



Republic of Mauritius

**WHITE PAPER**  
on  
**Health Sector Development & Reform**

Ministry of Health  
&  
Quality of Life

December 2002

# **MISSION STATEMENT**

## **MINISTRY OF HEALTH AND QUALITY OF LIFE**

- **Enhance the health status of the population**
- **Improve the quality of health care delivery with a view to increasing patients' satisfaction**
- **Enhance social equity through the provision of a wider range of health services to the whole population**
- **Ensure that the health sector is consolidated and that the health services remain accessible to every citizen**

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## PREFACE

### *By the Minister of Health and Quality of Life*

This document sets out our plans for developing the health sector and options for financing them. It is for consultation and we welcome all views that people may have on the scope and content of the plan, and the best ways of funding the vital developments proposed.

The future prosperity of this country depends on the health of the people. Throughout our history, we have had to depend on the capacities of our people. For further progress, we must increasingly ensure that our people are fit and well. Better education and better health are the twin pillars of sustainable economic and social development.

In September 2000, on assuming office, after taking stock of the situation, I decided to prepare a medium term Action Plan for development and reform and to get better results. But it was clear that we needed major changes if we were to reach up to the standards already achieved by developed countries.

It is better to spend more on prevention now rather than on huge hospital bills in the future. Our aim must be to keep people out of hospital and get them healthier at home, at work and at school. A key component of the proposed reforms is to strengthen primary care with a 24-hour family doctor service to complement the 'Caravanes de Santé' services already being developed.

In the past two years we have had to start a major programme to replace and improve old buildings and equipment. We have also had to provide a range of new high-tech diagnostic facilities such as CT scan, MRI and nuclear medicine. There have also been developments in high tech. treatment such as a major expansion in heart surgery, haemodialysis in four regions, transplant surgery, lithotripsy, cobalt radiotherapy for cancers and more up-to-date equipment for operation theatres and intensive care units. But we must sustain this programme of replacement and renewal of the health estate through a systematic programme of assets' management.

There are three next steps in our programme of technical development. First we want to extend all these new services to cover all people in the country including Rodrigues. Second, we want adequate finance to continue this programme of keeping pace with the most cost-effective medical technology as it becomes available. Last but not least, we need to do more to attract and retain the best staff. This is a high priority if we are to sustain our progress in the health sector.

I sincerely hope that every citizen of this country will contribute positively in this wide consultation exercise.

**(Hon. A.K. Jugnauth)**  
**Minister**

## EXECUTIVE SUMMARY

**Abstract:** *The White Paper on Health Sector Development and Reform proposes the Action Plan for Health. The aim of the Action Plan is to improve the level of health in Mauritius and the range and quality of health services, to meet the present and future needs of the people. The White Paper reviews the progress that has been made in the last two years in the development of services and identifies specific further new and expanded services that are necessary, to secure in Mauritius the levels of health and of health services, that are enjoyed by people in developed countries. Mauritius has been doing well, but it can do better.*

*The principal developments proposed include a 24 hour family doctor service, major expansion of high tech, diagnostic and treatment services, new and improved hospitals and health centres and a greater emphasis on health promotion and preventive medicine.*

*The Action Plan proposes the introduction of an assets management approach for the health services estate, to renew and maintain buildings and equipment in full working order. It includes a better deal for staff as part of a human resources development plan, with 3,900 extra jobs and a programme of continuing education and training. Quality assurance is to be extended to all facilities to improve the effectiveness and efficiency of services, and a Patient's Charter will be put in place to promote consumer protection.*

*The results expected from the plan include an increase in the expectation of life to above 75 years, further reductions in infant and maternal deaths; increase in the numbers of life saving heart operations, and in the capacity to reduce deaths from kidney failure through expansion of kidney dialysis and transplant services. Further improvements will be made in the quality of prevention and care for those with hypertension and diabetes to reduce the risk of complication from these conditions. Mental health services will be reformed. Health promotion will focus on improvements in lifestyle to reduce tobacco use and alcohol abuse, increase exercise and improve diet. Programmes will also be strengthened to provide more support to the most disadvantaged people whose health is affected by poverty, homelessness, disabilities and malnutrition.*

*The cost of these developments is beyond what can be expected in the medium term from the normal budget sources. Options for supplementary finance for the Action Plan are presented, including national health insurance, extra incentives for the development of the private sector, conversion of the National Savings Fund, health taxes on tobacco and alcohol, an efficiency drive within the health sector and charges for health services.*

*The White Paper is published for public consultation and views are invited to be submitted by 31 March 2003 to promote the widest possible debate on priorities and methods of funding as a basis for national policy.*

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### *Health Status*

The general state of health of the population of Mauritius is good and has been improving steadily over the past decades. People are living longer and fewer children die in their first year. In the last thirty years, in Mauritius, expectation of life has increased from 63

years to 71 years and infant mortality has fallen from 64 to 14 deaths in the first year of life for every 1000 live born babies.

These are major achievements which put Mauritius above the levels of health of developing countries, where expectation of life is only 64 years and infant mortality is 61.

Mauritius has also managed to reduce its rate of growth in population significantly over the years. This has been due to Government's policy of providing a strong and sustainable family planning programme and to access to education and employment opportunities for women. Today, the annual population growth rate is below 1 per cent.

Although Mauritius has been doing well by comparison with developing countries, new measures are needed to improve its performance to reach the levels achieved by other countries such as Singapore, New Zealand and the higher income developed countries. These countries have expectation of life above 75 years and infant mortality rates below 7.

One reason for this difference in health status between the countries may well be the difference in the level of professional staffing in their health services. The number of doctors and nurses employed per 100,000 population in Mauritius, for example, is significantly below that found in these countries which have better levels of health.

A further reason may be in the relative level of investment in the health services in different countries. At present, Mauritius spends about 2.8 percent of its national resources (Gross Domestic Product) on health. Comparable figures for other countries are Madagascar 2%, Singapore 3.3%, Seychelles 5.9%, UK 7.0%, New Zealand 8.0%, Belgium 8.9%, France 9.8% and the USA 13%.

### **Overview of current health services**

Mauritius provides state health services throughout the country free at the point of use to all its 1.2 million people. It also has a well established private sector.

The state health services employ over 650 doctors, 2,700 nurses, about 50 dentists and 17 pharmacists. At primary care level, the state health services have 134 facilities (Including Area Health Centres, Medi-clinics, a Community Hospital and Community Health Centres) which provide medical, nursing, dispensary and support services at local level. In addition, there are 5 regional hospitals and three district hospitals with over 2500 beds. Separate specialist hospitals include a mental hospital with 800 beds, and an Eye hospital, an Ear, Nose and Throat hospital, a Cardiac Centre and a Chest hospital which together have over 200 beds. In the state health services, at primary care level, there are about 2.8 million attendances a year; at hospital level, in a year there are nearly 2.5 million outpatient attendances and nearly 200,000 inpatient admissions, with a 75% average occupancy of available beds. The regional hospitals and primary care centres or facilities benefit from a wide range of clinical and non-clinical support services including pathology laboratories, X-Ray, CT scan and MRI, pharmacy, blood collection and

transfusion, public health and hygiene, medical records and information services, catering, laundry, transport and cleaning.

The private sector which absorbs 32% of the total expenditure on health in the country, employs over 400 doctors and provides primary and secondary services with 14 private clinics, nearly 600 beds, 20 private medical laboratories and 275 private pharmacists. In a year, the private sector has 27,000 admissions for in-patient treatment, undertakes 13,000 surgical operations and delivers over 2,000 babies.

## **Health Sector Development**

In recent years, the pattern of health problems in Mauritius has changed dramatically. The infectious diseases of the past have been largely eliminated; population growth has declined to less than 1% a year; expectation of life has increased by an average of three months a year over the last 40 years. But the country now faces growing problems of non communicable diseases including heart disease, diabetes, stroke, cancer, tobacco and alcohol related diseases and mental illness.

### *Infectious diseases*

After years of success in combating such problems as malaria, childhood infectious diseases and TB, the aim for the future is where possible to eradicate the diseases or to contain them at their present low level. The child vaccination programme is being strengthened to cover haemophilus influenza. The National Strategic Plan for HIV/AIDS is being reinforced to reverse the recent upward trend in this condition that affects about 1 per thousand of adults in the country.

### *Non-communicable diseases (NCDs)*

In adults aged thirty and over, 20 per cent have diabetes, 30 percent have hypertension, 40 percent are overweight. 42 percent of men are smokers and 16 percent of adults are heavy drinkers. The typical diet in Mauritius is high on salt and fat and low on vegetables, fruits and fibre. This pattern of health risks gives rise to an increasing level of NCDs and a growing avoidable burden on the health services including complications that require heart surgery, haemodialysis and transplants, eye surgery and long stay psychiatric, medical and other treatment.

In the last two years, new and expanded services have been developed to meet these growing problems. These include the mobile screening service (Caravanes de Santé), national health education and medical treatment programme covering diabetes, hypertension and cancer in women.

### *Curative services*

Greater emphasis than ever before has been laid on curative services in the past two years to bring Mauritius up-to-date in medical technology for diagnosis and treatment of

disease. Rs 1.3 billion are being spent on major new projects started in the past two years and in that period Rs150 million has been spent on new medical equipment for hospitals.

The principal major projects in progress are the reconstruction of the Dr Jeetoo hospital, new outpatients and treatment services at Victoria Hospital, new national centre for mental health and regional mental health services, extension of the cardiac unit at Victoria Hospital, reconstruction of Souillac hospital, renovation of health centres, and improvements to catering departments.

CT scan, MRI and nuclear medicine services have been introduced to aid accurate diagnosis of a variety of disabling and life threatening conditions. High tech. treatment has been expanded to meet growing needs including a major expansion in heart surgery at the Cardiac Centre, haemodialysis in four regions, transplant surgery, lithotripsy for eradicating kidney stones, cobalt radiotherapy for cancers and more up-to-date equipment for theatres and intensive care units.

Fibre optic equipment is now available in all regions for urology services; a national lupus service is now open for patients suffering from this serious connective tissue condition and a new national spinal surgery service has been started. Visits of expert teams from abroad have been expanded for surgery on complex cases not normally undertaken by local doctors and in the past two years, over 500 patients have been sent at a cost of Rs56 million for treatment abroad not available in Mauritius.

The management of Accident and Emergency Services has been reformed to reduce waiting time and increase the effectiveness of services using a triage system of assessment with a fast track for urgent cases, elderly and children. Catering, reception, cleaning and complaints procedures have been improved to provide greater attention to consumer interests.

### *Human resources*

There are 13,000 staff posts in the state health services. In the past two years, 2,900 vacancies in professional, technical and other grades have been filled. Provision has been made to fill a further 1000 posts.

With the first SSR medical school students now in their final clinical training years, and support from France and the UK in producing generalists and specialists, the prospects for sustained growth in medical staff are more assured. Nurse training is also expanding and becoming more specialised. Through regional collaboration, courses for other health professions are being established. A dental school and dental hospital are being developed. Continuing professional education programmes are active in each region to keep staff up-to-date and to review the effectiveness of current clinical practice. The Mauritius Institute of Health co-ordinates education and training programmes in collaboration with other institutions including the University of Mauritius.

## *Management*

The health services in Mauritius operate through five regions and with separate arrangements for Rodrigues. Each region has its own Health Advisory Board to advise on the health needs of the region, effectiveness and efficiency of services and consumer matters. The management of the regions is the responsibility of regional health directors who have much of the day to day work of the regions under their decentralised control, including the hospitals and the community health services. The Ministry of Health and Quality of Life (MOHQL) is responsible for overall policy, planning and management, resource allocation and regulation, together with parliamentary and international matters.

## *Public private partnership*

The MOHQL works closely with the private sector and in recent years has used private services lacking in the state sector including CT scan, MRI and kidney dialysis. The MOHQL provides training services for private sector staff and a wide range of medical laboratory services. Further joint ventures are being currently explored in the Public Private Partnership initiative of the World Bank.

## *Rodrigues*

The population of 35,000 of Rodrigues have access to hospital and community health services. Recent improvements in facilities include the introduction of the NCD mobile screening services, an Intensive Care unit for the Queen Elizabeth hospital, haemodialysis services, a physiotherapy unit and a new incinerator for the hospital. The incentives to attract staff to work in Rodrigues have been improved and specialist services expanded with plastic surgery being provided in Rodrigues for the first time this year.

## **The Action Plan for better health**

Despite developments in Mauritius in the past two years, current resources and services are insufficient to meet the challenge of the pursuit of the best world standards in health and health services. The Action Plan aims at ensuring that the country has the vital services that are required and the capacity to deliver them in the most cost-effective way. The standards of health care facilities will be raised and the programmes of continuous education, training and quality assurance for staff will be strengthened to keep them up to date with modern developments; a systematic programme of asset management will be sustained to ensure the timely replacement, renewal and maintenance of the health sector estate of buildings and equipment.

## *Aims*

The Action Plan aims for:

- a better deal for patients

- a better deal for staff
- more efficient health services
- joint working with the private health sector, and
- better tangible results approaching those achieved in many developed countries.

### *Scope and content of the Action Plan*

#### *New and expanded services*

In summary the Action Plan proposes the introduction of many new and expanded services. These include:

- 24-hour family doctor service
- High technology services to tackle the complications arising from diabetes and hypertension including new and extended cardiac surgery programme, transplant programme (for eyes and haemodialysis), extended renal dialysis programme, joint replacement surgery (hips, knees etc.), spinal injury and extended neurosurgical services and complex eye surgery
- National Institute for Non Communicable Disease
- National oncology centre
- Health promotion and preventive medicine services for every community
- Patient's Charter system to protect consumer interests
- Information system with a smart card for tracking and improving the quality of treatment, linked to the present carnet de santé
- Staff retention, productivity scheme and quality improvement programme
- Better maintenance and repair of buildings and equipment
- Special development support for Rodrigues and the outer islands
- Improvements in dental services to promote better dental health and extend existing services

#### *Other new facilities*

The state health services will also include the following developments:

- Replacement and renewal programme for all health sector buildings and their equipment: e.g. upgrading of the Victoria Hospital Candos, conversion of Mahebourg and Long Mountain hospitals, Poudre d'Or, ENT and parts of SSRN as well as the completion of the upgrading of Dr. Jeetoo hospital.
- New developments at Flacq (nursery, orthopaedics, cardiology and haemodialysis)
- Regional mental health units and community mental health services
- New hospital for the central regions (250 beds with teaching facilities)
- New specialised Accident and Emergency Departments for each region and for Rodrigues

The running costs of these schemes are included in the plan.

### *Other developments in state health services will include:*

- Health promotion and occupational health
- Teaching departments in clinical and other disciplines
- Ayurvedic medicine
- More intensive prevention programmes against sexually transmitted diseases and HIV/AIDS

The Plan also includes provision for increase in health services to respond to the needs of the rising population and the increasing proportion of elderly people. Legislation for control of dangerous chemicals will be introduced, as well as a new law on regulation of the use of organs for transplants, a new Public Health Act, and a new law on invitro-fertilisation to aid infertile couples.

### *Rodrigues and the outer islands*

The Action Plan proposes extending access to modern health services to people throughout the whole country. For this purpose Rodrigues and the Outer Islands will be given specific support. They will benefit from the developments in primary health care and have access to the new high technology services to be established on Mauritius island. The following measures will be taken for Rodrigues:

- A mental health facility will be set up
- A SAMU service will be provided
- A family doctor service will be developed
- The NCD programme will be fully established
- Maternal and Child Health Service will be strengthened to reduce infant mortality in Rodrigues
- Paediatric services will also be strengthened
- Specialist orthopaedic services will be available
- A programme of development, general renovation and planned preventive maintenance of buildings and equipment will be promoted, with additional funding
- A continuing medical education programme and similar programmes for other professionals will be extended using visiting tutors and distance learning
- Patients will be linked through the patient information service to the National Complaints Commission and their own regional service
- Further decentralisation of operational management will be effected to promote local decision-making on local matters and local management of operational budgets
- The services at Mont-Lubin and La Ferme Area Health Centres will be rationalised

## **Increasing the level of resources for health in Mauritius**

If Mauritius is to tackle successfully the major health problems of the country, it needs to devote substantially more resources to the health sector. It has a good record of past achievement but lacks the capacity to keep pace with the country's needs both in primary health care and in high technology facilities. Many of the present hospitals and health centres are old, poorly maintained and buildings and equipment are in need of replacement or renewal.

One of the implications of the Action Plan will be to raise the resource commitment to the health sector from its current level of about 2.8% of GDP to beyond 3%.

## **Results**

The Action Plan for Health has been designed to achieve specific targets to respond to the health needs of all the people of Mauritius and to maintain a fit and healthy work-force to sustain the country's competitive edge on the world economy. The overall aim is to create a self sufficient, sustainable health service fit for the 21<sup>st</sup> century. Within this overall aim the key health sector targets are set out below.

### *Health targets*

- Increase in expectation of life at birth to above 75 years
- Reduce infant mortality (deaths under one year) to single figures within the next five years (i.e under 10 deaths in infants in their first year of life, per thousand live births), and maintain maternal mortality below 20 per hundred thousand live births and perinatal mortality (still births and deaths within the first week) to below 20 per thousand live and still births).

### *Service targets*

- Double the number of open heart operations
- Save 500 lives a year from end stage renal failure
- Halve the amputation rate in diabetes
- Provide decent hospital and community services for those who are mentally ill
- Replace older hospitals with modern facilities (Jeetoo, Victoria, Brown Sequard, ENT, Mahebourg, Souillac, Poudre d'Or and Long Mountain)
- Provide a 24 hour family doctor service to everyone
- Provide nearly 3,900 new jobs in the health sector
- Improve the effectiveness and efficiency of preventive and curative clinical services and financial and general management

### *Consumer targets*

- Ensure effective quality care for all those with non communicable disease, especially diabetics and those with hypertension
- Identify and pursue consumer targets including the reduction of waiting time, improvement in privacy, better quality of reception and 'hotel' services, protection of patients' human and civil rights, the establishment of informed

consent as a basis for all clinical intervention, and the involvement of the community in planning and evaluation of health services.

