



International Development  
Research Centre



Mauritius Institute of Health



Ministry of Health and Quality  
of Life

## Supporting the Joint MOHQL/WHO Smoking Cessation Initiative in Mauritius

# Report on Strengthening the Health Information System regarding tobacco use among NCD patients attending public health institutions

*Study conducted under  
African Tobacco Situation Analysis (ATSA) Initiative of the  
International Development Research Centre (IDRC) & Bill and  
Melinda Gates Foundation (BMGF)*

March 2010

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## List of Abbreviations

AHC:	Area Health Centre
ATSA:	African Tobacco Situation Analysis
BMGF:	Bill and Melinda Gates Foundation
CHC:	Community Health Centre
DHS:	Demographic and Health Survey
FCTC:	Framework Convention on Tobacco Control
HIS:	Health Information System
IACR:	International Association of Cancer Registries
IDRC:	International Development Research Centre
MIH:	Mauritius Institute of Health
MOH&QL:	Ministry of Health and Quality of Life
NCD:	Non-Communicable Disease
NCR:	National Cancer Registry
RRAHC:	Rivière du Rempart Area Health Centre
SSRNH:	Sir Seewoosagar Ramgoolam National Hospital
WHO:	World Health Organization

## Acknowledgements

The investigating team extends sincere thanks to the following persons for their valuable support:

- Jacqui Drope, Senior Programme Officer and Eugene Gbedji, Programme Officer of ATSA initiative at IDRC.
- Mrs R. Veerapen, Senior Chief Executive, Ministry of Health and Quality of Life, Mauritius.
- Dr R. Munbodh, WHO Liaison Officer, WHO Office, Mauritius
- Dr K. Bissoondoyal, Regional Health Director, SSRN Hospital, Mauritius
- Nursing and Health Records staff involved in this study.
- Mrs V. Venkatachellum, Word Processing Operator, MIH

## ***Executive Summary***

Under the African Tobacco Situation Analysis (ATSA) project of International Development Research Centre (IDRC) and Bill and Melinda Gates Foundation (BMGF) to support the joint Ministry of Health and Quality of Life (MOH&QL)/World Health Organization (WHO) smoking cessation initiative, the existing Health Information System (HIS) regarding tobacco use among Non-Communicable Diseases (NCD) patients has been assessed by a core team of health professionals with different competencies, namely research, statistics, health record and medical science grouped under the umbrella of the Mauritius Institute of Health. This has led to a broad-based discussion on the existing HIS related to tobacco use, its strengths and weaknesses and particularly on means of strengthening the system

The HIS in Mauritius has a long tradition with a core set of indicators derived from a solid system of high quality data collection from different health service levels. However, there is no systematic collection, compilation, analysis and use of data related to tobacco use.

A study carried out at one health region indicates that 45% of case-notes include data on smoking status at first attendance at the hospital whereas at the Area Health Centre, it was 97%. However, generally no data on smoking status is collected during subsequent visits.

Revised tools and guidelines have been developed and piloted in view of strengthening the information support for planning, policy formulation and decision making. The few changes have resulted into proper data compilation, analysis and reporting. The findings indicate that 15.5% of the NCD patients were smokers and another 10.7% ex-smokers. Among 33 current smokers at

previous visits, 12 (70.6%) have decreased the number of cigarettes they smoke and 4 (23.5%) have stopped smoking,

The findings of the situational analysis and the implementation of the revised tools on a pilot basis have led to the following main recommendations: address data gaps related to tobacco use, establish HIS networks at service point and regional levels, utilize tobacco use data for tobacco control programme and evaluation.

As the implementation of above recommendations will necessitate additional resources, it is proposed during the first phase to select a number of geographically representative health institutions where the project will be initiated. Additional health personnel should be properly trained in view of ensuring the systematic collection of all information included in the forms. Logistic support which includes computer softwares and networking will also be required.

Strengthening the present health information system regarding tobacco use by NCD patients will make a significant contribution to the national efforts towards reducing tobacco-related diseases and deaths.

## 1. BACKGROUND

Under the African Tobacco Situational Analysis (ATSA) initiative of the International Development Research Centre (IDRC) of Ottawa, Canada and the Bill and Melinda Gates Foundation (BMGF), the Mauritius Institute of Health (MIH) carried out a baseline assessment of the tobacco control situation in Mauritius in May-June 2008. Broad-based discussions among the stakeholders, namely, the civil society, the government, research and academic institutions led to a consensus to inform and support the national tobacco control program.

Three priority areas requiring thorough systematic and action research were identified at this stakeholders meeting:

- a. Surveillance, monitoring and evaluation of tobacco control
- b. Tobacco cessation
- c. Smoke-free public and workplaces.

The government of Mauritius is already implementing the National Action Plan on Tobacco Control 2008-2012 which aims at reducing tobacco-related morbidity and mortality. In addition, new FCTC compliant regulations have been passed in November 2008 and enforced as from 1<sup>st</sup> of March 2009. As from 1<sup>st</sup> of June 2009, the law made provision for rotating health pictorial messages on cigarette packages to warn and discourage smokers from this unhealthy habit. However, this was effective only in October 2009 as existing stocks had to be cleared.

In December 2008, an in-country meeting was held with the participation of representatives from IDRC and the Mauritian consortium during which the priority areas were further discussed in light of the rapid positive development in tobacco control policies in Mauritius. It was proposed to carry out the following studies to support the government measures:

- a. Supporting a newly created joint MOH&QL/WHO smoking cessation initiative
- b. Evaluation of pictorial health warnings on cigarette packages
- c. Supporting the smoke-free initiatives in public and work places.

## 2. PROBLEM STATEMENT

In Africa, Mauritius stands out with one of the highest smoking prevalence: 35.9 % of males aged 20 years and above, with 14.9% of youth aged 13-15 years being current smokers. (*Figures are from Reports of Non-Communicable Disease Survey 2004 and Global Youth Tobacco Survey 2003.*)

Smoking is a major risk factor for most of the NCDs which top the disease burden in the country. 30% of people suffer from hypertension and 50% die of cardiovascular diseases. Around 1000 new cases of cancer are diagnosed every year of which, cancer of lungs, oral cavity, cervix and colon-rectum are main sites.

