

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.

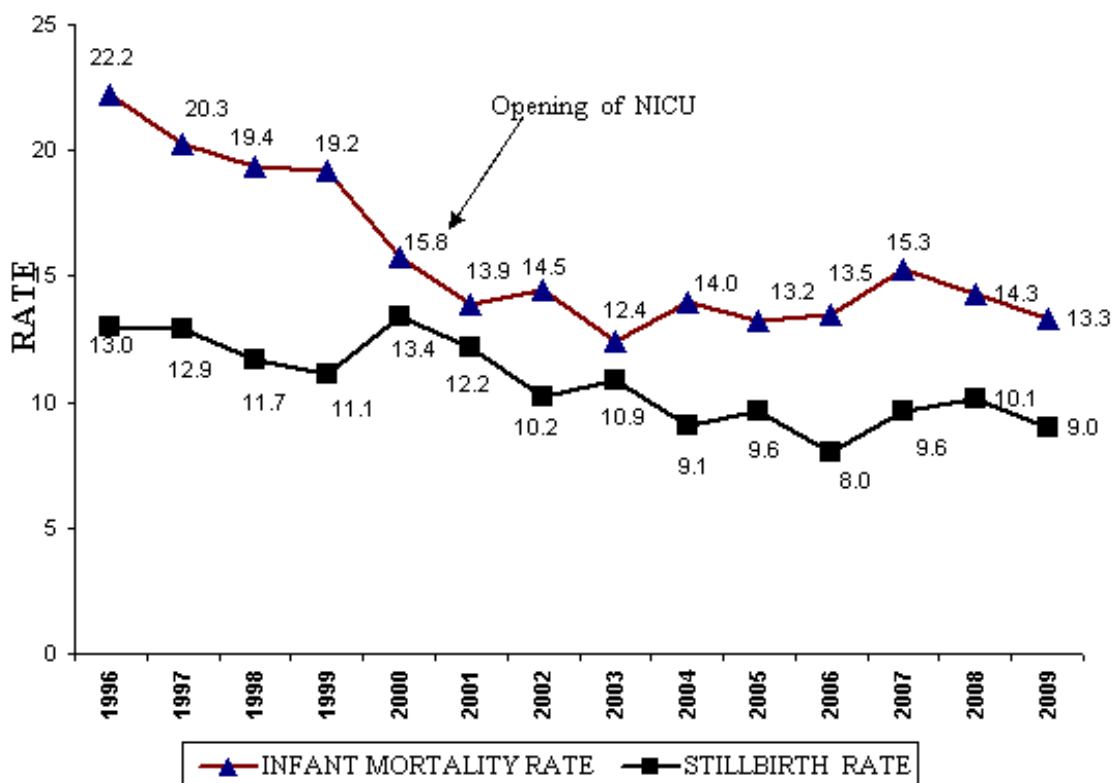
POPULATION AND VITAL STATISTICS

The estimated resident population of the Island of Mauritius at the end of 2009 was 1,239,788 (611,593 males and 628,195 females) as compared to 1,234,042 in 2008, growing at a rate of 0.47%.

During the year 2009, 14,623 live births were registered, giving a crude birth rate of 11.8 per thousand mid-year resident population. In 2000, the crude birth rate was 16.9. Life Expectancy at birth, 67.4 for males and 74.6 for females in 2000, was estimated to be 69.3 and 76.5 respectively in 2009.

The number of deaths registered in 2009 was 8,987, corresponding to a crude death rate of 7.3 per thousand mid-year resident population as compared to 6.8 in 2000 and 7.1 in 2008.

The number of infant deaths, that is deaths among children aged under one year, registered in 2009 was 195, corresponding to an infant mortality rate (IMR) of 13.3 per thousand live births as compared to 14.3 in 2008. 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, a decreasing trend has been noted in stillbirth rate from 13.4 per 1,000 total births in 2000 to 9.0 in 2009.



The number of maternal deaths registered in 2009 was 10 as compared to 6 in 2007 and 2008 equally. The maternal mortality rate per 1,000 livebirths was 0.68 in 2009 as compared to 0.15 in 2000 and 0.38 in 2008. 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 2009, there were five regional hospitals with a total of 2,408 beds and two district hospitals namely Souillac Hospital with 30 beds and Mahebourg Hospital with 57 beds. There were also a psychiatric hospital with a bed complement of 731, and other specialised hospitals for chest diseases (61 beds), eye diseases (59 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 3,474 as compared to 3,819 in 2000.

