration of breastfeeding.

Chapter 5 Conclusion

5.1 DISCUSSION

Using data from the Demographic and Health Survey conducted in 1987, this study has analyzed the socio-economic and bio-social factors that are responsible for the levels and patterns of infant mortality in Transkei. The reliability of the estimates were first looked at, given the generally poor quality of demographic data from developing countries. Although a quantitative evaluation of the level of misreporting was not possible because of the nature of the survey design, the level of misreporting was qualitatively evaluated. Myers' index was used to find whether evidence of age misstatement could be found. Digit preference, which was examined by the index, was found where the age was not stated exactly. It is clear that there is no significant digit preference (Table 5). It is also noteworthy that digits ending with '0' and '5' showed a lower occurrence than other digits. Furthermore, the overall preference index compares well with that found in countries where age is reported with accuracy.

Sex ratio also revealed patterns which have been found in other parts of the world. Preferential reporting of births of a particular sex is therefore not suspected.

There is evidence that deaths are under-reported. The first indication of omissions in deaths was found in the

reported distribution of deaths (Table 10) in the first month. Only one death in the first seven days of life was reported in the entire survey. A possible explanation for so few early deaths is that some early deaths might have been omitted. Secondly, the age-specific death-rate pattern (see figure 4) found in the survey must be viewed as suspect. The possible explanation of such a low death rate reported of children in the age range of fifteen and above is that respondents tended to forget deaths of children who were not with them at the time of their death, as suggested in section 3.1. It could then be reasonably deduced that there have been some omissions in the statement of deaths. This has proved the most significant of all reporting errors. Consequently, the mortality rate of 86 deaths per 1000, estimated from the data, is an underestimation of the 'true' figure.

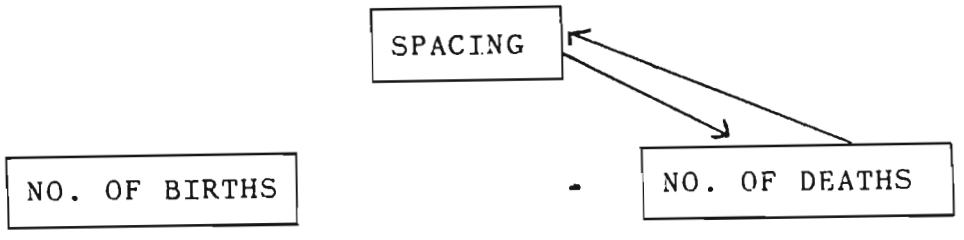
The post-neonatal deaths, which constituted the majority of deaths in the first year of life (69.11%), are mostly associated with general socio-economic conditions in a country (Geronimus 1987:246), whereas neo-natal deaths are generally associated with bio-medical conditions (Geronimus 1987:246). It is mostly the reduction of post-neonatal deaths which has led to the improvement in the overall infant mortality in developed countries (Geronimus 1987:246).

5.2 Discussion on Underlying Causes of Infant Mortality

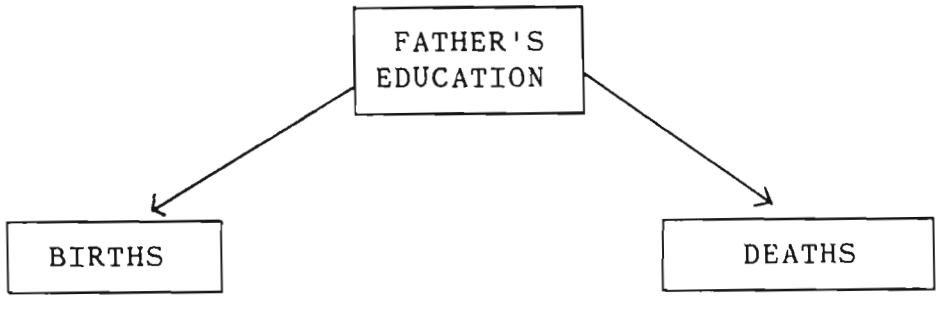
Fewer first born babies died than other babies (Table 23). This is contrary to the general trend worldwide, which has shown that first born babies are at a higher risk of dying (Potter 1988:181). This could be ascribed to the great care given to the first born children among AmaXhosa. It is common practice for a woman, before giving birth to a first child, to leave her homestead and stay with her parents for a couple of months, so that they can give some advice on childrearing (Tyani 1991).

Fig 28 The Causal Connection of Demographic Factors on I.M.R

a)



(b)



Note [i] [j] means that factor i has no influence on j.

[i] → [j] means that factor i has a negative influence on j.

Figure a is based on tables 24,25,28

Figure b is based on tables 24,29

When other factors have been taken into account, the overall level of fertility of a woman (woman's parity) does

not have any significant effect on the level of infant mortality (Table 24). Factors associated with fertility patterns i.e. age of the mother when giving birth, spacing of births and the length of breastfeeding are negatively correlated to infant mortality (Table 24). These fertility patterns are not necessarily related to the overall fertility rate e.g. women who have longer time intervals between births do not necessarily have fewer children (Table 29).

This study found that both infant mortality and fertility levels are higher among people of lower economic status (Tables 24 & 30). The connection commonly observed between high birth rate and infant mortality rate (sometimes taken as indicating causality), is probably due in great part to the fact that large families and high infant mortality rate are common among the economically disadvantaged.

Spacing between births has been proved to have a positive effect on infant survival (Table 24). The influence of the preceding birth interval in reducing deaths to the index child are logically compatible with the proposed causal mechanisms. These include the depletion of maternal reserves and the competition for maternal reserves and the competition for mother's care, particularly where resources are scarce (Potter 1988 :181-2). Furthermore, the tendency for the birth interval that follows a child that died to be shorter (Table 26) is probably due to the fact that the death happens during a period when the mother is

temporarily protected from the risk of conception through lactational ammenorrheoa, or sexual abstinence. When the post-partum non-susceptible period is truncated, there is a greater chance of an earlier conception.

Data on breastfeeding are extremely inadequate as they do not provide information on intensity of breastfeeding and supplementary feeding. Secondly, there has been no way of verifying the accuracy of the reported duration of breastfeeding as they both influence the post-partum period and the health of the baby (Hull 1985: 55-57). Notwithstanding these limitations, a pronounced improvement in overall survival for those who breastfed longer has been found. It should be noted that breastfeeding contributes to a reduction in infant mortality by giving children healthy food, better disease control and also through extending birth control (refer to section 1.5). It is clear that since there is a low level of contraceptive use (28% have ever used them), spacing of births by most women depends entirely on lactational amenorrhoea. The influence of lactational ammenorrhoea is further strengthened by the tradition of abstaining from sexual activity during breastfeeding. The study has shown that this tradition is negatively correlated with the educational status of the mother (Table 28), presumably because educated mothers prefer to use modern contraceptives.

The mother's educational levels have been used in this study as a surrogate for the contribution of cultural

factors, traditions, norms and preferences, since it is difficult to integrate cultural factors into a quantitative account of infant mortality. The apparent lack of correlation between the educational status of the mother and infant mortality (Table 25), is a noteworthy one, since mother's educational status has always been implicated as a significant factor influencing infant mortality (see section 1.5). Other recent studies, for example, Mbacke *et. al.*, (1987) (cited in Onyenunwa 1989), have also observed in Kenya that mother's educational level was not an important factor. It is possible that the lack of significance of mother's education reflects the diminishing role of formal education in improving the health status of women in the Transkei. It is also possible that the type of education in Transkei does not enhance health awareness (Schools in Transkei do not offer health education, besides limited visits by nurses from clinics; Mniki 1992).

The income level of the household is closely associated with the father's educational level. It should be noted that a typical Transkeian household earns about 90 % of its income from salary or wage income (Bembridge 1987 cited by Heron 1991 47-57). Therefore, agriculture is secondary to remittances of the father as a basic means of subsistence. The father's education has proved to have a significant effect on infant mortality (Table 24). It is therefore apparent, from this study that economic factors, rather than behavioural patterns, have an influence on infant mortality.

