

## 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.

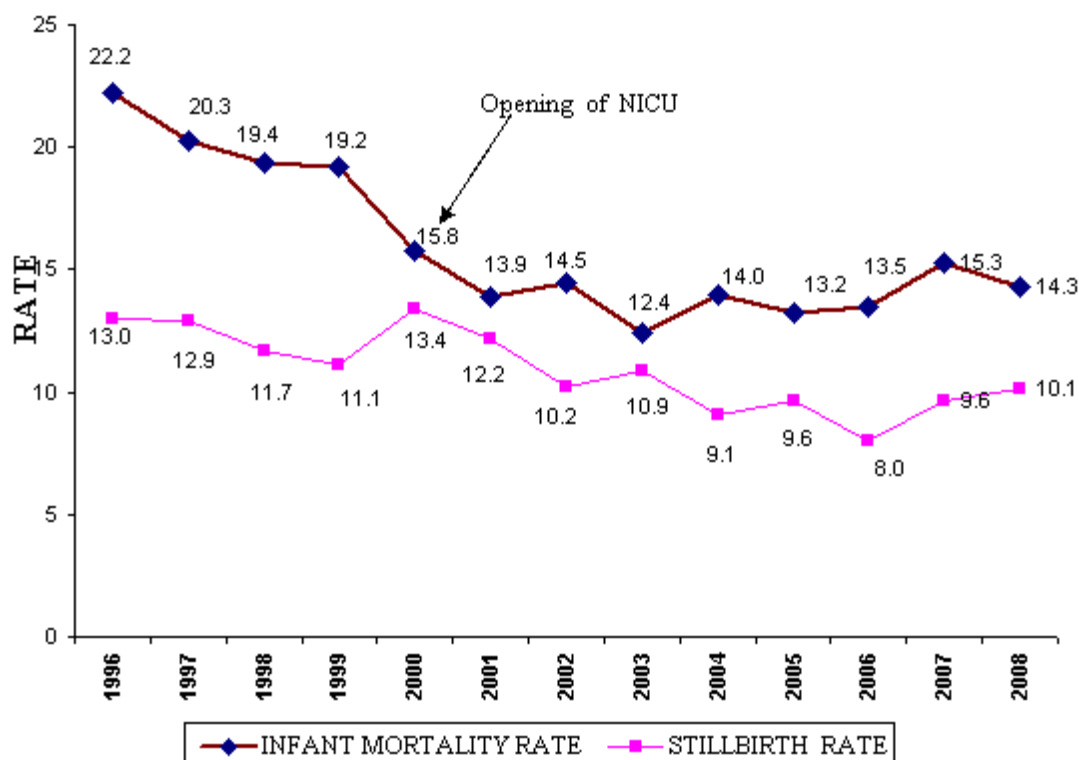
#### POPULATION AND VITAL STATISTICS

The estimated resident population of the Island of Mauritius at the end of 2008 was 1,234,042 (609,261 males and 624,781 females) as compared to 1,227,075 in 2007, growing at a rate of 0.57%.

During the year 2008, 15,590 live births were registered, giving a crude birth rate of 12.7 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 76.1 respectively in 2008.

The number of deaths registered in 2008 was 8,798, corresponding to a crude death rate of 7.1 per thousand mid-year resident population as compared to 7.3 in 2006 and 6.8 in 2007.

The number of infant deaths, that is deaths among children aged under one year, registered in 2008 was 223, corresponding to an infant mortality rate (IMR) of 14.3 per thousand live births as compared to 15.3 in 2007. 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 9.6 in 2007. However, it slightly rose to 10.1 in 2008.



The number of maternal deaths registered in 2008 was 6. The maternal mortality rate per 1,000 livebirths was then 0.38 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 2008, there were five regional hospitals with a total of 2,410 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 751, and other specialised hospitals for chest diseases (61 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 3,500 as compared to 3,819 in 2000.

In the private sector there were, as at the end of 2008, seventeen nursing homes (private clinics) with a total of 582 beds. The total number of beds in the public and private sectors as at the end of 2008 was thus 4,082, 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 2008.

The number of contacts with government preventive and curative 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 which decreased from 8.4 million in 2006 to 8.2 million in 2007, was 8.4 million in 2008 with a daily average of around 23,000.