In the private sector there were, as at the end of 2009, nineteen nursing homes (private clinics) with a total of 807 beds. The total number of beds in the public and private sectors as at the end of 2009 was thus 4,281, that is, 290 inhabitants per bed. In 2000, the corresponding ratio was 264.

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. 4 Ayurvedic Clinics were providing outpatient care. Out-patient care was also provided in the private sector, including 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 2009.

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 was 8.2 million in 2007, 8.4 million in 2008 and 8.8 million in 2009.

HEALTH PERSONNEL

At the end of 2009, there were 1,500 doctors in the Republic of Mauritius, that is 11.7 doctors per 10,000 population. Of those doctors, 887 (59.1%) were employed in the public sector. In 2000, there were 1,080 doctors, that is, 9.1 per 10,000 population.

There were 250 dentists, of whom 59 in the public sector, at the end of 2009. The corresponding number of pharmacists was 386 and 19 respectively. The number of qualified nurses and midwives in the public & private sectors was 3,500 of whom 313 were in the private sector.

INPATIENT SERVICE

In 2009, the number of admissions (including re-admissions) to government hospitals in the Island of Mauritius were 187,361 of which 166,394 (88.8%) was in general hospitals. Bed occupancy in the public sector was 73.0% as compared to 72.1% in 2008 and 69.9 % in 2000.

OUT-PATIENT SERVICE

The total number of attendances at out-patient departments of public hospitals (sorted, unsorted and casualty) was 2,904,193 in 2009 as compared to 2,680,003 in 2000. An average of 3,930 patients was seen daily at the Accidents and Emergency Departments of government hospitals in 2009.

In 2009, attendances for the treatment of common diseases and injuries at the community hospitals, mediclinics, area & community health centres were 4.12 million, as compared to 2.83 million in 2000 and 3.92 million in 2008. An increase of 5.1% has been noted in the number of attendances from 2008 to 2009.

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, 12,127 in 2008 and 11,694 in 2009. 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 increased from 292,253 in 2006 to 327,182 in 2007 mainly due to enhanced activities related to growth monitoring was 309,270 in 2008 and 302,227 in 2009.

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 18.9% in 2009. The percentage of caesarian section on total births occurring in government hospitals increased from 20.5% in 1996 to 26.6% in 2000 and to 42.4% in 2009.

The number of babies immunized against *tuberculosis* (B.C.G.) by M.C.H. staff in 2009 was 12,821. The number of children immunized against *diphtheria, whooping cough, tetanus, hepatitis B and HIB* (3rd dose) was 13,376. Those immunized against *poliomyelitis* (3rd dose) was 13,482 and against *measles/mumps/rubella* (MMR) was 13,316. The figures refer to the activities of M.C.H. staff at government vaccination centres. High coverage rates for the 3rd dose of DPT/ Hep B/ Hib/ Polio in 2008, as indicated in the table below, is mainly due to the changes in vaccination schedule as per the recommendations of the World Health Organisation. Data pertaining to vaccinations done in the private sector are not available.

Immunisation Coverage Rate as a percentage of total births(Surviving Infants):

	2000	2005	2006	2007	2008	2009
BCG	87.2	90.1	89.3	90.6	90.6	88.9
D.P.T, Hep B & Hib(3 rd dose)	87.3 *	87.4*	89.6	88.7	97.0	92.7
Polio (3 rd dose)	87.4	87.9	89.8	88.7	97.2	93.4
MMR	84.3	87.9	92.2	91.4	90.0	92.3

* without HIB

SCHOOL HEALTH

During the year 2009, the nursing staff responsible for school health visited 626 pre-primary schools and screened 20,718 children. 5.5% of these children were reported to have nits and lice. The nursing staff also visited 286 primary schools and screened 60,353 pupils. 31,838 pupils of Standards III, V and VI were submitted to vision tests and 853 of the 989 children with defective vision were referred to specialist. 14,792 new entrants to primary schools were immunized against *diphtheria & tetanus (D.T.)* and *poliomyelitis*. 14,909 of them were also immunized against *MMR* and 15,370 school leavers were immunized against *tetanus*.