In this study, the work status of the mother was only classified into two groups, based on whether or not they were working at the time of the survey. While working mothers enjoyed a nominal advantage when this factor was assessed individually, it was found to have a detrimental effect when other factors were taken into account. Judging from the educational level distribution of these women, most of them are employed in low income jobs. These findings, therefore, tend to highlight the lack of alternative child care for mothers who are employed in low income positions.

The residential status factor has not been found to be significantly correlated with infant mortality. There is a problem in defining urban areas, which might bias the finding of urbanization on infant mortality. The urban areas have been defined in the study as the 28 "proclaimed" towns which are defined as such by the local authorities in Transkei. This definition, however, is not a true reflection of the number of people urbanised, since it excludes a large concentration of people adjacent to these areas who are functionally urbanized. Unfortunately, no study, as yet, has tried to quantify the number of functionally urbanised people. There is also a high migration of young people to towns. Because of this rapid urbanisation, urban and rural boundaries have become blurred. The failure of the urban areas to show a significantly lower infant mortality rate is in direct contrast to many studies in developing countries, which has

shown this effect. This could be ascribed to the fluidity of the urban/rural status in Transkei.

Vaccination of infants is another factor which has been found to be highly effective in controlling infant mortality.

5.3 Summary and Conclusion

This analysis of the 1987 Demographic and Health Survey indicates that for the period 1984-1986, the level of infant mortality in Transkei was 86 per 1000 live births. This suggests a decline of the infant mortality rate in a period of about five years (refer to previous rates;section 1.2).

While overall high fertility rates and high infant mortality rates are associated with poor people, causality between them has not been proven (Fig. 28). Therefore the support of fertility control and mortality reduction measures should be justified on the merits of each rather than attributing any strong influence of one over the other.

Other factors associated with fertility patterns, namely, close spacing between births and early childbearing leads to higher infant mortality (Tables 24). Besides higher infant mortality, early motherhood has been associated with other social evils. Early motherhood interferes seriously

with woman's social development and limits her future life options. Her education is usually interrupted or discontinued, limiting her chances of a career, her earning capacity and even her chances of marriage (Tyani 1991). Both these demographic factors are a concern of infant health welfare and family planning programs.

This study has provided evidence for the widespread decline in the length of the lactation period (Fig. 15), which in turn has had a negative effect on infant mortality (Table 24). This is an example where apparent 'modernization' has had an effect detrimental to the health of the population.

It is also clear, from this study that income is crucial in lowering the high rates of infant mortality (Table 24). Higher income tends to lower infant mortality, especially where there is a high incidence of malnutrition among children (see section 1.5). Malnutrition occurs throughout most of the underdeveloped world through a deficiency of essential nutrients (see section 1.5). Health services in developing countries in general are usually distributed very unevenly, with the greatest share going to affluent families in the principal cities (Kleoczkowski 1984:38). At the same time as societies in Transkei are losing their traditional forms of solidarity and cooperation, social policies and national politics have often favoured the upper and middle classes. Judging from the vast difference in mortality levels between people of different income levels (as represented by father's education level),

there is a reason to believe that despite the general decline in the rate of infant mortality, the difference in rates between the lowest income level and the highest is actually increasing.

The engagement of women in cash or wage employment has been found to have a detrimental effect on infants. Women tend to fall into lower categories because of women's differential access to education and the constraints imposed by the sexual division of labour. Most women are employed in labour intensive, low income jobs. As economic reality compels women to engage in some form of paid employment, the number of women joining the labour force will increase. Therefore, conditions under which many women in Transkei work should be improved and affordable child care centres for these women should be provided.

The causes of death of infants identified in this study are divided into three groups:-

(a) First-level causes for which there are efficient preventative techniques that can be applied within a health system at an elementary stage of organization and that can be operated without substantial improvement in the standard of living. These would include: vaccination for all babies, prevention of births at early age, appropriate spacing of births, and breastfeeding for a longer period.

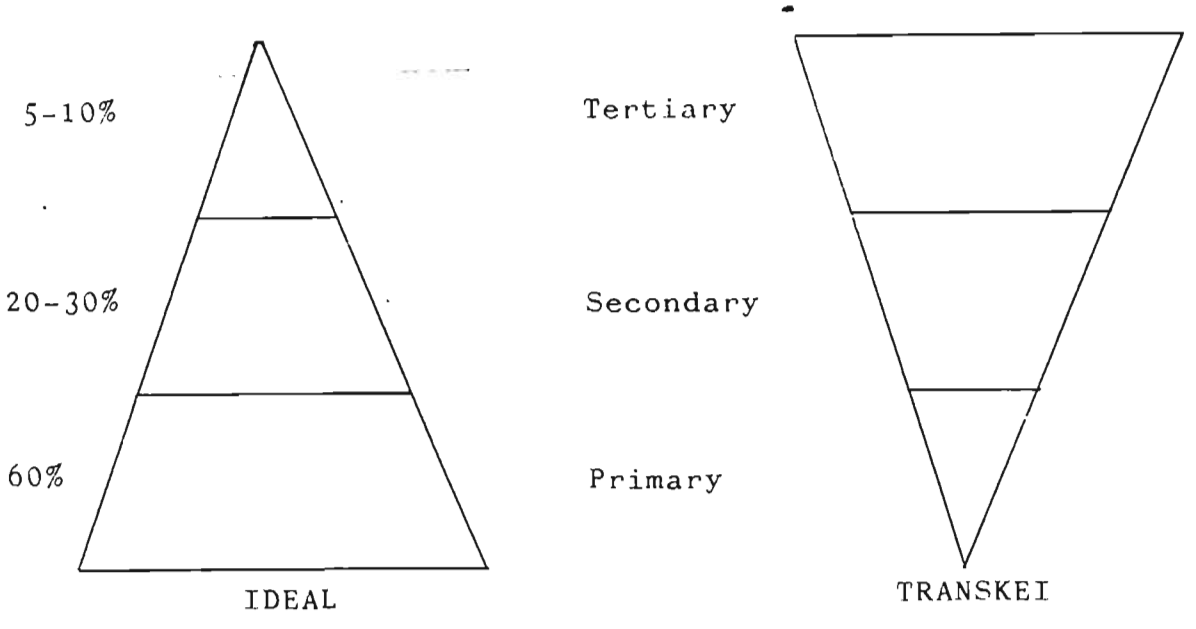
(b) Second-Level causes for which techniques of prevention and treatment demand an organised health system and one that depends fundamentally on the improvement of other sectors. This would include the prevention of malnutrition as a result of low income.

(c) Third-Level causes which could be prevented although less efficiently than those mentioned in second level. These prevention measures require further application of a more complex health service and changes of attitude in the population. For example, this would include the negative effect of employment on mothers.

The presence of the 'first level' factors highlights one thing: the need for emphasis on primary health care in Transkei. Despite the prestige accorded to primary health care worldwide, and the apparent endorsement of such plans by many countries, including Transkei, it cannot be said that these endorsements have been followed by national political decisions or by fundamental reorientation of national plans, both of which are vital if the concept is to be translated into reality. It appears that in Transkei, primary health care has not yet been fully accepted by policy makers. Ideally, according to WHO, a third world health service should allocate 5-10% of its resources to tertiary care, 20-30% to secondary care and 60% or more to primary health care. The present allocation of Transkeian resources is seemingly reversed, as 60% of resources goes to tertiary care, 30% to secondary

care and 10% to primary care, as indicated in Figure 29, below.

Figure 29 Allocation of Health Resources in Transkei



Source : Gerber (1985:38)

Lack of money for staffing, equipment and other facilities is often cited as the reason for not implementing some of the public health measures. But this is usually not based on a national calculation of the actual costs. We can take the case of child immunisation, which is a key public health activity. A child can be effectively totally immunised for about R10 (Muller 1984a:86). According to

our model, 13.63% of the children who died could have been saved if they were immunised before their first birthday. Moreover, many more get sick because of the same underlying reason. These children will be cured using expensive drugs and facilities, bringing enormous economic costs to their family and to the country. Families of children who die often face the ruinous expense of a funeral. It is therefore clear that by transferring some of the costly facilities earmarked for the privileged few, a more cost-effective use of present resources would result.