### *Health promotion targets*

- Promote health through changes in life style (reductions in tobacco use, alcohol abuse, obesity, and an increase in exercise and dental health), through improvements in people's understanding of how to look after their own health, through full implementation of the Food Act and through control of dangerous chemicals (new legislation to be introduced)
- Prevent the younger generation from becoming diabetic and hypertensive
- Promote inter-sector support for programmes for the most disadvantaged persons whose health is affected by lack of basic amenities, through poverty, homelessness, disabilities and malnutrition.

### **Costs**

The Action Plan proposes a 75% increase in the health budget, the commitment of Rs 4 to 5 billion for capital schemes for the replacement, improvement and expansion of services, and the employment of a further 3,900 professional, technical and supporting staff.

### **Finding the money**

Options presented for funding the Action Plan include:

- Increase in the state budget
- Introduction of health insurance with monthly contributions from employers, employed people and self employed
- Conversion of National Savings Fund (NSF)
- Extra incentives to expand the private sector
- Health taxes on tobacco and alcohol
- Efficiency drive within the existing services, and
- Charges for services provided.

### **Consultation**

The proposals are submitted for public consultation to promote the widest debate on priorities and methods of funding. Comments, suggestions and proposals need to be submitted **by 31 March 2003 to the Permanent Secretary, Ministry of Health and Quality of Life, Room 537, 5<sup>th</sup> Floor, Emmanuel Anquetil Building, Port Louis.**

## 1. INTRODUCTION

Over the past two years, this Government has made a bold start in achieving better health and in promoting better health services. Financial allocations have been increased, new projects developed and new services introduced. New buildings have been put up and old ones renovated. Modern equipment including high-tech equipment has been acquired. More specialised professional and technical staff have been recruited.

There has been substantial improvement, but much more remains to be done. **Indeed, a completely new strategy is required to improve our health system, to cater for people's rising expectations and needs, and to keep pace with advancing medical technology.**

This White Paper on Health Sector Development and Reform is a document for national consultation and it:

- provides an overview of the current state of the health sector
- presents for public consultation key proposals from the Action Plan
- includes options for funding that plan

## **2. HEALTH STATUS**

The general state of health of the population of Mauritius is good and has been improving steadily over the past decades. Two health indicators are commonly used to compare differences in levels of health within countries and between countries. These are the average length of life (the expectation of life at birth) and the proportion of children born alive but who die in their first year of life (the infant mortality rate).

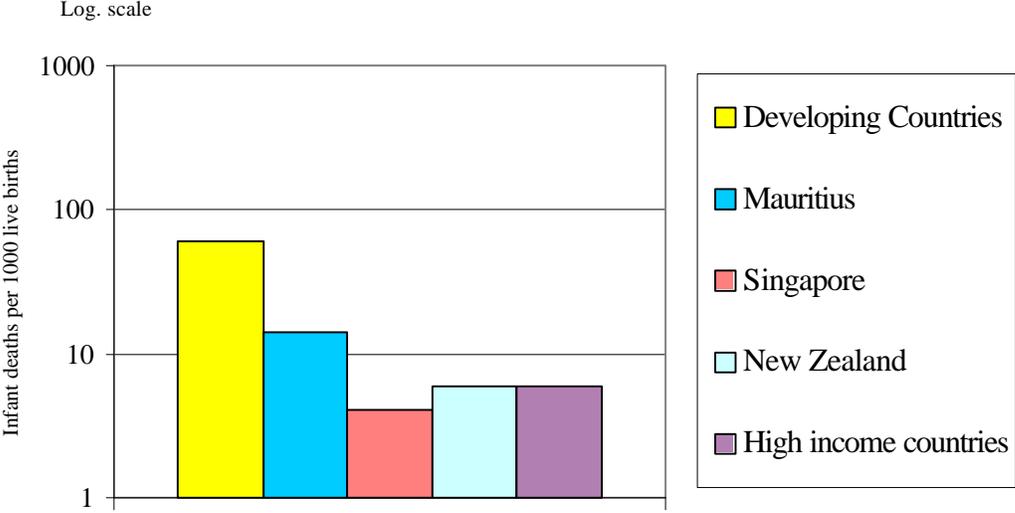
On both these indicators, Mauritius has been doing well. People are living longer and fewer children die in their first year. In fact, the improvement on these two measures has been remarkable. In the last thirty years, in Mauritius, expectation of life has increased from 63 years to 71 years and infant mortality has fallen from 64 deaths in the first year of life for every 1000 live born babies to 14.3 in the year 2001.

These are major achievements which put Mauritius above the levels of health in developing countries. For, in many developing countries of the world, life is short and the prospects of survival for children are low. For example, in developing countries in general in the same thirty year period from 1970, expectation of life at birth increased from 55 to 64 and the infant mortality rate declined from 110 to 61.

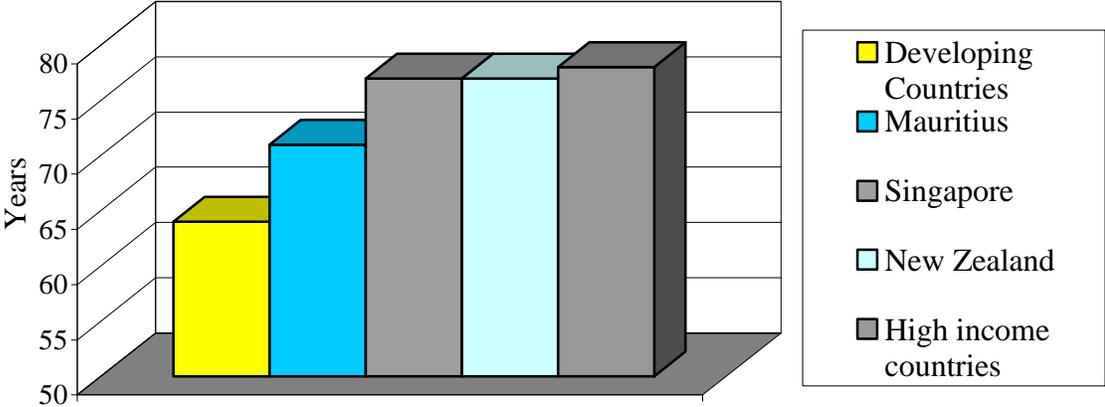
The population growth rate has been reduced significantly over the years. This has been due to Government's policy of providing a strong and sustainable family planning programme and access to education and employment opportunities to women. To-day, the population growth rate in Mauritius is below 1 per cent per annum.

Although Mauritius is doing well by comparison with developing countries of the world, measures are being taken to improve its performance to reach the levels achieved by other countries such as Singapore, New Zealand and the higher income developed countries. (See Figures 1 and 2). These countries have expectation of life above 75 years and infant mortality rates below 7.

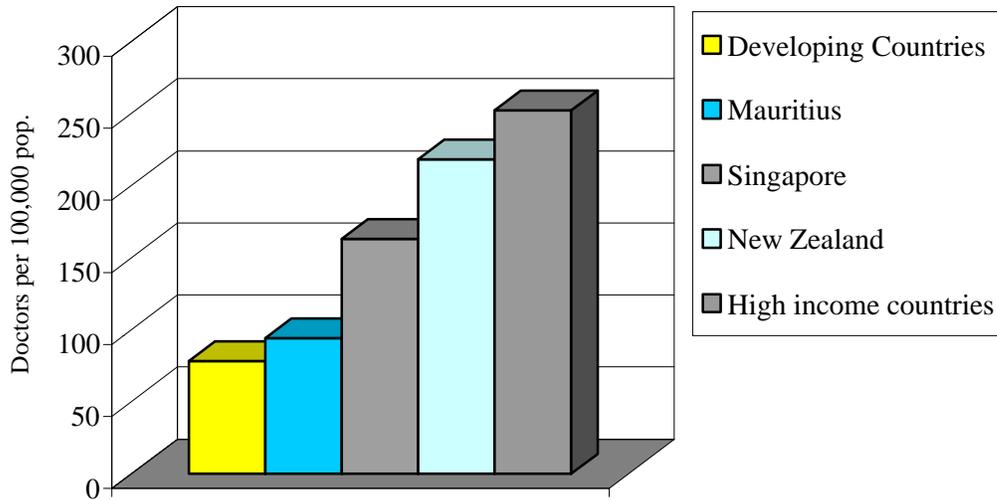
**Figure 1**  
**Doing well: Could do better**  
 Infant Mortality Rates



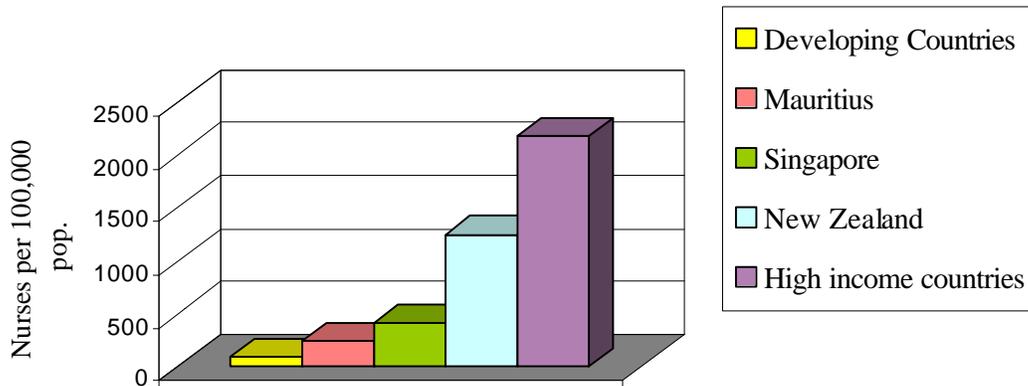
**Figure 2**  
**Doing well: Could do better**  
 Expectation of life



**Figure 3**  
**Doing well: Could do better**  
 Medical staffing levels



**Figure 4**  
**Doing well: Could do better**  
 Nurse staffing levels



One reason for this difference in health status between the countries may well be the difference in the level of professional staffing in their health services. The number of doctors and nurses employed per 100,000 population in Mauritius for example is significantly below that found in these other countries which have better levels of health. Conversely, the medical and staff levels in Mauritius are higher than that of developing countries (see Figures 3 and 4 above). So it seems that more doctors and nurses can lead to better health. The level of other professional staffing (laboratory staff and other paramedical staff) must also have a bearing on the results achieved, although international data are not available to give added support to this point.

A further reason may be in the relative level of investment in the health services in different countries. To compare levels of investment in health between countries, it is common to compare the proportion of national income that is spent on health. The usual measure of income to use is the Gross Domestic Product (GDP) that is the total value of all the goods and services produced in the country, excluding that from investments abroad. At present, Mauritius spends about 2.8 percent of its GDP on health. Comparable figures for other countries are shown in Figure 5 (Madagascar 2%, Singapore 3.3%, Seychelles 5.9%, UK 7.0%, New Zealand 8.0%, Belgium 8.9%, France 9.8% and the USA 13%).

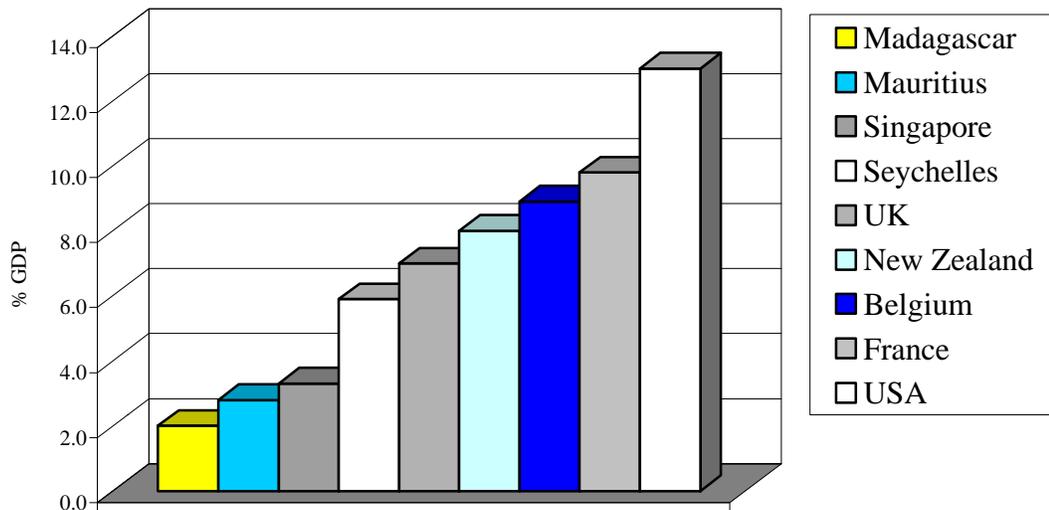
From these comparisons, it emerges that those countries with better health than Mauritius invest more of their resources in health. But a World Health Organisation Report, published in the year 2000, has an additional important point to make. WHO assessed that Mauritius was performing in the health sector at about 70% of its potential, having regard to its level of expenditure on health. WHO in this report ranked Mauritius at 84<sup>th</sup> out of 191 countries in overall achievement of the health system.

Mauritius is doing well but it could do better. To do as well as its trading partners and competitors in the global economy, it needs more investment in health and must make better use of its health resources. To understand what has to be done, it is first necessary to examine in more detail:

- the current health services;

- recent developments in responding to the changing patterns of health problems;
- the reforms contained in the Action Plan at the start of this third millennium, for taking the country towards the levels of health care standards already achieved by more developed countries.

**Figure 5**  
**% of GDP on Health**



### **3. OVERVIEW OF CURRENT HEALTH SERVICES**

Health Care is provided free of charge at the point of use to the entire population. A regionalised system of health services operates in the country. This is characterised by a network of accessible health care delivery institutions at the primary, secondary and tertiary levels.

At the end of 2001, there were in Mauritius:

- 1,107 doctors, that is one doctor for every 1,089 inhabitants - Of those doctors, 694 (63%) were working in the public sector, and amongst these, 245 were specialists.
- 149 dentists, that is one dentist for every 8,090 inhabitants - Of those dentists, 49 (33%) were working in the public sector.
- 245 pharmacists, that is one for every 4,920 inhabitants - Of those pharmacists, 17 (7%) were working in the public sector.
- 2,672 qualified nurses and midwives in the public sector, that is 4 nurses for every doctor working in the public sector. In addition, there were 703 student nurses.

#### **3.1 Primary Health Care**

There are at present 23 Area Health Centres (AHCs), 2 Medi-Clinics (MCs) and 1 Community Hospital (CH) spread over the whole country. These peripheral health units are the first points of contact and cases are referred from them to regional hospitals or specialised hospitals for specialist services. The services at the MC/CH include X-Ray, dental care, access to laboratory tests and pharmaceutical services for essential drugs not requiring specialist advice.

The AHCs/MCs/CH are linked to 108 Community Health Centres (CHCs) providing health promotion, health education, family planning and primary health care diagnostic and treatment services, spread across the regions.

For the year 2001, there were 3.1 million recorded attendances at the AHCs/MCs/CH and CHCs.

#### **3.2 Secondary Health Care**

Curative health services are delivered through three hospitals at the district level, and five regional hospitals, with a total bed capacity of 2,676. The regional hospitals provide services which include, accident and emergency services, general medicine, general and specialised surgery, gynaecology and obstetrics, chest medicine, orthopaedics,

traumatology, paediatrics and intensive care services. Radiotherapy services are provided at Victoria Hospital. The 'Service d'Aide Medicale d'Urgence' (SAMU) is attached to each Accident & Emergency Department and operates on a 24-hour basis.

There is one psychiatric hospital with 803 beds. The Eye Hospital, the Ear/Nose/Throat Centre and the Chest Hospital with a total bed capacity of 177 beds, offer specialised services in their respective fields.

In the year 2001, the number of occupied bed-days in all these curative institutions was around 946,000 with an occupancy rate of around 70 per cent.

In the public hospitals, in the year 2001, there were about 197,000 admissions for in-patient care, over 35,000 in-patients who had surgical operations, 2.7 million out-patient attendances with around 33,400 operations performed on out-patients, over 16,000 babies delivered, and more than 5.2 million pathological laboratory tests performed.

### **3.3 Tertiary Health Care**

High-technology delivery services include the functioning of the Cardiac Centre, which is managed by the Trust Fund for Specialised Medical Care. It is a 53-bedded institution, specialised in cardiac surgery, invasive cardiology and also provides a neurosurgical service. In the year 2001, 732 operations were performed at the Cardiac Centre on cardiac and neurosurgical patients. Other high-tech programmes in Mauritius include renal transplantation, laser and laparoscopic treatment.

The State health services are providing a range of high-tech diagnostic facilities, including CT scan and MRI to assist in complex cases. Dialysis is provided for patients with end-stage renal failure. Lithotripsy services are also provided at three regional hospitals. Nuclear medicine diagnostic services are also available at the J. Nehru Hospital.

### **3.4 Support Services**

All regional hospitals have their own laboratory departments for undertaking tests in biochemistry, haematology, histology, microbiology and parasitology. They also provide blood transfusion services (except at district hospitals). The Central Laboratory caters on a large scale for pathological tests for both public and private sectors. A specialised virology unit also operates under the aegis of the Central Laboratory. The Blood Transfusion Unit at Victoria Hospital is responsible for blood collection as well as for the distribution of blood for transfusion. The hotel services in the health delivery system form an integral activity within the day-to-day management of the hospital services. These include catering, laundry, cleaning and other related services. The health service has a fleet of 253 vehicles which includes ambulances, cars, mobile clinics and other vehicles.

### **3.5 Private Sector**

There are 14 private clinics in the country, providing a range of services suited to local needs. These include primary and specialist services, high-tech diagnostic services, renal dialysis and most recently cardiac surgery. These private sector facilities have 588 beds, of which nearly half are in single rooms. In the year 2001, there were 27,176 admissions in private clinics, 13,697 surgical operations performed and 2,694 babies delivered. Of the total 4,297 health sector beds on the island of Mauritius, 14 per cent are in the private sector. There are 413 registered private doctors, some working with the private clinics and others working from their private premises, offering general and specialist services. There are 20 private medical laboratories which cover different pathological tests and other services.

## 4. HEALTH SECTOR DEVELOPMENT AND REFORM

In recent years, the pattern of health problems has dramatically changed. The infectious diseases of the past have been largely eliminated. But these have been replaced by a new and growing problem of non-communicable diseases including heart disease, diabetes, stroke and mental illness. This change has required a reassessment of the services required to meet the changing health needs and the way in which those services are managed. In the past two years, major changes have been made in service development. The Action Plan sets the scene for the future. The changes undertaken and the future proposals in the Action Plan are now considered.

