ISLAND OF MAURITIUS

AN ANALYSIS OF THE HEALTH SITUATION

This analysis of the health situation includes discussion on population and related vital events, on health delivery system, services and personnel, and on activities carried out in public and private health institutions. The morbidity patterns and mortality trends have also been discussed.

POPULATION AND VITAL STATISTICS

The estimated resident population of the Island of Mauritius at the end of 2007 was 1,227,075 (606,307 males and 620,768 females) as compared to 1,219,208 in 2006, growing at a rate of 0.65%.

During the year 2007, 16,190 live births were registered, giving a crude birth rate of 13.2 per thousand mid-year resident population. In 1997, the crude birth rate was 17.4. Life Expectancy at birth, 66.4 for males and 74.3 for females in 1997, was estimated to be 69.1 and 75.9 respectively in 2007.

The number of deaths registered in 2007 was 8,323, corresponding to a crude death rate of 6.8 per thousand mid-year resident population as compared to 7.0 in 2005 and 7.3 in 2006. The number of deaths recorded in the months of March and April 2007 makes a total of 1,241 as compared to 1,916 deaths in the same two months of 2006, that is a decrease of 35.2%.

The number of infant deaths, that is deaths among children aged under one year, registered in 2007 was 248, corresponding to an infant mortality rate (IMR) of 15.3 per thousand live births as compared to 13.5 in 2006. The IMR which was 19.6 in 1995 increased to 22.2 in 1996, the highest rate in the last decade. Following the opening of the Neonatal Intensive Care Service at Victoria Hospital in May 1999, the IMR drastically fell from 19.2 in 1999 to 15.8 in 2000. The lowest IMR (12.4) was recorded in 2003. As shown in the chart below, during the same period, a decreasing trend has been noted in stillbirth rate from 12.9 per 1,000 total births in 1997 to 8.0 in 2006. However, it slightly rose to 9.6 in 2007.
The number of maternal deaths registered in 2007 was 6. The maternal mortality rate per 1,000 livebirths was then 0.37 as compared to 0.52 in 1997. The lowest rate with only one death due to complication following childbirth was 0.05 in 2002.

HEALTH DELIVERY SYSTEM

In the Island of Mauritius, as at the end of 2007, there were five regional hospitals with a total of 2,395 beds and two district hospitals namely Souillac Hospital with 30 beds and Mahebourg Hospital with 63 beds. There were also a psychiatric hospital with a bed complement of 794, and other specialised hospitals for chest diseases (63 beds), eye diseases (57 beds), ear, nose, and throat (E.N.T.) diseases (65 beds) and heart diseases (63 beds). This brought the total number of beds in government institutions to 3,530 as compared to 3,819 in 2000.

In the private sector there were, as at the end of 2007, thirteen nursing homes (private clinics) with a total of 550 beds. The total number of beds in the public and private sectors as at the end of 2007 was thus 4,080, that is, 3.3 beds for 1,000 inhabitants. In 1997, the corresponding ratio was 3.0 beds.

All regional and district hospitals as well as the Psychiatric, Eye, E.N.T and Cardiac hospitals have an out-patient department. Out-patient services were also delivered in two community hospitals, two medi-clinics, 21 Area Health Centres (AHC) and 113 Community Health Centres (CHC). The basic services delivered at CHC include the treatment of common diseases and injuries, maternal and child care, and family planning. In addition to these services, AHC also provide dental care. This service was also delivered in a few CHC’s. Out-patient care was also provided in the private sector, including several clinics and dispensaries on sugar estates. There were also 13 health offices, a chest clinic, a social hygiene clinic, and a National Centre for the Immuno-suppressed in operation as at the end of 2007.

The number of contacts with government health services, which includes attendances for the treatment of diseases and injuries at outpatient departments of hospitals, mediclinics, area health centres, community health centres, and ayurvedic clinics, together with admissions and attendances at hospitals for other services such as haemodialysis, diet clinic and physiotherapy, that increased significantly from 7.9 million in 2005 to 8.4 million in 2006, was 8.2 million in 2007.