Tobacco is the single most preventable risk factor for the above diseases and therefore requires immediate action to limit the harm. In December 2008, a pilot smoking cessation clinic has been started by the MOH&QL targeting patients attending NCD clinics at one Community Health Centre. Many factors support this initiative and justify for smoking cessation service.

- a. Cessation therapies are effective.
- b. Quitting helps to reclaim years of healthy life.
- c. Smoking cessation reduces the economic burden on the health sector.
- d. Quitting contributes to reduce morbidity and mortality.
- e. A likely boost in demand for smoking cessation service with the introduction of new tobacco control regulations.

The MOH&QL has the infrastructure and manpower to set up smoking cessation clinics to conduct counseling of smokers. What is required in short term, is the empowering of health professionals with the necessary knowledge and skills in view of conducting effective counseling either individually or in groups and providing the necessary psychosocial support for cessation. In the medium and long term, health professionals should also be trained in pharmacotherapy regarding smoking cessation.

In addition, in the present HIS there is no systematic collection, compilation, analysis and use of data pertaining to tobacco use. In the context of tobacco control in Mauritius, it is essential that such data be made available to support the smoking cessation program. Therefore it is planned to explore and strengthen existing relevant data from NCD patients in the public health service. This data will help to determine tobacco-related morbidity in Mauritius and will represent a very effective advocacy tool for the tobacco control program in general as well as for the expansion and consolidation of the smoking cessation program in particular.

### **3. OBJECTIVES**

#### **3.1 General Objective**

To generate and use health information for policy formulation, planning, management, monitoring and evaluation of health services and programmes in view of:

- (a) preventing tobacco use;
- (b) improving treatment of tobacco related diseases; and
- (c) strengthening prevention campaigns and smoking cessation clinics.

#### **3.2 Specific Objectives**

- (i) To assess the present health information system regarding data collection, compilation and analysis on tobacco use by NCD patients of public health institutions.
- (ii) To strengthen the present health information system regarding tobacco use by NCD patients.

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## **Part One:**

### **Assessing the present health information system regarding data collection, compilation and analysis on tobacco use by NCD patients of public health institutions**

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#### **4. METHODOLOGY**

The study has three components which are complementary and maximize both the quantity and quality of data collected:

- (i) An overview of the Health Information System in Mauritius was carried out with particular reference to non-communicable diseases.
- (ii) A situation analysis of the tobacco use data in Health Information System was conducted at the national level, including a SWOT analysis.
- (iii) A more in-depth analysis of tobacco use data was conducted at two NCD clinics located within one of the five health regions of Mauritius

## 5. SITUATION ANALYSIS

### 5.1 Overview of Health Information System in Mauritius

The Health Information System (HIS) of the Republic of Mauritius contributes towards health welfare through a more effective health service delivery and through efficient management at all levels. Mauritius is one among the few developing countries that have sound and reliable data on the demographic and epidemiological trends. The five main components of the HIS are:

1. Population and vital statistics
2. Infrastructure and Personnel
3. Services
4. Morbidity
5. Mortality

The Health Statistics Unit, the Health Records Division, the Demography/Evaluation Unit and some other Units and Agencies of the MOH&QL provide information to health managers and policy makers. They are responsible to provide information support to the managerial process for National Health Development. The information support takes the form of routine publications as well as responses to ad hoc requests.

The information generated in the Health Statistics Unit comes from the raw data that are collected from the various health institutions (hospitals, health centres, health offices, private clinics, etc). The mode of transmission of the data is through pre-designed forms and electronic format. The data received in the Unit are edited for completeness and accuracy and analysed and the information generated is disseminated through weekly bulletins, monthly reviews and annual reports. The main annual reports are available on the MOH&QL website (<http://www.health.gov.mu>).

The data collected by the Health Records Division are used to meet ad hoc requests from health managers and planners. Daily, weekly and monthly reports are prepared for the monitoring of health care delivery. An annual report, namely “Summary of work performed in hospitals” is also prepared for planning purpose.

Morbidity data pertaining to patients treated as in-patients are submitted to the Health Statistics Unit for processing and analysis. The database, which include ICD-10 codes of the “main condition”, as well as other characteristics of the patients are compiled at hospital level.

Health Research forms an integral part of the HIS in Mauritius. It provides policy makers, health care providers as well as community leaders with relevant information that are not available from routinely collected data. A few Units of the MOH&QL, namely the Demography/Evaluation Unit, the Health Statistics Unit, the AIDS Unit, the Nutrition Unit, the Non-Communicable Diseases Unit and the Central Health Laboratory are mainly involved in this process. In addition the MIH, which is the research and training arm of the MOH&QL, conducts Health Systems Research and provides data for evidence-based decision making.

### ***5.1.1 Data management related to NCD***

#### **(a) Cancer Registry**

The National Cancer Registry (NCR) was set up in 1995 by the MOH&QL in close collaboration with the MIH, the Central Health Laboratory and the Radiotherapy Unit and with support from the World Health Organization. One year later, it obtained the official affiliation to the International Association of Cancer Registries (IACR).

All newly diagnosed and/or treated cases of cancer in public laboratories and hospitals are registered retrospectively. The archives of the Central Health Laboratory and all regional haematology laboratories are assessed. The Radiotherapy Centre patient register and that of the Overseas Treatment Unit of the Ministry of Health are also used. A Cancer Registration Form is being implemented in patients’ case notes to gather specific information. ICD-10 and ICD-Oncology are used for coding and classification purposes.