### 4.1 Infectious Diseases

#### 4.1.1 Present Situation

Mauritius has achieved much to improve the health of its people by virtually eradicating the major infectious diseases of the past, such as malaria, polio, diphtheria, typhoid and cholera, which still seriously affect many countries in the African region. It has also been one of the most successful countries in the region in containing sexually transmitted diseases and HIV/AIDS. As with many developed countries, the task ahead is to maintain this control and to deal effectively with any re-emerging outbreaks of infection. This surveillance will require continued systematic management of screening, vaccination, treatment and case finding services, improving quality control measures and continuing education and training of staff.

The overall success in the control of infectious disease has been principally achieved by three factors:

- **safe water and sanitation** which has controlled water borne diseases such as typhoid and cholera
- **combined public health, health education and clinical programmes** for control of diseases such as malaria and food poisoning and the more recent containment of HIV/AIDS
- **national vaccination programmes** against childhood disease such as diphtheria, measles, whooping cough, polio, mumps and TB; and against diseases more common in adults such as rubella, tetanus and infective hepatitis; also against disease risks for the many travellers from Mauritius to other countries, including yellow fever, typhoid and meningitis.

For the year 2001, there were no cases of measles, schistosomiasis, diphtheria, leprosy and whooping cough. Polio has successfully been eradicated and procedures are underway for Mauritius to be declared a polio free zone.

The successful control of infectious disease has had also much do with the increasing levels of education and literacy in the country, national media systems for communication, smaller family size, better housing and infrastructure of roads, public

transport and power, food hygiene and refrigeration, high levels of employment and the alleviation of poverty. Support from outside bodies such as WHO has ensured expert attention to the most cost-effective measures, equipment, staff training and evaluation.

### *Malaria*

Mauritius was once a country with high levels of endemic malaria. The number of cases has declined from tens of thousands a year in the 1940s to 668 in 1982 of which 45 were imported, and now, the number of cases has fallen to 66 in the year 2001, of which all were imported cases. The highly successful eradication of local malaria in Mauritius, with expert support from WHO, is being maintained to stop any resurgence of the disease in this country.

The programme to contain malaria includes environmental controls on mosquito breeding, selective spraying of the airport, seaport, ships, and planes, the follow-up of travellers from countries with endemic malaria, and free preventive drugs for Mauritian travellers visiting these countries. Following many years of continual containment of the disease, certain trained staff are being put on stand-by and redeployed on other duties. The malaria unit now carries responsibility for the general surveillance of all notifiable infectious diseases in Mauritius.

### *Tuberculosis*

The number of cases of tuberculosis of the lung has remained between 100 and 150 a year since 1980 and shows no sign of decline. In the year 2001, over 20,000 vaccinations against TB (BCG vaccination) were carried out mainly on children, but also on those adults who had been in contact with active cases. Treatment is provided at Poudre d'Or hospital and through the Port Louis chest clinic at Dr. Jeetoo hospital.

### *HIV/AIDS*

Since 1987, when the first HIV/AIDS case was reported in Mauritius up to the end of 2001, there have been 276 cases amongst Mauritians, of whom 72 have died. The case rate amongst adults is low by international standards and is amongst the lowest in the African region. By comparison with Mauritius, the case rate in adults in the USA is 6 times higher, in France it is 4 times higher and in the UK about 30 per cent higher. Mauritius is doing well in the battle against this killer disease.

At present, 0.08 per cent of adults have HIV/AIDS, that is less than one person in a thousand. In Sub-Saharan Africa, 9 per cent of adults have HIV/AIDS and in some

countries, the figures are even higher, for example in Swaziland, 25 per cent adults have the disease, in Botswana 36 per cent and in South Africa 20 per cent.

But there is a worrying upward trend in the figures in Mauritius. In 1999, there were 28 new cases of HIV/AIDS, but in the years 2000 and 2001, there were 50 and 55 new cases respectively. The 2001 figure represents a 100 per cent increase over the 1999 figure. In antenatal women screened in 1999, there were 2 cases whereas in the years 2000 and 2001, there were 6 cases each. In the screening of target groups including prison inmates in 1999, there were 6 cases, whereas in the years 2000 and 2001, there were 20 and 16 cases respectively. This increased number of cases has prompted special attention by the Government.

#### **4.1.2 Measures taken to combat Infectious Diseases**

##### *Expanded Programme of Immunisation*

The conquest of infectious diseases in children, with the development of the Expanded Programme of Immunisation (EPI), is a major achievement in public health, far beyond that of most other countries in the region. Fatal and disabling conditions such as polio, diphtheria, measles, whooping cough, TB and tetanus, not uncommon risks to children a generation ago, and a continuing risk in other countries in the world, are now largely a thing of the past in Mauritius. Current vaccination levels in children are more than sufficient to ensure widespread immunity. Vaccination coverage against tuberculosis, diphtheria, whooping cough, tetanus, poliomyelitis, measles, mumps and rubella have reached nearly 100%. For many years, the programme was supported with aid from international sources. It is now funded from the normal budget. Essential components of this success have been a well managed programme with trained and competent staff working in every part of the country, sustained funding and supply of vaccines to meet the needs of the whole population, and a well-educated supportive community.

##### *HIV/AIDS*

Under a National Co-ordinating Committee, chaired by the Deputy Prime Minister and Minister of Finance, a comprehensive strategy and programme on HIV/AIDS has been established, and is being implemented through the MOHQL national HIV/AIDS unit. The national programme includes:

- **Screening:** all blood donors (31,000 tests in 2001); high risk groups - intravenous drug users and sex workers- (4,500 tests in 2001); migrant foreign workers (7,100 tests in 2001), cardiac and renal patients undergoing surgery and their blood donors (2,700 tests in 2001), antenatal women (16,300 tests in 2001)
- **Health education** and counselling for high risk groups and those infected, plus the provision of free condoms; education also in schools, women's groups and with other community organisations. Use is made of national and

local media including TV, radio and newspapers to highlight risks and to promote safe practice.

- **Preventive treatment with antiretroviral drugs** is provided free for any pregnant infected women after 25<sup>th</sup> week of pregnancy and for the first 6 weeks for their babies after birth. Infected mothers are normally delivered by caesarean section to reduce the risk of contamination of the child by the mother. Babies are also put on artificial milk. This programme of child protection reduces the risk of infection passing from the mother to the child from 30% with no treatment to 3% with treatment.
- **Treatment** of the HIV/AIDS patients is provided free at the National Day Care Centre which is temporarily located at Bouloux Area Health Centre, Cassis pending the construction of the new Dr. Jeetoo Hospital. It is backed up by five regional testing centres. Anti-retroviral drugs are provided free of charge to all those infected patients. Treatment is also provided for infections within the normal health services. Antiretroviral drugs are also given to people exposed to infection following sexual assault, through use of damaged condoms or through accidents to health service staff treating HIV/AIDS patients. Patients receive counselling and psychological support with assistance from the non government organisation PILS which receives a government grant.

The national programme is addressing the rising trend in HIV/AIDS cases, the higher rates found in certain groups such as the prison population and the response that can be made to successfully contain the disease. The programme is another example of how a serious killer disease which has ravaged other African countries has been well controlled here. Primary prevention and health education will remain the backbone of the HIV/AIDS programme. But there is no room for complacency; continued vigilance is essential.

Additionally, Mauritius is supporting the implementation of the SADC HIV/AIDS Strategy Plan, particularly in the tourism sector where we are taking the lead. Needs assessment in that sector is being carried out in SADC countries.

A Memorandum of Understanding has been signed between the Member States of Indian Ocean Commission and the UN Agencies regarding HIV/AIDS. In that context, projects have been submitted to the WHO for funding under the Programme Accelerating Fund. As regards the Global Fund, a country coordinated programme has been worked out by key stakeholders from Government Institutions, NGOs and the private sector. The overall goal of the programme aims at reducing by year 2010 new HIV infections among the most vulnerable groups, that is, the Commercial Sex Workers, the injecting drug users and the youth.

### **4.1.3 Plans for the future**

The aim for the future is where possible to eradicate or contain infectious diseases at their present very low level. Special attention will be given to the rising trend in HIV/AIDS.

- The malaria control surveillance programme will be further reinforced with the support of the World Health Organisation with the aim of making Mauritius a malaria free zone. This will be an additional boost to our flourishing tourist industry.
- In order to give additional protection to children, the new Haemophilus Influenzae Vaccine (Hib) will be included in the current EPI Package as from the next financial year. Haemophilus Influenzae are a major cause of morbidity and mortality in young children throughout the world. The Hib prevents meningitis, pneumonia, epiglottitis and serious infections caused by the Hib bacterium. Introduction of this vaccine will cost some Rs 25 million a year.
- Early detection and contact tracing for HIV/AIDS and malaria will be reinforced for those Mauritians travelling abroad and migrant workers.
- The National Strategic Plan for HIV/AIDS 2001-2005 will be evaluated in order to identify any shortcomings and devise new strategies to reduce the incidence of the disease and improve treatment and care.
- The existing collaboration with Member States of Indian Ocean Commission and SADC Countries will be strengthened to combat the increasing incidence of HIV/AIDS in the region.

## 4.2 Non-Communicable Diseases (NCDs)

### 4.2.1 Present Situation

NCDs in Mauritius represent 74 per cent of the total burden of disease in men and 76 per cent in women and include diabetes, hypertension, cerebrovascular diseases, cancer, mental illness and substance related diseases linked to tobacco use and alcohol abuse. Successive surveys have shown that NCDs represent a major threat to Mauritius.

The last NCD Survey carried out in 1997 revealed that:-

- 20 per cent of the population aged 30 years and above are diabetics
- 30 per cent of the population aged 30 years and above are hypertensive
- 40 per cent of the population in the same age group are overweight
- 42 per cent of men and 3.3 per cent of women are smokers
- 16 per cent of male Mauritians are heavy drinkers, i.e. they drink alcohol two or more times a week and have at least 3 drinks on those days

The survey also mentions the other risk factors which include lack of physical activity, changing lifestyles, inappropriate eating habits and stress.

National mortality figures show that 50 per cent of the deaths occurring in Mauritius are due to cardio-vascular related problems

In fact, the results of the NCD Survey confirmed those of the Nutrition Surveys carried out in 1985, 1991 and 1995 which indicated the faulty eating habits of the population with a high consumption of salt and fats, a poor consumption of vegetables and fruits, a lack of fibre in the diet and a high consumption of fast foods.

NCDs represent a major threat to the health of the community and country at large and impact heavily on the curative budget as well as on the social status of the nation. For instance, huge amounts of money are spent annually by Government on drugs and on the following services which are directly required as a result of NCDs:-

- open heart surgery, angiography and angioplasty for cardio-vascular related problems
- haemodialysis
- eye operations
- amputations

It has been established that when NCDs are detected, controlled and prevented, the gains obtained are as follows:-

- reduction of pain and suffering of the patients
- reduction of economic and social burdens on the society and in particular, on the patients' families
- reduction in number of days' work lost through illness

Effective prevention campaigns can in the long term reduce drastically the number of surgical operations to treat complication of heart disease which in Finland, for example, have fallen by over 60 per cent as a result of its long term heart disease prevention programme over the past three decades.

### **Diabetes**

Diabetes is a major problem affecting some 20 per cent of the adult population over 30 years, giving rise to disabling circulatory problems, renal failure and blindness. Projections suggest that premature mortality from diabetes will more than double by the year 2005 unless prevention and treatment services are improved.

Diabetes can be controlled by diet and exercise in many patients. But for some, in addition, injections with insulin is required. Diabetes can be hereditary. If uncontrolled, diabetes can lead to serious complications. These may result in loss of good circulation of blood to the legs, renal failure, loss of eyesight and heart disease. Such conditions require expensive treatment for which services have only recently become generally available and there are long waiting lists for them.

Support has also been enlisted from the Mauritius Diabetic Association in the prevention programme on diabetes.

### **Cardio-vascular Diseases**

In 2001, 40% of deaths in people of working age were from diseases of the circulatory system, including hypertension. Projections suggest that mortality from these conditions by 2005 will increase by over 20 per cent unless action is taken to improve prevention and treatment.

Heart disease is mainly caused by smoking, lack of exercise, unbalanced diet, obesity, diabetes, hypertension and hereditary factors. Mauritius has one of the highest rates of heart disease in the world and the rate is steeply rising. Without treatment, many patients are unable to work and become dependent on their families. The number on hospital waiting lists is just the tip of the iceberg of this disease which affects one third or more of

the population. Moreover, many persons with the disease, are unaware of it. In many cases, heart surgery is necessary.

In the year 2000, 348 cardiac surgery operations were carried out at the Cardiac Centre. There are at present over 100 patients awaiting cardiac surgery. There are probably over 1000 awaiting the angiography test necessary to assess their suitability for surgical treatment. The range of treatments provided at the Cardiac Centre includes open heart surgery, the insertion of pacemakers that can strengthen the capacity of people with weak hearts, and angioplasty, a procedure for unblocking constricted coronary arteries that carry blood to the heart. If people wait too long for these operations, they can get seriously worse. Some die waiting for the treatment that can save them, which all contributes to the relatively high rate of mortality due to cardiovascular diseases in the country.

## Hypertension

The 1998 NCD survey revealed that hypertension prevalence was about 30% in those people aged 30 years and above and had increased by 20 per cent since 1987. High blood pressure contributes to the risk of coronary heart disease, stroke and damage to the heart, brain, kidneys and retina. Management of hypertension involves prescribing drugs which will maintain normal blood pressure in all affected individuals, and in promoting changes in lifestyle to reduce risks to health such as smoking, unbalanced diet, obesity and lack of exercise.

The national health promotion programme plays an important part in the management of hypertension.

High blood pressure is generally a “silent disease”, especially when it develops over a long time. Risk factors associated with high blood pressure include smoking, alcoholism and stress. The prevalence of high blood pressure among the community is high. The last NCD survey revealed the following:

- diagnosed cases of hypertension have increased by 20 per cent since 1987
- the control of blood pressure in persons with already diagnosed hypertension is poor
- prevalence of high cholesterol has rebounded to the 1987 values after having fallen significantly between 1987 to 1992

The relative risks of dying from ischaemic heart disease, stroke and renal failure associated with hypertension are high.

## Cerebro-vascular Diseases

Neurological illnesses are next in importance to cardio vascular diseases in morbidity and mortality in Mauritius. In 2001, cerebro vascular diseases accounted for 15.6 per cent of deaths registered on the island. This includes deaths from infections of the brain such as brain abscess and tumours, vascular lesions, degenerative diseases, spinal tumours and injuries. Child deaths and infant mortality caused by congenital anomalies were 11 per cent and 18 per cent respectively in the year 2001. Another matter of great concern is the rising number of road accidents causing brain damage and spinal injury.

The incidence of stroke in Mauritius is one of the highest of the world; it has similar risk factors to those for hypertension and diabetes. Stroke contributes to 6 per cent of the total burden of disease in men and women in Mauritius. The control of diabetes and hypertension will go a long way towards reducing the incidence of cerebro-vascular diseases.

## Cancer

The prevalence of cancer among the population is on the upward trend. Some 1,500 new cases were registered during the year 2000. Cancer constitutes 5 per cent of the burden of disease in men and 7 per cent in women in Mauritius. The principal forms of cancer in the country are breast and cervical cancer in women, lung cancer in men and leukaemia in children and young adults. To contain this situation, the development of a National Cancer Control Programme is underway. This programme aims towards the:

- early detection of cancer through screening
- upgrading diagnosis facilities
- improvement in cancer therapy through the acquisition of modern equipment and the dispensing of new chemotherapy drugs
- improvement of palliative care

Under this programme it is planned to reinforce the current trend in oncology services for undertaking radiotherapy and chemotherapy. Surgical treatment of cancers will remain with the surgical specialties.

## Mental illness

Mental illness is a serious and growing problem. In 2000, there were overall 79,000 contacts with health services by persons with mental disorders (counting primary health care visits, outpatient attendances, hospital admissions and admissions to private clinics). That is an average of one contact a year with mental health services for every 15 persons in the country.

Projections suggest that the burden of disease for the single component of alcohol abuse in this country could increase by as much as 202 per cent in men and 90 per cent in

women by 2005 unless alcohol consumption is reduced and prevention and treatment services are improved. Containing the problems of drug abuse and suicide are two other important tasks ahead.

Traditionally, mental health services have been provided centrally at the Brown Sequad Mental Health Care Centre. This national centre has 750 in-patients and has over 72,000 out-patient attendances a year. It provides in-patient care for many different types of cases, including those who are mentally ill and mentally handicapped patients and who need long term care, alcoholics and others who have been in the centre for many years and for whom it has become their home. NGOs such as the Friends in Hope and the Epilepsy Group are also contributing towards the rehabilitation of mental health patients.

Regional mental health services for outpatients and some in-patients in medical wards are now being provided throughout the country as the first step in a major reform in line with WHO recommendations.

### **Substance abuse related diseases**

**Smoking:** Smoking is a major health hazard for men and a growing problem in young people. It is one of the principal risk factors for heart disease and it increases the likelihood of complications in diabetes. Smoking causes lung cancer, chronic obstructive lung disease and is associated with a variety of other life threatening conditions. It creates a hazard for others, especially young children when they are exposed to tobacco smoke indoors. Smoking may also be a cause of fire in homes.

7 per cent of the burden of disease in men is attributable to tobacco-related diseases. Smoking will remain a substantial public health and clinical problem in Mauritius for many years with continued high rates of smoking in men currently assessed at 44 per cent unless the programme of prevention and early treatment is sustained and improved.

**Alcohol:** The 1998 NCD survey revealed that 16 per cent of adult males are heavy drinkers, i.e. they drink at least 2 days per week and take 3 drinks per day. Heavy alcohol intake may result in a variety of health problems such as electrolyte depletion, vitamin deficiencies in micronutrients, liver damage, pancreatitis alcoholic cardiomyopathy and a number of psychiatric disorders. Health institutions provide treatment and follow up for all these alcohol related disorders. Accordingly, this Ministry is putting enormous emphasis on promoting the adoption of healthier life style which includes avoiding alcohol abuse. Health promotion activities are undertaken at Primary Health Care level with the involvement of the community and in collaboration of different Ministries and NGOs. Alcoholics are admitted for treatment at Brown Sequad and at Flacq hospitals.