## HEALTH PERSONNEL

At the end of 2008, there were 1,450 doctors in the Republic of Mauritius, that is one for every 876 inhabitants. Of those doctors, 852 (58.8%) 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 235 dentists, of whom 61 in the public sector, at the end of 2008. The corresponding number of pharmacists was 348 and 20 respectively. The number of qualified nurses and midwives in the public & private sectors were 3,500.

## INPATIENT SERVICE

In 2008, the number of admissions (including re-admissions) to government hospitals in the Island of Mauritius were 193,348 of which 170,959 (88.4%) was in general hospitals. In 2007, there were 191,244 admissions with a bed occupancy of 71.3%, which slightly increased to 72.1% in 2008.

## OUT-PATIENT SERVICE

The total number of attendances at out-patient departments of public hospitals (sorted, unsorted and casualty) was 2,851,646 in 2008 as compared to 2,680,003 in 2000. An average of 3,920 patients was seen daily at the Accidents and Emergency Departments of government hospitals in 2008 as compared to 3,834 in 2007.

In 2008, attendances for the treatment of common diseases and injuries at the community hospitals, mediclinics, area & community health centres were 3,956,543, as compared to 2,825,135 in 2000 and 3,753,885 in 2007. An increase of 5.4% has been noted in the attendances from 2007 to 2008 as compared to a decrease of 3.6% from 2006 to 2007.

## 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, 12,857 in 2007 and 12,940 in 2008. 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 and 331,531 in 2008 mainly due to enhanced 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 16.7% in 2008. 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 39.9 in 2008.

The number of babies immunized against *tuberculosis* (B.C.G.) by M.C.H. staff in 2008 was 13,665. The number of children immunized against *diphtheria, whooping cough, tetanus, hepatitis B and HIB* (3<sup>rd</sup> dose) was 14,635. Those immunized against *poliomyelitis* (3<sup>rd</sup> dose) was 14,663 and against *measles/mumps/rubella* (MMR) was 13,574. 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:

	2000	2005	2006	2007	2008
BCG	87.2	90.1	89.3	89.2	89.3
D.P.T, Hep B & Hib(3 <sup>rd</sup> dose)	87.3 *	87.4*	89.6	87.3	95.6
Polio (3 <sup>rd</sup> dose)	87.4	87.9	89.8	87.4	95.8
MMR	84.3	87.9	92.2	90.0	88.7

\* without HIB

## SCHOOL HEALTH

During the year 2008, the nursing staff responsible for school health visited 556 pre-primary schools and screened 19,914 children. 5.0% of these children were reported to have nits and lice. The nursing staff also visited 282 primary schools and screened 69,048 pupils. 33,931 pupils of Standards III, V and VI were submitted to vision tests and 1200 of the 1,325 children with defective vision were referred to specialists. 16,845 new entrants were immunized against *diphtheria & tetanus* (D.T.) and *poliomyelitis*. 16,468 of them were also immunized against MMR and 17,360 school leavers were immunized against *tetanus*. 25,886 pupils mostly aged 13-17 years were screened at 171 secondary and 17 pre-vocational schools ( see page 40 ).

DENTAL HEALTH

The total number of attendances at government dental clinics (static and mobile) in 2008 was 325,245, out of which 63,533, that is 19.5%, were of primary schoolchildren, 9,066 (2.8%) were of expectant women and nursing mothers, and 10,800 (3.3%) were of pre-primary school children. The number of cases treated for paradontal diseases was 28,579 and the number of surgical operations on jaws, including surgical extractions of roots and impacted teeth, was 7,181. Fluoride was distributed to 28,073 children and a total of 27,309 children and adults were exposed to oral health education.