(b) **Medical Records related to NCD**

A well-structured system of recording exists in all government hospitals and health centres. Apart from recording and archiving information for patient health care management, the Records Office collects and submits data pertaining to all health care delivery service. An outline of the medical records information system related to NCD is given below:

<b>Nature of Return</b>	<b>Processing of data</b>	<b>Reporting and Dissemination</b>
Database on patients with Diabetes Mellitus and Hypertension	Every hospital and Area Health Centre maintains a computerized register of these patients and updates it daily.	Report is submitted to management on request.
Amputations carried out	A database of amputations is kept by every hospital. Every month, the number of additional cases is submitted to MOH&QL headquarters where a centralized database is kept . Report consisting of number of cases and patients by sex, diabetic or non-diabetic, traumatic or non-traumatic, is prepared every month. Return on site of amputation is also compiled.	Available to management and NCD Secretariats.
Register of Hospital Discharges	In-patient episodes of each patient are kept in a database which is submitted to MOH&QL headquarters every month by all public hospitals. Report is prepared by the Medical Statistics Division.	Information on diseases is available on request.

(c) **NCD Screening Service**

In view of controlling and/or reducing the high prevalence of chronic diseases such as diabetes, cancer and cardiovascular diseases and the related risk factors, the MOH&QL has established a Prevention, Information and Early Detection Programme since 2001 which aims at reaching the whole community at different sites, including places of work.

The data on the screening service are submitted to the Health Records Division on a monthly basis where it is compiled and presented in tabular forms to be disseminated to health managers for monitoring purposes.

The Monthly Report includes information on the number of persons reached by the programme and the number of those detected with diabetes, hypertension and obesity. Data are also available on cigarette smoking, alcohol consumption and the practice of physical exercises among adults aged 18 years and above. Information on health education and screening for breast and cervical cancer is also included in the report.

(d) **Health Survey Data**

Demographic and Health Survey (DHS) as such is not conducted in Mauritius. However, several surveys covering health-related issues are conducted to gather information that is not currently available from routine statistics. These surveys, conducted periodically or on an ad hoc basis, by the MOH&QL or other agencies (after ethical clearance of the MOH&QL) include the following:

- (ii) Non-Communicable Diseases Survey
- (iii) Nutrition Survey
- (iv) Mental Health Survey
- (v) Dental Health Survey
- (vi) World Health Survey
- (vii) Global Youth Tobacco Survey
- (viii) Global School-based Student Health Survey

(e) **Morbidity Statistics**

Morbidity Statistics consist mainly of data on in-patient service of government hospitals recorded in database at hospital level and the diagnoses are coded according to ICD-10. Tobacco use related details are not included in these datasets.

(f) **Mortality Statistics**

All deaths occurring in the territory are duly registered by the Civil Status Office. The information given on the cause of death and other characteristics of each deceased person are recorded in a national database. Data produced from this dataset cannot be related to smoking habits of the deceased persons.

**5.2 Tobacco use data in HIS**

**5.2.1 *NCD related health system***

The public health service delivery is based on a regionalised system characterised by a network of accessible health delivery institutions at primary, secondary and tertiary levels.

The primary health care services consist of Mediclinics, Area and Community Health Centres. The main services provided are primary health care diagnosis and treatment of common diseases and minor injuries, Maternal and Child Health, Vaccination, Dental Health, Family Planning and Health Promotion.

The secondary level consists of regional and district hospitals with in-patient and emergency services; specialised out-patient clinical care is also provided.

The tertiary level consists of specialised hospitals with services such as cardiac surgery, invasive cardiology, neurology, renal transplantation, laser and laparoscopic treatment. Haemodialysis and high-tech diagnostic facilities such as CT-Scan and MRI are also available.

Most of the secondary and tertiary services are also available in the private sector, mainly in 19 private clinics with facilities for in-patients.

NCD Services are delivered in 5 Regional Hospitals and all health centres, namely Mediclinics, Area and Community Health Centres.

Newly diagnosed NCD patients who are referred to NCD clinics come from:

- (i) NCD and Breast & Cervical Cancer Screening programme.
- (ii) Primary and Secondary School Health Screening Programmes
- (iii) General consultation clinics at AHCs and CHCs
- (iv) Accident & Emergency Department
- (v) Unsorted Out-patient Department
- (vi) Other specialised clinics and
- (vii) Private Practitioners

NCD clinics are conducted by a team comprising of:

- (i) Medical Officers
- (ii) Nutritionist
- (iii) Nursing Officers trained in NCD
- (iv) Health Care Assistants trained in NCD

### **5.2.2 Recording System**

At first attendance in NCD clinic, the NCD sheet (**Annex I: 4 pages**) is filled by NCD Nursing Officers/Health Care Assistants.

Identification Data of patient is recorded, personal and past medical history as well as family history is noted.

Information about lifestyle includes: smoking and drinking habits, physical exercise and dietary habits. Vital measurements and results of investigations are also recorded.

### 5.2.3 Tobacco use data

Presently, statistics in regard to tobacco use is available from periodical surveys only, namely:

- NCD Surveys
- Global Youth Tobacco Surveys
- Global School-based Student Health Survey

Data related to cause of death and hospital discharged patients exist without information on their smoking habit.

Questionnaire used by the screening service includes smoking habits of respondents but with limited reliability and accuracy.

Data related to patients who have undergone lower limb amputation include their smoking status without further details.

Data related to patients in NCD clinics are available. Questions related to tobacco use are inadequate and information is usually not updated.

### 5.2.4 Non-Communicable Disease Sheet

As it can be seen in the NCD Sheet (**Annex I**), data on smoking habit of the NCD patient collected are as follows:

Smoking Habit:	
Non smoker	<input type="checkbox"/>
Ex Smoker	<input type="checkbox"/> Stopped .....years ago
Smoker	<input type="checkbox"/> Duration of habit ..... years; No. of cigarettes ...../day

The following general observations are made on the data presently collected:

- (i) Available data are not sufficient for a good clinical management of the patient
- (ii) Information on smoking habits is not captured at subsequent visits
- (iii) No patient database exists for analysis and reporting purposes
- (iv) Some analysis is done on adhoc basis and is often limited to regional level.

