# CHALLENGES FACING

# A

# COMMUNITY HEALTH PHYSICIAN

# IN

# BOPHUTHATSWANA

# CHALLENGES FACING A COMMUNITY HEALTH PHYSICIAN IN BOPHUTHATSWANA

by

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TABLE OF CONTENTS

To May, Lebogang and Boitumelo.

LIST OF TABLES

LIST OF FIGURES

SUMMARY

An overview of the state of health, the environmental circumstances and health care provision of the inhabitants of Bophuthatswana is presented.

The objectives of the study are shown and methods used are described.

The demography and area , the environmental and socio-economic circumstances, morbidity, mortality and disease profiles, health service provision and use as well as resources and restraints are discussed.

Recommendations are made in respect of improvement in health service provision and health status.

# CHAPTER 1

## INTRODUCTION

The state of health, the environmental circumstances and health service provision in respect of the inhabitants of Bophuthatswana have not previously been described. It was considered that a description of these circumstances would be of value to a Community Health Physician operating in that area.

Occurrence of disease or illhealth in man is a result of the interaction of multiple factors relating to man, his environment (physical and socio-economic environments), and agents causing disease.[1]
Effective control of diseases which cause death, illness, and disability in any given community is dependent upon adequate knowledge of these factors and their interaction and on available resources and their utilization. An overview of these factors and their interaction, the availability and utilization of resources, as well as possible lines of approach which may be taken by a Community Health Physician in meeting these challenges will be presented.

Bophuthatswana was chosen for this study for the following reasons:

1. It is inhabited mainly by Blacks who, like most Blacks in the rest of Southern Africa are in need of health care and for whom the services of a Community Health Physician may be of benefit.

2. There is no knowledge on the part of the author of the existence of a similar study on Bophuthatswana.

3. Although Bophuthatswana consists of several geographic units, administratively it is a unit and its Department of Health and Social Welfare is the administrative centre in the field of health care for all geographic units.

4. Personal contact with senior officials of the Department of Health and Social Welfare had previously been established and it was considered that this would greatly facilitate the collection of information.

5. The author has previous personal experience with health care services and environmental health conditions in some parts of Bophuthatswana.

# CHAPTER 2

## OBJECTIVES

The objectives of this study are:

1. to obtain information on the state of health and health care provision in respect of the inhabitants of Bophuthatswana with a view to making a community diagnosis.

2. to determine priority health needs.

3. to make recommendations on corrective measures a Community Health Physician could carry out in meeting these priority health needs.

# CHAPTER 3

## METHODS OF DATA COLLECTION

### 3.1 Definition of criteria.

State of health of inhabitants: For the purpose of this study, this refers to mortality and morbidity rates, health and disease profiles socio-economic circumstances and the demographic structure of the resident Black population of Bophuthatswana irrespective of their ethnic affiliation.

Environmental circumstances: For the purpose of this study, this refers to water for drinking purposes sanitation and road and rail communication network.

Health service provision: This refers to the structure of the health service, level of care offered (first second and third level) and utilization of health services.

### 3.2 Sample and control groups.

As the study was based upon a survey of the available literature and the spoken word of interviewees, sample and control groups were not considered appropriate.

### 3.3 Methods of data collection.

Relevant data was obtained from the records and reports of the Bophuthatswana Departments of Health and Social Welfare, Education, Agriculture and Forestry and Works, as well as from the

interviews with officers and employees of the abovementioned Departments.

3.4 Barrier dates.

Data collection took place from the 6th to 10th July 1981.

Analysis of data was carried out during August and September 1981.

The submission date was 5th October 1981.

3.5 Appraisal of the literature has been ongoing and has been an integral part of the study.

# CHAPTER 4

# RESULTS

## 4.1 Areas

Bophuthatswana consists of seven scattered geographical units which are situated in the western part of the Transvaal, the Northern Cape and the Orange Free State.

The units are separated by land belonging to Whites. These units lie between latitudes 24° and 30° south and longitudes 22° and 29° east. The total area in 1975 was 3,8 million hectares.[2]

The 7 units are divided into 12 magisterial districts or regions, as shown in figure 1. The rainfall is low, 300 to 400 mm in the western regions of Molopo, Ganyesa and Tlhaping - Tlharo and 500 to 600 mm in the eastern regions of Mankwe Odi and Moretele. Rivers are few and their flow varies throughout the year and from month to month.

## 4.2 Population

### 4.2.1 Size

The total population numbers 1,328,600 (1980 population census personal communication) of which 208,600 (15,7%) are in urban and the 1,120,000 (84,3%) in rural areas. The urban settlements are the proclaimed townships which have housing and infra-structure of roads, safe water supply and a standard method of waste and sanitation

disposal. Rural settlements are in the form of villages with informal development of infrastructure. In these areas there are no permanent sources of safe water supply, no standard methods of waste and sanitation disposal and roads are not formally developed.

The peri-urban settlements like the rural villages, do not have proper infrastructure. It is not clear to the author whether these peri-urban squatter settlements were taken to be rural or urban in compiling the census figures.

4.2.2 Distribution

The most densely populated regions are the Eastern Odi and Moretele regions with population figures of 340,000 (25,6%) and 240,400 (18,0%) respectively. (Table 1). In all regions, rural population size is greater than the urban population.

4.2.3 Structure

The demographic structure based on a percentage estimate, indicates that 233,300 (17,5%) were children under the age of 5 years, 440,200 (33,1%) between the ages of 5 and 14 inclusive; i.e. 673,500 (50,6%) of the population are children under 15 years. The remaining 454,000 (34,2%) were between the 15 and 44 years inclusive, 133,300 (10,0%) between 44 and 59 years inclusive and 67,400 (5,1%) over the age of 60 years. (Figure 2).

The total population of females is 706,600. If it is assumed that the age structure of the female population does not differ from that of the total population significantly, then the female population size in the child bearing age 15 to 44 years is about 240,300 (18,1%).

## 4.3 Socio-economic Circumstances

### 4.3.1 Level of educational achievement

There are no figures available to indicate the literacy rate in the general population of Bophuthatswana. Information in this regard will be provided by the detailed population census when this becomes available.

Of the estimated 213,400 children between the ages of 10 and 14, 190,900 (89,4%) were attending school in 1980.