### **4.2.2 Measures taken to combat NCDs**

Given the alarming situation of Non-Communicable Diseases in Mauritius, Government is firmly determined to contain this problem. In the past two years, the Ministry of Health and Quality of Life has embarked on cost-effective community based intervention

programmes, which include prevention, health promotion and education, screening and early detection of NCD cases, as well as medical and surgical treatment services. These programmes have been developed with the support of the World Health Organisation and top surgeons from UK, such as Professor Yawobal Sethiah of "Chain of Hope", and other professors from France, Russia, India and Geneva such as Prof. A. Kalangos of "Association Humanitaire Coeur Pour Tous".

### **Decentralisation of NCD**

As a very first measure, in October 2000, the NCD services and NCD clinics were decentralized to operate at regional hospitals as well as at Area Health Centres and Community Health Centres.

### **NCD Mobile Service**

Many people with early stages of NCDs however are not identified through the standard primary and secondary care services. This is because the persons who come to a health institution for a medical check up, are those who feel sick. NCDs usually do not show any symptoms at an early stage. But, to enlist the collaboration of the 70 to 80 per cent of the population (considered as healthy) so that they could be screened for NCDs, the NCD Mobile Service, popularly known now as “Caravane de la Santé” was introduced in March 2001. The main objectives of this new Service are to:-

- screen people for NCDs (diabetes, hypertension, problem of vision, obesity and breast and cervical cancer);
- give each citizen a Health Card with details on his/her status regarding the tests for the NCDs carried out; and
- educate the community on risk factors for NCDs and the new lifestyle required with the changing patterns of diseases.

There are many advantages of this new service. For example:-

- it is operated between 1.00 p.m. to 6.00 p.m. everyday, except on Sundays and Public Holidays. As such, the people attend the service at their leisure after their work;
- except for breast and cervical cancer screening, the results of all other tests are given immediately to the persons through the issue of a Health Card; and
- any person detected for an NCD is immediately referred to the health centre nearest to his/her place of residence for confirmation of tests carried

out and follow up. Those requiring specialized treatment are subsequently referred to the Regional Hospital for management of the disease. In fact, many cases of cancer detected by the Mobile Service have been successfully treated by the Ministry.

By mid September 2002, the NCD Mobile Service which comprises five caravans in Mauritius, had visited more than 80 villages. More than 79,000 persons have now been screened for NCDs and more than 18,000 women aged between 35 and 60 years have been screened for breast and cervical cancers. About 7 per cent of new cases of diabetes and 19 per cent of new cases of persons with hypertension have been recorded. It has also been found that more than 72 per cent of the population are not doing physical exercises at all. The results of the 6500 smears, reported upon to-date, indicate that 3.5 per cent of smears are abnormal. All these women have been recalled for treatment. The benefit of this cancer screening programme is, that so far, 200 women with cancer have been detected and are being treated.

### **National Programme for NCDs**

Along with the decentralization of the NCD Services, clinical guidelines and protocols for the management of NCDs were developed. An Action Plan for the implementation of the guidelines is now in place. Additionally, with the assistance of Dr. V. Mohan from the “M.V. Diabetes Specialities Centre” of Chennai, a National Programme for NCDs in Mauritius has been developed and is being implemented.

NCD teams comprising Community Physicians, Community Health Nurses, Nutritionists, Health Information Education and Communication Officers and Community Health Workers have been trained to manage and implement health promotion programmes at community level. NCD Secretariats have been set up at each region. They are responsible to ensure effective and efficient implementation, monitoring and evaluation of the NCD and health promotion programmes in the regions.

The National Programme on NCDs and the Clinical Guidelines for the management of the diseases, were fully supported by a WHO Mission that visited Mauritius in October 2001, headed by Professor P Pushka of Finland.

### **Nutrition Intervention Programmes**

The intervention programmes on nutrition have been strengthened with:-

- the production of pamphlets, posters and other IEC materials to sensitize the population on the importance of health patterns
- the inclusion of food labelling in the Food Regulations, to create awareness in the population about the quality of food they are consuming

- the updating of training modules for health personnel with emphasis being laid on nutritional values
- Inclusion of health components in the curriculum of primary school children

Additionally, the following nutrition projects are being implemented:-

- Growth Monitoring of children ( 0 – 3 years) in Day Care Centres
- Nutrition Information System for children and pregnant women

### Health Promotion Programme

The health promotion programme was strengthened in early 2002 and more aggressive health promotional activities are now being carried out with different stakeholders, including women, youth, school children, senior citizens and the community at large. A large reduction in the number of uncontrolled NCDs is being noted. For instance, at Flacq Hospital, the number of cases of uncontrolled diabetes and hypertension has gone down from more than 80 per cent in 2001 to 45 per cent in July 2002.

Other positive results have been registered so far with the decentralized NCD services and health promotion programme, especially, in the regions where the NCD Mobile Service has operated. For example, there has been a reduction in the number of in-patient attendances (the order being 12 per cent at Dr. Jeetoo Hospital in 2001 compared to the figure for 2000, 5 per cent at Victoria Hospital and 4 per cent at Flacq Hospital for the same period).

The aim of the Ministry is to bring NCDs down to a controllable level as has been the case for infectious diseases. The results will not be immediate. Building on the present programme, NCDs could be at a controllable level in Mauritius within a decade.

### Other Measures

- **Local Health Committees:** Community involvement in health development has been enhanced through the setting up of Local Health Committees to further mobilise people for health promotion and prevention.
- **Health Centres:** The role of health centres is being strengthened to deal with NCDs. The screening and patient education and support service pioneered through the "caravanes de santé" is being expanded and a similar service is being established in every health centre in the country, as part of a major reform of primary health care. The school health services, run from the health centres are also giving greater emphasis to lifestyle risk factors in their health education work.

- **Tobacco advertising and promotion:** This has been banned in Mauritius and there are restrictions on smoking in public places and offices. The price of tobacco has been raised on health grounds in previous budgets to reduce smoking. Smoking is a key feature of health education programmes in schools and in work places. It is a focus of the NCD programmes for patients with hypertension and diabetes. A National Quit and Win Competition to encourage smoking cessation was organised in 2002 on the lines pioneered in Australia and the United Kingdom.
- **Breast and Cervical cancer screening and counselling:** A National Breast and Cancer Screening and Counselling Programme is being implemented through the "Caravane de Santé" Project.

#### 4.2.3 Plans for the future

- **Family Doctor Service:** It is planned to introduce a 24-hour family doctor service for every person in the country. This will ensure a more coherent screening service than ever before. It will provide for the first time continued local skilled medical support to reduce the risks of NCDs in every community. The doctors who will be specially trained for this work, will follow clear national guidelines setting out the best care for each type of case. The doctors engaged under this scheme will not be permitted to do private practice. They will give special attention to their registers of hypertensive and diabetic patients and those with other detected NCDs to ensure proper clinical management. This service will require an additional 400 doctors and over 1000 nurses.

The family doctor service will have a role in promoting health in the community. The family doctors will establish new forms of regular health surveillance and will provide domiciliary care for elderly and disabled people. They will act as gate-keepers to secondary and tertiary care services. In the first instance, the project will be undertaken, on a pilot basis in one selected area of the country. In the light of the feedback from the pilot project, the scheme will be extended in two phases to cover the country as a whole. The first Phase will require the recruitment and training of 200 doctors working in 50 group practices across the country as a whole with full supporting staff. In the final Phase the family doctor service will be extended to 100 group practices, over a period of 3-5 years. Technical assistance for consultancy services will be sought for the design of the Family Doctor Service Scheme.

**Group practices:** The group practices will operate in the following way:

- **Doctors:** Each group practice will have between 4 and 12 doctors depending on the size of population served. Small practices will work together to ensure 24 hour cover
- **Patients:** Each doctor will serve initially up to 6000 registered patients. The numbers will fall as more doctors are recruited

### Plans for the future (cont'd)

- **Premises:** The group practices will provide their services based in accredited premises which will be either Area Health Centres or Medi-clinics or other premises
- **Protocols:** The doctors will work to agreed protocols
- **Monitoring and Evaluation:** The doctors' work will be subject to continual monitoring and evaluation to ensure quality standards of care and to ensure that the pattern of prescribing keeps within norms
- **Patients' choice of doctors:** Patients will be able to choose their own family doctor and to change if they are unsatisfied with the services given.
- **Drugs:** Family doctors will prescribe drugs from the national essential drugs list which will be dispensed from pharmacies in regional hospitals, district hospitals and dispensaries.
- **Over the counter drugs:** Certain commonly used drugs and dressings will be provided as over the counter items from health centres, without a doctor's prescription, under the supervision of practice nurses.
- **Nutrition:** A nutrition survey geared towards nutrient analysis of cooked meals will be carried out to identify certain deficiencies, which may be the leading causes of the emergence of chronic nutrition diseases such as diabetes, hypertension, cardio-vascular disorder and certain types of cancers. Emphasis will be laid on the promotion of appropriate diets as part of healthy lifestyle for households, pregnant women and infants. Consumer protection regarding quality and safety of food will be re-inforced through enforcement of Food Act, and the issue of guidelines for food services.
- **Health Promotion:** Health education and patient education at local, regional and national levels involving all points of delivery of health services will be strengthened. Health promotion campaigns will be reinforced in schools, colleges and work-places. Assistance from local health and community development groups will be enlisted and the collaboration of national media such as TV, Radio and the press will be sought.
- **Mobile NCD Clinics:** Modern equipment for screening and detection of non-communicable diseases, including breast and cervical cancers will be provided to the 'Caravane de Santé' to reinforce its activities.

## Plans for the future (cont'd)

- **National Institute for NCDs:** A new National Institute will be established to provide leadership in the field of NCDs. This Institute will be set up in Reduit. It will offer out-patient, day patient and in-patient services for patients referred from regional services. It will be a national centre for teaching and research. Its aim will be to set new standards in the field of NCDs health services, covering the whole range of activities. It will have a key role in monitoring the quality of services and the results achieved. It will reinforce links with expert centres abroad and ensure that Mauritians are getting the best possible service for this major health challenge facing the country.
- **Cancer:** Under the National Cancer Control Programme, oncology services will be reinforced for undertaking radiotherapy, chemotherapy and surgery. Monitoring will be strengthened through linking the cancer registry to the proposed new patient information systems. This will help to keep track of patients, to identify trends in the pattern of disease in the country and in the evaluation of the effectiveness of services.
- **Mental Health:** Activities will be strengthened for promoting better mental health in the population at large in view of the numbers of people who suffer from stress-related illness, depression, alcohol and drug abuse and those who attempt suicide. The national plan for mental health has been developed in consultation with local specialists and groups and with advice from experts from WHO. The plan includes:
  - Regional In-patient, Day patient, Outpatient and Community care:** These services will be developed in every region, for those who are mentally ill. These units will include separate facilities for men and women and one region will have a unit for adolescents. Separate regional services will also be set up for treating patients suffering from the acute phase of alcoholic poisoning. Community psychiatric nurses will provide regular support to those patients in community care.
  - Rehabilitation Programme:** The mental health services will be integrated in the primary health care as a community based programme. Community care services in each region will ensure that patients who can be safely managed at home will not normally be admitted to the regional hospitals or to the national mental health care centre.
  - National Referral Centre:** A new national mental health care centre is being built with in-patient, day patient and out-patient services close to the Brown Sequard site. This will include a unit for the secured and other high risk patients who cannot be managed at regional level. Patients who can benefit from the wider range of support services that will continue to be available at the national centre, will also be referred from regional centres.

### Plans for the future (cont'd)

**The National Drug Users Centre:** The centre which is run by a voluntary organisation (NATRESA), will continue to receive technical support from the Ministry of Health and Quality of Life.

**Mental Health Promotion:** Programmes will be developed in every region with the health promotion services linking closely with the regional psychiatric service and with NGOs.

- **Smoking and Health:** Support will be given to smokers who want to quit through all health service points of contact. Training will be provided for health service professional staff to have the knowledge and skills to help people to quit smoking and to reduce the number of young people smoking. The laws on tobacco will be enforced, including laws on non-smoking in public places, non-advertisement and promotion of tobacco, and no smoking by food handlers on commercial premises such as shops, restaurants, kitchens and bars.
- **Maternal and Child Health:** Baby Friendly Initiative will be enhanced in all the hospitals. Exclusive Breast Feeding will be promoted.
- **The Nutrition Information System** will be established countrywide to provide regular and timely information for monitoring the nutritional status of children and pregnant women.
- **WHO Collaborating Centre:** Action will be initiated for Mauritius to be a WHO Regional Collaborating Centre for NCDs at the invitation of WHO.

#### 4.2.4 Expected Results of the Action Plan to meet the challenges of NCDs

The Action Plan is based upon the provision of new and expanded services in areas where it is known that they can make improvements in the health of the country and in the quality of services. The outcome of these investments will be measured by the results achieved in the coming years. Certain specific targets have been set. These include:

- **Targets for diabetes**
  - Save 500 lives a year from end stage renal failure with an expanded dialysis and renal transplant service
  - Halve the amputation rate in diabetes

- Save blindness in 100 patients a year by providing complex eye surgery at the Eye hospital
  - Ensure 80 per cent or greater effectiveness in the management of diabetes with existing services and with support from the proposed National Institute NCDs
  - Promote better health for diabetics through changes in lifestyle (reduced smoking, alcohol abuse, and obesity; increased exercise and appropriate diet.)
  - Promote a better understanding of the factors that adversely affect people prone to diabetes, and a lifestyle to reduce the risk of diabetes in such people and the development of complications
  - Increase expectation of life for those with diabetes closer to that of the general population
- **Targets for heart diseases:**
    - Double the national number of open heart operations and angioplasties
    - Ensure effective quality of care for those with heart disease at all levels of service
    - Promote health through changes in lifestyle (reductions in tobacco use, alcohol abuse, obesity, and an increase in exercise), through improvements in people's understanding of how to look after their own health.
- **Targets for cancer:**
    - Provide screening services for breast and cervical cancer for the whole country
    - Promote cancer prevention as part of all health promotion programmes
- **Targets for mental health:**
    - Provide decent mental health care centres and community services for those who are mentally ill in every region
    - Provide separate in-patient treatment of adults and adolescents

- Provide separate facilities for alcoholics and those who are mentally ill
  - Protect human and civil rights of all patients
  - Promote family and community care for those who can be managed safely out of hospital
  - Promote greater emphasis on rehabilitation and active personal care for all patients by increasing number of staff in community and hospital based rehabilitation services and by bringing about reforms in management of patient services
- **Targets to reduce smoking and alcohol abuse:**
    - Reduce smoking rates in men, women and young people
    - Reduce smoking amongst patients with hypertension and diabetes
    - Reduce deaths and disability from smoking related disease including lung cancer, heart disease, chronic obstructive lung disease and stroke
    - Prevent young people starting smoking
    - Reduce alcohol consumption and alcohol abuse

## 4.3 Primary Health Care Services

### 4.3.1 Present Situation

Primary health care Services include services provided at Community Health Centres, Area Health Centres and schools. In the past two years, Primary health care Services have been expanded and strengthened by the development of the 'Caravane de Santé' for the early detection of NCDs. Additional medical staff has been provided in the health centres to ensure adequate medical coverage and to avoid cancellation of medical sessions. The health centres are being upgraded and equipped to support the NCDs programme at local level

### 4.3.2 Plans for the future

The development and reform of the health services involves a major investment in preventive, health promotion and primary health care. This includes the further extension of primary health care screening services and the new 24-hour family doctor services with full support staff.

**Community health services:** Community medical services will be strengthened to ensure better management of community health promotion and public health programmes in collaboration with the family doctor services. This will involve the recruitment of over 200 additional medical, nursing and other technical and support staff including dietitians and health education staff.

The work of community health will focus on:

- (a) implementing the policy on better health at local level;
- (b) establishing supportive settings and media links in schools, workplaces and community facilities;
- (c) supporting better education and training of professionals in health promotion and patient education; and
- (d) delivering specific services such as the school health programme, family planning services, vaccination and immunisation programme, dental health, public health surveillance and the enforcement of public health measures for improving environmental health, environmental health services and the community response to epidemics and re-emerging infections.

### **Plans for the future (cont'd)**

The staff in community health services will work closely with the family doctor service on jointly planned programmes. Both family doctor scheme and community health will be developed as medical specialities with 3-year training courses. Community nursing will be strengthened with specialised nurses for community work at health centres, in the community and assisting the family doctors in domiciliary service. Community dentistry will be provided at all Area Health Centres backed up by services from the new private dental hospitals.

The management arrangements for primary health care will be part of the proposed review on management considered in section dealing with management.

**Primary health care facilities:** At present the health centres serve widely varying sizes of population from less than 2,000 to over 10,000 per Community Health Centre and from 23, 000 to over 100,000 per Area Health Centre. All regions will be provided with a full range of primary health care services. This should provide greater confidence to people in the use of primary health care facilities and avoid the present over-use of hospital facilities. In future, hospital services will be open only to accident and emergency cases and to specialist referrals from primary health care.

**New Area Health Centre:** A new Area Health Centre will be constructed at Goodlands.

## 4.4 Curative Services

### 4.4.1 Developments in Curative Services

Greater emphasis than ever before is being laid on the development of curative services. Over the past two years, major investment has taken place to extend the range of services available. The projects involved investments in the expansion of existing services and introduction of new ones.

#### *Diagnostic services*

- **Modern high tech equipment:** Two CT Scanners and one MRI have been purchased at the cost of Rs 12 M and Rs 49 M respectively to support treatment of NCDs and trauma. One CT Scanner is located at Victoria Hospital and one CT Scanner and the MRI are located at Sir Seewoosagar Ramgoolam National Hospital.
- **Nuclear medicine:** A national centre has been set up at J Nehru hospital. It has equipment for diagnostic exploration of internal organs with radioactive materials to provide clearer images of function and abnormalities. The International Atomic Energy Agency has provided assistance in terms of equipment, nuclear reagents and training.