### 5.2.5 SWOT Analysis of the tobacco use data in HIS

The outcomes of the SWOT analysis carried out by the team are given in the table below:

<p style="text-align: center;"><b>STRENGTHS</b></p> <ul style="list-style-type: none"> <li>• Data collection form available with questions on smoking</li> <li>• Trained personnel</li> <li>• Data used on ad hoc basis</li> <li>• Collaboration and coordination of various departments</li> </ul>	<p style="text-align: center;"><b>WEAKNESSES</b></p> <ul style="list-style-type: none"> <li>• NCD form used for clinical management only</li> <li>• Inadequacy of questions on smoking</li> <li>• No complete patient coverage</li> <li>• Data not systematically compiled</li> <li>• Limited analysis and use of data</li> <li>• Absence of a good IT networking</li> <li>• Inadequate feedback at some levels</li> <li>• Lack of written elaborate health information policy to ensure compliance and enforcement in reporting</li> <li>• Absence of standard data management procedures &amp; guidelines</li> <li>• Limited resources and skills of personnel</li> </ul>
<p style="text-align: center;"><b>OPPORTUNITIES</b></p> <ul style="list-style-type: none"> <li>• ATSA/IDRC initiative</li> <li>• Political will</li> <li>• New tobacco regulations</li> <li>• Collaboration between all stakeholders</li> <li>• Setting up of one tobacco cessation clinic</li> <li>• E-health plan/health information system strengthening strategic plan</li> <li>• Good organizational structure in place</li> </ul>	<p style="text-align: center;"><b>THREATS</b></p> <ul style="list-style-type: none"> <li>• Strategies not implemented</li> <li>• Uncertain funding</li> <li>• Lobbying by tobacco industry and other pro-tobacco groups</li> </ul>

#### **Analysis of the opportunities**

The ATSA/IDRC initiative provides a unique opportunity to build tobacco use health information system strengthening activities on existing data collection systems. The process of assessment of the existing system, the development of a strengthening plan and clarification of a vision with clear objectives will result in an Action Plan. With strong leadership, the latter can provide a mechanism for

achieving consensus about the way forward and be used for advocacy to get the necessary resources to carry out the strengthening activities.

Strong political will is already being demonstrated by the Minister of Health and Quality of Life who is providing robust leadership and support. New tobacco regulations are in place and are being enforced. A tobacco cessation clinic is being piloted and plan for additional clinics is being developed.

A good organizational structure already exists which facilitate collaboration among all stakeholders. The E-health Plan provides for a phased implementation of a computerized system. It is planned to establish good networking at all health service delivery points.

What is required is to review the data collection system with focus on tobacco use related information and to develop the information culture through use of data for planning, monitoring and evaluation at peripheral, regional and national levels of the health system.

### **5.3 In-depth analysis of tobacco use data at one Health Region of Mauritius**

For convenience purposes, Health region No. 2, namely the northern region, was selected and it was decided to carry out the study among patients attending the NCD clinics of the Sir Seewoosagar Ramgoolam National Hospital (SSRNH) and Rivière du Rempart Area Health Centre (RRAHC). Approval was obtained from the MOHQL.

A collaborative approach was adopted involving a team, comprising of the NCD Coordinator of the selected region, the Chief Health Records Officer, the Chief Health Statistician, one community physician, one health records officer, health records clerks and NCD nurses. During different consultative meetings, the team decided on the strategy of conducting the study.

For an assessment of tobacco use data, 200 case files of patients attending NCD clinics as from Monday the 29<sup>th</sup> of June to Friday 3<sup>rd</sup> of July 2009 have been examined and details on tobacco use analysed. A form was designed to collect the required information (**Annex II**).

The findings are as follows:

	SSRNH		RRAHC	
	YES	NO	YES	NO
NCD Sheet available in case-note of patient	20	80	97	3
Data on smoking status was available	45	55	97	3
Data was recorded on initial attendance only	34	<i>Not applicable</i>	97	<i>Not applicable</i>
Data was recorded on more than one visit	11	<i>Not applicable</i>	0	<i>Not applicable</i>

**At SSRN Hospital:**

- The NCD Sheet was not available in 80% of case-notes
- Data on smoking status was available in 45% of case-notes.
- 11 out of 45 case notes (24%) contained data on smoking status on subsequent visits in the medical histories.

**At Rivière du Rempart Area Health Centre:**

- The NCD Sheet was not available in 3% of case-notes
- Data on smoking status was recorded in 97% of case-notes on first attendance at the NCD clinic.
- There were no data available on smoking status on subsequent visits.

#### 5.4 Corrective measures proposed

Based on the study findings, new tobacco use data collection tools and guidelines have been designed and implemented on a pilot basis at the same NCD clinics during December 2009. The table below gives additional details on corrective measures proposed.

	<b>Weaknesses Identified</b>	<b>Corrective Measures Proposed</b>
1	Inadequate questions	To review NCD Sheet to include questions on starting date of smoking, frequency with more details, passive smoking, its frequency and place of exposure and on whether advice received on quitting.
2	No update on smoking status on subsequent visits	Design a new NCD “Subsequent Assessment” sheet to include questions on current smoking status
3	Data not compiled	To initiate a Monthly Return Form
4	Analysis and use of data very limited	Need to establish data collection system at each NCD clinic in view of facilitating analysis and reporting

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## Part Two:

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### Strengthening the present HIS regarding tobacco use by NCD patients

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#### **6. REVISED TOOLS AND GUIDELINES**

To implement the corrective measures for improving data on tobacco use, the following tools were designed:

- (i) a modified version of the NCD sheet called the Pilot NCD sheet (**Annex III**)
- (ii) a newly designed monthly return form called NCD clinic – Pilot Data Transmission Form - Tobacco Use (**Annex IV**).