In the age groups 15 to 19 years 105,900 (72,7%) out of the total of 145,500 were scholars with a minimum educational training of 4 years (sub-standard A and B and standards 1 and 2).[3] Table 2 indicates the number of pupils who registered for primary, secondary and tertiary education in 1980.

The drop out rate is high at both primary and secondary educational level ranging from 20 to 48 percent of the original registered number of pupils.

4.3.2 Income

Full data of the latest Gross National Income (GNI) and Gross Domestic Product (GDP) are not available yet. In 1974/75 the GNI, representing the income derived by permanent inhabitants in Bophuthatswana (including those temporarily absent such as commuters and migrant workers) was R264 million.[4] At that time commuters and migrant workers contributed a greater percent to the GNI - 66,6% - than the GDP.

Bophuthatswana is situated close to the commercial and industrial centre of Pretoria - Witwatersrand - Vaal complex. The presence of rail and road transport system between it and the industrial centre and between it and mining centres of Rustenburg and Thabazimbi permits many inhabitants of Bophuthatswana to work in these towns and cities either as commutors or migrant workers. In addition, industries have been established on land belonging to White South Africans near the borders of Bophuthatswana at Rosslyn near Pretoria, Brits, Rustenburg and Lichtenburg in the west. In 1974, 23,600 Blacks, males and females from urban and adjacent rural areas were employed in these border industries.[5] Most of these workers were inhabitants of Bophuthatswana.

Industrial development within Bophuthatswana notably at Babelegi in Moretele and

Ga-Rankuwa in Odi districts respectively have increased employment opportunities. Mining industry in districts near Rustenburg creates further employment opportunity.

A large section of the rural inhabitants are employed by Whites in the adjacent areas as labourers.

The author would have liked to determine the proportion of unemployed persons to the total economically active age group (15-59 years), and the per capita Gross National Product (GNP). However, data on these aspects were not available to the author.

4.3.3 Agriculture

Economic activity in the rural areas is mainly subsistance farming, stock farming being commoner than crop farming. The average yield of crops per hectare of dry land (land not under irrigation) is reported to be unsatisfactory in relation to the production potential of the soil and the stated possible reasons are inefficient cultivation methods, insufficient or no fertilizer applications, poor seed and ineffective weed and plant disease control measures.[6]

There are small areas in Tlhaping-Tlharo, Thaba-Nchu and Taung where irrigation is practiced. These areas together with Disobotla region, where a statutory body, the Agricultural Development Corporation, has been operating, have

increased the yield per hectare of maize, wheat and groundnuts.

In 1979, the Department of Agriculture recorded a harvest of 48,700 tons of maize, 7,200 tons of wheat, 2,200 tons of groundnuts, 400 tons of beans and 200 tons of vegetables (figures taken to the nearest hundred).

In the same year, R5.0 million was paid by the Bophuthatswana Marketing Board to producers of maize wheat and oilseeds and it was estimated that close to R20.0 million would be used for this purpose in 1981.[7] This reflects increased production, increased prices, and increase utilization of the services of the Marketing Board.

Data on the amount of animal products (meat and milk) consumed by the inhabitants of Bophuthatswana is not available, however, the value of live stock sold to City Deep abbatoir (outside Bophuthatswana) in 1979/80 was R3,96 million.

## 4.4 Environmental Circumstances

### 4.4.1 Water Supply

Bophuthatswana has semi arid climatic conditions. Surface water in the form of rivers is variable throughout the year.

In the urban townships there is adequate supply of safe potable water, derived

from surface water reservoirs outside Bophuthatswana. Residents of peri-urban settlements rely on either safe water collected from the adjacent township (or sold by residents of adjacent townships) as well as on surface or ground water obtained from rivers, wells and bore-holes. In the rural areas where 85% of the population live, water for domestic purposes is obtained from wells, streams and bore-holes. There is no data on the number of people who depend on wells, rivers or bore-holes as a source of drinking water. No data relating to the bacteriological and chemical quality of water from these sources is available.

Thus 15.7% of the total population get safe drinking water and the rural population (84,3%) has no reliable source of safe water for drinking purposes.

4.4.2 Sanitation

All urban areas have a system of sewage disposal (waterborne sewage in most towns and pail systems in some smaller towns). In the peri-urban settlements and rural villages the inhabitants use pit latrines, however there is no data on the number of dwellings which have and that of dwellings which do not have pit latrines. There is no available data on the state of sanitation in the rural villages and peri-urban settlements.

Legislation has been passed in terms of

which Bophuthatswana Water Co-operation will be established. The Act makes provision for the control of supply and use of water and for the establishment of sewage disposal facilities on a co-ordinated basis.

4.4.3 Roads and rail communication network

Running along the eastern and southern borders of Bophuthatswana are main roads and railway lines which form a communication link between Pretoria - Witwatersrand - Vaal (PWV) complex and the Northern Travsvaal and between the PWV and the Western Transvaal respectively. The road and railway line along the southern border pass through 3 of the central and southern magisterial districts, Molopo, Ditsobotla and Taung. The only other districts through which pass a railway line are Bafokeng and Mankwe. Communication within Bophuthatswana is mainly public transport in the form of buses, except in the case of some villages in Ganyesa and Tlhaping - Tlharo, where most villages are reported to have no access to public transport Details of the network of roads in relation to human settlements and in relation to health care institutions are not available. In most of the magisterial districts, hospitals are situated along the main roads close to the border of the districts and hundreds of kilometres away from the main body of district population.

## 4.5 Morbidity and Mortality

There is no available data on crude death rates, neonatal, infant, the under-five and maternal mortality rates.

Wyndham and Irwig[8] in their paper on comparison of mortality rates of various population groups in South Africa using the 1970 official deaths and census statistics, stated that the majority of deaths in Blacks occurred in children under 5 years of age; about 50% of all deaths in this population group occurred in children under 5 years compared with only 7% of deaths among Whites. The commonest causes of death were found to be infections - gastroenteritis and pneumonia. Syndham and Irwig estimated the infant and the under-one year mortality rates in Blacks to be 123.9 per 1000 live births and 135,8 per 1000 respectively. In each age group the age-specific mortality rate of Blacks far exceeded that of Whites. There is no reason to believe that infant and the under-five mortality rates in Bophuthatswana are significantly different.