HEALTH PERSONNEL

At the end of 2007, there were 1,444 doctors in the Republic of Mauritius, that is one for every 876 inhabitants. Of those doctors, 844 (58.1%) were employed in the public sector. In 1997, there were 1,016 doctors, that is, one for an average of 1,137 inhabitants.

There were 228 dentists, of whom 64 in the public sector, at the end of 2007. The corresponding number of pharmacists was 327 and 22 respectively. The number of qualified nurses and midwives in the public & private sectors were 3,300.

INPATIENT SERVICE

In 2007, the number of admissions (including re-admissions) to government hospitals in the Island of Mauritius were 191,244 of which 171,190 (89.5%) was in general hospitals. In 2006, there were 194,022 admissions with a bed occupancy of 71.3%, that is the same rate registered in 2007.
OUT-PATIENT SERVICE

The total number of attendances at out-patient departments of public hospitals (sorted, unsorted and casualty) was 2,818,771 in 2007 as compared to 2,680,003 in 2000. An average of 3,834 patients was seen daily at the Accidents and Emergency Departments of government hospitals in 2007 as compared to 4,100 in 2006.

In 2007, attendances for the treatment of common diseases and injuries at the community hospitals, mediclinics, area & community health centres were 3,753,885, as compared to 2,825,135 in 2000 and 3,895,605 in 2006. A decrease of 3.6% has been noted in the attendances from 2006 to 2007 as compared to an increase of 9% from 2005 to 2006.

MATERNAL AND CHILD HEALTH

The number of first attendances for antenatal examinations by the M.C.H staff at government clinics was 15,963 in 2000, 12,869 in 2006 and 12,857 in 2007. The total number of first and subsequent attendances (by staff and doctors) for antenatal and postnatal examinations and children under 5 years seen at Well Baby clinics which were 299,104 in 2005 and 292,253 in 2006 increased to 327,182 in 2007 mainly due to the activities related to growth monitoring.

The percentage of low birth weight (less than 2,500 grammes) among live births in the public sector, which increased from 14.3% in 2000 to 17.2% in 2005, was 17.3% in 2007. The percentage of caesarian section on total births occurring in government hospitals increased from 20.5 in 1996 to 27.2 in 2000 and to 38.0 in 2007.

The number of babies immunized against *tuberculosis* (B.C.G.) by M.C.H. staff in 2007 was 14,272. The number of children immunized against *diphtheria*, *whooping cough*, *tetanus*, *hepatitis B and HIB* (3rd dose) was 13,970. Those immunized against *poliomyelitis* (3rd dose) was 13,976 and against *measles/mumps/rubella* (MMR) was 14,400. The figures refer to the activities of M.C.H. staff at government vaccination centres. Data pertaining to vaccinations done in the private sector are not available.

Immunisation Coverage Rate as a percentage of live births:

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
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<tbody>
<tr>
<td>BCG</td>
<td>87.2</td>
<td>90.1</td>
<td>89.3</td>
<td>89.2</td>
</tr>
<tr>
<td>D.P.T, Hep B &amp; Hib (3rd dose)</td>
<td>87.3 *</td>
<td>87.4*</td>
<td>89.6</td>
<td>87.3</td>
</tr>
<tr>
<td>Polio (3rd dose)</td>
<td>87.4</td>
<td>87.9</td>
<td>89.8</td>
<td>87.4</td>
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<td>MMR</td>
<td>84.3</td>
<td>87.9</td>
<td>92.2</td>
<td>90.0</td>
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</table>

* without HIB

SCHOOL HEALTH

During the year 2007, the nursing staff responsible for school health visited 516 pre-primary schools and screened 18,608 children. 5.3% of these children were reported to have nits and lice. The nursing staff also visited 275 primary schools and screened 75,141 pupils. 30,757 pupils of Standards III, V and VI were submitted to vision tests and 936 of the 1,168 children with defective vision were referred to specialists. 14,805 new entrants were immunized against *diphtheria & tetanus (D.T.)* and *poliomyelitis*. 14,086 of them were also immunized against MMR and 15,464 school leavers were immunized against *tetanus*. The secondary school health programme was launched in February 2007 and 25,238 pupils were screened at 170 secondary and 15 pre-vocational schools (see page 40).
DENTAL HEALTH