NURSING HOMES (PRIVATE CLINICS WITH IN-PATIENT SERVICE)

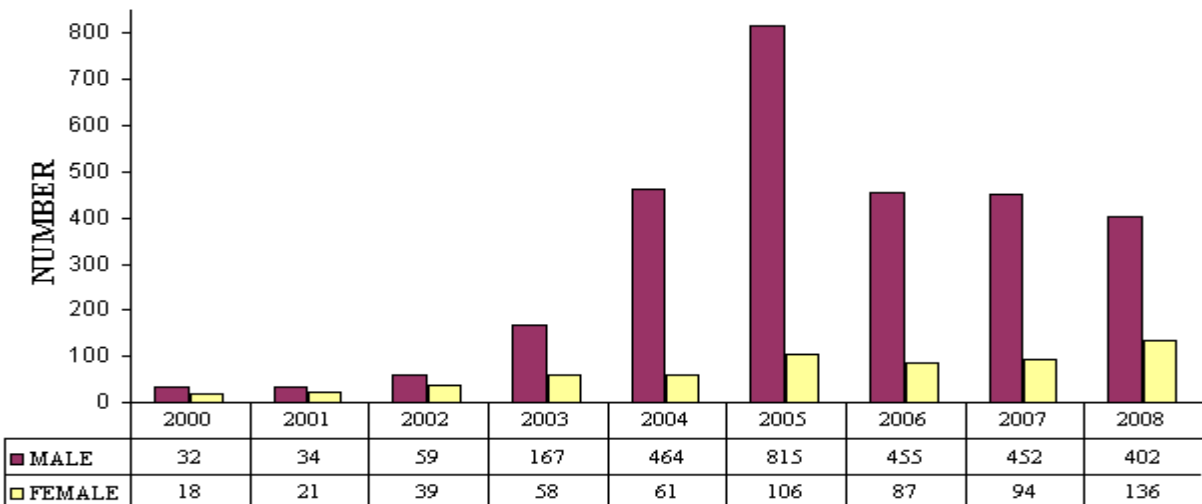
The total number of cases seen, including admissions, at the 17 nursing homes in 2008 was 97,830. 44,863 of these cases were seen for treatment (including operations) and 52,967 for examinations, investigations or observations. 3,048 livebirths and stillbirths that occurred in these institutions represented 19.4% of births in the whole island. 7.9% 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 50.1 in 2008.

MORBIDITY

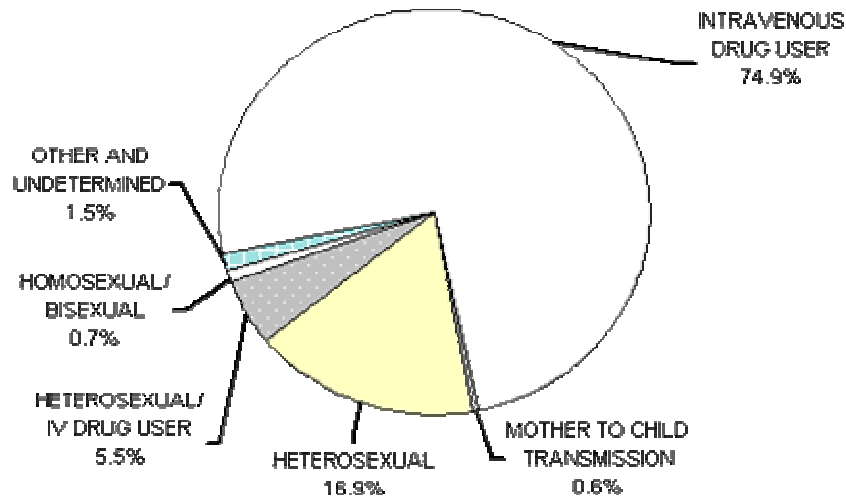
The first case of AIDS was notified in October 1987. As at the end of 2008, a total of 3,844 cases of HIV/AIDS were detected, of whom 3,671 (2,993 males, 678 females) were Mauritians; 243 of these Mauritians were known to have passed away. 76.0% of the 3,671 HIV infected Mauritians were in the age-group 25 to 49 years and 17.9% 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 538 new cases registered in 2008 indicate a leveling of the epidemic.

NEW HIV/AIDS CASES AMONG MAURITIANS BY SEX



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 80% in 2007 and 72% in 2008. The distribution of the 3,671 infected Mauritian by mode of transmission is shown in the pie-chart below:



No case of chikungunya was reported in 2008 and only one (imported) case 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 7.3% of all cases treated as in-patients in government general hospitals in 2008. Among other principal causes of discharges, there were *Diarrhea and gastroenteritis* with 4.5%, *Diabetes Mellitus* with 4.1%, *Hypertensive Diseases* with 3.6%, *Acute Myocardial Infarction and other Ischaemic Heart Diseases* and *Abdominal and Pelvic Pain* with 2.8% equally. The distribution by ICD-10 chapters indicates that 13.3% of all cases treated were due to “*Pregnancy, childbirth and the puerperium*”, 10.9% due to “*Injury and Poisoning*”, 9.9% due to “*Disease of the Circulatory System*”, and 8.7% due to “*Diseases of the Respiratory System*”.