Data on the prevalence and incidence rates of various diseases is not available. In 1980, a total of 2093 notifiable medical conditions were notified in Bophuthatswana.[9] These include malaria; measles; meningococcal infections; tuberculosis; typhoid and viral hepatitis types A, B, and non A - non B. Out of the 2093 notified medical conditions, 1,353 (64,6%) were tuberculosis, 631 (30,5%) were measles, 54 (2,6%) were viral heaptitides and 39 (1,9%) were typhoid.[9]

hepatitis

Prevalence and incidence of these conditions in the general population are not known because among those who have the condition in the community, only those who present themselves to the health service and are positively diagnosed, will be notified. In addition, the value of notifications is often not appreciated by health workers who already feel that they are overworked.

4.6 Disease profiles

There is no population or community based data on disease profiles. Infections and childhood malnutrition are reported to be the commonest occurring medical conditions in clinics and hospitals.

Nutritional anthropometric studies in the under-fives is being conducted in the community of Ditsobotla by the health personnel of Gelukspan Hospital.

4.7 Health service provision and use

Health care provision in Bophuthatswana fall under one statutory organization, the Department of Health and Social Welfare. However private organizations and individuals are free to provide health care subject to approval by the Department (Minister's 1980 Health Policy Statement). Private practice of all health professions - medical, nursing, social work etc. is allowed.

The Department is the administrative, the planning, the co-ordinating, the employing and the policy making centre of the service.

For administrative and practical convenience the 12 magisterial districts have been divided into 16 health regions. Of the 16 health regions, 9 have hospitals as regional centres and one has a Regional Health Authority which provides clinic, welfare and environmental services. This depends on Ga-Rankuwa Hospital for hospital services.

Each of the 9 hospitals controls peripheral clinics in its health region, and at regular intervals each clinic is visited by a hospital doctor to assess and treat patients referred by the clinic nurse. Each of the clinics is reported to offer the first and second level of health care. The first level is prevention in the form of immunizations, health education, antenatal and post natal services and family planning.

Curative treatment of minor ailments is the second level of care provided.

The clinics staff consists of 200 clinic sisters, 36 midwives and 24 enrolled nurses. Some clinics render maternity services as well.

A great proportion of time is spent on assessment and treatment of minor ailments than on rendering preventive services.

School Health Services have recently been established.

Private practitioners, mainly medical are concentrated in the urban areas.

There are 9 government and 2 private hospitals. Seven of the 9 government hospitals were initially missionary hospitals established in rural villages.

Attached to the 9 hospitals are 120 clinics, 4 of which had to remain closed throughout 1980 because of shortage of staff. In 1980, the total clinic attendances were 1,363,576 and total out-patient attendances 460,139. The mean number of total annual outpatient attendances for every inpatient admission is 19,8. There are 4,226 hospital beds, 2565 (60.7%) of which are general medical, surgical and maternity beds while 645 (15.3%) and 1016 (24.0%) are for tuberculosis and psychiatric patients respectively.

From data collected by the department, mean percent hospital bed occupancy in 1980 was 125.8. Owing to lack of data on hospital discharges and deaths mean length of stay, throughput per bed, and turn-over interval cannot be determined. A breakdown of bed occupancy, beds per 1000 population, ratio of total outpatient attendances to hospital admissions, number of clinics, and estimated catchment populations for each hospital and for Odi Regional Health Authority are shown in Table 3.

In his 1981 policy statement the Minister of Health and Social Welfare indicated that it is the policy of the department to provide a health care service which entails the promotion of good health, prevention and treatment of the disease as well as rehabilitation.

According to the Minister's 1981 budget speech, a Bophuthatswana National Advisory Council on Rehabilitation has been appointed.

4.8 Resources

4.8.1 Money

Estimates of Expenditure to be defrayed from Revenue Account for the year ending on 31 March 1982, indicate that out of the total government revenue account of R396,26 million, the Department of Health and Social Welfare received R25,73 million (6.5%) in the 1980/81 financial year.[10] A breakdown of government expenditure for the 1980/81 is shown in Table 4.

For the year ending on 31 March 1982, R26,45 million (6,3%) out of a total government budget of R421,74 million (100%) has been allocated to the Department of Health and Social Welfare. Figure 3.

Of the R26,45 million allocated to the department R16,00 million (60.5%) will be in respect of salaries wages and allowances and R5,02 million (19,0%), R3,24 million (12.2%) and R2,21 million (8,3%) for consumables, machinery equipment and tools, and other respectively. Figure 4.

Budget for capital developments other than machinery and vehicles is not included in this department's budget.

Provision of R2,01 million has been made

in the Urban Affairs and Land Tenure Departmental Budget for the establishment extension and alteration development projects of hospitals and clinics.

A total provision of R14,25 million has been made for housing in certain towns.

4.8.2 Manpower

The total authorised staff establishment of Bophuthatswana Department of Health and Social Welfare as at 31 December 1980 was reported to be 7,087 posts, of which 351 (5.0%) were reported to be vacant.[11]

It is stated that of the 351 vacant posts, 26 were medical, 229 permanent trained nurses, 15 paramedical, 54 clerical, 27 welfare officers and 43 health inspectors and technical assistants' posts.

Reports indicate that the most inadequately staffed health care institutions are the remote rural hospitals and clinics. Clinics have a greater ratio of vacant to occupied posts than hospitals in comparable locations. Owing to lack of time the author was not able to obtain data on the number of vacant and occupied posts in each of the health regions. Tlhaping-Tlharo, a remotely situated health region had 50.1% of the total registered nurses posts vacant as at 7 July 1981, while Molopo health region which includes the urban

areas of Mafikeng, Montshiwa, Mmabatho and the surrounding rural areas had only 10.0% of the total nursing posts vacant as at 7 July 1981. There is a mean doctor per 1,000 population of 0.05, i.e. 18,300 persons per doctor. Table 5.

It is reported that 36 medical students were granted bursaries by the Bophuthatswana government for medical training.

Five hospitals provide training for general nursing, 7 for midwifery, 6 for enrolled nursing and 9 for enrolled nursing assistant.

Out of the 109 nurses who wrote examinations for Diploma in General Nursing in 1980, 61 passed, 26 failed (23,9%) and 22 were awaiting results at the time the annual report was written.

Medical technologists are trained at Bophelong while other paramedical students and health inspectors receive their training outside Bophuthatswana. Data on the number and production rate of qualified trainees is not available.

It is reported that a shortage of medical personnel has necessitated recruitment from Europe, Australia and African countries of medical personnel, 11 of whom had accepted the offer by 7 July 1981.