##### **6.1 Guidelines for the establishment of tobacco use data management procedures**

A set of guidelines (**Annex V & VI**) has been developed for the implementation of the pilot NCD sheet and the Pilot Data Transmission Form - Tobacco Use:

- Nursing officers/Health Care Assistants will fill in the NCD sheet/Subsequent Assessment sheet.
- The health records staff will fill the Pilot Data Transmission Form - Tobacco Use. In health centres where health records staff is not posted, the Nursing Officer/Health Care Assistant trained in NCD will fill in the monthly return.
- At the end of every month, all health facilities will submit their completed data transmission form to the Regional Health Information Office (planned to be set up).
- Data entry will be carried out with appropriate application software.
- A self-generated monthly summary report will be available for each health service point as soon as data entry and validation are completed. Similar reports will be compiled monthly on a regional and national basis for monitoring purposes.
- Periodical reports will be compiled for wide circulation as information support to decision making and policy formulation.

## 6.2 Pilot Phase

The pilot NCD sheet has allowed collection of additional information as follows:

- Duration of smoking habit for ex-smoker.
- Number of days and cigarettes the respondent smokes per week.
- Whether smokers were advised to stop smoking
- Exposure to 'passive smoking' with duration and place.

The 'Subsequent Assessment' sheet also made provision for updating smoking status of the patient on follow-up visits.

To address the absence of an appropriate database, mainly because of the absence of a computerized network, a Pilot Data Transmission Form was developed.

This form was very useful to extract previous tobacco-related information from NCD patients' files and their current smoking status was also recorded.

To demonstrate the relationship between tobacco use and other conditions like high blood pressure, coronary vascular disease, amputations etc, we need to include indicators on these conditions in the form. For the purpose of this pilot study, we collected data on BP level of the patients as an example.

A half-day training session for nursing and health records staff involved in data collection at SSRN Hospital and RRAHC was carried out in the first week of December 2009. They were closely supervised by the team to ensure that all tobacco-related information was correctly recorded.

During the data collection exercise that was carried out during the 3<sup>rd</sup> week of December 2009, a few data omissions were noted mainly with regard to previous smoking status. In some cases of follow-up patients, information related to 'whether advised to stop smoking' and 'exposure to passive smoking' was not available in the patients' case notes.

The completed Data Transmission Forms were submitted to the Health Statistics Unit for data entry and analysis. Data entry was done using the Access software and the statistical analysis was performed using the Epi-Info 3.1 software.

## 6.3 Findings

### 6.3.1 Age and sex distribution

During the pilot phase, a total of 187 NCD patients were covered: 100 at the SSRN Hospital and 87 at the RRAHC. The age and sex distributions are as follows:

Age group	Number		
	Men	Women	Total
< 30 years	2	1	3
30 – 39 yrs	5	3	8
40 – 49 yrs	14	28	42
50 – 59 yrs	34	34	68
60 – 69 yrs	24	19	43
70 – 79 yrs	12	8	20
80 yrs and over	2	1	3
<b>Total</b>	<b>93</b>	<b>94</b>	<b>187</b>

### 6.3.2 Current smoking status

The distribution of the 187 respondents by their current smoking habit and age is given in the table below:

Age group	Never smoked	Ex-smoker	Smoker
< 40 years	9	-	2
40 – 49 yrs	27	4	11
50 – 59 yrs	47	8	13
60 – 69 yrs	34	7	2
70 and above	21	1	1
<b>Total</b>	<b>138</b>	<b>20</b>	<b>29</b>
<b>%</b>	<b>73.8</b>	<b>10.7</b>	<b>15.5</b>

Out of the 29 smokers, only one (3.4%) was a woman. 25 smokers (88%) smoked on a daily basis. 2 of them were smoking 50 or more cigarettes daily.

### 6.3.3 *Change in smoking status*

Of the 33 respondents who were reported as current smokers at their previous visits, 17 (51.5%) have changed their smoking habit, as detailed below:

<b>Change in smoking habit</b>	<b>Number</b>	<b>%</b>
Stopped smoking	4	23.5
Increased number of cigarettes	1	5.9
Decreased number of cigarettes	12	70.6
<b>Total</b>	<b>17</b>	<b>100.0</b>

The majority had either stopped smoking or was smoking fewer cigarettes.

### 6.3.4 *Exposure to passive smoking*

3 (1.9%) of those who were non-smokers have reported to be exposed to passive smoke.

### 6.3.5 *Advice received*

Two-thirds of the current smokers declared to have been advised to stop smoking.

### 6.3.6 *Relationship between smoking status and BP level*

The statistical analysis carried out to determine the association between smoking status and blood pressure level gave the following result:

<b>Blood Pressure Level</b>	<b>Smoking status</b>		
	<b>Non-smoker</b>	<b>Smoker</b>	<b>Total</b>
High*	27	5	32
Normal/low	131	24	155
<i>Total</i>	<i>158</i>	<i>29</i>	<i>187</i>

\* systolic > 140 / diastolic > 90

We found no association between smoking status and blood pressure level (Yates Chi Square=0.06, p=0.804). More conclusive results can be obtained with a larger number of patients.

## **7. DISCUSSION**

There is sufficient evidence that demonstrates health benefits of tobacco use cessation. Therefore the Mauritian government's plan to promote quitting among smokers, through setting up of smoking cessation clinics in public health care settings, is a laudable one. The ATSA initiative of IDRC and BMGF has provided an opportunity to review the current Health Information System (HIS) related to tobacco use in view of supporting the smoking cessation programme.

In spite of a good HIS in Mauritius, data on tobacco use by patients are not routinely collected. Hence, it is not possible to link morbidity and mortality statistics to tobacco use. However, the NCD clinics data on smoking status of the patients are recorded on first attendance. The situation analysis of the data collection system carried out at NCD clinics has confirmed the inadequacy of information pertaining to tobacco use. Moreover data available are not analyzed and rarely used. The absence of a fully computerized networking is a major cause of the absence of information required by programme and health managers. Additionally, there is a strong need to review the existing data collection methodology including formulation of data management procedures and guidelines. In light of the situation analysis, a set of corrective measures has been proposed. Revised tools have been developed and used on a pilot basis at one Regional Hospital and one Area Health Centre.