#### *Medical treatment services*

- **Endoscopy and Colposcopy services:** Fibre optic equipment has been provided in five regional hospitals for the provision of urology services. Colposcopy equipment has also been provided in three regional hospitals namely, Dr Jeetoo, Victoria and SSRN Hospitals for enhancing the diagnostic capabilities in gynaecology treatment.
- **Hyperbaric services:** A new service is being set up at Victoria hospital to meet the growing demand for the treatment of accidents related to deep sea diving. The service can also assist patients such as diabetics, with non-healing ulcers in the legs. The equipment consists of an air pressure chamber, which can take up to 10 patients at a time.
- **Lupus services:** A Lupus unit has been set up at Victoria hospital for patients suffering from systemic lupus condition (a serious condition affecting connective tissue in any organ of the body, especially in young women.) Weekly clinics are now available. The special serological tests necessary for diagnosis are done in the pathology department and the special drugs for treatment are now available. About 100 patients are being treated by this service. Working arrangements have been established with Dr. Isenberg of London for the training of medical and para-medical staff on lupus issues.

- **Ayurvedic Medicine:** This service will be reintroduced in our health services. In this context, the Long Mountain Hospital will accommodate an Ayurvedic Centre with the upgrading of the Herbarium. The provision of Ayurvedic Medicine will also be extended to l'Escalier and Belvédère Medi Clinics. Two Ayurvedic doctors are being recruited.
- **Haemodialysis:** This service has been expanded to three regional hospitals in Mauritius. Dialysis services will soon be made available in the two remaining regional hospitals namely, Flacq and Dr. A.G. Jeetoo Hospitals. 46 dialysis machines, of which 32 have been newly acquired at a cost of about Rs 8.9M, are now fully operational.
- **Specialised cardiac units:** There are specialised units in three regional hospitals. These act as referral centres for patients not adequately managed at local levels. They provide medical diagnostic and treatment services. Units are being set up in two other regions.
- **Leukaemia treatment:** Diagnostic and treatment facilities for leukaemia have been reinforced within the oncology department at Victoria Hospital. These facilities are being developed with advice from an expert from Australia. This new service provides drug treatment and radiotherapy for leukaemia patients.

### *Surgical services*

- **The Cardiac Centre:** The centre at Pamplemousses provides a national service for all aspects of cardiac surgery in the country, including open heart surgery and invasive cardiology. In the year 2001, there were 22,000 attendances at the out-patient department of the cardiac centre and 732 operations were performed including cardiac and neurosurgical cases.
- **Organ transplant service:** Renal transplant has been started in J. Nehru hospital with a service level of between 25 and 30 transplants being undertaken a year using donors from close relatives. Cornea transplant are being done at the Subramanian Bharati Eye hospital in Moka.
- **Arthroscopy services:** Action has been initiated for the acquisition of new fibre optic equipment to assist orthopaedic surgeons. Staff will be trained for this service which will enable them to treat joint injuries and degenerative joint disease.
- **Neurosurgery services:** Neurosurgery services which were provided at SSRN hospital only have been extended to Victoria hospital. The unit at SSRN hospital will cater for the regions of Port Louis, the north and Flacq whereas the unit at Victoria Hospital will cover the regions of Plaines Wilhems, Black River and the south. The new CT scan and MRI services are essential for this work for providing detailed

images of bones and internal organs principally of the head, brain, and spine, to assist in the treatment of tumours and injury from accidents and violence.

- **Spinal Surgery Treatment service:** This new service has already been introduced at Victoria hospital. It is proposed to have, in the new OPD at Victoria Hospital, a specialised unit for both Neurosurgery and Spinal surgery with a new special theatre equipped to undertake such highly specialised work involving orthopaedic and neurosurgery staff.
- **Neonatal ICU services:** These services are provided in two regions for the early treatment and care of small and sick babies. Additional equipment has been installed including incubators, life-support, infusion, and monitoring equipment essential for the survival of underweight babies.

### *Other services*

- **Accident and Emergency services:** The Accident and Emergency Departments of all regional hospitals, which constitute the shop window of the health care delivery system, have been reorganised to reduce patients' waiting time and to increase the effectiveness of services. A system of 'triage' nurse has been established whereby urgent cases are separated from non-urgent ones. A 'Fast Track' system has been introduced for urgent cases, for the elderly and for children. The Medical Superintendent in each region is now directly responsible for the supervision of that department. Referred patients are seen immediately by doctors who stay in the A & E department.

Currently these services are heavily overburdened with patients who should be treated in Primary health care facilities. About 30% of current cases attending A & E departments of the regional hospitals are genuine accidents or emergencies and many of those being treated in the unsorted out-patients do not need the specialist care of a hospital service. This situation will be remedied in the plans for improving the effectiveness and efficiency of Primary health care Services.

- **Maternal and Child Health services:** These services have been strengthened at both the peripheral and secondary levels. Ante-natal and post-natal care at the health centre and hospital levels have been reorganised. Specialist care is available in some health centres in every region.
- **Maternity services:** These services are now equipped with echography equipment for diagnosis and monitoring the growth of babies in the womb, and foetal monitors to monitor labour.
- **Reproductive Health services:** Counselling services have been reinforced to contain dropouts among users of contraception. The family planning programme has shifted its focus from achieving demographic targets to improving the reproductive health of

the population in line with the recommendation of the Plan of Action adopted at the 1994 Cairo International Conference on Population and Development. Greater emphasis is being laid on promoting adolescents' reproductive health in order to maintain fertility at replacement level, that is, an average of two children per family. The Mauritius Family Planning Association and Action Familiale are fully supporting the Reproductive Health Programme.

- **Kidney stone treatment:** Lithotripsy services have been established in three regions, namely Victoria, J. Nehru and SSRN Hospitals. The machines 'blast' the stones without the need for conventional surgery.
- **A Mobile Dental Clinic:** The mobile clinic has been launched in April 2002 to increase efficiency of the school health service by making dental services accessible to secondary school children. In addition to screening oral diseases, the Mobile Dental Clinic also assists in promoting oral health awareness among the school population. Dental treatment is also provided to targeted school children.
- **Blood services:** The Blood Transfusion Service is the sole service for blood donation and transfusion in the country. A new national policy has been developed. It defines the role of the national service, the decentralisation of blood banks, standards for blood donations, testing blood, the preparation of blood products, disposal of medical wastes, medical ethics, capacity building, and information systems. In this context, the assistance of the Blood Donors' Association has been enlisted.
- **Foreign Medical visiting teams:** Since September 2000, some nine foreign medical teams visited Mauritius to undertake complex surgical operations which are not normally undertaken by local doctors in our hospitals. Over 200 surgeries were performed. These bring substantial savings as they obviate the need to send these patients overseas.
- **Overseas Treatment:** Over the last two years, around 500 patients have been sent abroad for treatment and an amount of Rs56 million has been spent for the purpose. Memoranda of Understanding have been signed with various hospitals in India for the provision of treatment facilities which are not available locally.
- **Medical Staffing at AHCs and CHCs:** Medical staffing levels at AHCs and CHCs are being reinforced to ensure that all planned medical sessions take place to eliminate the disruptive effects of cancellation of medical sessions at short notice. In certain health regions, there have been zero cancellations of sessions for the past months.

### *Support Services*

- **Reception Desks:** There are reception desks in two regional hospitals namely SSRN and Victoria Hospitals to direct visitors to the main services of the hospitals and to improve “l'accueil” of the public. This service is being extended to other hospitals.
- **Security measures:** These measures have been reinforced at the level of hospitals. A Police Officer is present at all times at the Accident and Emergency Departments. A Security Committee under the chairmanship of the Regional Health Director and including representatives of the Police and security guards has been set up to review security measures at hospital level.
- **Cleaning:** The cleaning of toilets in all hospitals has been contracted out. The overall cleaning of kitchens in all regional hospitals and Brown Sequard Mental Health Care Centre has also been contracted out. In addition to the maintenance team which exists at hospital level, a roving maintenance team has been set up to carry out cleaning and maintenance works in hospitals, AHCs and CHCs in each region. Regular cleanliness competitions are being organised to sensitise health personnel and users of the service on the need for a clean environment.
- **Complaints:** A Regional Health Complaints Board has been set up in each region to look into all matters relating to complaints from the public. Reports from these Boards are sent to the Headquarters.

#### **4.4.2 Plans for the future**

Major development of curative services through capital and service development schemes and increased number of specialist staff will be carried out as follows:

##### *Medical treatment services*

- **Haemodialysis:** 125 kidney dialysis machines as well as the required buildings, staff, materials and support equipment will be made available to meet the growing burden of patients in end stage kidney failure. The cost of the extra machines and water treatment plants will amount to over Rs 30 million. A further Rs 8 million will be required yearly for the running costs. An additional number of 8 doctors and 16 nurses will be appointed and trained for this special service. The service is already available in three regional hospitals and will be extended to the other two regions.

### **Plans for the future (cont'd)**

- **Cancer services:** An Oncology Centre will be set up at Victoria Hospital to reinforce the present cancer services provided. The bed capacity of the unit will be doubled. A leukaemia ward will be provided to treat patients with blood cancers
- **Geriatric:** Geriatric wards will be set in each regional hospital to meet the needs of the increasing percentage of persons aged 60 and above. Medical and paramedical personnel will be trained in enhancing care in geriatrics. This will include the exploration of facilities for postgraduate training in Geriatrics. It is expected that the ageing population will increase from 10 per cent in 2001 to 23 per cent in 2040. The common geriatric problems are cardiovascular diseases, cancer, orthopaedic cases, psychiatric illnesses and many others. There is good evidence that early and timely preventive strategies can reduce subsequent morbidity and mortality. The Family Doctor Service will be an additional benefit in the care of the elderly. Extra costs will be reflected in services at all levels of care, including pharmaceutical services. An additional amount of Rs 23 million will be required and this may rise to Rs 37 million by the end of the planning period. Two geriatric wards will be provided in each region for the care of the elderly.

### ***Surgical services***

- **Cardiac Centre:** The Cardiac Centre will be upgraded in terms of bed capacity, surgical theatre and staff requirements to meet the growing needs of the population including the provision of cardiac surgery for children. The support of visiting experts who work on cases more complex than normally attempted in Mauritius will be strengthened. With the technical assistance to be provided by the Chain of Hope from London and Dr A. Kalangos, Chairman of the “Clinique de Chirurgie Cardiovasculaire, Hôpitaux Universitaires de Genève” and President of the “Association Humanitaire Coeurs pour Tous” of Geneva, the Cardiac Centre of Pamplemousses will eventually become a Referral Centre for complex Cardiac cases for neighbouring Indian Ocean Islands. The Centre will be equipped with latest technology and trained personnel to deal with all types of paediatric cardiac cases and treatment will be given to foreigners against payment of appropriate fees. The development of cardiac surgery in the private sector, where this can be done safely and effectively with expert support from abroad, will be encouraged.
- **Specialist surgery services for children:** This service will be introduced in Mauritius to avoid many children being sent abroad for treatment or having to wait for the occasional visits from foreign teams. This service will include orthopaedic and general surgery for children born with physical disabilities.

### Plans for the future (cont'd)

- **National Renal Transplant service:** The service will be extended to provide up to 300 kidney transplants a year, to ensure that those who can benefit from a kidney transplant can have the service when suitable kidney donors are found. The law on the donation of human organs is being prepared to assist the development of this and other transplant services.
- **Complex Eye Surgery (vitreous surgery):** Complex eye surgery will be undertaken using complex laser techniques to reduce blindness in the diabetic patients. Equipment costing Rs10 million is being purchased. Staff will be trained to undertake over 100 operations a year at the Subramania Bharati Eye hospital at Moka.
- **Angiography:** This facility will be made available at Victoria hospital so as to improve diagnosis and considerably reduce morbidity and mortality among cardiac cases. It is planned to expand the capacity of the regional cardiac units and to extend the service to all regions. In the first instance, coronary care facilities will be made available at J. Nehru and Flacq Hospitals. To keep pace with rapid advances in technology, extra funds will be required. The specialist units will also have an important role to play in teaching, service development and evaluation. They will be supported by the Mauritius Institute of Health.
- **Coronary care units** will be made available at J Nehru hospital and Flacq hospitals for patients in these regions
- **Hand Unit:** A Hand Unit will be organised at J. Nehru Hospital to deal with surgical treatment of injuries to the hand including repairs of bones and structures, with the use of reconstructive surgery of tendons, vessels and tissue using plastic surgery techniques.
- **An expert paediatric surgery service:** A new service will be established to meet the needs of 250 children a year.
- **Neurosurgery services** will be further developed. The newly set up unit at Victoria hospital will be provided with new wards and operating theatres
- **Spinal unit:** this will be organised jointly by the neurosurgical and orthopaedic units to handle complex spinal injuries and diseases. It will share facilities with the neurosurgical unit. Cases of spinal deformity may also be treated there.

## Plans for the future (cont'd)

### *Other clinical services*

- **The Accident and Emergency Department:** These departments in every region are being upgraded to properly equipped traumatology units and will be supported with trained medical specialists. Over Rs200 million in capital expenditure will be required for this purpose and an additional 20 staff.
- **Drugs and Pharmaceutical Services:** There will be further expansion of this service to take account of the many changes in demand for drugs. These include the introduction of new high-tech and other services which will increase expenditure on drugs; the provision of antiretroviral drugs for the treatment and control of HIV/AIDS; the price implications of improvements in quality control on suppliers; the reduction of funding through external aid for example in family planning and vaccination services and the enforcement of WTO rules on trading. The list of drugs will be continually updated to keep up with the developments in therapeutic opportunities.
- **A Drugs Quality Control Laboratory:** The laboratory will be set up to serve the following purpose:

As a back-up to the generic procurement of drugs to ensure the quality of generics bought

To provide a guarantee of quality for all drugs imported in Mauritius and avoid adverse events due to poor quality drugs

To foster confidence in cheaper generic drugs especially in the event of the implementation of generic substitutions; and

To be in line with accepted WHO and other international guidelines on quality, safety and efficacy of drugs

To provide technical back-up for our exports and pharmaceutical products manufactured by local producers

To cater for toxicological assays in cases of poisoning or overdose with drugs abuse

- **SAMU service:** This service will be strengthened to respond to the growing problem of medical emergencies and accidents.

## **4.5 Other Preventive Services**

### **4.5.1 Rehabilitation Services**

Rehabilitation services are presently provided through hospitals and community health services. Hospital based services involve Physiotherapists, Occupational Therapists, Speech Therapists, Psychologists and Social Workers who work towards restoring the functional ability of the patients including those suffering from mental illnesses. The community based rehabilitation staff (CBR) are engaged in visiting disabled persons. Such staff work in collaboration with social organisations in the provision of appliances.

### **4.5.2 Prosthetics and Orthotics Services**

The Orthopaedic Workshop is also providing rehabilitation services for prosthetics and orthotics. In fact, with the increasing number of accidents, congenital deformities and paralysis among others, there has been a growing need for orthopaedic devices. In this respect, the workshop situated at Coromandel has been equipped with modern equipment and all other amenities to cater for the increasing demand for prostheses and orthoses. 15 technicians have been recruited and are being trained at the Mauritius Institute of Health in the new techniques of prosthetics and orthotics.

### **4.5.3 Environmental Health**

The Environmental Health Services provide basic protection of the public health of the population. This includes public education and the enforcement of laws on public hygiene, protection against environmental hazards, the maintenance of public health standards and the control of environmental pollution of noise and water.

The Ministry of Health and Quality of Life has been designated under the Environment Protection Act to be the enforcing agency for drinking water quality and the control of noise and odour. In this connection, the Environmental Health Unit of the Ministry is required to assist:

- the overall formulation of policy goals to ensure that the health of the people is adequately protected against environmental hazards;
- the monitoring and surveillance of the environmental hazards affecting health in relation to drinking water quality, noise and odour
- the establishment of health-based standards and norms;

The Environmental Health Unit is also assessing parameters of pollution and has been called upon to advise on technical measures for the abatement of nuisances.

#### **4.5.4 Occupational Health**

Occupational health aims at protecting and promoting workers' health through the prevention of occupational and other work-related diseases and injuries, by providing a safe and healthy working environment. 3,640 workers were examined in the year 2000. The main occupational health problems encountered are occupational backache, contact dermatitis, musculoskeletal pain and noise induced hearing loss.

The Health Quality Laboratory situated at Réduit in the National Environmental Laboratories Complex carries out the following tests for workers:

- Audiometric test for workers exposed to noise
- Spirometric test for workers exposed to dust
- Vision test for drivers

In 2001, the laboratory has undertaken 419 audiometric, 279 lung function and 67 vision tests.

The Pesticides Control Board is responsible to register pesticides coming to Mauritius, issuing permit for imports and sale of pesticides in Mauritius. The Board is also responsible to monitor the health of workers involved in the use of pesticides.

A new Dangerous Chemical Control legislation is being prepared to replace the Pesticide Control Act 1982.

A Technical Committee has been set up to review the recommendations of the Addison report on asbestos. Sectoral plans have been proposed by different Ministries to tackle the problem of asbestos. The Committee is preparing an action plan to deal with the recommendations contained in the Report.

#### **4.5.5 Food Security**

The improvement of the environment involves good hygienic sanitary conditions at domestic level, commercial and industrial establishments and at leisure places. The Health Inspectorate Division has been reinforced to meet the challenges in this field. Over the last two years, more than 494 sanitary contraventions have been established by the Division under provisions of the Food Act 1999 and Food Regulations 2000. In addition, the educational programmes to sensitize the population including food handlers

on hygienic issues have been strengthened. 45,436 food handlers have followed the training course in food hygiene.

About 43,000 food premises have been inspected. Approximately 379,000 kg of foodstuffs including meat, fish, vegetables, fruits and canned food have been seized, condemned and destroyed. More than 10,000 containers of foodstuffs have been inspected at the Port.