In 2008, of the 17,418 cases (11,018 males and 6,400 females) treated as in-patients in government general hospitals due to consequences of external causes, 6,875 (39.5%) were following “*Falls*”, 1,821 (10.5%) following “*Transport Accidents*” and 1,710 (9.8 %) following “*Assaults*”. Of the 1,008 (5.8%) of cases treated as in-patients following “*Attempted suicides*”, 563 (55.9%) were females.

In 2008, of the 2,852 cases treated as in-patient at the Cardiac Centre, 1,168 (41.0%) were for “*Angina pectoris*”, 785 (27.5%) for “*Chronic Ischaemic heart diseases*” and 368 (12.9%) for “*Mitral stenosis and other rheumatic mitral valve diseases*”. A total of 820 operations were performed at the Centre, including re-opening cases, of which 454 (55.4 %) were cardiac surgeries.

*Cataract* was responsible for 6,830 of the 8,480 cases treated as in-patients at S.Bharati (Eye) Hospital in 2008 (that is 80.5%). Among the cataract cases, 6,311 (92.4%) were operated upon. 411 cases were also treated at the hospital for “*injuries and other consequences of external causes*”.

During the year 2008, 582 in-patients were treated at the Poudre d’Or (Chest) Hospital. Thirty-six patients died at the Hospital, giving a fatality rate of 6.2%. Of the 582 patients, 435 (74.7%) were males. *Pulmonary tuberculosis* was the morbid condition for 136 patients (101 males, 35 females), that is 23.4% of the total.

Of the 617 new cases diagnosed at the out-patient specialist clinics in chest diseases during the year 2008, 33 (5.3%) were diagnosed with *tuberculosis*, of which 28 *pulmonary*. Among the non-tuberculous diseases, *asthma* was in first place with 226 new cases, that is, 36.6% of all new cases diagnosed.

Of the 4,382 in-patients treated at Brown Sequad Hospital in 2008, *mental and behavioural disorders due to the use of alcohol* accounted for 1,961 cases (1,771 males, 190 females), that is 44.8%. *Schizophrenia* was responsible for 1,410 (32.2%) cases.

Of the 379 cases (0-3 months) treated as in-patients in 2008 at the Neonatal Intensive Care Unit, located in the complex of Victoria Hospital and SSRN Hospital, 190 (50.1%) were for *disorders related to length of gestation and fetal growth*, 109 (28.8%) for *respiratory and cardiovascular disorders specific to the perinatal period* and 27 (7.1%) for *infections specific to the perinatal period*. There were 90 deaths among those 379 cases, giving a fatality rate of 23.7%; this rate was 21.9% in 2007 and 24.1% in 2006.

The number of new cases diagnosed at the specialist clinics in dermatology in 2008 were 13,180 of which 3,980 (30.2%) were *skin infections* (1,487 of fungal origin and 1,030 of viral origin). 20.7% of new cases were treated for *eczema*, 9.4% for *psoriasis and similar disorders*, and 6.5% for *acne*.

Of the 4,449 cases treated as in-patients at the E.N.T Hospital in 2008, 1,057 (23.8%) were for “*acute pharyngitis*” and 514 (11.6%) for “*acute tonsillitis*”. Another 7.4% of the in-patients were treated for “*otalgia and effusion of ear*” and 2.1% for “*foreign body in the nostril, pharynx and respiratory tract*”. A total of 1,350 operations were performed on in-patients at the centre, of which 398 (29.5%) 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 2008 was 4,869. *Diseases and conditions of ear* accounted for 1,629 new cases (33.5% of the total new cases diagnosed), *diseases and conditions of nose* for 1,585 (32.6%) and *diseases and conditions of throat* for 1537 (31.6%). *Tonsillitis (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 2008 was 216 (165 males and 49 females). The main venereal diseases treated were *venereal warts* with 93 cases, *gonococcal infections* with 47, *syphilis* with 13 and *herpes simplex* with 10 cases. The total attendances at the National Day Care Centre for the Immuno-suppressed were 1,147 (739 males, 408 females), of which 913 were for voluntary counselling and 191 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 2008 was *tonsillitis, laryngitis, nasopharyngitis, sore throat, URTI* with 12.0%. Other most common causes of first attendances were *fever/pain all over* with 7.9%, *influenza* with 7.0% and *cough, pain in throat, chest pain, wheezing, hiccough, sneezing* with 8.2%.