4.8.3 Materials and machinery

Access to machinery, equipment, materials and consumables (medicine, vaccines, fuel etc.) is not a problem. Factors limiting the acquisition and maintenance of these resources are finance and appropriately skilled manpower. The department had 252 vehicles which include ambulances for all hospitals in 1980. It is reported that there was shortage of ambulances in 1980 owing to the freezing of vehicle purchase in that year.

Each of the 9 hospitals is reported to have and to be utilizing x-ray and minor laboratory facilities.

It is reported that there is shortage of accommodation for nurses at some of the remote rural clinics.

4.9 Restraints

4.9.1 Professional

The views expressed by officials of the department indicate that there is reluctance among doctors to be transferred to remote rural hospitals, most of the doctors remaining in the urban situated hospitals of Bophelong near Mafikeng, Montshiwa and Mmabatho, Moroka in Thaba - Nchu, and Jubilee Hospital near Temba township. It is reported that shortage of medical and

nursing staff is more prominent in remote hospitals and clinics. It is further reported that artificial deficiency of financial and material resources is often created by the diversion of funds by doctors to expensive non-essential equipment (i.e. equipment of low cost-effectiveness and cost-efficiency in relation to the populations priority health needs). Hence the Minister's statement that health manpower is not only inadequate in number but inappropriate in orientation and distribution as well.

4.9.2 Political

The Bophuthatswana Government allocates money to different departments including the Department of Health and Social Welfare. Political decisions determine the amount of money to be allocated to the department. Indirect political pressure is reported to have influenced decisions on the extension of hospital beds, wards, and sofisticated equipment in some areas at the expense of primary health care in other regions even without demonstrable need for such extensions or for such luxury equipment. Bophelong Hospital, situated at the capital town near Mafikeng and with a total of 1,050 hospital beds (314 beds for general medical, surgical and maternity and 736 beds for psychiatric patients) constituting 25% of the total number of hospital beds in Bophuthatswana, is to have

its general beds extended by 300 beds in 1981/82 while some rural areas are without a clinic and some regions like Lehurutshe and Odi with populations of 52,500 and 340,000 respectively, are without a single hospital bed.

The Minister pointed out that the department needs adequate data to convince the politicians that health care service deserves to be allocated a bigger share of the budget than the present amount allocated.

4.9.3 Public

The views expressed by the Minister and other senior officials of the department indicate that the communities are co-operative, in raising funds for the establishment of clinics and nurses accommodation and in utilizing the available services. People are reported to be amenable to change and not inclined to discard hospital and clinic services in favour of services of traditional healers. It is thought that prolonged contact with Christian religion and Western style of life are important factors in this regard.

There is no available indication of the restraint on health care provision by the communities' demands for a particular health care system.

# CHAPTER 5

# DISCUSSION

## 5.1 Areas

Because of the fact that Bophuthatswana consists of seven separate units situated long distances from one another the available resources in relation to the size of population has to be scattered over a wide area in a similar manner to extend coverage of at least primary health care to every unit and district. Distribution of the 7 geographic units and the distance separating them from one another, increase the cost of running a health service and make effective co-ordination of health services between the units difficult. The low rainfall result in inadequate supply of water for drinking and agriculture purposes.

## 5.2 Population

Typical features of developing communities occur in Bophuthatswana. These are a high ratio of urban to rural population (85,3% : 15,7%), a high ratio of children under 14 years to adults (50,7% : 49,3%) and a low ratio of those over 60 years to total population (5,7% : 94,3%).

A high population of young children and that of females in the child bearing age group of 15 - 44 years indicate the importance of mother and child health, school health, maternity and family planning services.

The estimated adult male dependence ratio calculated

on the basis of persons between 0 - 14 years per 100 males in age group 15 - 59 is 229,3. The high ratio of dependents to economically active population further aggravates the poor socio-economic circumstances through poverty and low educational achievement of the majority of children in such communities.

The high concentration of the population in the eastern regions can partly be explained by the search for better employment opportunities in the PWV complex by the previous generations and partly by the earlier resettlement of urban Blacks by the South African government. Inadequate health care service provision in this highly populated region is cause for concern.

## 5.3 Socio-economic circumstances

### Educational level

Three quarters of children of school-going age (10 to 14 years) enrolled at various schools in 1980. However, the high drop out rate at primary and secondary school levels result in loss of a large number of potential manpower and in persistence of low socio-economic circumstances.

Bryant[12] states that education significantly influences the improvement of health in the sense that better health tends to follow better education.

The population of children of school-going age accounts for the budget of R44,48 m

(10,5%) allocated to the Department of Education.

Income

Because of Bophuthatswana's proximity to the PWV industrial and commercial centres and to the smaller mining towns of Rustenburg and Thabazimbi, employment opportunities for most of the inhabitants are favourable. This is not the case, however, with inhabitants of the more remote areas who have to depend on subsistence farming and on farm labour.

Industrial development within Bophuthatswana is expected to provide more employment opportunities. However, the high proportion of dropouts at school imply that a large percent of the present and future labour force is and will remain unskilled. Health and wealth (or the lack of it) are closely associated. The GNI is dependent on productivity which in turn is related to the levels of acquired skills.

The author has no recent data on Bophuthatswana's GNP consequently the determination of per capita GNP was not possible.

Economics and education are the indicators of development which directly and indirectly influence the improvement of health in terms of resources available and their appropriate utilization for the provision of better nutrition and environmental conditions.

Agriculture

Subsistence farming in the rural areas is associated with poor crop production (poor in quality and in quantity). Malnutrition in the rural communities is associated with poor agricultural production. Although the prevalence of malnutrition in the general population is not known, malnutrition ranks second to infections in hospital populations in Bophuthatswana.

György and Kline[13] state that protein calorie malnutrition (PCM) and infections are the commonest causes of disease and death in developing countries. Poor nutrition in early childhood, 0 - 5 years adversely affect physical and intellectual development of the child. In a study done on school children who had previously suffered from severe PCM in early childhood Monkeberg demonstrated that the level of intellectual development of these children was consistently low when compared with that of their siblings.

Cunningham[14] states that there is synergy between malnutrition and infection, 60% of deaths caused by infections in children under 5 years being associated with malnutrition.

Khan and Gupta[15] in their study on malnourished children refer to malnutrition as a product of poor socio-economic circumstances in the rural and urban African communities.