#### **4.5.6 Plans for the future**

- **Rehabilitation services:** These services will be reinforced by the recruitment of additional Therapists, Clinical Psychologists and Social Workers. They will play an increasingly important part in the development of specialities such as orthopaedics, cardiac and neurosurgery. Support will also be provided to patients in the community, including those discharged from hospital care for mental illness, and for those from medical and surgical acute units after treatment for strokes, hip-replacements and accidents for example.
- **Prosthetics and Orthotics Services:** The services at the Orthopaedic Workshop will be upgraded to provide artificial limbs and other contraptions to the regional hospitals and other rehabilitation services.
- **Environmental Health:** Activities of the Environmental Health Service will be reinforced in order to cope with the changing patterns of risks.
- **Occupational Health:** Activities of the Occupational Health Division will be further strengthened. The Health Quality Laboratory will be upgraded. A National Action Plan to deal with the Asbestos issue is being formulated.
- **Food Security:** Provisions of the Food Act and Food Regulations will be strictly enforced.

## **4.6 Buildings and Equipment**

### **4.6.1 Present situation**

Infrastructure and equipment are two important features in the delivery of appropriate health care services. Over the years, these have been neglected. Thus, the poor condition of public health buildings and the non-replacement of obsolete equipment became serious causes for concern and even contributed to the growing feeling of dissatisfaction in the population. Currently, a building for a new hospital with 100 beds costs about Rs100-150 million. A new building to accommodate an Area Health Centre costs around Rs 10-15 million while the cost of a new building for a Community Health Centre is about Rs 4-5 million. These exclude the costs of acquisition of land.

### **4.6.2 Measures taken for developing infrastructure, replacement of obsolete equipment and acquisition of new high-tech equipment**

Over the recent years, a lot of effort has been made to upgrade the existing infrastructure and acquire modern equipment so as to ensure that the objectives set in the Ministry's mission statement are met. Thus, there have been substantial improvements in the health services, reflecting the Government's commitment to this important sector and its policy of providing additional resources for health. The major projects including the proposed construction of the new Dr. A.G. Jeetoo Hospital as well as the renovation programmes completed or in progress in the health sector since September 2000, are summarized at Annex 1. Projects for an estimated value of Rs 70 million have been completed and projects which are expected to cost about Rs 600 million are in progress.

For the financial year 2002/2003, the Government increased the overall expenditure for the health sector by 14 per cent. Investment for development in the field of national health has been raised by 65 per cent. The priorities of the Government have already been established so as to get value for money. In order to ensure that the public health institutions have the necessary tools and modern equipment to achieve the objectives set, substantial investments have been made over the last two years. In that respect, more than Rs 165 million have been spent as indicated at Annex 2. These comprise, inter-alia, a new Cobalt machine (Rs 19 million), one MRI (Rs 60.6 million), two CT Scanners (Rs 29 million), one Lithotripsy machine (Rs 10.6 million), five Urology sets (Rs 7 million), 32 Haemodialysis machines (Rs 9 million) and three Water Treatment Plants (Rs 3.6 million).

### 4.6.3 Plans for the future

- **Asset management:** The cost of replacing the health sector estate of buildings, equipment and furniture, is estimated to be Rs 6 billion. In this respect, a planned cycle of replacement, renewal and maintenance will be established. Assets management for the health sector will be further reinforced.
- **Buildings:** Provision for planned maintenance, repair and renewal programme for buildings and equipment will be made. As far as infrastructure is concerned, the projects listed at Annex 3 have already been initiated or are in the pipeline.
- **Capital Replacements:** An amount of Rs1.1 billion will be required for capital investment for the coming five years.
- **New equipment for new services:** Provision will be made for the purchase of new equipment and for their maintenance. An extra of Rs 135 million will be required for financial year 2002-2003 for the purchase of medical equipment including high-tech equipment as indicated at Annex 4.
- **New buildings for new services:** New buildings will be required to respond to technological development and ensure consistency in the provision of services throughout the country. In that respect, provision will be made for new infrastructure.
- **Advances in medical technology:** The provision of high-tech services will be strengthened. Some Rs 600 million for a capital reserve will be required to cover technical innovation in the planning period and an extra of about Rs 350 million for renewal, replacement and upgrading of high tech equipment already in place.
- **Extra Funding:** There is a crucial need for a sound system of assets' management for our health sector if we are to provide the high standard of services available in the developed countries. For this reason, we need to invest heavily in the health sector in the coming years. In view of the heavy investment envisaged, it would be necessary to look for alternative sources of financing
- **Financial sustainability:** Whilst some innovations continue to be funded from external sources, Mauritius must now increasingly rely on its own financial resources not only for innovation but also for the recurrent costs, maintenance, renewal, replacement, and upgrading of services.

## 4.7 Staffing

### 4.7.1 Present Situation

Human resource is the most critical resource in the health services. A workforce with a high level of commitment is central to any programme for health reform. There is therefore a need for a better deal for staff for the future development of health services.

At present, there are about 13,000 posts on the Ministry's establishment, of which 10,440 have been filled. These include 690 doctors, of whom 250 are specialists, as well as 2,700 qualified nurses and midwives.

One of the main problems being encountered at present is the migration of staff, particularly nurses, to more developed countries. Since 1998, some 190 nurses have left the service to migrate to the United Kingdom. Furthermore, 71 Nursing Officers have not resumed duty at the expiry of their leave and there is a strong likelihood that they will not come back to their posts.

### 4.7.2 Measures taken to improve staffing situation

Recently, out of the 10,440 posts filled in the establishment of the Ministry, over 2,900 vacancies have been filled at all levels to ensure the smooth running of the various services. These include the intake of 59 foreign doctors and 23 Mauritian doctors on a contract basis, 763 student Nurses, 389 Health Care Assistants, 55 student Midwives and over 600 minor grade staff.

For the present financial year, the recruitment of another 80 medical officers is under way. The posts are being advertised locally and abroad. In addition, 14 posts at specialist level have been advertised locally and abroad. Provision has also been made to fill 1,000 vacancies in various grades, including 300 male hospital servants.

650 additional posts created in the current estimates, comprising 300 student Nurses, 200 Health Care Assistants and 100 paramedical and supporting staff will also be filled.

At present, a total of 766 student Nurses, 56 student Midwives and 377 Health Care Assistants are undergoing training at the School of Nursing and are expected to be qualified as Nursing Officers, Midwives and Health Care Assistants as follows:

Grade	2002	2003	2004	2005
Nursing Officer	-	255	260	251
Midwife	-	24	32	-
Health Care Assistant	317	60	-	-

- **4.7.3 Plans for the future**

- **The challenge:** The plans for the future depend heavily on recruiting more staff to provide a greater volume of services. The Action Plan calls for 3,900 extra staff. It also calls for increasing numbers and more specialized staff for the new diagnostic, medical and surgical services, many of them involving high tech. equipment.
- **Major reform:** Moreover the plans are based upon a major reform of the way in which the health service operates to achieve its objectives. In the future more emphasis will be laid on patient education and health education which will permeate the delivery of all services. This will require staff with new skills and a new approach in dealing with patients.
- Linked to this, will be the expansion of community care. The aim is to keep people out of hospital. Emphasis will be on prevention and rehabilitation. The objective will be to keep people healthy at work, at school and at home and restore lost abilities in those who have been ill. There will accordingly be an expansion of primary health care, with new family doctors, community nurses and supporting staff.
- **Making progress:** To make progress with these plans we need to:
  - recruit the staff we need, and
  - retain the staff we have
- **Better deal for staff, including improvements in the efficiency and effectiveness of services and increased productivity:** The Action Plan proposes a new deal for staff. This will cover improvement in working conditions, continuing professional development, better career prospects and better physical facilities. This new package will be a major drive on efficiency, quality and productivity within the health sector with a target of 2 per cent economies a year on the current budget, savings from which will be ploughed back into performance related pay and service developments. Consideration will be given to the introduction into staff contracts of incentives to achieve greater cost-effectiveness in the use of human resources. These measures will go a long way in the retention of health personnel, be it medical and para-medical. A Task Force will be set up to look into this matter. Technical assistance for consultancy services will be sought for the formulation of a human resource development plan for health sector.

### Plans for the future (cont'd)

- **Recruitment of health personnel:** For the wide range of new and expanded services to become fully operational, some additional 3,900 staff will be required. This includes 150 consultant and specialist medical staff, over 550 other medical staff, some 1,600 nurses, 520 clinical support staff, 340 medical records, managerial, administrative and clerical staff and over 600 minor grades.
- These are major tasks. Medical staff will be recruited from among forthcoming graduates of the SSR Medical School, from those graduating under the joint scheme University of Bordeaux II/University of Mauritius, and from abroad. In addition, medical specialists will be available through the scheme with the University of Bordeaux II and the Mauritius Institute of Health. Nurses and other paramedical staff will be recruited and trained locally with some sent abroad for specialist training. New specialist courses will be increasingly established in Mauritius, for local and regional needs, working closely with other countries in the Indian Ocean. A private dental college and dental hospital are being set up to serve local and regional needs.
- **Continuing professional development for medical and paramedical staff:** The Action Plan proposes that there will be developed programmes of continuing education for all staff to keep the services up-to-date with new methods and to review achievement of the best standards in each area of work. A part of this process will be the development of accreditation linked to career development and the system of rewards. This will also be the subject of consultation as the basis for the development of detailed schemes.
- **Gemba Kaizen:** There will be a major drive on efficiency. This will build on the steps already taken with the Gemba Kaizen project. This is an approach that looks for quality improvement at the work-place. It empowers staff to manage their work more effectively and to get rid of waste and inefficiency. We know it works; we have the results to prove it. This will become a developing theme of the health sector reform setting the pace for the whole public sector.
- **Human Resource Development Plan for Health:** Technical assistance for consultancy services will be sought for the establishment of a Human Resource Development Plan for Health.

## 4.8 Education and training

### 4.8.1 Present Situation

A comprehensive programme of continuing professional education and quality assurance is being developed for all medical, nursing and paramedical staff to promote and maintain high standards of performance and keep staff up-to-date with innovations in this country and abroad. Local clinical teaching and research programmes have been established within the health service to meet the needs of health personnel.

The School of Nursing in Mauritius operates at Victoria and SSRN Hospitals. The School offers courses for general student nurses (3 years), for student midwives (2 years) and for Health Care Assistants (6 months).

In-service training is being provided in first aid, NCDs, reproductive health, clinical nurse management and ward management. Post basic courses currently available are midwifery (1 year), community health nursing (1 year) and the B.Sc course in collaboration with the University of Middlesex (3 years). The last phase of this course will be completed in 2004. Continuing professional education programmes have been established in every region.

A post graduate course for doctors has been provided in epidemiology, with the University of Bordeaux II. Other courses for health personnel include reproductive health, with UNFPA and WHO, an in-service course for Speech Therapy with the Commonwealth Secretariat Technical Assistance Programme, training for trainers in the care of the elderly with Lux Development and intensive care for nurses, with the University of Bordeaux II.

The Mauritius Institute of Health is acting as local co-ordinator for the above-mentioned programmes and has in addition organised the following over the past two years: training for Dispensers and Dental Assistants, training for trainers in medical education in collaboration with the 'Conference Internationale des Doyens de Facultés de médecine d'Expression Française', courses in information technology and orientation courses for newly recruited foreign medical officers.

The following courses are also being organised in collaboration with the University of Mauritius:

- Diploma in Sanitary Science
- Diploma in Medical Laboratory Technology

#### 4.8.2 Plans for the future

- **Teaching and Research:** Ten departments for undergraduate and post graduate teaching and research department namely, general medicine, general surgery, obstetrics and gynaecology, paediatrics, anaesthetics, ophthalmology, psychology, ENT, general practice and public health will be set up. These will support the present medical undergraduate teaching programme undertaken by the SSR Medical School as well as the post graduate health sciences teaching in disciplines relevant to the health service needs of Mauritius. The departments will have functions in teaching, research and health services. They will be jointly developed with the relevant academic bodies. Development of other health sciences including management, pharmacy, dentistry, medical sociology and health economics are envisaged. An amount of Rs 50 million for capital costs will be required for developing teaching facilities and the running costs for the academic departments will rise to Rs 35 million annually by the end of the planning period.
- **Professional education:** Support will continue to be provided from abroad for the enhancement of professional education. Arrangements are being extended with Bordeaux II for post-graduate specialist training for medical staff in Orthopaedics, Internal Medicine and Paediatrics. The initial courses for anaesthetists are being continued. These courses are being made available with support from France to students from six countries in the region.
- **Post Basic courses:** These courses will be run for nurses in specific clinical areas with a view to enhancing their knowledge, skills and aptitude in such fields as theatre nursing, intensive care, neonatal services, orthopaedics and psychiatric.
- **Professional and technical support:** Support for training in pharmacy, dental services, remedial services, laboratory sciences, X-ray and other imaging services will be extended to ensure sustainable professional and technical support for the range of services offered and to promote quality assurance in each area
- **Developments in academic disciplines and the promotion of research:** These programmes will be strengthened with the provision of computer assisted library facilities and on-line teaching aids
- **Role of Mauritius Institute of Health:** The role of the Mauritius Institute of Health in operational health system research and professional training and development closely linked to immediate service needs, will be reinforced

## **4.9 Information, Monitoring and Research**

### **4.9.1 Present Situation**

The development of information communication technologies is a fast-changing field. Effective health services rely on accurate and relevant information. Health information systems integrate data collection, processing, reporting and use of the information necessary for improving health service effectiveness and efficiency through better management at all levels of health service.

The annual report of the Medical Records Unit includes vital statistics on births and deaths, with the related figures on birth rates, fertility, death rates, and age specific death rates. In addition, the Medical Statistics Section collects data on use of hospitals and health centres, notifiable communicable diseases and on the rates of vaccination for children and adults against infectious diseases. These are classified according to the International Classification of Diseases.

The Evaluation Unit collects information on demographic trends and the use of family planning services. It also keeps vital statistics showing population growth, fertility, marriage and divorce rates.

At present, the Ministry of Health and Quality of Life with the support of the Ministry of Information Technology and Telecommunications and the WHO is expanding the network of its ongoing health information programmes.

Health Information Systems to improve efficiency of services have been developed at the peripheral, secondary and support services levels. These include:

- Computerisation of seven Health Centres, 2 medi-clinics, Stores System and Registry System at the Headquarters
- Implementation of the e-mail service at the headquarters and the Regional Hospitals
- Setting up of the Ministry's website
- Upgrading of the Integrated hospital information systems at J. Nehru Hospital
- Upgrading of the Central Health Laboratory System

## Research and Development (R & D)

Research and Development are key components of the health sector. The Mauritius Institute of Health is primarily involved in health systems research. The Central Health Laboratory has been active in clinical aspects of diabetes, hypertension, tumour markers and sexually transmitted infections. The Nutrition Unit, the Medical Statistical Unit and the NCD Unit have contributed significantly to surveys and studies in major public health problems. In addition, the Mauritius Family Planning Association and Action Familiale have been involved in the field of sexual and reproductive health.

Other special studies that have contributed to the understanding of the scope and effectiveness of the health services in Mauritius include:

**Burden of Disease Study 1997:** The survey showed the relative contribution of different diseases and conditions to death and disability, using a standard methodology developed for WHO

**Cost-effectiveness Study 1997:** The survey showed how far the principal health problems identified in the Burden of Disease Study are being dealt with and the relative cost-effectiveness of future investments in service development

**State of health sector infrastructure and priorities for investment 1996:** The survey showed maintenance and development requirements, master plans for principal sites and model designs for rapid development of standard service buildings

**Study on computerised hospital ward and data collection system 2000-2002:** Pilot studies are being carried out

**Medi-clinics patient based computer data collection and management system, 2000-2002:** Computer modules of protocols for classification of patients by diagnosis, options for treatment, recording of prescriptions and treatment provided, are being developed.

**National Health Accounts:** National health accounting matrices covering public and private health expenditures, in accordance with the International Classification of Health Accounts supported by WHO and Commonwealth Regional Health Community Secretariat are being developed. The National Health Accounts (NHA) is a tool specifically designed to inform the health policy process, including policy design and implementation, policy dialogue and the monitoring and evaluating of health care interventions. NHA methodology which measures and organises expenditures as they flow from financing sources through financial intermediaries to providers and, ultimately, across various functions of the health system, is also used to make financial projections of a country's health system requirements.

#### 4.9.2 Plans for the future

- **Integrated Information System and Smart Card:** A smart card containing electronic medical records for patient identification and the monitoring of patient care will be introduced. The card will have a computer chip inside which will enable the health service to track patients' use of services, update diagnostic and treatment records and provide an input for recalling patients for periodic review. The records provided through the use of the smart cards will also provide an in-put for review of service performance, unit costs, prescribing practice, and the variations in burden of disease, access to services and patterns of care in different communities and in different hospitals and health centres.
- **Manpower and finance:** Data on staffing will be computerised to allow profiling of staff planning and will take into account service development plans, staff wastage rates, retirements, staff health and sickness. Manpower and finance records with the patient information data will be integrated in the information system.
- **Research and Development:** Research will be undertaken in close collaboration with Mauritius Institute of Health and the proposed health sciences teaching and research departments. The research will focus on the performance of the health services to respond to health needs, the changing pattern of health and service delivery. The results will be fed into the continuing professional education programme and into the planning process. An institutional framework will be established for research and development to identify priorities for health research, to build a capacity for research, to set up a database and reference library, to set up an Ethics Committee and to protect the intellectual property rights.
- **Efficiency drive:** Research will support drive for greater efficiency and effectiveness. The yield from these economies will be put into staff rewards and service developments.
- **Investment required:** An amount of Rs 100 million for capital costs of the computer based information system and a further yearly amount of Rs 89 million for running costs and productivity schemes will be required by the end of the planning period.
- **National Health Accounts:** National Health Accounts will be produced on an annual basis. NHAs will be institutionalised.

## 4.10 Management

### 4.10.1 Present Situation

The Ministry of Health Headquarters is responsible *inter alia* for the following:

- policy development
- planning and the management of change
- resource allocation
- legislation and regulation
- monitoring
- inter sector policies and programmes
- international relationships
- parliamentary matters

Government is highly committed to decentralise and modernise the health services with a view to rendering them more accessible to the public and more responsive to the needs of the citizens. In this context, the country is divided into five health regions as follows:

- Region 1 - **Port Louis** (*based on Dr A.G. Jeetoo Hospital*)
- Region 2 - **Pamplemousses** (*based on SSRN Hospital*)
- Region 3 - **Moka/Flacq** (*based on Flacq Hospital*)
- Region 4 - **Grand Port/Savanne** (*based on J. Nehru Hospital*)
- Region 5 - **Plaines Wilhems** (*based on Victoria Hospital*)

Each of the five regional hospitals is under the responsibility of a Regional Health Director. The latter is responsible for the overall administration and management of the regional health services including the community health services, the area health centres, the regional and other hospitals. As part of the process of decentralisation, certain personnel and financial management functions, previously undertaken at the Ministry's Headquarters, are now the responsibility of the Regional Health Directors.