The total number of attendances at government dental clinics (static and mobile) in 2007 was 307,393, out of which 62,502, that is 20.3%, were of primary schoolchildren, 9,125 (3.0%) were of expectant women and nursing mothers, and 7,843 (2.6%) were of pre-primary school children. The number of cases treated for paradontal diseases was 26,706 and the number of surgical operations on jaws, including surgical extractions of roots and impacted teeth, was 8,103. Fluoride was distributed to 26,438 children and a total of 19,991 children and adults were exposed to oral health education.

NURSING HOMES (PRIVATE CLINICS WITH IN-PATIENT SERVICE)

The total number of cases seen, including admissions, at the 13 nursing homes in 2007 was 83,915. 27,416 of these cases were seen for treatment (including operations) and 56,499 for examinations, investigations or observations. 2,766 livebirths and stillbirths that occurred in these institutions represented 16.9% of births in the whole island. 9.2% of livebirths had low birth weight (less than 2,500 grammes); the corresponding figure was 4.7% in 2000. The percentage of caesarian section on total births, which increased from 35.3 in 2000 to 48.4 in 2005, was 45.8 in 2006 and 50.0 in 2007.

MORBIDITY

The first case of AIDS was notified in October 1987. As at the end of 2007, a total of 3,284 cases of HIV/AIDS were detected, of whom 3,133 (2,591 males, 542 females) were Mauritians; 219 of these Mauritians were known to have passed away. 75.8% of the 3,133 HIV infected Mauritians were in the age-group 25 to 49 years and 18.4% in the age-group 15 to 24 years. As shown on the chart that follows, the number of new HIV/AIDS cases is more significant among the male than among the female.

Prior to 2000 the incidence was fairly low with 20 to 30 new HIV cases being reported annually. Over the period 2001 - 2005 the number had increased by nearly two folds annually: 55 in 2001, 98 in 2002, 225 in 2003, 525 in 2004 and 921 in 2005. The upward trend observed during these years could be partly explained by enhanced surveillance and testing facilities at various points across the country and scaling up of outreach Voluntary Counselling and Testing (VCT) sessions among the most at risk groups. However, a substantial decrease in the incidence was recorded in 2006 with 542 new cases. The 546 new cases registered in 2007 indicate a leveling of the epidemic.

NEW HIV/AIDS CASES AMONG MAURITIANS BY SEX

<table>
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<th>YEAR</th>
<th>MALE</th>
<th>FEMALE</th>
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<tbody>
<tr>
<td>2000</td>
<td>22</td>
<td>18</td>
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<td>2001</td>
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<td>87</td>
</tr>
<tr>
<td>2007</td>
<td>452</td>
<td>94</td>
</tr>
</tbody>
</table>
At the beginning of the epidemic, the mode of transmission of the HIV virus was predominantly heterosexual. The rising incidence as from year 2000 was driven by Injecting Drug Users (IDUs) acting as the main mode of transmission. The gradual shift in mode of transmission from heterosexual to IDUs became evident in 2003 when 66% and in 2004 when 87.0% of the new cases were detected among the IDUs as compared to only 7% in 2001 and 14% in 2002. The shift reached its peak in 2005 (92%) and dropped to 86% in 2006 and 80% in 2007. The distribution of the 3,133 infected Mauritians by mode of transmission is shown in the pie-chart below:

Only one case of Chikungunya was reported in 2007. In 2006, there were a total of 11,165 reported cases with high frequencies in February and March. As from April, the figure decreased considerably with no cases from September to December. The northern part of the island was mostly affected with 6,193 cases in the districts of Port Louis, Pamplemousses and Riviere du Rempart, summing up to 56% of all reported cases. The first time this disease was reported in 2005 with 1,381 cases mostly in the district of Port Louis and in the month of May.