Another problem with implementing public health care is the difficulty that is always found to measuring its success. Studies often falter when trying to gauge the effects of specific interventions, unlike successes of the 'heroic' remedies, which are associated with tertiary health care. Even the limited assessment of primary health care is usually based at health clinics and is therefore not able to give proper results. The intervention is rarely tailored to suit the particular community and lacks the flexibility needed to take on the majority of the health problems.

5.4 RECOMMENDATIONS

(1) Data Accuracy

The aggregate checks used in chapter 4 for evaluating the accuracy of the data are not sufficient. The whole

demographic enquiry needs to be reorganized so that these errors could be eliminated. In cases where this cannot be done, the exact magnitude of this error should be quantified. Some of the following methods, which have been suggested as helpful in surveys (e.g. Roy 1985 :93-100) could then be applied:-

(a) Self-validation could be performed. If the same variable is estimated or obtained from two or more sets of data, one direct and the other indirect, and the major portion of information is collected from two or more different sources, and by two or more interviewers in a single survey operation, then the direct estimate may be validated by the indirect one or vice versa. For instance, the set of questions on infant mortality history could be compared, say, with the set of questions on pregnancy history. This approach is likely to be more costly and require more time to implement, but when successfully undertaken, is likely to give more accurate results.

(b) Aggregate estimates derived from a survey could be compared with those obtained from other sources external to the survey for detection of any gross errors. In the case of infant mortality rates for instance, service statistics based on clinics, hospitals and primary health centres, where available, can provide independent information.

The whole enquiry into infant mortality should be divided into two components :-

a) a comprehensive study which measures the level of infant mortality together with underlying factors influencing infant mortality. Such a study will help in assessing the health status of the community and help in developing plans and policies to address priority health needs.

b) a more regular enquiry which is conducted on a smaller scale, which is geared to gauging the extent to which already identified factors are being combated. Such an enquiry would help in evaluating the progress of the programs that have been set, and provide quality assurance. It would thus be possible to refine interventions and monitor services and activities.

The level of infant mortality in a country must be linked to other indicators such as its Gross National Product (GNP), which are usually reported on national television, radio and in official publications. Infant mortality, in addition to showing the level of welfare and development, is a good indicator of the level of distribution of development within a society. A relatively small section of the society may influence GNP to be high, giving an impression that the whole society is affluent.

When more information is available, comprehensive public health policies could be formulated, and priorities set based on health needs and resources available.

5.4.2 Measures to reduce Infant mortality

A basic level of service could be established in each village. Such a service could be manned by a modestly trained community worker, who has been recruited from the community itself, capable of carrying out basic prevention measure like immunisation and promoting other preventative measures, as suggested by Harrison (1972:301-2). Such a worker must seek to promote the health of the whole population in the area, including the health of people who never go to hospitals or health centres. Crisis intervention in the form of feeding schemes to ameliorate the problem of malnutrition could be applied in the short-term. Such feeding schemes are practised on a small scale in some parts of South Africa (Tyani 1991). The schemes usually help to sustain children over the crucial first year of life; while longer term structural changes are anticipated to restructure the economy so as to benefit the whole society. Such well-meant schemes might fail if they do not involve the community in decision-making and the running of such projects.

Prevention of adolescent pregnancies could be linked to the campaign against sexually transmitted diseases. Focusing on the elimination of one specific set of infectious diseases instead of a comprehensive approach, merely shifts

the ailment in a society from one factor to another. In particular, the anti-Acquired Immuno-deficiency syndrome (AIDS) campaign, which has drawn unprecedented interest in the history of public health, could be broadened to include other related issues like adolescent pregnancies. Health workers should work with schools and other youth serving agencies e.g. church, cultural clubs and political organisations to develop, evaluate and improve health education programs that address a range of health-risk behaviours among young people. Schools have both the responsibility and strategic capacity to ensure that young people understand the nature of the risk of either unplanned pregnancies or infection by sexually transmitted diseases. In order to have maximum effect, the specific scope and content of such education should be locally determined and should be consistent with parental and community values. Radio and television are other powerful tools that can be used to reach out to the community. As Ncayiyana (1991b:24-25) said, such campaigns must form part of a larger effort to ameliorate the socio-economic status of the community as a whole.

Local customs and methods of bringing up children should be known. Proper intervention would try to encourage good customs. A longer period of breastfeeding, for instance, is one custom which could be encouraged. It could help to ameliorate the level of malnutrition, and help to reduce diseases like diarrhoea. Spacing of children is another traditional virtue which could be encouraged. Spacing of

children was long practised among the AmaXhosa (Tyani 1991). Tradition used to ridicule a woman who breastfed a baby, whilst having another on her back. When couples wished to avoid pregnancy, they used to follow a rational course of action. This action involved such measures as discouraging a partner's sexual interest, avoiding coitus or coital sex, or creating conditions that are nonconducive to intercourse. Such principles should be encouraged.

Infant formulae companies should be forced by law to carry a notice on the label which would inform the user that it is not a substitute for breastmilk (as cigarette boxes in some countries warn people against lung diseases). Commercial adverts which tend to present infant formulae as "almost similar" to breastmilk should be outlawed. In addition, antenatal clinic staff together with health workers should advise, assist and encourage newly delivered mothers on matters related to breastfeeding and act on an individual basis when problems are encountered.

The working conditions of women should be improved. Women should be legally entitled to maternity leave for up to forty weeks around the time of their confinement, and be able to claim for about half of that period as maternity pay. Women should also have a legal right to take a reasonable time off work for ante-natal care without loss of pay, provided there is a proof of antenatal appointments. These rights are enjoyed by working mothers

in Britain (Beard 1989:30). Most of the improvements in working conditions should be effected by companies beyond the minimum requirement of the law. Employer companies could, for instance offer schemes which enable women to return to work part time for two or three years after the birth of a child before resuming their full-time job.

Day nurseries could also be set up by either the state or private companies. Such nurseries would be set up with the particular needs of the business and its workers in mind. Such a service would either be provided free of charge or at least be heavily subsidised. These schemes could be used as an alternative to medical aid schemes, which have a strong emphasis on curative medicine. The viability of such plans could be a subject of further investigation.

In addition to the unfavourable working conditions of Transkeian women, the workloads which women carry in their homes leave them with very little time to undertake self-improvement projects; and technological innovations have largely passed them by, being directed for most part towards men's activities. There is, therefore, a need for an affirmative action to lift the status of women at home and in society in general.

Summary

While overall high fertility rate and infant mortality rate are associated with poor people, causality between them has not been proven. Therefore the support of fertility control and mortality reduction measures should be

justified on the merits of each other rather attributing any strong influence of one over the other. Other factors associated with fertility patterns, namely, close spacing between births and early childbearing leads to higher infant mortality. It is also clear, from this study that children born to low income parents are at high risk. Children whose mothers are engaged in salaried employment have a higher infant mortality rate. Vaccination of infants is one of best ways to save lives during the first year.