The distribution by ICD chapters shows that 23.1% of first attendances at the above mentioned dispensary service points were due to “*Diseases of Respiratory System*” and 9.0% due to “*Diseases of the musculoskeletal system and connective tissue*”. They were followed by the “*Diseases of the skin and connective tissue*” with 6.0% and “*Diseases of the digestive system*” with 6.3%. The total number of first attendances, 1,679,650 in 2007, increased by 11.4% to reach 1,870,945 in 2008

Of all new cases of cancer detected in 2006 that were registered by the National Cancer Register, the most common types among males were that of *prostate gland* with 9.9%, colon with 8.7%, *trachea, bronchus and lung* with 7.0%. The two main types of cancer among females were that of *breast* (35.8%) followed by that of *cervix uteri* (11.4%).

## CAUSE OF DEATH

*Heart diseases* and *Diabetes mellitus* were the first two principal underlying causes of mortality in 2008, with 1,724 (19.6%) and 2,004 (22.8%) deaths respectively; *Cancer (Malignant Neoplasm)* of all sites taken together was in the third position with 1049 (11.9%) deaths. Deaths due to *Cerebrovascular diseases* amounted to 838 (9.5%) was in the fourth position.

The distribution of deaths by Chapter of the International Classification of Diseases (10<sup>th</sup> Revision) showed that *Diseases of the Circulatory System* (Chapter IX) were responsible for 35.0% of the deaths. *Endocrine nutritional and metabolic diseases* (Chapter IV) with 23.6% of the deaths were in second place followed by *Neoplasms* (Chapter II) with 11.9%.

Of the 3,076 deaths due to *Diseases of the Circulatory System* in 2008, 1,724 (56.0%) were due to *Heart diseases*. *Stroke and other Cerebrovascular diseases* accounted for another 838 (27.2%) deaths. 23.7% of the 3,076 deaths occurred among persons aged less than 60 years.

Of the 1,049 deaths due to *Neoplasms* in 2008, the most common types of cancer were that of *trachea, bronchus and lung* with 13.6%, *female breast* with 10.9%, *stomach* with 8.1% and *colon* with 5.9%. 35 persons died due to *leukaemia* (3.3%)

Of the 529 deaths due to external causes in 2008, 33.8% were due to *transport accidents*, 15.9% due to *suicides*, 9.8% due to *assaults*, 9.8% due to *accidental drowning and submersion* and 3.4% due to *exposure to smoke, fire and flames*.

*Congenital anomalies* with 44 deaths were the principal killers of children under one year in 2008, that is 19.7% of the total (223). 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 26 (11.7%) of the deaths, and *septicaemia and infections specific to the perinatal period* with 26 (11.7%) deaths.

Six maternal deaths were registered in 2008; one death was due to *abortion*, one due to *eclampsia*, two due to *postpartum haemorrhage*, one due to *pulmonary embolism* and one due to *disseminated intravascular coagulation*.

## TRENDS IN CAUSE-SPECIFIC MORTALITY

Out of the 8,798 deaths registered in the Island of Mauritius in 2008, 35.0% were due to “*Diseases of the Circulatory System*” and 22.8% due to “*Diabetes Mellitus*”. “*Heart diseases*” represented 19.6% 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*