Deliveries constituted 7.5% of all cases treated as in-patients in government general hospitals in 2007. Among other principal causes of discharges, there were Diarrhea and gastroenteritis with 3.9%, Acute Myocardial Infarction and other Ischaemic Heart Diseases with 3.7%, Hypertensive Diseases with 3.5%, Diabetes Mellitus with 3.3% and Abdominal and Pelvic Pain with 3.3%. The distribution by ICD-10 chapters indicates that 13.6% of all cases treated were due to “Pregnancy, childbirth and the puerperium”, 11.1% due to “Disease of the Circulatory System”, 10.9% due to “Injury and Poisoning” and 7.8% due to “Diseases of the Respiratory System”.

In 2007, of the 17,612 cases (11,358 males and 6,254 females) treated as in-patients in government general hospitals due to consequences of external causes, 7,120 (40.4%) were following “Falls”, 1,785 (10.1%) following “Transport Accidents” and 1,623 (9.2%) following “Assaults”. Of the 921 (5.2%) of cases treated as in-patients following “Attempted suicides”, 542 (58.8%) were females.
In 2007, of the 2,980 cases treated as in-patient at the Cardiac Centre, 1,097 (36.8%) were for “Angina pectoris”, 891 (29.9%) for “Chronic Ischaemic heart diseases” and 279 (9.4%) for “Mitral stenosis and other rheumatic mitral valve diseases”. A total of 964 operations were performed at the Centre, including re-opening cases, of which 537 (55.7%) were cardiac surgeries.

Cataract was responsible for 5,095 of the 6,537 cases treated as in-patients at S.Bharati (Eye) Hospital in 2007 (that is 77.9%). Among the cataract cases, 4,464 (87.6%) were operated upon. 358 cases were also treated at the hospital for “injuries and other consequences of external causes”.

During the year 2007, 549 in-patients were treated at the Poudre d’Or (Chest) Hospital. Twenty-seven patients died at the Hospital, giving a fatality rate of 4.9%. Of the 549 patients, 405 (73.8%) were males. Pulmonary tuberculosis was the morbid condition for 145 patients (107 males, 38 females), that is 26.4% of the total.

Of the 894 new cases diagnosed at the out-patient specialist clinics in chest diseases during the year 2007, 41 (4.6%) were diagnosed with tuberculosis, of which 23 pulmonary. Among the non-tuberculous diseases, asthma was in first place with 539 new cases, that is, 60.3% of all new cases diagnosed.

Of the 4,394 in-patients treated at Brown Sequard Hospital in 2007, mental and behavioural disorders due to the use of alcohol accounted for 1,859 cases (1,671 males, 188 females), that is 42.3%. Schizophrenia was responsible for 1,448 (33.0%) cases.

Of the 434 cases (0-3 months) treated as in-patients in 2007 at the Neonatal Intensive Care Unit, located in the complex of Victoria Hospital and SSRN Hospital, 206 (47.5%) were for disorders related to length of gestation and fetal growth, 135 (31.1%) for respiratory and cardiovascular disorders specific to the perinatal period and 15 (3.5%) for infections specific to the perinatal period. There were 95 deaths among those 434 cases, giving a fatality rate of 21.9%; this rate was 24.1% in 2006 and 26.0% in 2005.

The number of new cases diagnosed at the specialist clinics in dermatology in 2007 were 14,115 of which 4,152 (29.4%) were skin infections (1,756 of fungal origin and 1,022 of viral origin). 21.7% of new cases were treated for eczema, 8.7% for psoriasis and similar disorders, and 6.2% for acne.

Of the 4,097 cases treated as in-patients at the E.N.T Hospital in 2007, 779 (18.2%) were for “acute pharyngitis” and 543 (12.7%) for “acute tonsillitis”. Another 6.8% of the in-patients were treated for “otalgia and effusion of ear” and 6.3% for “foreign body in the nostril, pharynx and other respiratory tract”. A total of 1,439 operations were performed on in-patients at the centre, of which 392 (27.2%) were “excision on tonsils and adenoids”.