Recommendations

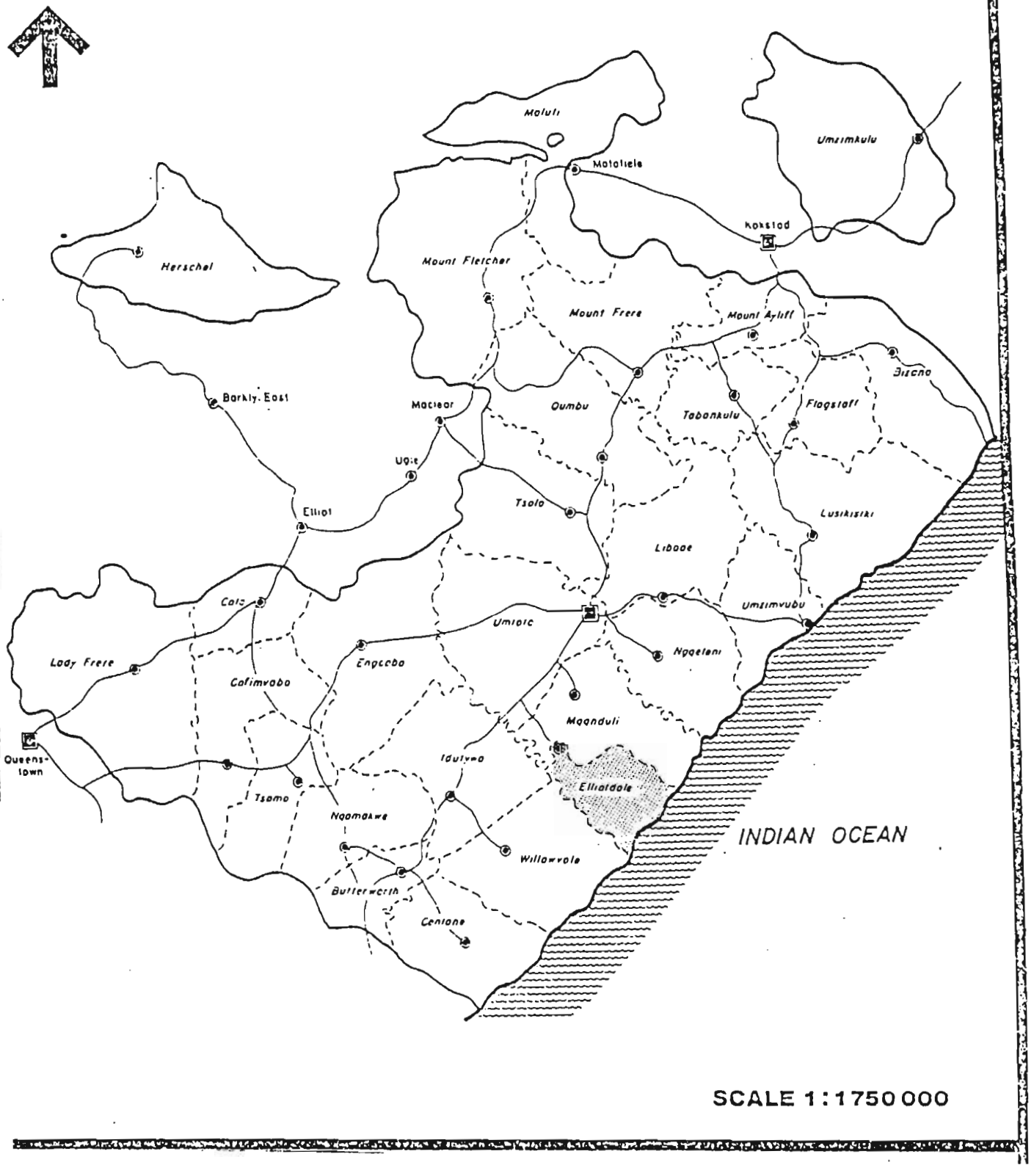
Part of the resources which support urban based health facilities which support urban based health facilities must be transferred to rural areas to support community based health services. Such services could be used in supporting immunisation campaign, feeding schemes and prevention of adolescent pregnancies. Such campaigns must form part of a larger effort to ameliorate the socio-economic status of the community as a whole, rather than being seen as an end in themselves.

An enquiry into a possibility of employers moving away from the present medical aid schemes, to be involved in preventative medicine such as providing day nurseries to working mothers is necessary. A campaign to lift the status of women in society, will, in a longer term, benefit

the health of children greatly.

Appendix A

The Map of Transkei



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Appendix B

The Questionnaire

CHECKED CONTROLLED

FIELD

RGN·HSRC

Human Sciences Research Council

OPINION SURVEY CENTRE

DEMOGRAPHIC AND HEALTH SURVEY

The Human Sciences Research Council (HSRC) regularly undertakes research covering a wide range of social issues among all population groups, for example educational matters, sport, unemployment, the problems experienced by the aged, and health services.

The only way in which information on fertility and the present health status of mothers and children in South Africa can be accurately determined is by questioning a representative sample of mothers and children. The authorities need this information in order to improve the health services in Southern Africa.

Those persons who are asked to participate in this research have been chosen in a random way.

Your opinion is important in this research and you must please answer all questions.

Your name and address does not appear anywhere on this questionnaire and you do not have to sign the questionnaire or any other documents. During the computer processing all personal identifying particulars are destroyed. You therefore remain anonymous. All the information you provide by answering the questions will be treated as confidential and will be used for research purposes only.

It is HSRC policy to publish all research findings

	CARD NUMBER	Ø 1	1-2
	RECORD NUMBER		3-6
	TEAM		7-8
	INTERVIEWER'S NUMBER		9-1Ø
	OFFICE CONTROLLER'S NUMBER.		11-12
1	VISITING POINT		13-16
2	LINE NUMBER OF WOMAN		17-18
3	POPULATION GROUP		19-2Ø
4	STATE		21-22
5	MAGISTERIAL DISTRICT		23-26
6	LOCALITY		27-28
7	RURAL (1) TOWN (2) CITY (3)		29
8	ESD NUMBER		3Ø-33
9	PROJECT NUMBER	S D A H O 1 S 2 7 4	69-78
1Ø	SURVEY NUMBER		79-8Ø

ø	2	1-2 3-12

SECTION 1 : RESPONDENT'S BACKGROUND

No	Questions and filters	Coding categories	
100	Give the date on which this interview took place	Month ..... Year 19....	13-14 15-16

LET US TALK ABOUT YOURSELF AND THE OTHER PLACES WHERE YOU HAVE LIVED

101	Is this your usual place of residence or do you currently stay here for employment or other reasons?	This is my usual dwelling..... 1 Currently staying here: For employment..... 2 Visiting here..... 3 Other reason..... 4	103 17
102	IF THIS IS NOT YOUR USUSAL RESIDENCE: How often do you return to your usual residence?	Not applicable: only visiting here..... 1 Mostly once a week..... 2 About once a month..... 3 About once every three months. 4 About once every six months... 5 About once a year..... 6	18
103	In what kind of area is the dwelling situated? (your usual and the current dwelling) (LEAVE CURRENT BLANK IF NOT APPLICABLE)	Your usual / The current Rural village/ rural concentration 1 / 1 Scattered rural 2 / 2 Urban white area 3 / 3 Urban non-white area 4 / 4	19-20
104	Type of dwelling is a	Your usual / The current Shack 1 / 1 Traditional dwelling 2 / 2 Western type dwelling 3 / 3	21-22
105	The population group of the respondent is.....	Black..... 1 Chinese..... 2 Coloured..... 3 Indian..... 4 White..... 5	23

106a

	Black state		Rest of RSA			Foreign Country	
	Rural	Town	Rural	Town	City		
(i) Where were you born?	1	2	3	4	5	6	24
(ii) Where did you mostly live until you were 12 years old?	1	2	3	4	5	6	25
(iii) Where is your usual residence situated?	1	2	3	4	5	6	26
(iv) Where is your current residence situated? (LEAVE BLANK IF CURRENT NOT APPLICABLE)	1	2	3	4	5	6	27

IF USUAL RESIDENCE PROCEED TO QUESTION ——— 108C

106b

(i) If this is not your usual residence, where is it situated?

White area 00
Venda..... 01
Gazankulu..... 02
Lebowa..... 03
Bophuthatswana.. 04
Qwaqwa..... 05
Kwandebele..... 06
Kangwane..... 07
Kwazulu..... 08
Ciskei..... 09
Transkei..... 10
Lesotho..... 11
Botswana..... 12
Swaziland..... 13
Other..... 14

28-29

(ii) Is it in a rural or urban area?

Rural..... 1
Urban..... 2

30

(iii) What is the name of the (nearest town)?

Town.....

31-34

106c Can you give me the name of (if rural: a big town close to) the place where you lived mostly until your 12th year?

.....

Town.....

Country state...
.....