The modifications brought to NCD sheet have allowed the collection of additional essential tobacco-related information. It is thus demonstrated that the smoking status of a significant proportion of patients has changed after following treatment at NCD clinics.

The pilot exercise has highlighted the possibility of linking tobacco use data with morbidity and the importance of additional data to support smoking cessation service.

It is also imperative to shift from a “data driven” to an “action-driven” HIS through the setting up of a proper reporting and feedback mechanism. The feedback process will ensure the optimal use of available data for monitoring and decision making.

Additional resources will be required to strengthen the HIS. Staff and logistic support which includes computers and softwares are needed. Analytical capacity of records and statistics personnel should be enhanced. NCD coordinators and community physicians should be trained for monitoring and evaluation including the feedback mechanism. A pool of records and nursing staff is also essential to ensure proper completion of the ‘new’ NCD sheets and timely transmission of data. In order to obtain reliable and complete data, it is proposed to select geographically representative centres to be involved in the project at a first stage.

In view of obtaining enhanced information to assess the economic and health impact of tobacco use, it may be envisaged to conduct adhoc studies. The tobacco related HIS may be further strengthened through reviewing the death certificates, hospital discharged patient database and cancer registration forms.

To conclude, a strengthened HIS is mandatory to guide policy actions, mount effective interventions, particularly smoking cessation programmes, and carry out strong advocacy against tobacco. Furthermore, this tobacco use HIS will be used as an essential tool to guide the implementation of the National Action Plan on Tobacco Control 2008-2012 in view of reducing the burden of tobacco related morbidity and mortality.

## 8. RECOMMENDATIONS

To enhance the information support to the MOH&QL/WHO smoking cessation initiative in Mauritius, it is proposed to strengthen the Health Information System related to tobacco use with focus on NCD clinics at all Regional Hospitals, Medi clinics, Area and Community Health Centres.

In view of meeting the above-mentioned objective, the following actions are being recommended:

- (i) To amend the NCD sheet so as to make provision for collection of additional essential information related to tobacco use.
- (ii) To develop guidelines for proper data collection and effective use of health information.
- (iii) To train community physicians, nursing and health records staff to ensure that the amended NCD sheets are properly filled.
- (iv) To provide computers including appropriate software to facilitate data capture and transmission.
- (v) To utilize collected tobacco-use data at each centre level for monitoring purposes and for supporting the smoking cessation programme.
- (vi) To prepare data reports for each health region on a quarterly basis.
- (vii) To prepare tobacco use annual data summary on a national basis.
- (viii) To undertake further research to measure the health and economic burden of tobacco use in the Republic of Mauritius.

## 9. BIBLIOGRAPHY

1. ATSA Workplan 2008: Support to Tobacco Control Strategies in Mauritius. Mauritius Institute of Health
2. Global School-based Student Health Survey 2007 Country Report – Republic of Mauritius. WHO/MOH&QL/CDC.
3. Global Youth Tobacco Survey 2008 and Global School Personnel Survey 2008 Report for Mauritius and Rodrigues. MOH&QL/WHO/CDC.
4. Health Information System Strengthening Strategy in Mauritius, 2009. World Bank, 2009
5. Health Statistics Report, 2008 – Island of Mauritius and Island of Rodrigues. MOH&QL.
6. National Action Plan on Tobacco Control, 2008-2012 – Republic of Mauritius. MOH&QL.
7. Mauritius Non Communicable Diseases Survey Report, 2004. MOH&QL
8. Rodrigues Non Communicable Diseases Survey Report, 2004. MOH&QL

Ministry of Health & Quality of life          <b>NON-COMMUNICABLE DISEASE SHEET</b>	<b>Hospital/AHC/CHC:</b>		<b>Unit No.:</b>	
	<b>Surname:</b>			
	<b>Other name:</b>			
	<b>National I.D. No.:</b>			
	<b>Sex:</b> M   F		<b>Date of Birth:</b>	
<b>Marital Status:</b> Single Married Widow Sep./Divorced Other			<b>Ethnic Group:</b> GP Hindu Muslim Chinese Other	
<b>Address:</b>			<b>Tel. No.:</b>	
			Home <input type="text"/>	
			Work <input type="text"/>	
			Other <input type="text"/>	
<b>Occupation:</b>				

Date filled:

<b>FAMILY HISTORY</b>	<b>DM</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>	If yes, specify: S <input type="checkbox"/> P <input type="checkbox"/> C <input type="checkbox"/> O <input type="checkbox"/>				
	<b>HBP</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>	If yes, specify: S <input type="checkbox"/> P <input type="checkbox"/> C <input type="checkbox"/> O <input type="checkbox"/>				
	<b>CVD</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>	If yes, specify: S <input type="checkbox"/> P <input type="checkbox"/> C <input type="checkbox"/> O <input type="checkbox"/>				
	<b>Others specify →</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>	If yes, specify: S <input type="checkbox"/> P <input type="checkbox"/> C <input type="checkbox"/> O <input type="checkbox"/> (S=sibling, P=parent, C=children, O=other)				
<b>PERSONAL HISTORY</b>	<b>Condition</b>	<b>Yes/No</b>	<b>If yes date diagnosed</b>	<b>Major Complications</b>	<b>Yes/No</b>	<b>Date of detection</b>	
	1. Diabetes Mellitus			Ischaemic Heart Disease			
	2. Hypertension			Congestive Cardiac Failure			
	3. Coro. Heart Disease			Stroke			
	4. Hyperlipidaemia			Peripheral Vascular Diseases			
	5. Other Chronic diseases (specify)				Peripheral Neuropathic Diseases		
					Renal failure		
					Retinopathy		
					Blindness		
					Others, specify		
			Amputation: If yes, specify Right <input type="checkbox"/> Left <input type="checkbox"/> Below ankle <input type="checkbox"/> Above ankle <input type="checkbox"/> Above Knee <input type="checkbox"/>		Date done:		
<b>Past diseases/operations:</b> .....							
<b>Allergy:</b> .....							