Bophuthatswana has a high population of children under the age of 15 years, of which 233,300 (17,6% of the total population) are below the age of 5 years, consequently nutritional deficiencies particularly in rural areas where the majority of the population live, will affect the health of a significant proportion of the population.

Malnutrition is by no means a health problem alone, especially in its prevention. Agricultural, educational and economic development as well as family planning are the most effective long-term measures for the prevention of malnutrition.

## 5.4 Environmental circumstances

Water supply and sanitation.

Lack of safe water for drinking purposes is one of the major health problems in Bophuthatswana.

In 1980 cholera occurred in Moretele and Odi region where most of the rural inhabitants rely on streams as their only source of water supply. The bacteriological quality and the deficiency of water plays an important role in the occurrence of typhoid and other water borne diseases seen in these two regions. With legislation for the establishment of water supply now passed the foundation has been laid for measures that will lead to the reduction of mortality and morbidity from water borne diseases.

Reliance on surface and ground (bore-holes) water

as the only source of drinking water in the rural population where pit latrines and surface toilets are used necessitate in the short term the need for health education as regards the disposal of excreta and boiling of water before use.

Road and Rail Communication network

For the community to have access to health services and for health services to have access to the communities it is essential that there be roads or rail and means of transport.

The rural areas, particularly those in the western regions, are poorly provided for in this regard. It is estimated that 95% of females who attend antenatal clinics deliver at home and those that do come, do so late because of lack of transport.

## 5.5 Mortality and Morbidity

Lack of data in this regard is a common finding in most developing countries. Wyndham and Irwig in their study on mortality in different South African population groups indicate that among Blacks the under-five mortality contributes half of the total deaths, the major causes of death being infections and malnutrition.

Barker and Rose[16] state that infant mortality rates among Black South Africans between the years 1970 and 1974 was 127/1000 live births. There is no reason to believe that mortality figures for Bophuthatswana are significantly different.

## 5.6 Disease profile

There are no avilable data on disease profiles

of the denominator population. Hospital and clinic attendances indicate that infections and malnutrition are the commonest medical conditions. The actual prevalence and incidence of these conditions in the general population are likely to be high. Even notifiable medical conditions such as tuberculosis and measles are likely to be under-reported in the rural areas where coverage of health service is inadequate.

5.7 Health Service provision and use.

Provision of health services is inadequate in the remote rural areas of Ganyesa -Tlhaping-Tlharo and Lehurutshe as well as in the most populated region of Odi. A very low ratio of doctor per 1000 population indicate that even if the vacant medical posts were to be filled there would still not be enough doctors. Concentration of the health personnel in urban areas suggest that increasing numbers of medical nursing and para-medical posts is unlikely to change the present distribution.

The high hospital bed occupancy occurring in most regions and large numbers of outpatient and clinic attendances indicate a high demand for health care services. With adequate training of less highly skilled personnel coverage of health services can be extended to the remote areas.

5.8 Resources and restraints

Financial resource is a major limiting factor in health service provision in many developing communities.

Health care service is essentially labour intensive and because of the deployment of highly trained personnel, a greater portion of budget allocated for health care service is utilized as salaries for staff (60,5% of total budget).

Cooper[17] on analysing the 1970/71 revenue expenditure of the British National Health Service Hospitals demonstrated that 69,2% of total hospitals expenditure was in respect of salaries of personnel.

Bophuthatswana cannot obtain loans from developed countries consequently it has to rely on its limited resources and on South African government aid for capital developments.

There is no data on the amount of money spent on preventive and on curative services separately. More money appears to be used on hospital development while elementary health care is not available to many inhabitants.

Inadequate numbers and uneven distribution of manpower in relation to population size and distribution is one of the major problems of health care service.

Adequate objective data is essential for the planners and politicians in decision making. It is to be expected that like all people, professional health workers would prefer to settle in areas which offer better educational health and recreation facilities and better infrastructural services.

The occurrence of disease in a community is a

results of the interaction of multiple factors relating to man, agents causing disease and environmental factors.[18] The control of infectious disease in the developed countries was mainly the result of introduction of environment control measures including better housing clean drinking water and sanitation, rather than by high ratio's of doctors, nurses and other trained personnel.[19]

Low infant and maternal mortality rates, longer expectation of life at birth and virtual elimination of most infectious diseases in the developed countries were due to greater food production per head, better means of distributing the food through improved system of transport and hence higher average levels of nutrition, availability of clean and plentiful water supply, adequate housing and construction of efficient system of sewage disposal. The possible optimal outcome that any health care service can achieve in a given community is determined by the socio-economic, nutritional and environmental health conditions of that community. Health workers who seek to control the disease and to improve the state of health of the inhabitants of Bophuthatswana will be more effective in this regard if they work with other development workers - agricultural, educational, infrastructural and other developers.

# CHAPTER 6

## RECOMMENDATIONS

The following are recommendations for the improvement of health service provision and health status of the inhabitants of Bophuthatswana:

1) that a system of data collection involving community participation at village level and in terms of which mortality, morbidity and births may be determined, be established.

2) that population based epidemiological surveys be carried out by every regional health team with the view to the determination of local priority health needs and the establishment of baseline data.

3) that resources be directed to adequate provision of preventive maternal and childhealth services with the view to decreasing infants, the under-five and maternal mortality rates.

4) that local community members be incorporated into the health team, be given basic training and be provided with basic equipment for rendering maternity services in rural areas where there is no access to health services.

5) that at all levels, manpower be developed from local sources and appropriate functions be delegated in accordance with the person's competence.

6) that existing and proposed health services be evaluated in terms of cost-effectiveness and appropriately modified where necessary.

CHAPTER 7

ACKNOWLEDGEMENTS

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The author acknowledges the assistance of Mr. P.H.L. Moraka, Secretary of Works Department and Mr. Oscar Setlogelo of the Education Department for giving the author insight into the activities of their respective departments.

BIBLIOGRAPHY

1. Spencer I.W.F. : Community Health. An Introductory Orientation for South African Students : Shuter and Shooter : Pietermaritzburg 1980.

2. Bureau for Economic Research re Bantu Development Bophuthatswana : Economic Revue. Benbo No. 20575 Pretoria 1975.

3. Bophuthatswana Government : Annual Report Depart. of Education 1980.

4. Bophuthatswana Government : Republic of Bophuthatswana : Chris van Rensburg Publications (pty.) Ltd. : Johannesburg 1977.