35-38
39-42

107 In what month and year were you born?

Month.....
(Don't know month = 98
Year 19.....
(Don't know year = 98)

41-42
43-44

02

108	How old were you at your last birthday? (COMPARE AND CORRECT 107 AND/OR 108 IF INCONSISTENT)	Age in completed years	45-46
109	Have you ever attended school?	Yes... 1 No.... 2 → 112	47
110	What was the highest school standard you completed?	No Std..... 00 Std 1..... 01 Std 2..... 02 Std 3..... 03 Std 4..... 04 Std 5..... 05 → 112 Std 6..... 06 Std 7..... 07 Std 8..... 08 Std 9..... 09 Std 10..... 10 → 111	48-49
111	(i) Do you have a post-school qualification? Name of qualification .... (ii) Normal duration of course.....	No..... 1 Yes..... 2	50 51-52 → 11
112	Can you read a letter or newspaper easily, with difficulty or not at all?	Easily..... 1 With difficulty. 2 Not at all..... 3	53

INTERVIEWER: QUESTIONS 113 TO 116 MUST BE ASKED IN RESPECT OF THE RESPONDENTS USUAL RESIDENCE

113	What is the major source of water of your USUAL RESIDENCE?	Piped into residence .... 01 Piped into yard/plot..... 02 Public tap..... 03 Borehole with handpump... 04 Well with handpump..... 05 Well without handpump.... 06 Spring/stream/river..... 07 Dam/lake/pond..... 08 Tanker truck or other vendor..... 09 Rainwater..... 10	54-55

114	Do you have your own toilet in the house or yard of your USUAL RESIDENCE, or do you share a toilet with others outside your yard, or is there no toilet? IF MORE THAN ONE, MARK THE MOST APPROPRIATE FACILITY	Toilet in house.... 1 Own toilet in yard... 2 Toilet outside yard... 3 Toilet outside yard shared with others..... 4 No toilet..... 5	56
115	What kind of toilet facility does your USUAL RESIDENCE have? IF MORE THAN ONE, MARK THE MOST APPROPRIATE FACILITY	No toilet..... 1 Flush toilet..... 2 Bucket toilet..... 3 Pit toilet..... 4	57
116	Does your USUAL RESIDENCE have.....		

	YES	NO	
Electricity?	1	2	58
Refrigerator?	1	2	59
Radio?	1	2	60
Television?	1	2	61

117	What is your religion, if any?	Christian Protestant..... 1 Catholic..... 2 ZCC..... 3 Other..... 4 Traditional tribal..... 5 Hindu..... 6 Muslim..... 7 Other..... 8 None..... 9	62
118	What is your home language, the one you speak most of the time at home?	Afrikaans..... 01 English..... 02 Other European..... 03 Indian..... 04 Sotho: Southern Sotho.... 05 Western Sotho (Tswana)..... 06 Northern Sotho (Pedi)..... 07 Nguni: Swazi..... 08 Ndebele..... 09 Xhosa..... 10 Zulu..... 11 Shangana-Tsonga..... 12 Venda..... 13 Other (specify).....	63-64

Ø2&Ø3

SECTION 2 : REPRODUCTION

NOW I WOULD LIKE TO ASK ABOUT ALL THE LIVE BIRTHS YOU HAVE HAD DURING YOUR LIFE

2Ø1	Have you ever given birth?	Yes 1 No 2 → 2Ø6		65
2Ø2	Do you have any <u>son</u> or <u>daughter</u> you have given birth to who is now living with you at your <u>usual</u> or <u>current</u> place of residence?	Yes 1 No 2 → 2Ø4		66
2Ø3	(i) How <u>many sons</u> live with you at your <u>usual</u> or <u>current</u> place of residence? (ii) And how <u>many daughters</u>?	Sons ..... (IF NONE ENTER Ø) Daughters ..... (IF NONE ENTER Ø)		67 68

PROJECT NUMBER SDAHØ1S274	69-78
SURVEY NUMBER	79-8Ø
Ø 3	1-2 3-12

2Ø4	Do you have any <u>son</u> or <u>daughter</u> you have given birth to, who is alive but <u>NOT LIVING</u> with you or at your <u>usual</u> or <u>current</u> place of residence?	Yes 1 No 2 → 2Ø6		13
2Ø5	(i) How many <u>sons</u> are <u>alive</u> but <u>DO NOT LIVE</u> with you or at your usual or current place of residence? (ii) And how many <u>daughters</u>?	Sons ..... (IF NONE ENTER Ø) Daughters ..... (IF NONE ENTER Ø)		14 15
2Ø6	Have you ever <u>given birth</u> to a <u>boy</u> or <u>girl</u> who was <u>born alive</u> but only survived a few hours or days, or died later?	Yes 1 No 2 → 2Ø8		16
2Ø7	How many <u>boys</u> have died? And how many <u>girls</u> have died?	Boys died ..... (IF NONE ENTER Ø) Girls died..... (IF NONE ENTER Ø)		17 18
2Ø8	SUM ANSWERS TO 2Ø3 AND 2Ø5 AND ENTER TOTAL	Total		19-2Ø
2Ø9	Just to make sure that I have this right you have had in total ..... live births during your life. Is that correct? Yes ..... No ..... (PROBE AND CORRECT 2Ø1 TO 2Ø8 AS NECESSARY)			

			03
210	You now have ..... children. How many more do you want? IF NOT PREGNANT? How many more do you want after this pregnancy? IF PREGNANT GIVE ONLY ONE ANSWER (i), (ii) or (iii)	(i) Number (ii) Range: Between.... and.... (iii) Leave it to God/ fate..... 1 Undecided/ Don't know..... 2	☐☐ 21-22 ☐☐☐☐ 23-26 ☐ 27

CHECK 208:

One or more births

☐

(PROCEED TO 211)

No births

☐

(PROCEED TO 219)

03, 04, 05, 06, 07, 08 & 09

NOW I WOULD LIKE TO TALK TO YOU ABOUT [illegible] STILL ALIVE OR NOT. BEGINNING WITH THE FIRST ONE YOU HAD. (RECORD BIRTH INFORMATION [illegible] FIRST). (RECORD TWINS IN A SEPARATE COLUMN AND [illegible]

211 What name was given to your (first, next) boy? (Record twins on separate lines and mark with bracket)	212 Is (NAME) a boy or a girl?		213 Is (NAME) still alive?		214 IF DEAD: How old was (NAME) when he/she died? (Record days if less than one month, months if between one and 23 months, or years when 2 or more years)			215 In what month and year was (NAME) born? (Probe: What is his/her birthday OR in what season?)		216 IF ALIVE: How old is he/she? (Record age in completed years)	217 Is he/she living with its mother or with grandparents/relatives or elsewhere			
Name of child	Boy	Girl	Yes	No	Days	Months	Years	Month	Year	Age in years	Mother	Grandparents/relatives	Elsewhere	
1	1	2	1	2							1	2	3	29-4
2	1	2	1	2							1	2	3	43-5
	Boy	Girl	Yes	No	Days	Months	Years	Month	Year	Age in years			04	69-5 1-2 3-12
3	1	2	1	2							1	2	3	13-2
4	1	2	1	2							1	2	3	28-4
5	1	2	1	2							1	2	3	43-5
	Boy	Girl	Yes	No	Days	Months	Years	Month	Year	Age in years			05	69-8 1-2 3-12
6	1	2	1	2							1	2	3	13-2
7	1	2	1	2							1	2	3	28-4
8	1	2	1	2							1	2	3	43-5
	Boy	Girl	Yes	No	Days	Months	Years	Month	Year	Age in years			06	69-8 1-2 3-12
9	1	2	1	2							1	2	3	13-2
10	1	2	1	2							1	2	3	28-4
	1	2	1	2							1	2	3	43-5
	Boy	Girl	Yes	No	Days	Months	Years	Month	Year	Age in years			07	69-8 1-2 3-12
	1	2	1	2							1	2	3	13-2
	1	2	1	2							1	2	3	28-4
	1	2	1	2							1	2	3	43-5
	Boy	Girl	Yes	No	Days	Months	Years	Month	Year	Age in years			08	69-8 1-2 3-12
	1	2	1	2							1	2	3	13-2
	1	2	1	2							1	2	3	28-4
	1	2	1	2							1	2	3	43-5
	Boy	Girl	Yes	No	Days	Months	Years	Month	Year	Age in years			09	69-8 1-2 3-12
	1	2	1	2							1	2	3	13-2
	1	2	1	2							1	2	3	28-4
	1	2	1	2							1	2	3	43-5