DENTAL HEALTH

The total number of attendances at government dental clinics (static and mobile) in 2009 was 323,769, out of which 64,123, that is 19.8%, were of primary schoolchildren, 8,359 (2.6%) were of expectant women and nursing mothers, and 7,321 (2.3%) were of pre-primary school children. The number of cases treated for paradontal diseases was 31,305 and the number of surgical operations on jaws, including surgical extractions of roots and impacted teeth, was 8,614. A total of 42,341 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 19 nursing homes in 2009 was 111,012. 47,555 of these cases were seen for treatment (including operations) and 63,457 for examinations, investigations or observations. 2,968 livebirths and stillbirths that occurred in these institutions represented 20.1% of births in the whole island. 8.4% 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 gradually increased from 35.3 in 2000 to 48.4 in 2005, and from 45.8 in 2006 to 52.3 in 2009.

MORBIDITY

The first case of AIDS was notified in October 1987. As at the end of 2009, a total of 4,396 cases of HIV/AIDS were detected, of whom 4,219 (3,429 males, 790 females) were Mauritians; 384 of these Mauritians were known to have passed away. 75.7% of the 4,219 HIV infected Mauritians were in the age-group 25 to 49 years and 17.6% 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. However, the proportion of females has increased from 11.6% in 2004 to 25.3% in 2008; in 2009, it was 20.4%.

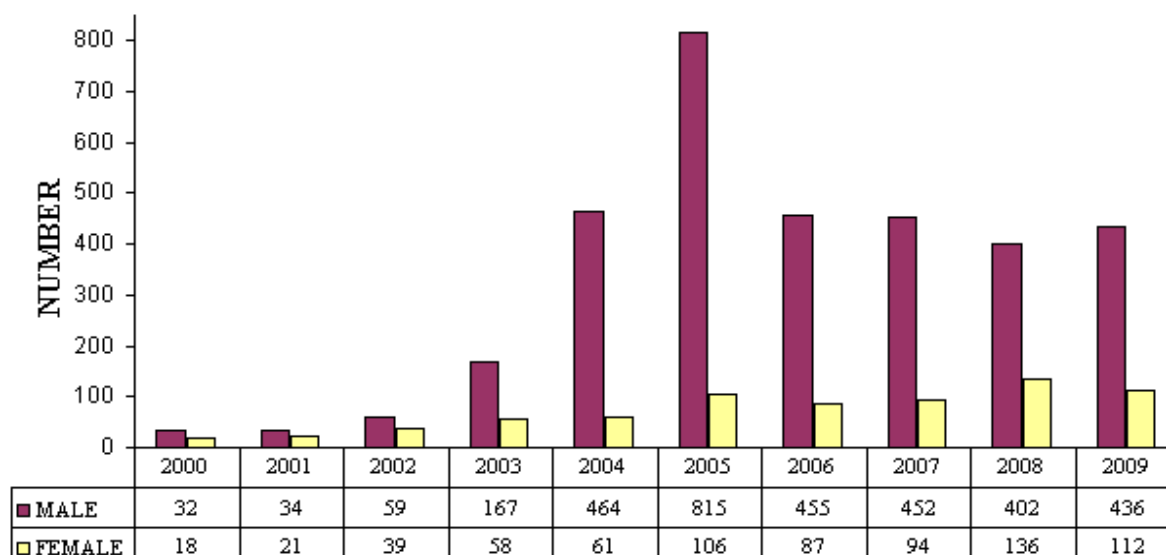
**Distribution of HIV/AIDS by sex and age * group
(1987 – 2009)**

Age group (Years)	Male	Female	TOTAL
<5	10	9	19
5 -14	4	5	9
15 - 19	54	79	133
20 - 24	431	179	610
25 - 29	756	164	920
30 - 34	640	128	768
35 - 39	522	95	617
40 - 44	481	66	547
45 - 49	310	31	341
50 & above	221	34	255
TOTAL	3,429	790	4,219