5. Bureau for Economic Research re Bantu Development.

6. Bophuthatswana Government : Annual Report Department of Agriculture and Forestry 1979.

7. Bophuthatswana Government - op cit.

8. Wyndham C.H. and Irwig L.M. A Comparison of the Mortality rates of various population groups in the Republic of South Africa. S. Af. Med. J. 1979 55 796 - 802.

9. Department of Health : Epidemiological Data. Reports of notifiable medical conditions. S. Afr. Med. J. 1981, 59 166.

10. Bophuthatswana Government : Estimates of the Expenditure to be defrayed from Revenue Account during the year ending 31 March 1982.

11. Bophuthatswana Government : Annual Report of the Department of Health and Social Welfare 1980.

12. Bryant J. : Health and the Developing World. Cornell University Press : London 1969.

13. Geörgy P. and Kline O.L. (edit) : Malnutrition is a problem of ecology. S. Karger A.G. : Basel (Switzerland) 1970.

14. Cunningham N.J. The Under-fives Clinic - what difference does it make? J. Trop. Paed. Environ. Child Health 1978 24 237 - 326.

15. Khan A.A. and Gupta B.M. A study of malnourished children in the Children Hospital Lusaka (Zambia). J. Trop. Paed. Environ. Child Health 1979 25 42 - 45.

16. Barker D.J.P. and Rose G. : Epidemiology in Medical Practice. Churchill Livingstone : Edinburgh 1979.

17. Cooper M.H. : Rationing Health Care. Crown Helm Limited : London 1975.

18. Leavel R.H. and Clark E.G. : Textbook of Preventive Medicine. McGraw Hill Book Company Incorporated New York 1953.

19. Abel-Smith B. and Leiserson A. Poverty Development and Health Policy. World Health Organization : Geneva 1978.

TABLE 1

| MAGISTERIAL DISTRICT | URBAN | RURAL | TOTAL |
|---|---|---|---|
| Bafokeng | 19,108 | 74,593 | 93,711 |
| Ditsobotla | 21,410 | 76,397 | 97,807 |
| Ganyesa | 0 | 34,541 | 34,541 |
| Lehurutshe | 2,289 | 50,196 | 52,485 |
| Madikwe | 3,941 | 46,814 | 50,755 |
| Mankwe | 0 | 75,673 | 75,673 |
| Taung | 20,050 | 90,443 | 110,493 |
| Thabanchu | 5,500 | 51,102 | 56,602 |
| Tlhaping-Tlharo | 2,795 | 80,250 | 83,045 |
| Molopo | 7,709 | 85,381 | 83,090 |
| Moretele I | 22,784 | 170,309 | 193,093) )240,387 |
| " II | - | 47,294 | 47,294) |
| Odi | 103,023 | 237,037 | 340,060 |
| TOTAL | 308,609 (15,7%) | 1,120,028 (87,3%) | 1,328,637 (100%) |

Population of Bophuthatswana by district and locality (urban and rural). Based on preliminary results of 1980 census.

TABLE 2

| Educational Level | Number enrolled |
|---|---|
| Primary Schools<br>Sub A and B, Std. 1 to 5 | 350,444 |
| Secondary Schools<br>Std. 6 to 10 | 85,062 |
| Teacher Training | 3,002 |
| Technical Training | 512 |
| University of Bophuthatswana | 227 |

Pupils and students enrolled in Bophuthatswana Schools in 1980.

TABLE 3

| Hospital | Estimated Catchment Population | Number of Clinics | Clinics per 1000 Population | Total Annual Clinic Attendances | Total Op. Annual Attendances | Beds per 1000 Population | Ratio of Op. Attendances To Admission | Bed Occupancy % |
|---|---|---|---|---|---|---|---|---|
| Bophelong Hospital | 146,000 | 14 | 0.10 | 201,287 | 67,173 | 7.2 | 19.2 | 114 |
| Gelukspan Hospital | 45,000 | 5 | 0.11 | 48,878 | 56,435 | 12.4 | 12.1 | 151 |
| George Stegman Hospital | 176,000 | 16 | 0.09 | 202,692 | 26,226 | 4.5 | 19.4 | 130 |
| Jubilee Hospital | 250,000 | 20 | 0.08 | 255,486 | 77,028 | 1.6 | 20.1 | 93 |
| Moreteletsi Hospital | 52,000 | 12 | 0.23 | 124,152 | 55.028 | 2.1 | 24.0 | 186 |
| Moroka Hospital | 57,000 | 6 | 0.11 | 46,775 | 100,067 | 7.0 | 11.0 | 132 |
| Taung Hospital | 125,000 | 12 | 0.10 | 117,918 | 65,971 | 3.1 | 19.3 | 121 |
| Thusong Hospital | 37,000 | 2 | 0.25 | 71,740 | 24,978 | 8.1 | 7.3 | 78 |
| Tshwaragano Hospital | 61,000 | 14 | 0.05 | 31,882 | 36,693 | 4.4 | 19.0 | 128 |
| Odi RegionalAuthority | 330,000 | 14 | 0.04 | 262,766 | Nil | 0.00 | N/A | N/A |

Health care service availability demand and utilization in different health regions.

TABLE 4

| Department | Expenditure in million rands | Percent of Total Govt. Expenditure |
|---|---|---|
| Works | 80,89 | 20,4% |
| Finance | 72,74 | 18,4% |
| Education | 45,84 | 11,6% |
| Economic Affairs | 33,00 | 8,3% |
| Transport | 29,93 | 7,6% |
| Urban Affairs and Land Tenure | 29,58 | 7,5% |
| Internal Affairs | 26,16 | 6,6% |
| Health and Social Welfare | 25,73 | 6,5% |
| Agriculture and Forestry | 16,41 | 4,1% |
| Police | 8,38 | 2,1% |
| Defence | 8,23 | 2,1% |
| Posts and Telecommunications | 8,11 | 2,0% |
| Others | 10,66 | 2,7% |
| TOTAL NATIONAL GOVERNMENT EXPENDITURE | 396,22 | 100% |

Breakdown of Bophuthatswana Government Expenditure for 1980/1981 financial year.