### *Regional Health Advisory Boards*

In line with the Ministry's policy to accelerate the decentralisation process, five Regional Health Advisory Boards have been set up in Mauritius. Each Board is headed by a Chairman appointed by the Minister and comprises the Regional Health Director, the Regional Public Health Superintendent, the Senior Consultant of the region, the Regional Nursing Administrator, a representative of minor grade staff and four representatives of the local community.

The role of the Regional Health Advisory Board is mainly to advise on health needs of the region, effectiveness and efficiency of the management of health services and issues concerning the welfare of patients and improvement of health services in the region.

### *Management Meetings*

The communication between headquarters and the regions has been improved. Following the Gemba Kaizen concept, since October 2001, monthly meetings under the chairmanship of the Minister are held at each of the five regions with the senior staff from the region and from the headquarters. During these meetings, many issues are dealt with concerning overall administration and the delivery of health care services throughout the region.

#### **4.10.2 Plans for the future**

- **Review of the management structure:** Technical assistance for consultancy services will be sought for the review of the management structure of the health services with a view to further decentralising and modernising the services and for realising efficiency gains.
- **Review of procurement procedures:** A detailed analysis will be undertaken of existing procurement procedures and guidelines will be established in line with best practice.

#### *Immediate Plans:*

- **National Health Council:** The Council will be set up to oversee policy and management in the public sector health services. It will have advisory functions.
- **Continuing Training:** Refresher courses and on-the-job training will be provided to enhance managerial capabilities at top, middle management and at supervisory levels.
- **ISO 9002:** The delivery of high quality care to provide the best possible outcome for all patients will continue to be the primary purpose of the ongoing Quality Assurance Programme. The ISO 9002 Certificate has been awarded to the Subramania Bharati Eye Hospital. This Programme will be extended to all other health institutions and will require additional technical staff for the purpose of training and development.

## **4.11 Public/Private Partnership**

### **4.11.1 Present Situation**

#### *Private Health Institutions*

Health care is undergoing significant transformation because of changing pattern of diseases and evolving techniques of care and treatment. These changes are coupled with increasing costs in the delivery of health care. In view of the limited resources, new cost-effective approaches have to be adopted. There is therefore need for greater public and private partnership.

In this respect, the Ministry is already having recourse to the services of private clinics in respect of such services as renal dialysis, and until recently, for CT Scanner and MRI services.

There are good working relations with the private health institutions. Over the past two years, the Ministry has provided training to nurses in the private sector. Some 20 Student Nurses and 7 Student Midwives from the private sector have been trained at the Schools of Nursing which operate under the aegis of the Ministry. Additionally, in the field of high-tech medicine, medical and paramedical staff of the Cardiac Centre are allowed to participate in cardiac surgery sessions and other high-tech programmes in the private sector, with a view to updating their skills and knowledge. Likewise, opportunities are offered to a number of medical and nursing staff from the private sector to participate in surgery sessions at the Cardiac Centre.

Furthermore, the private sector will be called upon to be more involved in the provision of health facilities under the Public Private Partnership. There is provision for a study on Public Private Partnership for the health sector in the newly approved IDF grant with the World Bank.

#### *Support Services*

In the context of public private partnership, the Ministry is already having recourse to private firms for such services as cleaning of toilets and kitchens, security and laundry. Consideration will be given to the contracting out of additional services at operational level to the private sector.

#### 4.11.2 Plans for the future

- **Joint training:** There will be greater access for the private sector to national training courses and to continuing education for medical, nursing and paramedical staff. There will be joint access to library and information services. 50 seats for training of Student Nurse have been made available to the private sector for courses starting in January 2003
- **Quality assurance, accreditation and consumer protection:** Standards will be developed to ensure quality assurance in private health institutions. Accreditation will be linked to licensing and opportunities for public sector contracts.
- **Joint technical assistance programme:** To respond to the growing problems of procuring equipment, public and private partnerships will be encouraged through joint technical assistance programme. This joint programme will focus on selecting, installing and maintaining complex high-tech equipment as well as the training of staff
- **Partnership in family medicine:** Public and private partnership will be a key feature of the new family doctor service
- **Partnership in high-tech services:** Public and private partnership will be further strengthened in the delivery of high-tech medical care
- **Joint development investment programme:** The private sector contribution to health care will be further developed in line with Government's policy to encourage public private partnership. This will ensure sustainable development of both the private and public sector

## 4.12 Legislation

Work on a set of legislative reforms has reached an advanced stage of preparation. Some new legislation will be introduced and other legislation concerning the health sector is being revisited.

- **Dangerous Chemicals Control Bill:** The legal framework for the control of dangerous chemicals is being strengthened. A Dangerous Chemicals Control Bill is being finalised. Its main objective is to provide for the prevention of damage to health and to the environment caused by chemical substances and for the provision of better protection to workers, members of the public and the environment
- **Human Tissue (Removal, Preservation and Transplant Bill):** The draft Bill is being finalised in consultation with the State Law Office and the World Health Organisation. The object of the Bill is to provide the legal framework for carrying out the removal, preservation and transplant of human tissue, other than blood transfusion under appropriate medical supervision
- **In-Vitro Fertilisation Bill:** A proper legislative framework will be enacted to regulate In-Vitro Fertilisation. In this context, the Ministry has enlisted legal assistance through the World Health Organisation
- **Nursing Council (Amendment) Bill:** The Nursing Council Act 1992 is being reviewed to make better provision with regard to the composition and functions of the Nursing Council. Provision will be made for the Medical Tribunal to deal with cases of malpractice and negligence by Nursing Officers in the performance of their duties. The Bill will also make provision for a code of practice for Nursing Officers
- **Pharmacy Council Bill:** A draft Bill is being prepared for the establishment of a Pharmacy Council to regulate the activities of the profession. It will provide a legal framework for the registration of Pharmacists and the establishment of a Code of Ethics for the profession
- **National Health Complaints Commission Bill:** Legislation will be enacted to set up a National Health Complaints Commission which will have its own investigation bureau. A Patients' Charter of rights and responsibilities will be introduced
- **Pregnancy Control Bill:** A draft Bill is being prepared in consultation with the Ministry of Women's Rights, Child Development & Family Welfare and other stakeholders to address to issues concerning the termination of pregnancies, especially in cases of sexual assault

- **Private Health Institutions Regulations:** Regulations under the Private Health Institutions Regulations 1989 are being worked out. These will consolidate setting up and the operations of private health institutions in Mauritius
- **Tobacco Regulations:** New Regulations are being worked out. These will make provision for the banning of any form of advertisement or sponsorship on tobacco. The ultimate objective of the regulations is to significantly reduce the number of smokers
- **Pig Breeding Regulations:** Regulations will be prepared to better regulate pig breeding practices in Mauritius

## 5. RODRIGUES & OUTER ISLANDS

### 5.1 Present Situation

The health infrastructure of Rodrigues consists of one main regional hospital – the Queen Elizabeth Hospital, located at Creve Coeur, Port Mathurin and a network of peripheral health delivery institutions comprising two Area Health Centres located at La Ferme and Mont-Lubin, and 13 Community Health Centres which operate under the direction of the main regional hospital.

There are 115 beds at Queen Elizabeth Hospital and in 2001, there were 6,047 in-patient admissions. There were 66,474 attendances at the out-patient department in the same year.

Both La Ferme and Mont-Lubin Area Health Centres offer a 24 hour out-patient and selective in-patient services. These two centres with 63 beds provide general curative care and maternity services. There were 3,564 admissions at the two centres in 2001 and 51,322 attendances at their Out-patient Department.

The private health sector in Rodrigues is almost non-existent, with only one private pharmacy and one private practitioner operating in Port Mathurin.

The life expectancy at birth for males during the period 1999-2001 was 70.9 whereas for females, it was 77 years. Infant mortality rate which was 32.9 per thousand live births in 1991, declined to 23.4 per thousand live births in 2001. This is considerably above the figure for the main island of Mauritius. The under five mortality rate has significantly improved; it was 35.5 per thousand live births in 1991, in 2001, it was 24.6. Maternal mortality rate has declined from 2.6 per thousand live births in 1991 to 1.2 in 2001.

The Expanded Programme on Immunisation covers more than 95 per cent of the targeted child population. Infectious diseases have been successfully controlled.

The causes of morbidity in Rodrigues are similar to those causes in the main island of Mauritius. Nearly 46 per cent of total deaths in 2001 were due to diseases of the circulatory system. The last survey undertaken in Rodrigues confirms the threat of non-communicable diseases in the island.

The health sector in Rodrigues has been kept high on the agenda of the Ministry. Various developments, ranging from the provision of industrial washing machines to the setting up of a Haemodialysis Unit and an ICU have already been undertaken.

### 5.2 Major developments in the health sector in Rodrigues

- **NCD Mobile Service and Health Promotion:** The NCD Mobile Service has been introduced in Rodrigues. One Caravan donated by WHO is visiting villages for early detection of NCDs through screening. Since October 2001, more than

35 villages have been covered. 3,000 persons have been screened for NCDs and about 600 women for breast and cervical cancers.

In August 2002, the Health Promotion Programme was launched to strengthen the ongoing NCD Programme. In this connexion, a Nutritionist has been posted to Rodrigues and two Rodriguan officers have received training in nutrition and nutrition related diseases. This training will be extended to other Rodriguans so as to ensure that the Health Promotion programme is extended over the whole island.

- **Intensive Care Unit (ICU):** An Intensive Care Unit has been set up in Queen Elizabeth Hospital in June 2001. It is equipped with modern equipment, including one Ventilator, one Echography Machine, one Pulse Oxymeter and a Gas Reticulation System. The ICU is now fully operational.
- **Haemodialysis Unit:** Until recently, patients from Rodrigues suffering from renal problems had to come to Mauritius for haemodialysis. Besides, causing hardships to their own families, those patients had to shoulder the additional financial burden of travelling to Mauritius.

To address the problem, a Dialysis Unit was set up at the Queen Elizabeth Hospital in June 2002. The Unit is equipped with two dialysis machines and one Water Treatment Plant. Currently, five patients are undergoing treatment there and it is expected that those Rodriguans who are presently in Mauritius for such treatment, will return to Rodrigues to continue their treatment.

- **Renovation Works:** The Male and Female Wards at Queen Elizabeth Hospital have both been renovated. Renovation work at the Female Ward was completed in June 2001 and that at the Male Ward, in October 2001.
- **Physiotherapy Unit:** A new Physiotherapy Unit has been set up at the main hospital.
- **Computerisation:** The health services at both Mont Lubin and La Ferme Area Health Centres have been computerised.
- **Incinerator:** To ensure proper disposal of hospital waste, a new and modern incinerator has been installed at Creve Coeur and is fully operational. The previous incinerator had been out of use for some years.
- **Equipment:** In addition to the equipment for the ICU and the Haemodialysis Unit, two industrial washing machines and one echography machine for the maternity ward, have been made available to Rodrigues. A new Chemistry Analyser has been provided to the Queen Elizabeth Hospital in order to ensure rapid quality analysis of blood in Rodrigues itself.

- **Staffing:** To address the problem of shortage of staff in Rodrigues, the following main actions have been taken:
  - the tour of service of Mauritian doctors has been reduced from 12 to 6 months;
  - the disturbance allowance to the doctors has been increased from 25% to 50% as an incentive to encourage them to serve in the island; and
  - doctors from Madagascar have been recruited on a contract basis to work there.
  
- **Training:** The number of student nurses from Rodrigues who follow courses at the School of Nursing in Mauritius, has been increased from 6 to 14. Other in-service training courses have been mounted and are being organised for the nursing personnel.
  
- **Specialist services:** To ensure that specialist services in anaesthesia, surgery, paediatrics, obstetrics and gynaecology and general medicine, are also available in Rodrigues, a roster for the regular visits of Specialists there, has been established. On the basis of this reorganization exercise, Plastic Surgery was carried out for the first time in Rodrigues this year.

### 5.3 Plans for the future

Rodrigues and the Outer Islands will be given specific support. They will benefit from the developments in primary health care and have access to the new high technology services to be established on Mauritius island. The following measures will be taken for Rodrigues:

- A mental health facility will be set up
- A SAMU service will be provided
- A family doctor service will be developed
- The NCD programme will be fully established
- Maternal and Child Health Service will be strengthened to reduce infant mortality in Rodrigues
- Paediatric services will also be strengthened

### **Plans for the future (cont'd)**

- Specialist orthopaedic services will be available
- A programme of development, general renovation and planned preventive maintenance of buildings and equipment will be promoted, with additional funding
- A continuing medical education programme and similar programmes for other professionals will be extended using visiting tutors and distance learning
- Patients will be linked through the patient information service to the National Complaints Commission and their own regional service
- Further decentralisation of operational management will be effected to promote local decision-making on local matters and local management of operational budgets
- The services at Mont-Lubin and La Ferme Area Health Centres will be rationalised

## 6. FINANCING OPTIONS

### Current costs of health services

Government expenditure on running health services in Mauritius (including Rodrigues) is currently (Year 2002-2003) Rs 2,620 million a year. This represents a per capita recurrent expenditure on government health services of Rs 2,180 a year. In addition, the capital expenditure on health services in 2002-2003 is expected to be Rs 360 million. This gives a total for state expenditure on health of Rs 2,980 million or 1.9 per cent of the predicted GDP for the year. The state health services has an establishment of 13,000 staff, of whom 10,440 are in post.

It has been estimated that Rs 1,280 million a year is spent privately in Mauritius on medical care and health expenses, which is 0.9 per cent of expected GDP. Thus the estimated total expenditure on health services in Mauritius is currently Rs 4,260 million a year or about 2.8 per cent of GDP; that is about Rs 3,550 per head of population per year.

In financial year 2000/2001, there were 17,500 taxpayers claiming a total of Rs 65 million in tax relief for contributions to medical insurance schemes. It is thought that fewer than 50,000 of the total population have some form of private health insurance cover for the cost of private use of health services. These costs are mostly paid from out of pocket, or from savings or through family support rather than from health insurance.

### Estimates of cost

Estimates show that the Action Plan for Health, if fully implemented by the financial year 2008/9, will require 75 per cent increase in expenditure on health services, with Rs 4 to 5 billion in capital expenditure and the recruitment of nearly 3,900 extra health service staff.

An extra Rs 200 million is required yearly to maintain and keep the present buildings and equipment in proper working order. But a large part of the new commitment will be in developing services to meet the growing epidemic of non-communicable diseases. This will require additional funding beyond the limits likely to be provided from existing budget sources. The proposed family doctor service will cost Rs 500 million a year when fully developed and will require an extra 400 doctors, 1,000 nurses and 400 technical and other support staff.

### Review of Financing Options

A variety of measures for mobilising the extra funds for the health sector have been examined by the special Task Force on Health Financing<sup>1</sup> set up in February 2001 to review the financial implications of the Action Plan for health. These include the

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<sup>1</sup> Under the chairmanship of Mr Dev Manraj.

possible yield from health taxes on tobacco and alcohol, user charges, efficiency savings, and national and private health insurance schemes. In its review, it had to consider both the potential yield from these mechanisms and their sustainability. It has reviewed the many previous studies of health sector funding undertaken in Mauritius over the past two decades.

#### **Possible sources of funding the Action Plan:**

- (i) ***State Budget: Funding from the state budget taking into account each year in the budget exercise, the budget situation and claims from other priority sectors within the context of the real economic growth of the country and the national medium term financial plan***
- (ii) ***National Health Insurance Scheme: Introducing a National Health Insurance Scheme covering all employed and self employed people and their dependents to pay for new developments of vital services for tackling the major health problems of the country***
- (iii) ***Conversion of National Savings Fund (NSF): Freezing the NSF at current level and channelling future contributions from employers to the National Health Insurance Scheme. The employees, for whom contributions will have been made when the NSF will be frozen, may, on retirement, benefit from a lump sum based on funds accumulated in their individual accounts and return earned on investment. Future contributions will then be used solely for the National Health Insurance Scheme***
- (iv) ***Private Sector development: Stimulating further development of the private sector and supplementary private health insurance in pace with economic growth, combined with a fresh approach to accreditation to promote quality assurance and value for money***
- (v) ***Health taxes: Raising taxes on tobacco and alcohol***
- (vi) ***Efficiency savings: Establishing an ongoing major efficiency drive within the health services with the objective of achieving annual recurring economies and greater effectiveness in delivery of care and better value for money in procurement, the yield from which can be ploughed back into service development and a better deal for staff***
- (vii) ***Service charges: Making charges for services provided which might include nominal charges for attending health centres and hospitals, charges for overnight stay in hospital, prescription charges and the introduction of pay beds for private patients in public hospitals***

## **The choice of financing for the future health services**

Future financing for the health services could be from the state budget, as at present; or it could be from the state budget plus any, or from all, of the other sources listed above (ii - vii).

For example, the state budget could be used plus a National Health Insurance Scheme; or finance could be from the state budget plus health taxes on tobacco and alcohol. Alternatively, the state budget would be used for example, with all the other sources of funding. Or, again, the health services could be maintained just by the state budget: but under this option this source is unlikely to be sufficient to provide for the proposed new and expanded services within the next 5 – 10 years. Views on future sources of funding and the time scale for implementing the new and expanded services, are welcome as a key part of consultation.

## **New services to be provided**

If a NHIS is introduced, it could work in the following way. The NHIS would be put under the management of a new Board with the objective of meeting specific health needs of the country and making services more consumer friendly. The new services and developments proposed under the National Health Insurance Scheme could be as follows:

- 24-hour family doctor service for every family
- New and extended high technology services: extended cardiac surgery programme; transplant programme (kidneys and eyes), extended renal dialysis programme, joint replacement programme (hips, knees etc.), complex eye surgery, an extended neurosurgery programme
- National Institute of NCDs
- National Oncology Centre
- Diabetes screening programme
- Health promotion and preventive medicine programme for every community
- Expanded pathology services
- Health quality laboratory
- Cancer screening programme (Cervix uteri, breast)

- Patient's Charter
- Smart card and information system for tracking and improving the quality of patient treatment, linked to the present carnet de santé
- Staff productivity scheme and quality improvement programme
- Better maintenance and repair of all buildings and equipment
- Special development support for Rodrigues and the Outer Islands

### **NHIS Board**

The NHIS Board would be responsible to the Ministry of Health and Quality of Life for the collection and management of NHIS contributions. It would work closely with the National Pensions Fund and the National Savings Fund.