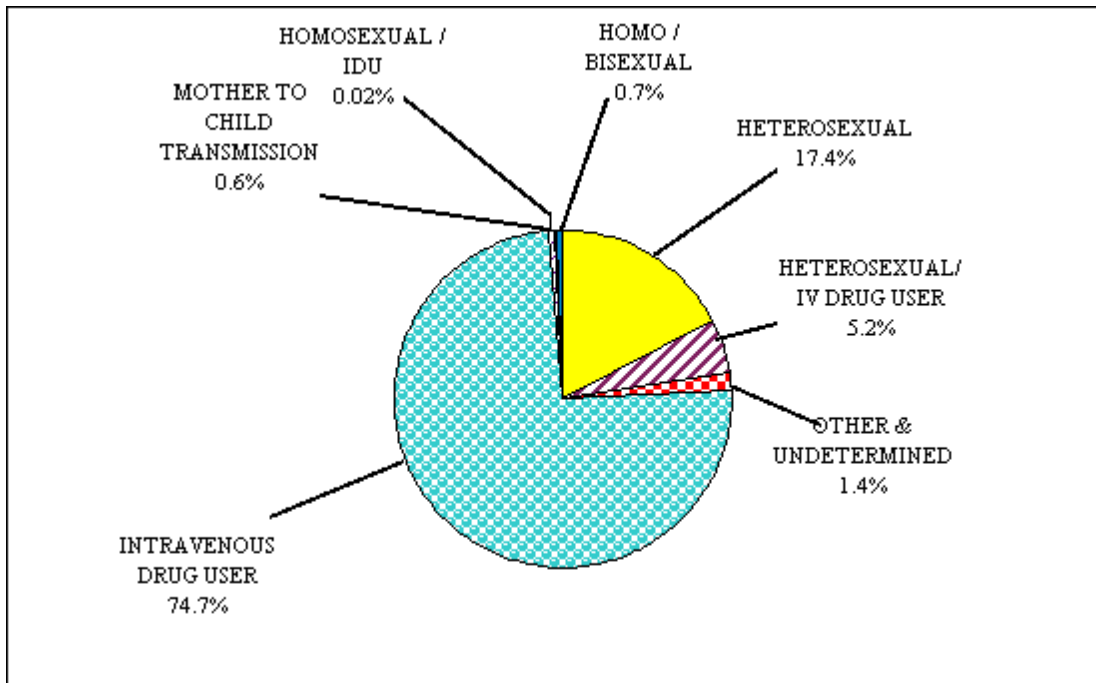
*Age at detection

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, since then, an average of 544 cases has been registered every year.

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, 72% in 2008 and 73% in 2009. The distribution of the 4,219 infected Mauritians by mode of transmission is shown in the pie-chart below:



No case of *chikungunya* was reported in 2008 and 2009 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. In 2009, 252 lab-confirmed cases of *dengue* were reported.

Active surveillance for all “Acute Flaccid Paralysis” cases started in August 2003 in the Republic of Mauritius, covering both the public and private sectors. The objective of the AFP Surveillance, as set by the World Health Organisation, is to detect any possible presence of polio virus in view to its eradication from the globe. The target for certification is a non-polio AFP detection rate of >1 case/100,000 population aged <15 years. A total of 31 cases among children less than 15 years of age have been detected in the country between August 2003 and December 2009; of whom 18 (58%) were less than 5 years old. The AFP Rate per 100,000 children (<15 years), which increased from 0.6 in 2004 to 2.7 in 2007, significantly dropped from 1.7 in 2008 to 0.35 in 2009.

Deliveries constituted 7.1% of all cases treated as in-patients in government general hospitals in 2009. Among other principal causes of discharges, there were *Diabetes Mellitus* with 4.9%, *Acute Upper Respiratory Infections* with 4.0%, *Diarrhoea and gastroenteritis* with 3.4%, *Hypertensive Diseases* with 2.8%, *Acute Myocardial Infarction and other Ischaemic Heart Diseases* and *Gastritis and duodenitis* with 2.5% equally. The distribution by ICD-10 chapters indicates that 12.9% of all cases treated were due to “*Pregnancy, childbirth and the puerperium*”, 10.1% due to “*Diseases of the Respiratory System*”, 10.0% due to “*Injury and Poisoning*” and 9.6% due to “*Disease of the Circulatory System*”.

In 2009, of the 16,197 cases (10,306 males and 5,891 females) treated as in-patients in government general hospitals due to consequences of external causes, 6,381 (39.4%) were following “*Falls*”, 1,857 (11.5%) following “*Transport Accidents*” and 1,541 (9.5 %) following “*Assaults*”. Of the 906 (5.6%) of cases treated as in-patients following “*Attempted suicides*”, 515 (56.8%) were females.