69-8

		0	1-2
			3-12
218	COMPARE 208 WITH NUMBER OF BIRTHS IN QUESTION 211 numbers are the same ☐ numbers are different ☐ Probe and concile		
219	Are you pregnant now?	Yes ..... 1 No ..... 2 → 223 Unsure ..... 3 → 223	☐ 13
220	For how many months have you been pregnant?	Months	☐ 14
221	Have you seen anyone for a check on this pregnancy?	Yes ..... 1 No ..... 2 → 223	☐ 15
222	Whom did you see about this pregnancy? Probe for type of person and record most qualified	Doctor ..... 1 Trained nurse/ midwife ..... 2 Traditional birth attendant 3 Other..... 4 No one 5	☐ 16
223	NEVER PREGNANT: ☐ → 301a Thinking back to the first time when you were pregnant, would you now say that this pregnancy occurred at the right stage in your life, or that it should have happened sooner or at a later stage of your life, or not at all?	Right stage of life..... 1 Later in life..... 2 Sooner in life..... 3 Not at all..... 4	☐ 17
	IF ONE OR NO PREGNANCY → 301a		
224	Thinking back about the spacing (time between) of all your pregnancies, would you now say that they were spaced correctly, too far apart or too close to each other.	All spaced correctly..... 1 All too far apart..... 2 Some too far apart..... 3 All too close together..... 4 Some too close together.... 5	☐ 18

SECTION 3 : HEALTH AND BREASTFEEDING

301a CHECK 215

One or more live births since Jan. 1982*	Last live birth before Jan. 1982*	If no live birth ever but pregnant	No live births ever
☐	☐	☐	☐
PROCEED TO 301(b)	PROCEED TO 323 (Page 16)	PROCEED TO 324 (Page 16)	PROCEED TO 326 (Page 17)

FOR FIELDWORK BEGINNING IN	1987,	1988,	AND	1989,
*THIS DATE SHOULD BE	1982,	1983	AND	1984,

LET US TALK ABOUT YOUR LAST TWO LIVE BIRTHS

301b ENTER NAME AND SURVIVAL STATUS OF THE LAST TWO LIVE BIRTHS SINCE JANUARY 1982*. BEGIN WITH THE LAST BIRTH.

301c	NAME AND SURVIVAL STATUS	LAST BIRTH Name ..... Alive ..... 1 Dead 2	BIRTH BEFORE LAST BIRTH Name ..... Alive ..... 1 Dead 2	☐☐ 19-20
302	When you were pregnant, did you see anyone for a check on this pregnancy? If yes: Whom did you see? (PROBE FOR TYPE OF PERSON AND RECORD MOST QUALIFIED)	Doctor ..... 1 Trained nurse/ midwife ..... 2 Traditional birth attendant. 3 Other 4	Doctor ..... 1 Trained nurse/ midwife ..... 2 Traditional birth attendant ..... 3 Other 4	☐☐ 21-22

	NAME AND SURVIVAL STATUS	LAST BIRTH Name ..... Alive ☐ Dead ☐	BIRTH BEFORE LAST BIRTH Name ..... Alive ☐ Dead ☐	
303a	Who assisted with these births? (PROBE FOR TYPE OF PERSON AND RECORD MOST QUALIFIED)	Doctor ..... 1 Trained nurse/ midwife ..... 2 Traditional birth attendant. 3 Other..... 4	Doctor ..... 1 Trained nurse/ midwife ..... 2 Traditional birth attendant. 3 Other 4	☐☐ 23-24
303b	Was (NAME) born in a	Hospital ..... 1 Clinic ..... 2 At home 3	Hospital ..... 1 Clinic ..... 2 At home 3	☐☐ 25-26
303c	Was the birth of (NAME) registered?	Yes ..... 1 No ..... 2 Don't know 3	Yes ..... 1 No ..... 2 Don't know 3	☐☐ 27-28
303d	IF (NAME) DIED: Was his/her death registered?	Yes ..... 1 No ..... 2 Don't know 3	Yes ..... 1 No ..... 2 Don't know 3	☐☐ 29-30
304	Was (NAME) born by operation (caesarean section)?	Yes ..... 1 No 2	Yes ..... 1 No 2	☐☐ 31-32
305	Did you ever breastfeed (NAME)?	Yes ..... 1 No ..... 2 IF NO → 308	Yes ..... 1 No 2	☐☐ 33-34
306	Are you still breastfeeding (NAME)?	Yes ..... 1 No ..... 2 Child died 3	Yes..... 1 No..... 2 Child died..... 3	☐☐ 35-3
307	For how many months did you breastfeed (NAME)?	Months ..... TILL BABY DIED = 97	Months	☐☐☐☐ 37-40

10

	NAME AND SURVIVAL STATUS	LAST BIRTH Name ..... Alive ☐ Dead ☐	BIRTH BEFORE LAST BIRTH Name ..... Alive ☐ Dead ☐	
308	Has (NAME) any of the following clinic cards?			
		Growth chart/ Road to health card: YES 1 / NO 2	Growth chart/ Road to health card: YES 1 / NO 2	☐☐ 41-42
		Vaccination card: YES 1 / NO 2	Vaccination card: YES 1 / NO 2	☐☐ 43-44
		Other record of vaccination: YES 1 / NO 2	Other record of vaccination: YES 1 / NO 2	☐☐ 45-46
		IF NO CARD AT ALL →		310
309a	IF YES AT 308 ASK: May I see the card please?	Yes, seen.... 1 No, not seen. 2 No card..... 3	Yes, seen..... 1 No, not seen.... 2 No card..... 3	☐ 47
		IF NO CARDS SEEN AT ALL →		310
309b	Complete according to card seen	How many times was (NAME) weighed	How many times (NAME) weighed	☐☐ 48-49
		How many vaccinations for:	How many vaccinations for:	
		TB/BCG	TB/BCG	☐☐ 50-51
		DWT	DWT	☐☐ 52-53
		Measles	Measles	☐☐ 54-55
		Polio	Polio	☐☐ 56-57
310	Has (NAME) ever had a vaccination/injection to prevent him/her from getting diseases?	Yes ..... 1 No ..... 2 Don't know 3	Yes ..... 1 No ..... 2 Don't know 3	☐☐ 58-59

	NAME AND SURVIVAL STATUS	LAST BIRTH Name ..... Alive ☐ Dead ☐	BIRTH BEFORE LAST BIRTH Name ..... Alive ☐ Dead ☐	
311	Has (NAME) had diarrhoea/runny tummy in the last 24 hours (or 24 hours preceding death)?	Yes ..... 1 No ..... 2 Don't know ... 3	Yes ..... 1 No ..... 2 Don't know 3	☐☐ 60-61
312	Has (NAME) had diarrhoea/runny tummy in the last 2 weeks (or 2 weeks preceding death)?	Yes ..... 1 No ..... 2 Don't know ... 3	Yes ..... 1 No ..... 2 → 316 Don't know ..... 3 → 316	☐☐ 62-63
313	Did you take (NAME) to a private doctor, or to a hospital or to a clinic to treat the diarrhoea/ runny tummy (the last time NAME was ill)?	Yes ..... 1 No ..... 2 Don't know ... 3	Yes ..... 1 No ..... 2 Don't know 3	☐☐ 64-65
314	Was (NAME) given a rehydration powder or water solution to drink to treat the diarrhoea/ runny tummy at home? (the last time)	Yes ..... 1 No ..... 2 Don't know . 3	Yes ..... 1 No ..... 2 Don't know 3	☐☐ 66-67 69-80

1	1	1-2 3-12

	NAME AND SURVIVAL STATUS	LAST BIRTH Name ..... Alive ☐ Dead ☐	BIRTH BEFORE LAST BIRTH Name ..... Alive ☐ Dead ☐	
315	Was there anything ELSE you or somebody did to treat the diarrhoea/runny tummy? IF YES MARK CODE 1 IF NO MARK CODE 2	Yes ..... 1 No ..... 2 Don't know 3	Yes ..... 1 No ..... 2 → 316a Don't know ..... 3 → 316a	☐☐ 13-14