The number of new cases diagnosed by specialists at the out-patient clinics of the E.N.T. Centre in 2007 was 4,097. Diseases and conditions of ear accounted for 1,702 new cases (41.5% of the total new cases diagnosed), diseases and conditions of nose for 1,501 (36.6%) and diseases and conditions of throat for 890 (21.7%). Tonsilitis (acute or chronic), allergic rhinitis, sinusitis (acute or chronic), sensorineural deafness and tinnitus were the most common diseases diagnosed at the centre.
The number of new cases treated at the Social Hygiene Clinic in 2007 was 210 (173 males and 37 females). The main venereal diseases treated were *venereal warts* with 83 cases, *gonococcal infections* with 49, *syphilis* with 12 and *herpes simplex* with 11 cases. The total attendances at the National Day Care Centre for the Immuno-suppressed were 1,071 (734 males, 337 females), of which 729 were for voluntary counselling and 222 for the treatment of HIV/AIDS.

The disease responsible for the greatest number of first attendances at the community hospitals, mediclinics, area and community health centres for the treatment of common diseases and injuries in 2007 was *tonsillitis, laryngitis, nasopharyngitis, sore throat, URTI* with 11.3%. Other most common causes of first attendances were *fever/pain all over* with 7.6%, *influenza* with 7.2% and *cough, pain in throat, chest pain, wheezing, hiccough, sneezing* with 6.9%.

The distribution by ICD chapters shows that 22.8% of first attendances at the above mentioned dispensary service points were due to “*Diseases of Respiratory System*” and 10.0% due to “*Diseases of the musculoskeletal system and connective tissue*”. They were followed by the “*Diseases of the skin and connective tissue*” with 6.4% and “*Diseases of the digestive system*” with 6.1%. The total number of first attendances, 1,853,374 in 2006, decreased by 9.4% to reach 1,679,650 in 2007.

Of all new cases of cancer detected in 2005 that were registered by the National Cancer Register, the most common types among males were that of *trachea, bronchus and lung* with 10.8% followed by that of *prostate gland* with 9.5%. The two main types of cancer among females were that of *breast* (34.0%) followed by that of *cervix uteri* (11.5%).

**CAUSE OF DEATH**

*Heart diseases* and *Diabetes mellitus* were the first two principal underlying causes of mortality in 2007, with 1,762 (21.2%) and 1,878 (22.6%) deaths respectively; *Cancer (Malignant Neoplasm)* of all sites taken together was in the third position with 909 (10.9%) deaths. Deaths due to *Cerebrovascular diseases* amounted to 760 (9.2%) was in the fourth position.

The distribution of deaths by Chapter of the International Classification of Diseases (10th Revision) showed that *Diseases of the Circulatory System* (Chapter IX) were responsible for 36.4% of the deaths. *Endocrine nutritional and metabolic diseases* (Chapter IV) with 23.1% of the deaths were in second place followed by *Neoplasms* (Chapter II) with 11.2%.

Of the 3,030 deaths due to *Diseases of the Circulatory System* in 2007, 1,762 (58.2%) were due to *Heart diseases*. *Stroke and other Cerebrovascular diseases* accounted for another 769 (25.4%) deaths. 24.3% of the 3,030 deaths occurred among persons aged less than 60 years.

Of the 936 deaths due to *Neoplasms* in 2007, the most common types of cancer were that of *trachea, bronchus and lung* with 12.4%, *female breast* with 9.7%, *stomach* with 8.5% and *colon* with 7.8%. 32 persons died due to *leukaemia* (3.4%).