In 2009, of the 2,972 cases treated as in-patient at the Cardiac Centre, 1,148 (38.6%) were for “*Angina pectoris*”, 849 (28.6%) for “*Chronic Ischaemic heart diseases*” and 279 (9.3%) for “*Mitral stenosis and other rheumatic mitral valve diseases*”. A total of 802 operations were performed at the Centre, including re-opening cases, of which 476 (59.4 %) were cardiac surgeries.

Cataract was responsible for 4,099 of the 5,773 cases treated as in-patients at S.Bharati (Eye) Hospital in 2009 (that is 71.0%). Among the cataract cases, 3,916 (95.5%) were operated upon. 356 cases were also treated at the hospital for “*injuries and other consequences of external causes*”.

During the year 2009, 673 in-patients were treated at the Poudre d’Or (Chest) Hospital. 47 patients died at the Hospital, giving a fatality rate of 7.0%. Of the 673 patients, 469 (69.7%) were males. *Pulmonary tuberculosis* was the morbid condition for 137 patients (86 males, 51 females), that is 20.4% of the total.

Of the 657 new cases diagnosed at the out-patient specialist clinics in chest diseases during the year 2009, 27 (4.1%) were diagnosed with *tuberculosis*, of which 25 *pulmonary*. Among the non-tuberculous diseases, *asthma* was in first place with 372 new cases, that is, 56.6% of all new cases diagnosed.

Of the 4,487 in-patients treated at Brown Sequard Hospital in 2009, *mental and behavioural disorders due to the use of alcohol* accounted for 2,274 cases (2,018 males, 256 females), that is 50.7%. *Schizophrenia* was responsible for 1,308 (29.2%) cases.

Of the 403 cases (0-3 months) treated as in-patients in 2009 at the Neonatal Intensive Care Unit, located in the complex of Victoria Hospital and SSRN Hospital, 199 (49.4%) were for *disorders related to length of gestation and fetal growth*, 63 (15.6%) for *respiratory and cardiovascular disorders specific to the perinatal period* and 33 (8.2%) for *infections specific to the perinatal period*. There were 71 deaths among those 403 cases, giving a fatality rate of 17.6%; this rate was 23.7% in 2008 and 21.9% in 2007.

The number of new cases diagnosed at the specialist clinics in dermatology in 2009 were 12,763 of which 4,175 (32.7%) were *skin infections* (1,492 of fungal origin and 989 of viral origin). 19.9% of new cases were treated for *eczema*, 8.4% for *psoriasis and similar disorders*, and 6.2% for *acne*.

Of the 5,364 cases treated as in-patients at the E.N.T Hospital in 2009, 1,347 (25.1%) were for “*acute pharyngitis*” and 733 (13.7%) for “*acute tonsillitis*”. Another 9.5% of the in-patients were treated for “*otalgia and effusion of ear*” and 5.2% for “*foreign body in the nostril, pharynx and respiratory tract*”. A total of 1,388 operations were performed on in-patients at the centre, of which 431 (31.1%) 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 2009 was 5,247. *Diseases and conditions of ear* accounted for 1,873 new cases (35.7% of the total new cases diagnosed), *diseases and conditions of nose* for 1,743 (33.2%) and *diseases and conditions of throat* for 1,621 (30.9%). *Tonsillitis (acute or chronic)*, *pharyngitis (acute, chronic or granular)*, *allergic rhinitis*, *sinusitis (acute or chronic)* *otitis externa* and *tinnitus* were the most common diseases diagnosed at the centre.

The number of new cases treated at the Social Hygiene Clinic in 2009 was 184 (149 males and 35 females). The main venereal diseases treated were *venereal warts* with 54 cases, *gonococcal infections* with 18, *syphilis* with 23 and *herpes simplex* with 7 cases. The total attendances at the National Day Care Centre for the Immuno-suppressed were 1,245 (816 males, 429 females), of which 983 were for voluntary counselling and 262 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 2009 was *Influenza/URTI* with 22.1%. Other most common causes of first attendances were *fever/pain all over* with 8.0% and *cough, pain in throat, chest pain, wheezing, hiccough, sneezing* with 7.9%. Another 6.3% were treated for *minor injuries*.