## LIFESTYLE/HEALTH EDUCATION

**1. Smoking Habit:** Non smoker

Ex Smoker  - stopped .....years ago

Smoker  Duration of habit ..... years ; No. of cigarettes ...../day

**2. Drinking Habit:** Non drinker

Ex Drinker  - stopped ..... years ago

Occasional Drinker  Frequency of drinking....days/month; No. of drinks ....units/occasion

Regular Drinker  Frequency of drinking .....days/week; No. of drinks ....units /week

**3. Physical Exercise:** Recreational Exercise: Yes  No

If yes, type of exercise:

Walking/jogging ..... Hours/week

Aerobic ..... Hours/week

Swimming ..... Hours/week

Other, specify ..... Hours/week

Constraints  
.....

**4. Diet:** Advice received: Yes  No  Who cooks for you? Self

Aware should take less fat: Yes  No  Family member

Aware should take less salt: Yes  No  Housemaid

How often do you take fast food?.....meals/week

Characteristic of eating habit/pattern (e.g. healthy/balanced, dependent on fast food etc...)  
.....

**5. Health Education Sessions:**

	<i>Dates</i>	<i>Theme</i>
1.....		
2.....		
3.....		
4.....		
5.....		

**6. Other remarks**  
.....  
.....



Unit No.:

Surname:

National I.D. No.:

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<b>Date:</b>	<b>Clinical Notes &amp; Treatment</b>
Weight (Kg)	
Waist (cm)	
BP ( mm Hg) Systolic Diastolic	
Urine Albumin	
Fasting plasma Glucose (mmol/L) FPG (N) < 7.0 RPG (N) < 11.1	
Cholesterol (mmol/l) Total	
HDL	
LDL	
Tri Glyc	
Hb <sub>A1C</sub>	<b>Investigations Requested</b>
Other	<b>Review</b>
☛ If referred tick here <input type="checkbox"/>	

<b>Date:</b>	<b>Clinical Notes &amp; Treatment</b>
Weight (Kg)	
Waist (cm)	
BP ( mm Hg) Systolic Diastolic	
Urine Albumin	
Fasting plasma Glucose (mmol/L) FPG (N) < 7.0 RPG (N) < 11.1	
Cholesterol (mmol/l) Total	
HDL	
LDL	
Tri Glyc	
Hb <sub>A1C</sub>	<b>Investigations Requested</b>
Other	<b>Review</b>
☛ If referred tick here <input type="checkbox"/>	



Ministry of Health & Quality of life  <b>PILOT NON-COMMUNICABLE DISEASE SHEET</b>	<b>Hospital/AHC/CHC:</b>		<b>Unit No.:</b>																									
	<b>Surname:</b>																											
	<b>Other name:</b>																											
	<b>National I.D. No.:</b> <table border="1" style="width:100%; height: 20px; border-collapse: collapse;"> <tr> <td style="width: 20px;"> </td><td style="width: 20px;"> </td> </tr> </table>																											
Sex: M <input type="checkbox"/> F <input type="checkbox"/>		<b>Date of Birth:</b>		<b>Age:</b> Yrs																								
<b>Marital Status:</b> Single <input type="checkbox"/> Married <input type="checkbox"/> Widow <input type="checkbox"/> Sep./Divorced <input type="checkbox"/> Other <input type="checkbox"/>		<b>Ethnic Group:</b> GP <input type="checkbox"/> Hindu <input type="checkbox"/> Muslim <input type="checkbox"/> Chinese <input type="checkbox"/> Other <input type="checkbox"/>																										
<b>Address:</b>			<b>Tel. No.:</b> Home <table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> Work <table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> Other <table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>																									
<b>Education Level:</b> Nil <input type="checkbox"/> Primary <input type="checkbox"/> Secondary <input type="checkbox"/> Higher <input type="checkbox"/>																												
<b>Occupation:</b>																												

Date filled:

<b>FAMILY HISTORY</b>	<b>DM</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>	If yes, specify: S <input type="checkbox"/> P <input type="checkbox"/> C <input type="checkbox"/> O <input type="checkbox"/>								
	<b>HBP</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>	If yes, specify: S <input type="checkbox"/> P <input type="checkbox"/> C <input type="checkbox"/> O <input type="checkbox"/>								
	<b>CVD</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>	If yes, specify: S <input type="checkbox"/> P <input type="checkbox"/> C <input type="checkbox"/> O <input type="checkbox"/>								
	<b>Others specify →</b>	Yes <input type="checkbox"/> No <input type="checkbox"/>	If yes, specify: S <input type="checkbox"/> P <input type="checkbox"/> C <input type="checkbox"/> O <input type="checkbox"/> (S=sibling, P=parent, C=children, O=other)								
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	1. Diabetes Mellitus			Ischaemic Heart Disease							
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	3. Coro. Heart Disease			Stroke							
	4. Hyperlipidaemia				Peripheral Vascular Diseases						
					Peripheral Neuropathic Diseases						
					Renal failure						
					Retinopathy						
					Blindness						
	5. Other Chronic diseases (specify)				Others, specify						
Amputation: If <u>YES</u> , tick as appropriate  <table style="margin-left: 40px;"> <tr> <td></td> <td align="center"><u>RIGHT</u></td> <td align="center"><u>LEFT</u></td> </tr> <tr> <td>Below Knee</td> <td align="center"><input type="checkbox"/></td> <td align="center"><input type="checkbox"/></td> </tr> <tr> <td>Above Knee</td> <td align="center"><input type="checkbox"/></td> <td align="center"><input type="checkbox"/></td> </tr> </table>						<u>RIGHT</u>	<u>LEFT</u>	Below Knee	<input type="checkbox"/>	<input type="checkbox"/>	Above Knee
	<u>RIGHT</u>	<u>LEFT</u>									
Below Knee	<input type="checkbox"/>	<input type="checkbox"/>									
Above Knee	<input type="checkbox"/>	<input type="checkbox"/>									
<b>Past diseases/operations:</b> .....											
<b>Allergy:</b> .....											