TABLE 5

| HOSPITAL AND RHA (with areas served in brackets) | ESTIMATED CATCHMENT POPULATION | DOCTORS | | NURSES | |
|---|---|---|---|---|---|
| | | Number | Drs/1000 Population | Number | Nurses/1000 Population |
| Bophelong Hospital (Molopo/Lehurutshe) | 146,000 | 15 | 0.103 | 703 | 4,81 |
| Gelukspan Hospital (Ditsobotla) | 45,000 | 5 | 0.111 | 291 | 6,47 |
| George Stegman Hospital (Mankwe) | 176,000 | 7 | 0.039 | 236 | 1.34 |
| Jubilee Hospital (Moretele) | 250,000 | 13 | 0.052 | 391 | 1.56 |
| Moreteletsi Hospital (Madikwe) | 52,000 | 2 | 0.038 | 98 | 1.88 |
| Moroka Hospital (Thaba-Nchu) | 57,000 | 15 | 0.263 | 304 | 5.33 |
| Taung Hospital (Taung/Ganyesa) | 125,000 | 6 | 0.048 | 237 | 9.48 |
| Thusong Hospital (Ditsobotla) | 37,000 | 4 | 0.108 | 192 | 5.19 |
| Tshwaragano Hospital (Tlhaping-Tlharo) | 61,000 | 2 | 0.033 | 181 | 2.97 |
| Odi Regional Authority (Odi) | 330,000 | 1 | 0.003 | 51 | 0.15 |

Number of doctors and nurses per 1000 population in each of the 10 health regions (clinic staff included).

FIGURE 1

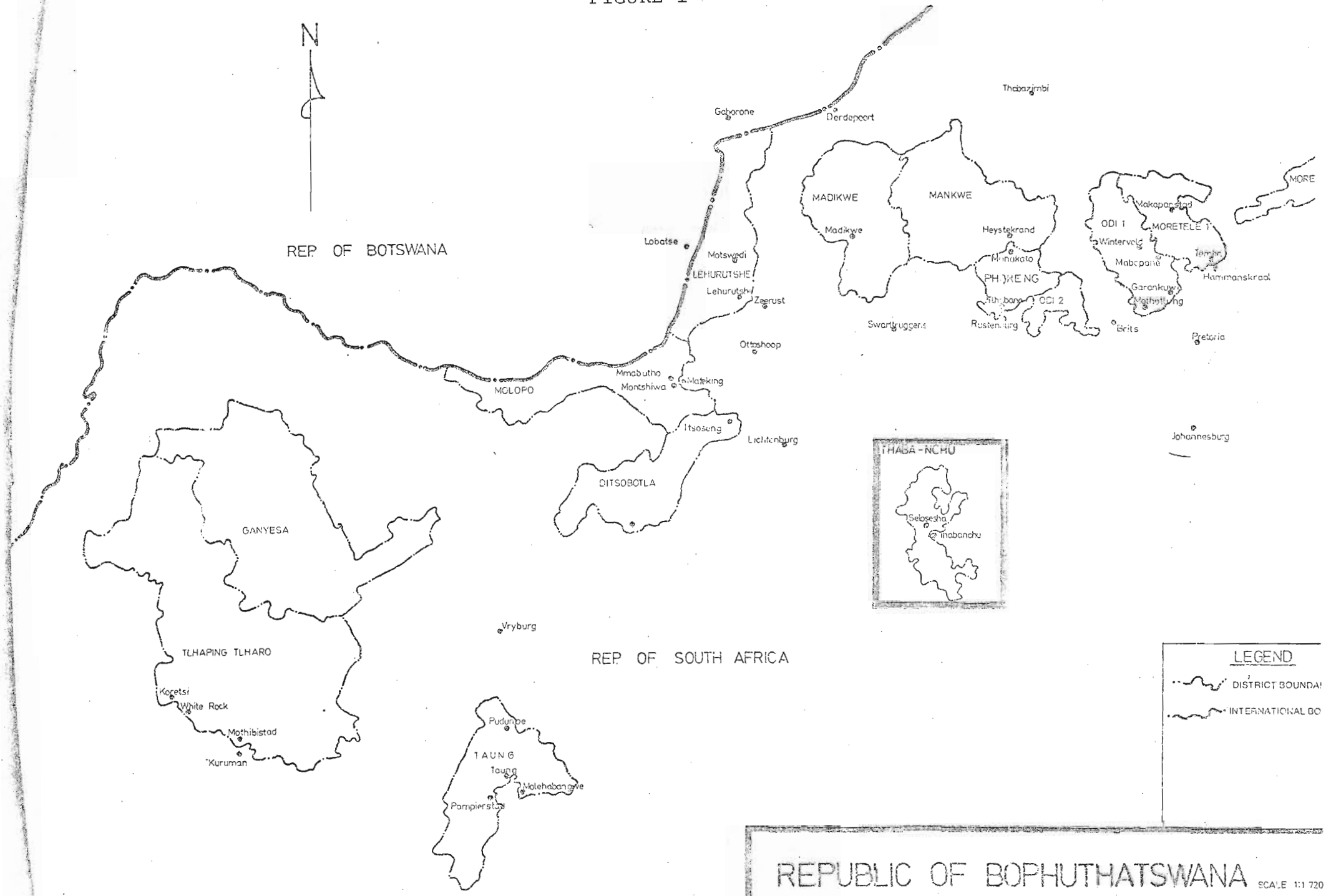

N
REP OF BOTSWANA
Gaborone
Derdepoort
Thabazimbi
Lobatse
Motswedi
LEHURUTSHE
Lehurutshe
Zeerust
MADIKWE
Madikwe
MANKWE
Heystekrand
Mmakato
PHOKENG
Thabazimbi
ODI 2
Swartruggens
Rustenburg
Brits
Pretoria
ODI 1
MORETELE 1
Makapanstad
Wintervelg
Mabopane
Temba
Hammanskraal
Garankuwa
Mothotlung
MORE
Ottoshoop
Mmabutho
Montshiwa
Mafeking
MOLOPO
Itsoseng
Lichtenburg
Johannesburg
DITSOBOTLA
THABA-NCHU
Selosesha
Thabanchu
GANYESA
Vryburg
REP OF SOUTH AFRICA
TLHAPING TLHARO
Koretsi
White Rock
Mothibistad
Kuruman
Pudumoe
TAUNG
Taung
Molehabangwe
Pampierstad
LEGEND
DISTRICT BOUNDA
INTERNATIONAL BO
REPUBLIC OF BOPHUTHATSWANA
SCALE 1:1 720