	LAST BIRTH YES	LAST BIRTH NO	BIRTH BEFORE LAST BIRTH YES	BIRTH BEFORE LAST BIRTH NO	
Injections, tablets or syrup	1	2	1	2	☐☐ 15-16
Increase fluids	1	2	1	2	☐☐ 17-18
Decrease fluids	1	2	1	2	☐☐ 19-20
Increase foods	1	2	1	2	☐☐ 21-22
Decrease foods	1	2	1	2	☐☐ 23-24
Stopped breastfeeding	1	2	1	2	☐☐ 25-26
Traditional healer	1	2	1	2	☐☐ 27-28
Other.....	1	2	1	2	☐☐ 29-30

CHECK 314:
Oral rehydration mentioned for any child ☐ → PROCEED TO 316b

Not mentioned ☐ → PROCEED TO 316a

316a	Have you ever heard of a special sugar and salt powder or solution that you can make or get for the treatment of diarrhoea at home?	Yes ..... 1 No 2	☐ 31

316b	Have you ever been in a group of women where a nurse told the women about.....		YES	NO	
		Care of pregnant women	1	2	32
		Spacing/prevention of pregnancy	1	2	33
		Health care of children	1	2	34
		Healthy foods	1	2	35

	NAME AND SURVIVAL STATUS	LAST BIRTH Name ..... Alive ☐ Dead ☐	BIRTH BEFORE LAST BIRTH Name ..... Alive ☐ Dead ☐	
317	Has (NAME) had fever in the last four weeks (of life)?	Yes..... 1 No..... 2 Don't know..... 3	Yes..... 1 No..... 2 → 320 Don't know..... 3 → 320	36-37
318	Did you take (NAME) to a doctor, hospital or clinic to treat the fever?	Yes..... 1 No..... 2 Don't know..... 3	Yes..... 1 No..... 2 Don't know..... 3	38-39
319	Was there anything ELSE you or somebody did to treat fever? IF YES: What was done? IF YES MARK CODE 1 IF NO MARK CODE 2	Yes..... 1 No..... 2 Don't know..... 3	Yes..... 1 No..... 2 → 320 Don't know..... 3 → 320	40-41
		YES / NO	YES / NO	
	Antimalarial treatment	1 / 2	Antimalarial treatment 1 / 2	42-43
	Antibiotics	1 / 2	Antibiotics 1 / 2	44-45
	Liquid/syrup	1 / 2	Liquid/syrup 1 / 2	46-47
	Aspirin	1 / 2	Aspirin 1 / 2	48-49
	Injection	1 / 2	Injection 1 / 2	50-51
	Traditional healer	1 / 2	Traditional healer 1 / 2	52-53
	Other.....	1 / 2	Other..... 1 / 2	54-55
320	Has (NAME) suffered from severe cough or difficult and rapid breathing in the last four weeks of life?	Yes..... 1 No..... 2 Don't know..... 3	Yes..... 1 No..... 2 → 32 Don't know..... 3 → 32	56-57

11&12

	E AND SURVIVAL STATUS	LAST BIRTH Name ..... Alive ☐ Dead ☐	BIRTH BEFORE LAST BIRTH Name ..... Alive ☐ Dead ☐	
321	Did you take (NAME) to a doctor, hospital or clinic to treat the problem?	Yes..... 1 No..... 2 Don't know..... 3	Yes..... 1 No..... 2 Don't know..... 3	☐☐ 58-59

69-80

1 | 2 1-2
3-12

322	Was there anything ELSE you or somebody did to treat the problem? IF YES: What was done? IF YES MARK CODE 1 IF NO MARK CODE 2	Yes..... 1 No..... 2 Don't know..... 3			Yes..... 1 No..... 2 → 323 Don't know..... 3 → 323			☐☐ 13-14
			YES	NO		YES	NO	
		Antibiotics	1	2	Antibiotics	1	2	☐☐ 15-16
		Cough syrup	1	2	Cough syrup	1	2	☐☐ 17-18
		Pill	1	2	Pill	1	2	☐☐ 19-20
		Injection	1	2	Injection	1	2	☐☐ 21-22
		Traditional healer	1	2	Traditional Healer	1	2	☐☐ 23-24
		Other	1	2	Other	1	2	☐☐ 25-26

323	A custom exists among some couples not to resume sexual relations while the mother is still breastfeeding	Did you practice this custom after the birth of (NAME) YES..... 1 NO..... 2	Did you practice this custom after the birth of (NAME) YES..... 1 NO..... 2	☐☐ 27-28
324	At the time you became pregnant with (NAME of youngest living child), or current pregnancy, did you want (more) children	Yes..... 1 No..... 2 → 326 Indifferent..... 3		☐ 29
325	Did you want your last (current) pregnancy then (now), did you want it at a later stage, or did you want it sooner or not at all?	Then (Now)..... 1 Later..... 2 Sooner..... 3 Not at all..... 4		☐ 30

12

326 TO ACHIEVE A DESIRED TIME/SPACE BETWEEN BIRTHS OR TO AVOID HAVING MORE CHILDREN, COUPLES USE VARIOUS WAYS AND METHODS TO DELAY OR AVOID PREGNANCY? HAVE YOU EVER USED ANY OTHER WAY OR METHOD?

	YES	NO	
PILL "Women can take a pill every day"	1	2	31
IUD "Women can have a loop or IUD placed inside them by a doctor/nurse"	1	2	32
INJECTIONS "Women can be given an injection by a doctor or nurse which stops them from becoming pregnant for several months"	1	2	33
DIAPHRAGM, FOAM JELLY "Women can place a sponge or suppository or diaphragm or jelly or cream inside them before intercourse"	1	2	34
CONDOM "Men can use a rubber sheath during sexual intercourse"	1	2	35
FEMALE STERILIZATION "Women can have an operation to avoid having any more children"	1	2	36
MALE STERILIZATION "Men can have an operation to avoid having any more children"	1	2	37
RHYTHM/PERIODIC ABSTINENCE "Couples can avoid having sexual intercourse on particular days of the month when the woman is more likely to become pregnant"	1	2	38
WITHDRAWAL "Men can be careful and pull out before climax"	1	2	39
ANY OTHER METHODS? "Have you ever used any other way or method including traditional ones that women or men can use to avoid pregnancy"? (specify).....	1	2	40 / 41-42

IF HUSBAND OR WIFE STERILIZED OR OTHER OPERATION ____ → 329

ALL OTHERS → 327

12

327 Are you currently doing something or using any method to avoid getting pregnant?

Yes ..... 1 → 335
No, not using..... 2 → 43

328 As far as you know, is it possible for you to have a child, supposing you wanted one?

Yes (including pregnant).. 1 → 335
No, due to operation..... 2 → 329
No, due to other reasons or Don't know..... 3 → 335

44

329 What kind of operation(s) made you or your husband/partner unable to have (MORE) children?

1 Female sterilization..... 01 → 330
2 Hysterectomy (removal of uterus or womb)..... 02 → 331
3 Male sterilization..... 03 → 332
4 Other operations which caused sterilization
.....
.....
..... → 333

45-46

FOR OTHER COMBINATIONS, ALSO COMPLETE APPROPRIATE QUESTIONS FROM 330 FURTHER.