**LIFESTYLE/HEALTH EDUCATION**

**3. Tobacco Use**

(a) Smoking Habit: Never Smoke  Ex Smoker  (No of years smoked: .....)

Smoker  (i) No of years: .....  
 (ii) No of days per week: ..... } *For smoker*  
 (iii) No of cigarettes per week: .....

(b) Was ever advised to stop smoking (*for smoker*): Yes  No

(c) Exposure to “passive” smoke (*for non-smoker / ex smoker*): Yes  No

If Yes, (i) No of Years: ..... (ii) Place(s): .....

**4. Drinking Habit:**

Non drinker

Ex Drinker  - stopped ..... years ago

Occasional Drinker  Frequency of drinking.. ..days/month; No. of drinks....units/occasion

Regular Drinker  Frequency of drinking .....days/week; No. of drinks ....units /week

**5. Physical Exercise:**

Recreational Exercise: Yes  No

*If yes, type of exercise:*

Walking/jogging ..... Hours/week

Aerobic ..... Hours/week

Swimming .....Hours/week

Other, specify ..... Hours/week

Constraints.....

**6. Diet:**

Advice received: Yes  No  Who cooks for you? Self

Aware should take less fat: Yes  No  Family member

Aware should take less salt: Yes  No  Housemaid

How often do you take fast food?.....meals/week

Characteristic of eating habit/pattern (*e.g. healthy/balanced, dependent on fast food etc...*)  
 .....

**5. Health Education Sessions:**

1 Date : : \_\_\_\_\_ Topics: \_\_\_\_\_

2 Date : : \_\_\_\_\_ Topics: \_\_\_\_\_

3 Date : : \_\_\_\_\_ Topics: \_\_\_\_\_

**6. Other remarks:**

Unit No.:

Name:

National I.D. No.:

<input type="checkbox"/>																			
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INITIAL ASSESSMENT			
<b>Height:</b> cm	<b>Weight:</b> kg <b>Ideal weight:</b> kg	<b>Waist:</b> cm	<b>BMI:</b>
<b>Blood Pressure (mmHg)</b> Systolic: Diastolic:	<b>Blood sugar (mmol/l)</b> Random: Fasting:	<b>Cholesterol (mmol/l)</b> Total: HDL: LDL: Triglycerides:	<b>Urine albumin:</b>  <b>Microalbuminuria:</b>
<b>HbA1c:</b>	<b>Urea:</b>	<b>Creatinine:</b>	<b>Visual Acuity:</b> R L
<b>ECG:</b>		<b>Echography:</b>	
<b>X-Ray:</b>		<b>Other specify:</b>	

**CLINICAL ASSESSMENT:**

**Respiratory system:**

**CVS:**

**Others:**

**Treatment:**

**Investigations requested:**

**Review:**

☛ If referred, tick here

Name:

Unit No.:

Current age: .....years

<b>SUBSEQUENT ASSESSMENT SHEET*</b>	
<b>Date:</b>	
<b>Weight (Kg)</b>	
<b>Waist (cm)</b>	
<b>BP ( mm Hg)</b> Systolic Diastolic	
<b>Urine Albumin</b>	
<b>Fasting plasma Glucose (mmol/L)</b> FPG (N) < 7.0 RPG (N) < 11.1	
<b>Cholesterol (mmol/l)</b> Total  HDL  LDL  Tri Glyc HbA1C	
<b>Tobacco Use</b>	Change in smoking habit since previous visit:      Yes: <input type="checkbox"/> No <input type="checkbox"/> If Yes:      1. Started / restarted smoking <input type="checkbox"/> 2. Stopped smoking <input type="checkbox"/> (tick one)      3. Increase no. of cigarettes <input type="checkbox"/> 4. Decrease no. of cigarettes <input type="checkbox"/>
<b>Clinical Notes &amp; Treatment</b>	
<b>Investigations requested</b>	
<b>Review</b>	
<b>Other</b>	☛ If referred tick here <input type="checkbox"/>

- This page should be completed for each visit, including section on “Tobacco use”.



## PILOT TOBACCO HIS

<b>Guidelines for Data Collection on NCD Patient Form</b>	
<b>1. Tobacco Use</b>	
(a) Smoking Habit	<p>Tick one of the three boxes only</p> <p>1. Duration of smoking is recorded (in years) as follows:</p> <ul style="list-style-type: none"> <li>(i) <math>x</math> number of years</li> <li>(ii) zero (0) for less than one year</li> <li>(iii) UNSP when number of years cannot be appropriately ascertained</li> </ul> <p>2. Number of cigarettes for one week is the average number of cigarettes smoked daily multiplied by 7, or the average number of cigarettes smoked over a week.</p> <p>3. Number of days per week is recorded as <math>x</math>, where <math>x</math> is between 1 to 7. Insert zero (0) if less than once a week</p>
(b) Advised to stop smoking	Advice should have been provided by a health professional only.
(c) Exposure to “passive” smoke	Place/s may include any building, mode of transport, leisure grounds, etc.,

<b>Guidelines for Data Collection on Data Transmission Form</b>	
Centre	Record name of health institution where NCD clinic was carried out
Date	Is the actual date when the NCD clinic was held
Serial No. (number)	Starts at 1 everyday and increases incrementally to show the number of patients having attended the clinic
Unit No.	Is the unique identifier of the patient at the health institution. Will be used to check for duplication
Patient's Name	Will be used to check for duplication
<b>STATUS (on previous visit)</b>	
(a) Blood Pressure	Record BP as 99/99, 999/99 or 999/999
(b) Smoking Habit	Insert the number only 1 for Never Smoked 2 for Ex-smoker 3 for Smoker
<b>CURRENT STATUS</b>	Record the status as per Subsequent Assessment Sheet  Insert the number only 1 for Started/restarted smoking 2 for Stopped Smoking 3 for Increased number of cigarettes 4 for Decreased number of cigarettes  Record Change in Smoking status by writing either Yes or No