The distribution by ICD chapters shows that 27.3% of first attendances at the above mentioned dispensary service points were due to “*Diseases of Respiratory System*” and 8.9% due to “*Diseases of the musculoskeletal system and connective tissue*”. They were followed by the “*Injuries*” with 6.5%, “*Infectious and parasitic diseases*” and “*Diseases of digestive system*” with 5.7% equally and “*Diseases of the skin and subcutaneous tissue*” with 5.4%. The total number of first attendances, 1,870,945 in 2008, increased by 1.4% to reach 1,896,942 in 2009

Of the 2,981 new cases of cancer detected during the period 2007 – 2008 that were registered by the National Cancer Register, the most common types among males were that of *prostate gland* with 11.3%, *trachea, bronchus and lung* with 10.1%, and *colon* with 8.2%,. The main types of cancer among females were that of *breast* (40.3%) followed by that of *cervix uteri* (9.1%) and *ovary* (5.6%).

CAUSE OF DEATH

Heart diseases and *Diabetes mellitus* were the first two principal underlying causes of mortality in 2009, with 1,705 (19.0%) and 2,046 (22.8%) deaths respectively; *Cancer and other Neoplasm* of all sites taken together was in the third position with 1,085 (12.1%) deaths. Deaths due to *Cerebrovascular diseases* amounted to 757 (8.4%) was in the fourth position followed by *Hypertensive Diseases* with 528 deaths (5.9%).

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 33.7% 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 12.1%.

Of the 3,032 deaths due to *Diseases of the Circulatory System* in 2009, 1,705 (56.2%) were due to *Heart diseases*. *Stroke and other Cerebrovascular diseases* accounted for another 757 (25.0%) deaths. 26.4% of the 3,032 deaths occurred among persons aged less than 60 years.

Of the 1,085 deaths due to *Neoplasms* in 2009, the most common types of cancer were that of *trachea, bronchus and lung* with 13.3%, *female breast* with 11.2%, *colon* with 6.9% and *stomach* with 6.4%. 28 persons died due to *leukaemia* (2.6%)

Of the 532 deaths due to external causes in 2009, 26.7% were due to *transport accidents*, 21.6% due to *suicides*, 9.0% due to *accidental drowning and submersion*, 6.6% due to *assaults* and 3.6% due to *exposure to smoke, fire and flames*.

Congenital anomalies with 51 deaths were the principal killers of children under one year in 2009, that is 26.2% of the total (195). The other principal causes of infant deaths were *septicaemia and infections specific to the perinatal period* with 21 (10.8%) death, and *slow fetal growth, fetal malnutrition and disorders related to short gestation and low birth weight* responsible for 13 (6.7%) of the deaths

10 maternal deaths were registered in 2009; one death was due to *complications following abortion*, one due to *postpartum haemorrhage*, two due to *obstetric embolism*, three due to *antepartum haemorrhage*, one due to *placental disorders* and two due to *abdominal/ectopic pregnancy*.