330 Female sterilization (Tieing or cutting of the tubes to prevent pregnancy)

Your age at operation 47-48

Number of living children at time of operation 49-50

How many months/years passed between birth of last child and sterilization? (Code months/years between first marriage and sterilization if no children)
Months.... 51-52
OR
Years..... 53-54

IF POSTPARTUM OPERATION IMMEDIATELY AFTER BIRTH: CODE 00 → 334

331 Hysterectomy (removal of uterus or womb)

Your age at operation 55-56
Number of living children at time of operation 57-58
PROCEED TO QUESTION 334

332 Husband had a sterilization operation

YOUR age at time of his operation 59-60
Number of your living children at that time 61-62
PROCEED TO QUESTION 334

12&13

333	Other operation, wife or husband which caused sterility	Number of your living children at time of the operation	63-64

IF WIFE OR HUSBAND STERILIZED (SEE 330 or 332)

IF NOT STERILIZED → 335

334	Did you ever regret that you (your husband) had the operation which caused you not to have more children?	Yes, should have had no operation at all..... 1 No, but operation should have been sooner..... 2 No, but should have had it later..... 3	65
335	IF EVER USED A METHOD OR STERILIZED	IF HUSBAND OR WIFE NOT STERILIZED OR NEVER USED ANY METHOD → 340 a	
	How many living children, if any did you have when you first did something or used a method to avoid getting pregnant?	Number of children ..... IF NONE ENTER 00	66-67

IF STERILIZED OR OTHER OPERATION (REFER TO QUESTION 329) → 401

69-80

1 3 1-2
3-12

336	Are you currently doing something or using any method to avoid getting pregnant?	Not sexually active..... 1 → 401 No, not using or pregnant..... 2 → 340a Yes, using..... 3	13
337	Which method are you using?	Pill..... 01 IUD..... 02 Injections..... 03 Vaginal methods..... 04 Condom..... 05 Rhythm/periodic..... 06 Abstinence..... 08 Withdrawal..... 09 Rhythm and withdrawal..... 10 Rhythm and condom..... 11 Condom and withdrawal..... 12 Other (specify).....	14-15

13

338	(i) Where do you usually obtain the METHOD? (ii) At what facility?	In this state ..... 1 Elsewhere ..... 2 Doctor's rooms ..... 01 Hospital ..... 02 Health clinic ..... 03 Mobile health clinic ..... 04 Mobile F.P. clinic ..... 05 F.P. Clinic ..... 06 Chemist or shop ..... 07 At the work ..... 08 Field-worker ..... 09 Church/club ..... 10 Other (specify)	16 17-18
339a	For how long have you been using (CURRENT METHOD) continuously?	Months ..... Years ..... (Since last birth = 97	19-20 21-22
339b	Do you or your husband intend to get a sterilization operation (after you had all your children)?	Yes, wife ..... 1 Yes, husband ..... 2 No ..... 3 PROCEED TO QUESTION 341	23
340a	Do you intend to use a method to avoid pregnancy at any time in the future?	Yes ..... 1 No ..... 2 Don't know 3	24
340b	Do you or your husband intend to get a sterilization operation (after you had all your children)?	Yes, wife ..... 1 Yes, husband ..... 2 No 3	25
	IF PREGNANT ☐ OTHERS ☐		401
341	If you became pregnant in the next few weeks, would you feel happy, unhappy, or would it not matter very much?	Happy ..... 1 Unhappy ..... 2 Would not matter 3	26

SECTION 4: MARRIAGE

13

401	Are you now married, or living with a man, or are you widowed, divorced or not living together? If husband currently living somewhere else mark code 1 or 2	Married ..... 1 Living together..... 2 Widowed ..... 3 → 405 Divorced ..... 4 → 405 Not living together ..... 5 → 405		27

402 - 404 ASK ONLY IN COMMUNITIES WHERE APPLICABLE
WHERE NOT APPLICABLE → 405

402	Does your husband/partner have any other wives besides yourself?	Yes ..... 1 No ..... 2 → 405		28
403	How many other wives does he have?	Number ..... Don't know ..... 98 → 405		29-30
404	Are you the first, second, ... wife?	Rank		31
405	Have you been married or lived with a man only once, or more than once?	Once ..... 1 More than once 2		32
406	In what month and year did you start living with your (first) husband or partner?	Month ..... (Don't know MONTH = 98) Year ..... (Don't know YEAR = 98)		33-34 35-36
407	How old were you when you started living with him?	Age		37-38
408	Are your father or mother still alive?		YES / NO	
		Woman's mother	1 / 2	39
		Woman's father	1 / 2	40
409	Are your (first) husband's/ partner's father and mother still alive?		YES / NO	
		First husband's mother alive	1 / 2	41
		First husband's father alive	1 / 2	42
		(Don't know = 8)		
410	CHECK 410 AND 409: All alive → 415 Other (some have died) → 411			

411	Was (MENTION PARENTS NOT ALIVE NOW) alive at the time you began living together with your (FIRST) husband or partner?		Alive	Not alive	
		Woman's mother	1	2	43
		Woman's father	1	2	44
		First husband's mother	1	2	45
		First husband's father	1	2	46
412	CHECK 411: No parents alive at marriage → 417 Some parents alive at marriage → 413				
413	At the time you began living together, did you and your (FIRST) husband or partner live with any of these parents?	Yes ..... 1 No 2			47
414	For about how long did you live together with a parent at that time?	Months ..... Years ..... (UP TO PRESENT = 97) → 416			48-49 50-51
415	Are you now living with any parents (at the place where you usually live)?	Yes, with parents ..... 1 → 417 No 2			52
416	Are you now living with other relatives (at the place where you usually live)?	Yes, other relatives ..... 1 No 2			53
417	CHECK 401: CURRENTLY MARRIED OR LIVING TOGETHER → 418 All others → 420				

NOW I HAVE SOME QUESTIONS ABOUT THE FUTURE | 13&14

418	How long would you like to wait before the birth of your (first/ next) child?	No more children ..... 97 Months ..... Don't know ..... 98 → 420	54-55
419	How old would your youngest child be then?	Age of youngest: Years ..... No children at present ..... 97 Don't know 98	56-57
420	If you could choose exactly the number of children to have in your whole life, how many would that be? WRITE DOWN SINGLE NUMBER, RANGE OR OTHER ANSWER.	i Number ..... ii Range: Between ... and ... iii Leave it to God/ fate ... 1 Undecided/Don't know ... 2	58-59 60-63 64 69-80

1	4

1-2
3-12

SECTION 5: HUSBAND'S BACKGROUND AND WOMAN'S WORK

NOW I HAVE SOME QUESTIONS ABOUT YOUR (MOST RECENT) HUSBAND/ PARTNER AND ABOUT YOUR WORK.

501	Did your husband/partner ever attend school?	Yes ..... 1 No ..... 2 → 504	13
502	What was the highest school standard he completed at that level?	Don't know ..... 98 No std ..... 00 Std 1 ..... 01 Std 2 ..... 02 Std 3 ..... 03 → 504 Std 4 ..... 04 Std 5 ..... 05 Std 6 ..... 06 Std 7 ..... 07 Std 8 ..... 08 → 503 Std 9 ..... 09 Std 10 10	14-15
503	(i) Does he have a post-school qualification? Name the qualification(s) .... (ii) Normal duration of course .... → 505	No ..... 1 Yes 2	16 17-18
504	Can (could) he read a letter or newspaper easily, with difficulty or not at all?	Easily ..... 1 With difficulty ..... 2 Not at all 3	19

505	What kind of work does (did) your husband/partner mainly do? (Describe in detail) Where does (did) he work? IF UNEMPLOYED OR PENSIONER: What did he usually do?	....	20-21
506	Does his work allow him to come home (here) every night, weekends, once a month, or less often?	Every night ..... 1 Weekends ..... 2 Once a month ..... 3 Less often 4	22
507	Before you married your (first) husband, did you ever work regularly to earn money?	Yes ..... 1 No ..... 2 → 509	
508	Did you then work on your family farm or work in a business run by your family?	Yes, family farm or business 1 No, other employment 2	23
509	Since you were first married, have you worked regularly to earn money?	Yes ..... 1 No 2	24
510	Did you then work on your family farm or in a business run by your family?	Yes, family farm or business 1 No, other employment 2	
511	Are you now working to earn money?	Yes ..... 1 No ..... 2 → 514	25
512	Do you now work on your family farm or in a business run by your family?	Yes, family farm or business 1 No, other employment 2	26
513	Does your work allow you to come here every night, weekends, once a month, or less often?	Every night ..... 1 Weekends ..... 2 Once a month ..... 3 Less often 4	27
514	What kind of work are you now doing, or did you mainly do when you were employed? (Describe in detail) Where do (did) you work?	....	28-29

69-80

Appendix C

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