A National Health Insurance Scheme could be introduced under a new law or as a new scheme under the existing legislation for the National Savings Fund. In the latter case permission would need to be granted by the NPF/NSF Management Committee. The permission of the NPF Board would also be required if the NPF were to act as the collection agent for contribution and of the NPF/NSF Investment Committee for providing loans for projects. If the National Health Insurance Scheme were introduced with the NPF as collecting agents, it would require about 6% of its income for administration, lower than some charities. It could be run with a single Board of Management at national level accountable to the Ministry of Health and Quality of Life. Technical assistance for consultancy services will be sought for the design and implementation of the NHIS.

The Health Insurance Scheme that has been considered by the Task Force on Health Financing would involve people paying a percentage of their monthly income into a national fund which would provide for new and expanded health services. If a National Health Insurance Scheme is introduced, there are a number of key questions to be addressed. These are interalia: (i) level of contributions; and (ii) lower and upper ceilings. At what level should the upper income ceiling be fixed so that everyone earning above that level would pay the same amount? At what lower level of income should people be exempt; or should there be no exemptions?

### **Private Health Insurance**

Many people have private health insurance in Mauritius either through their employment or as a matter of choice. The private health sector plays an important part in providing services suited to the personal needs of many people. This is to be encouraged and private

services and private health insurance should remain a significant and growing part of the health sector. The government would welcome views on how the private health sector can be strengthened to provide a better service and value for money. The introduction of incentives to stimulate growth of the private sector could be considered. In addition, other aspects of the public private partnership need to be strengthened. These include:

- (i) **Accreditation:** New accreditation arrangements are proposed in the Action Plan to improve quality assurance and to provide guarantees on prices, service effectiveness and safety. The Action Plan also envisages extending the State contracts with the private sector for specialised services for state patients where these can be more cost-effectively delivered within the private sector.
- (ii) **Joint Planning:** It is proposed to set up a joint forum for sector wide planning and consultation between the public and private health sectors to promote a better understanding of priorities, and to promote greater coherence in development and standards of care and joint ventures.

## Health Taxes

Taxes on tobacco and alcohol are common in many countries. These taxes can be used to reduce the use of the substances and to pay for health services, including health promotion programmes. Tobacco and alcohol related diseases are a major health problem in Mauritius. Health taxes would provide more targeted and effective control on these problems.

## Efficiency Savings

The efficiency of health services is the key objective for the future. This could provide a useful means to release resources for financial health service development. However, this could require new forms of management of staff and finance to make the necessary changes. It involves cutting resources and staff in one area and redirecting them for other purposes. It also involves establishing standards, targets, performance measures and new forms of rewards and control. It is an element in the public sector reform as yet in its early stages in Mauritius.

## Service Charges

Serious consideration may be given to the introduction of service charges to discourage overuse of State services and to contribute towards the cost of services. According to international standards the attendance rate at primary health services in general is over

twice the normal expected level. At AHCs and the MCs the rate of use is 60 per cent above the normal expected level. Charges could sensitise people to the cost of services and promote greater discrimination in their use of services for trivial conditions. The resulting reduction in demand could release more time of the professionals for effectively attending to the health needs of their patients.

Such provisions are a common feature of health services in developed and developing countries. Persons in need can be protected from charges. The introduction of service charges are included as part of the consultation and if agreed could be included within legislation for a reformed health service.

### **Multiple systems of financing health care**

The state health services have been until now financed through general taxation. Many other countries have multiple systems of financing which may include general taxation, health insurance, charges and co-payments, and health taxes on tobacco and alcohol.

To fund the Action Plan and the continued provision and development of existing services, their maintenance and renewal, will require extra funds. Each possible source of funds has limits to its yield, costs to its implementation and other pro's and con's for its introduction or extension. The government welcomes views on the use of alternative sources of funds to add to the existing funding from general taxation. Without extra funding the full benefits of the Action Plan cannot be realized or will be substantially delayed.

The speed of implementation of the Action Plan has of course another important aspect too: the saving of life and the reduction in disability. The full implementation of the Action Plan envisages the saving of over one thousand lives a year and substantial reductions in disability from those currently suffering from chronic conditions such as diabetes, hypertension, cancers etc. The common disabilities that can be avoided include blindness, amputation of limbs, kidney failure and heart failure.

If the Action Plan is delayed and not fully implemented until the year 2008/9, 16 years from now, instead of in 2008/9, the loss of life and quality of life will be substantial, affecting every community across the country.

In making the choice of methods of funding and the timescale for implementing the plan the country must also take into account the benefits to be gained or lost.

## Medium Term Expenditure Framework

A Medium Term Expenditure Framework (MTEF) assessment will be established for the health sector. Mauritius needs a more structured framework for the Health Sector, which defines priorities and articulates strategies for the medium term, while respecting a national aggregate expenditure envelope. Thorough understanding of cost implications of existing and proposed expenditure programmes is a key ingredient, as is the definition of expected outputs and outcomes upon which performance evaluation and future funding decisions should be based.

## Management of health systems with multiple funding

The financial management of systems with multiple funding need not be complex. Some countries, where multiple funding has grown in different ways over a long period of time, have very complex systems which are costly on administration and present many problems to users. The proposals that have been considered for Mauritius are however simple and inexpensive and would be handled at national level with no complex multiple accounting at operational levels.

## Consultation

The proposals in this White Paper are submitted for public consultation to promote the widest possible debate on priorities and methods of funding. Comments, suggestions and proposals need to be submitted **by 31 March 2003 to the Permanent Secretary, Ministry of Health and Quality of Life, Room 537, 5<sup>th</sup> Floor, Emmanuel Anquetil Building, Port Louis.**

**ANNEX 1**

**Completed and On-going Projects**

<b>Project</b>	<b>Estimated Cost (Rs)(Million)</b>	<b>Status</b>
<b>SSRN Hospital</b>		
Construction of a building to house CT Scan and MRI	14	Completed
Renovation of Riviere du Rempart AHC		Completed
Renovation of OPD, Waiting Pharmacy and Orthopaedic	1.6	Completed
<b>Long Mountain Hospital</b>		
Renovation of Female Ward (Phase I)	5.83	Work in progress
<b>Victoria Hospital</b>		
Construction of building to house CT Scan	8	Completed
Renovation of Hydrotherapy Unit	0.628	Completed
Renovation of Dialysis Unit and Cobalt Room	0.855	Completed
Laying of Tiles at Central Laboratory	0.680	Completed
Re-roofing works at Pre-natal and Post-natal wards, corridor along the Maternity ward.	2.9	Completed
Renovation of Gynae/OPD/Skin Unit		
Construction of Central Out-patient Dept.	175	Work in progress
Extension of Cardiac Unit	2.2	Work in progress
<b>ENT Hospital</b>		
Construction of a covered corridor with corrugated iron sheet of about 25 metres from	0.5	Drawings stage

<b>Project</b>	<b>Estimated Cost (Rs)(Million)</b>	<b>Status</b>
OPD to Ward level and provision of a lift		
Complete reticulation of waterpipes at ENT Hospital	0.2	Preliminary Stage
<b>Dr. A. G. Jeetoo Hospital</b>		
Renovation of Ward 6	3.1	Completed
Renovation of Post Natal Ward	3.1	Work in progress
<b>S. Bharati Eye Hospital</b>		
Extension and Modification Work at the Operation Theatre	0.3	Work in progress
Extension to OPD	5.6	
<b>Brown Sequard Hospital</b>		
Renovation of Ward 19	4.0	Completed
Renovation of male ward 5 and Conversion into a male rehabilitation ward	1.1	Completed
Re-roofing and partial renovation of OPD	1.7	Completed
Renovation of Ward 13	2.6	Work in progress
Construction of a new psychiatric hospital	222	Work in progress
<b>Souillac Hospital</b>		
A new Hospital	200	Work in progress
<b>Flacq Hospital</b>		
Relocation/Renovation of the AED and OPD	0.697	Completed
Renovation works at New Wing A	2.56	Work in progress

<b>Project</b>	<b>Estimated Cost (Rs)(Million)</b>	<b>Status</b>
Renovation works at New Wing B	2.0	Work in progress
General painting at La Lucie Roy, Clemencia, Melrose, Pellegrin, Sebastopol, GRSE, St. Julien Village, Lallmatie and Belle Mare Community Health Centres	2.0	Work in progress

**ANNEX 2**

**Main Equipment purchased over the last two years**

<b>Item</b>	<b>Quantity</b>	<b>Amount (Rs)(million)</b>
<b>SSRN Hospital</b>		
Ultrasound Scan Machine	1	1.8
Echography Apparatus	1	1.9
Dialysis Machine	5	1.4
Water Treatment Plant	1	1.2
Colposcope	1	0.2
Incubator for Nursery	6	0.8
Anaesthetic Ventilator	1	0.8
Anaesthetic Ventilator	2	1.6
Endoscopic Urological Surgery Set	1	1.4
Non Invasive Blood Pressure Monitor	4	0.2
MRI Equipment	1	60.6
CT Scanner	1	14.5
ENT Bronchoscope	1	0.2
<b>Cardiac Centre (Pamplemousses)</b>		
ENT Bronchoscope	1	0.2
Intensive Care Monitor	2	1.1
Anaesthetic Ventilator	1	0.8
Non Invasive Blood Pressure Monitor	7	0.4
Stress Test with Treadmill	1	0.6
<b>Rodrigues</b>		
Penlon Ventilator	1	0.5
Pulse oxymeters	3	0.083

<b>Item</b>	<b>Quantity</b>	<b>Amount (Rs)(million)</b>
Defibrillating Machine	2	0.35
Electric suction apparatus	1	0.15
Upper Gastrointestinal monitor	1	0.2
Fiberscope cold-light	1	0.2
Color Fibrescope	1	0.2
Wheel Chair (OPD)	4	0.08
Diathermy Apparatus – Physio	1	0.17
Dialysis Machine	2	0.56
<b>Government Analyst Division</b>		
Microwave Oven Digester	1	0.7
Automatic Distillator	1	0.7
<b>Flacq Hospital</b>		
Diathermy Machine	1	0.2
Anaesthetic Machine with Ventilator	2	1.3
Endoscopic Urological Surgery Set	1	1.4
Non Invasive Blood Pressure Monitor	4	0.2
Incubators for Nursery	6	0.8
<b>Victoria Hospital</b>		
Diathermy Machine	2	0.4
Dialysis Machine	15	4.2
Water Treatment Plant	1	1.2
Stress Test with Treadmill	1	0.5
Colposcope	1	0.2
High Powered Drill	1	1.1
Incubator for Nursery	3	0.4

<b>Item</b>	<b>Quantity</b>	<b>Amount (Rs)(million)</b>
Incubator for NICU	3	1.1
ENT Bronchoscope	1	0.2
Endoscopic Urological Surgery Set	1	1.4
Non Invasive Blood Pressure Monitor	5	0.3
CT Scanner	1	14.5
Cobalt Therapy Machine	1	19
<b>J. Nehru Hospital</b>		
Monitor for Renal Transplantation	2	0.4
Dialysis Machine	5	1.4
Mobile X-Ray Machine	2	1.5
ENT Bronchoscope	1	0.2
Lithotripsy Equipment	1	10.6
Monitor for Renal Transplantation	2	0.9
Endoscopic Urological Set	1	1.4
<b>Dr. A. G. Jeetoo Hospital</b>		
Water Treatment Plant	1	1.2
Bedside Blood Gas Analyser	1	0.6
Incubator for Nursery	5	0.7
Endoscopic Urological Surgery Set	1	1.4
Non-Invasive Blood Pressure Mouth	3	0.2
Dialysis Machine	5	1.4
Water Treatment Plant	1	1.2
<b>Souillac Hospital</b>		
Incubator for Nursery	1	0.1
<b>Mahebourg Hospital</b>		
Incubators for Nursery	1	0.1

**ANNEX 3****New Projects**

<b>New Projects</b>	<b>No. of Beds</b>	<b>Cost Rs</b>	<b>Time Frame</b>
The construction of a new Dr. Jeetoo Hospital	550	750M	2002-2005
The construction of new Psychiatric Wards in five regional hospitals: Victoria Hospital Dr. Jeetoo Hospital SSRN Hospital J. Nehru Hospital Flacq Hospital	120 55 90 90 90	NAV	2003-2004
The construction of a new NCD Institute	75	250M	2003-2004
The construction of three new blocks at Flacq Hospital to convert it into a full fledged regional hospital	90	NAV	NAV
The construction of a Cardiac & Renal Unit at J. Nehru Hospital	80	60M	2003-2004
The extension of the Medical Records Room at JNH	NA	2M	2003
The extension of the Leukaemia Ward at Victoria hospital	40	NAV	2003
The construction of a Spinal and neurosurgery unit at Victoria hospital	60	NAV	2003
The construction of a building to house the Hyperbaric Decompression Chamber	NA	2.0M	2002-2003
The construction of a new Catering Unit at Victoria Hospital	NA	NAV	2003-2004
The construction of a Day Care Centre for HIV/AIDS at Bouloux Area Health Centre	20	NAV	2003

<b>New Projects</b>	<b>No. of Beds</b>	<b>Cost Rs</b>	<b>Time Frame</b>
The upgrading of all Area Health Centres and Community Centres	NA	NAV	Ongoing
The construction of new Area Health Centres and Community Centres	NA	NAV	NA
The construction of a new Area Health Centre at Goodlands	10	NAV	2003-2004
Reception & Waiting Areas in all Regional Hospitals	NA	NAV	2003-2004
Upgrading of Bathrooms and Toilets at SSRN Hospital	NA	NAV	2003-2004
Construction of a New Dental Clinic at Flacq Hospital	NA	NAV	2003-2004
Enlargement of gate at old compound at Flacq Hospital	NA	NAV	2003-2004
Extension of Montagne Blanche Area Health Centre	NA	NAV	2003-2004
Construction of a Medical Records Library at Cardiac Unit, Victoria Hospital	NA	NAV	2003-2004
Setting up of an Eye Bank at Victoria Hospital	NA	NAV	2002-2003
Water proofing of Roche Bois and Saint Croix Community Health Centres	NA	NAV	2002-2003

**ANNEX 4****Medical Equipment for all Hospitals - 2002-2003**

<b>Equipment</b>	<b>SSRN Hospital</b>	<b>Flacq Hospital</b>	<b>Dr A.G. Jeetoo Hospital</b>	<b>Victoria Hospital</b>	<b>J. Nehru Hospital</b>	<b>Total (units)</b>	<b>Total Estimated Cost (Rs)</b>
Pulse Oxymetres/Capnographs OT/ICU	12	6	10	10	9	47	<b>10,575,000</b>
Pulse Oxymetres Paed/Med/Casualty	6	4	11	10	6	37	<b>4,810,000</b>
Anaesthetic Ventilator Neo/Paed/Adult	5	2	2	2	2	13	<b>6,500,000</b>
Digital X-Ray Machine	1			1		2	<b>8,000,000</b>
X-Ray Machine 500A	1	2		1	1	5	<b>5,000,000</b>
Mobile X-Ray machine 200mA	2		1	1	1	5	<b>1,500,000</b>
Automatic Film Processor	2		1	2	2	7	<b>2,100,000</b>
Dialysis Machines + 1 Water Treatment Plant for <b>FH</b>	6	10	9	5	4	34	<b>10,000,000</b>
Echocardiography Machine	1		1	1		3	<b>10,500,000</b>
C-Arm I.Intensifier + Trans Table Cardiac	1		1			2	<b>10,000,000</b>
Arthroscopic set	1				1	2	<b>3,000,000</b>
C-Arm + Operation Table-orthopaedics	-		1		1	2	<b>10,000,000</b>
Occupational Therapy (Paediatrics)	9	9	9	9	9	45	<b>300,000</b>
Occupational Therapy (Adult)	7	7	14	7	7	42	<b>300,000</b>
Hyperbaric Chamber				1			<b>20,000,000</b>
Equipment for Central Lab							<b>12,000,000</b>
Angiography System: (1 unit for VH & 1 unit for Cardiac Centre)						2	<b>54,000,000</b>
Equipment for Vitreo Retinal Surgery at SBEH							<b>10,000,000</b>

<b>Equipment</b>						<b>Total Estimated Cost (Rs)</b>
Equipment for New Souillac Hospital						<b>25,000,000</b>
Medical Equipment for Post Graduate Training						<b>5,000,000</b>
Other Medical Equipment and accessories						<b>50,000,000</b>
<b>Grand Total</b>						<b>258,585,000</b>

## Abbreviations

AED or A & E	Accident and Emergency Department
AHCs	Area Health Centres
CHs	Community Hospitals
CHCs	Community Health Centres
CT Scan	Computerised Axial Tomography
ENT Hospital	Ear Nose and Throat Hospital
GDP	Gross Domestic Product
Gemba Kaizen	Continuous improvement at the work place
GRSE	Grand River South East
HIV/AIDS	Human Immuno-deficiency Virus/ Acquired Immune Deficiency Syndrome
ICU	Intensive Care Unit
JNH	Jawaharlal Nehru Hospital
NCDs	Non Communicable Diseases
MCs	Medi-Clinics
MOHQL	Ministry of Health and Quality of Life
MRI	Magnetic Resonance Imaging
NA	Not Applicable
NAV	Not Available
NICU	Neonatal Intensive Care Unit
NHA	National Health Accounts
NPF	National Pensions Fund

NSF	National Savings Fund
OPD	Out-Patient Department
R & D	Research and Development
SBEH	Subramania Bharati Eye Hospital
SADC	Southern African Development Community
SAMU	Service d'Aide Medicale d'Urgence
SSRN	Sir Seewoosagur Ramgoolam National Hospital
UNFPA	United Nations Fund for Population Activities
WHO	World Health Organisation
WTO	World Trade Organisation