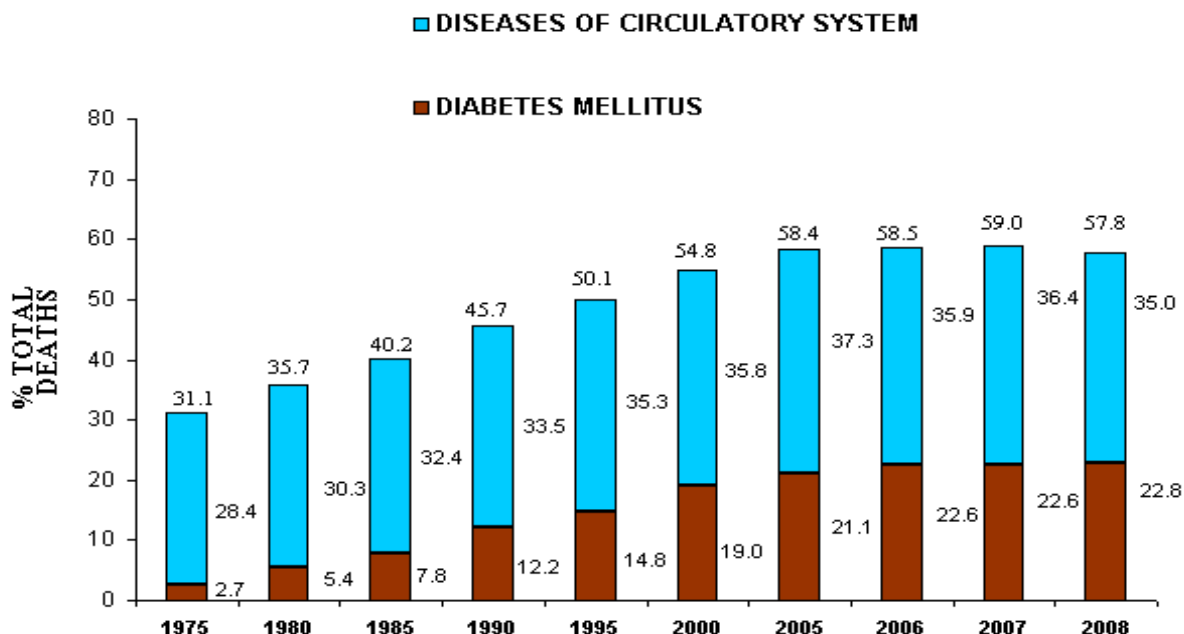
Year	ICD – 8		ICD – 9				ICD - 10			
	1975	1980	1985	1990	1995	2000	2005	2006	2007	2008
<b>Total Deaths:</b>	6,967	6,685	6,691	6,854	7,298	7,806	8,422	8,917	8,323	8798
<b>CAUSE:</b>										
<i>Heart Diseases</i> (%):	17.2	18.4	19.7	20.4	21.5	21.8	22.8	21.7	21.2	19.6
<i>Cerebrovascular Diseases</i> (%):	8.4	8.7	9.1	9.3	9.6	9.8	10.8	9.3	9.2	9.5
<i>Other Diseases of Circulatory system</i> (%):	2.8	3.2	3.6	3.8	4.2	4.2	3.7	4.8	6.0	5.9
<i>All Circulatory</i> (%) :	<u>28.4</u>	<u>30.3</u>	<u>32.4</u>	<u>33.5</u>	<u>35.3</u>	<u>35.8</u>	<u>37.3</u>	<u>35.9</u>	<u>36.4</u>	<u>35.0</u>
<i>Diabetes Mellitus</i> (%):	2.7	5.4	7.8	12.2	14.8	19.0	21.1	22.6	22.6	22.8
<i>Total Circulatory and D.M.</i> (%):	<u>31.1</u>	<u>35.7</u>	<u>40.2</u>	<u>45.7</u>	<u>50.1</u>	<u>54.8</u>	<u>58.4</u>	<u>58.5</u>	<u>59.0</u>	<u>57.8</u>

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 increase in the percentages of death due to “*Heart diseases*” between 1975 and 2005, a slight decrease has been noted as from 2006. However, a more rapid increase has been noted in regards to “*Diabetes mellitus*” over the last three decades as shown in the chart below with a slowdown during the recent years.

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.

**DEATHS DUE TO**



Taken together, “*Diseases of the Circulatory system*” and “*Diabetes Mellitus*” accounted for 59.0% of all deaths in 2007 and 57.8% in 2008 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. Since 2005 or 2006, slight increases have been noted in these indicators. However, slight decreases have been observed in 2008 in infant & under 5 mortality.

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 went down from 15.9% in 2007 to 15.0% in 2008. The same trend was observed in Rodrigues where it increased from 5.6% in 1990 to 14.3% in 2006; it slightly increased from 11.4% in 2007 to 12.7% in 2008.

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