FIGURE 2

AGE STRUCTURE IN YEARS OF THE BOPHUTHATSWANA POPULATION (MALE AND FEMALE) FROM 1980 CENSUS
1 CM = 50,000 PERSONS

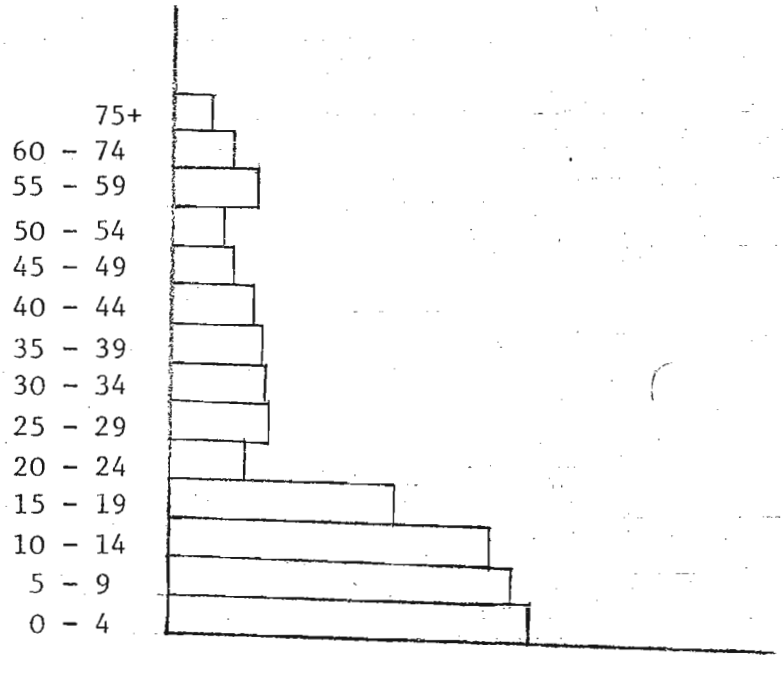
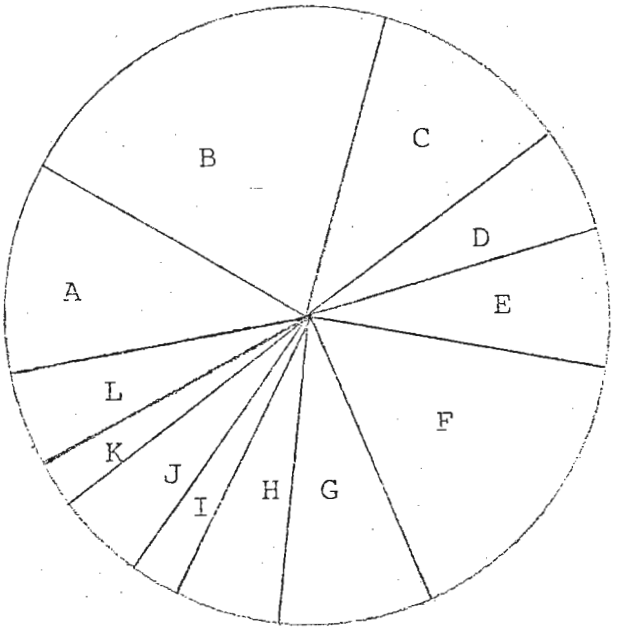


FIGURE 3

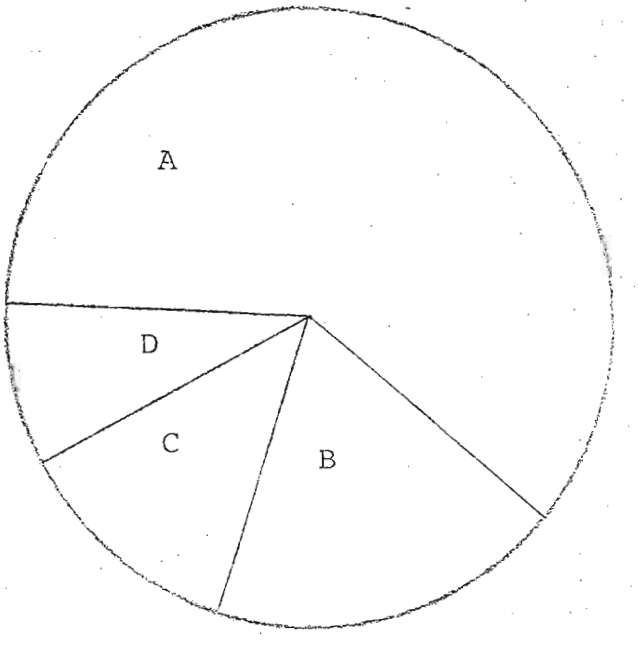
BUDGET ALLOCATION FOR VARIOUS BOPHUTHATSWANA GOVERNMENT DEPARTMENTS FOR YEAR ENDING 31.3.1982




| | | |
|---|---|---|
| A = Works ..... | R47,48m | (11,3%) |
| B = Finance ..... | R88,80m | (21,0%) |
| C = Education ..... | R44,48m | (10,5%) |
| D = Economic Affairs ..... | R23,85m | ( 5,7%) |
| E = Transport ..... | R30,51m | ( 7,2%) |
| F = Urban Affairs and Land Tenure ... | R66,83m | (15,8%) |
| G = Internal Affairs ..... | R33,77m | ( 8,0%) |
| H = Health and Social Welfare ..... | R26,45m | ( 6,3%) |
| I = Agriculture and Forestry ..... | R10,35m | ( 2,4%) |
| J = Posts and Telecommunication ..... | R19,88m | ( 4,7%) |
| K = Police ..... | R10,36m | ( 2,5%) |
| L = Other Departments ..... | R18,89m | ( 4,5%) |

FIGURE 4

BREAKDOWN OF BUDGET ALLOCATED FOR THE BOPHUTHATSWANA DEPARTMENT OF HEALTH AND SOCIAL WELFARE FOR THE FINANCIAL YEAR 1981/1982




A = Salaries and wages and allowances ...R16,00m (60,5%)

B = Consumables (Fuel, Transport, Cleansing and Laundry materials Medicines, Dressings and Vaccines, Advertisements and Publications and Laboratory materials)... R 5,02m (19.0%)

C = Machinery Equipment, Tools and Stocks (other than fuel and cleansing material) .... R 3,24m (12,2%)

D = Other ..... R 2,21m ( 8,3%)