TRENDS IN CAUSE-SPECIFIC MORTALITY

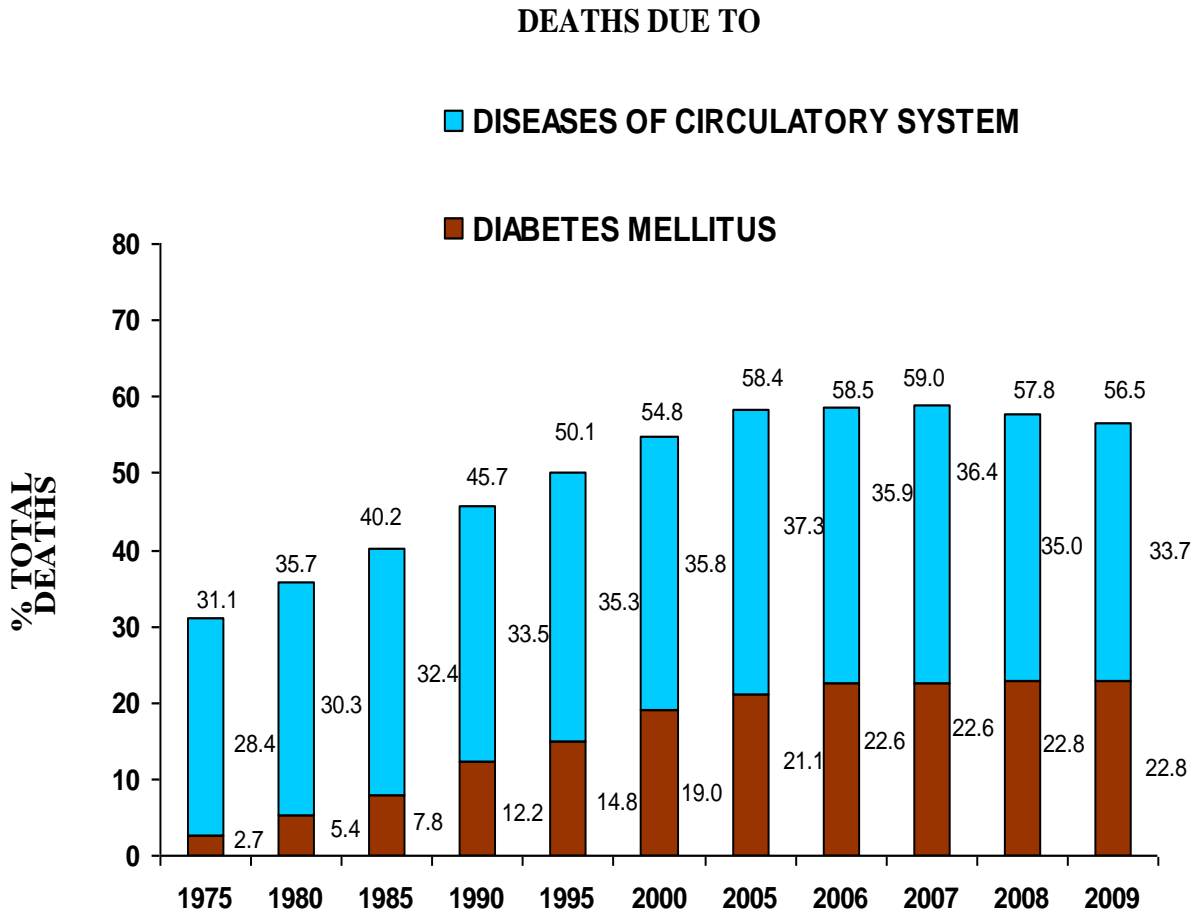
In 2005, Mauritius adopted the 10th Revision of the International Classification of Diseases (ICD-10) for mortality coding. This shift and other improvements in the coding process have resulted into discontinuities in trends in certain specific causes of death. Percentages of death due to a few major diseases relating to previous years have been adjusted.

% 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	2009
Total Deaths:	6,967	6,685	6,691	6,854	7,298	7,806	8,422	8,917	8,323	8798	8,987
CAUSE:											
<i>Heart Diseases</i> (%):	17.2	18.4	19.7	20.4	21.5	21.8	22.8	21.7	21.2	19.6	19.0
<i>Cerebrovascular Diseases</i> (%):	8.4	8.7	9.1	9.3	9.6	9.8	10.8	9.3	9.2	9.5	8.4
<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	6.3
<i>All Circulatory</i> (%) :	28.4	30.3	32.4	33.5	35.3	35.8	37.3	35.9	36.4	35.0	33.7
<i>Diabetes Mellitus</i> (%):	2.7	5.4	7.8	12.2	14.8	19.0	21.1	22.6	22.6	22.8	22.8
<i>Total Circulatory and D.M.</i> (%):	31.1	35.7	40.2	45.7	50.1	54.8	58.4	58.5	59.0	57.8	56.5

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. However, a decreasing trend has been noted as from 2006. On the other hand, 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 proportion of death due to “*Diseases of the Circulatory system*” and “*Diabetes Mellitus*” taken together had continued to increase from 31.1% in 1975 to reach 59.0% in 2007. Since then, it has started to decrease. It was 56.5% in 2009 compared to 57.8% in 2008.

1,085 persons died due to *cancers* in 2009. Mortality from this group of diseases has continued to grow from 9% in 2000 to 12% in 2009.

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, a decreasing trend has been observed in infant & under 5 mortality as from 2008. On the other hand, significant increases have been noted in regards to Maternal Mortality Ratio.

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 16.7% in 2009. The same trend was observed in Rodrigues where it increased from 5.6% in 1990 to 14.3% in 2006; since then, this rate has decreased to reach 10.0 in 2009.