Of the 526 deaths due to external causes in 2007, 28.1% were due to *transport accidents*, 24.1% due to *suicides*, 8.4% due to *assaults*, 7.2% due to *accidental drowning and submersion* and 3.2% due to *exposure to smoke, fire and flames.*
Congenital anomalies with 49 deaths were the principal killers of children under one year in 2007, that is 19.8% of the total (248). The other principal causes of infant deaths were Slow fetal growth, fetal malnutrition and disorders related to short gestation and low birth weight responsible for 27 (10.9%) of the deaths, and septicaemia and infections specific to the perinatal period with 20 (8.1%) deaths.

Six maternal deaths were registered in 2007; two deaths were due to disease of circulatory system complicating the puerperium, one due to eclampsia in puerperium, one due to intrapartum haemorrhage, one due to ruptured uterus and one due to puerperal infection.

TRENDS IN CAUSE-SPECIFIC MORTALITY

Out of the 8,323 deaths registered in 2007, 36.4% were due to “Diseases of the Circulatory System” and 22.6% due to “Diabetes Mellitus”. “Heart diseases” represented 21.2% of all deaths. Of all persons for whom “Diabetes Mellitus” was assigned as the underlying cause of death, around 40% ultimately died with “Heart diseases” and around 30% with “Cerebrovascular diseases” as their direct cause of death.

% underlying cause of death over total death registered

<table>
<thead>
<tr>
<th>Year</th>
<th>ICD – 8</th>
<th>ICD – 9</th>
<th>ICD - 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Deaths:</td>
<td>6,967</td>
<td>6,685</td>
<td>6,691</td>
</tr>
<tr>
<td>Heart Diseases(%)</td>
<td>17.2</td>
<td>18.4</td>
<td>19.7</td>
</tr>
<tr>
<td>Cerebrovascular Diseases(%)</td>
<td>8.4</td>
<td>8.7</td>
<td>9.1</td>
</tr>
<tr>
<td>Other Diseases of Circulatory system(%)</td>
<td>2.8</td>
<td>3.2</td>
<td>3.6</td>
</tr>
<tr>
<td>All Circulatory(%)</td>
<td>30.3</td>
<td>32.4</td>
<td>33.5</td>
</tr>
<tr>
<td>Diabetes Mellitus(%)</td>
<td>2.7</td>
<td>5.4</td>
<td>7.8</td>
</tr>
<tr>
<td>Total Circulatory and D.M.(%)</td>
<td>31.1</td>
<td>35.7</td>
<td>40.2</td>
</tr>
</tbody>
</table>

NB: Following the application of ICD-10, figures pertaining to the year 2000 and before have been adjusted in light of the 2005 data.

The cause-specific mortality trends indicate a slow and almost constant increase in the percentages of death due to “Heart diseases”. However, a more rapid increase has been noted in regards to “Diabetes mellitus” over the last three decades, as shown in the chart below.
Taken together, “Diseases of the Circulatory System” and “Diabetes Mellitus” accounted for 58.5% of all deaths in 2006 and 59.0% in 2007 as compared to 31.1% in 1975 and 45.7% in 1990.

TRENDS IN SELECTED HEALTH INDICATORS

Figures related to the following health indicators for the Islands of Mauritius and Rodrigues as well as for the Republic of Mauritius, together with charts, are given at page 12 - 18: Crude Birth Rates, Crude Deaths Rates, Stillbirth Rates, Infant Mortality Rates, Under-5 Mortality Rates, Maternal Mortality Ratios and % Low Birth Weight. Time series data on Immunization Coverage Rates are given at page 33.

As indicated by the specific line graphs, general decreasing trends have been observed in Mauritius as from 1990 in regards to Stillbirth, Infant Mortality, Under-5 Mortality and Maternal Mortality. However, since 2005 or 2006, slight increases have been noted in these indicators.

The percentage of low birth weight (< 2.5 Kg) among livebirths that occurred in public and private health institutions, which was 7.9% in 1990 in the Island of Mauritius, gradually increased to 16.0% in 2005; in 2007, it was 15.9%. The same trend was observed in Rodrigues where it increased from 5.6% in 1990 to 14.3% in 2006; in 2007, it dropped to 11.4%, a level similar to that registered in 2005 (chart at page 18).