

**REPORT OF THE INTERNATIONAL
INSULIN FOUNDATION ON THE
RAPID ASSESSMENT PROTOCOL FOR
INSULIN ACCESS IN MOZAMBIQUE**

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**Prepared by the International Insulin Foundation in collaboration with
AMODIA**

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List of Abbreviations

AMETRAMO	Mozambican Association of Traditional Healers
AMODIA	Associação Moçambicana dos Diabéticos (Association of Mozambican Diabetics)
CIF	Cost, Insurance, Freight (INCOTERM meaning that the insurance and delivery of goods to the destination is paid for by the supplier. Buyer is responsible for the import customs clearance and other costs and risks.)
CMAM	Central de Medicamentos e Artigos Medicos (Central Medical Store)
HCB	Hospital Central Beira
HCM	Hospital Central Maputo
HIPC	Highly Indebted Poor Country
IDDM	Insulin Dependent Diabetes Mellitus (Type 1 diabetes)
IDF	International Diabetes Federation
IIF	International Insulin Foundation
Medimoc	National Company that imports Medicines for Government of Mozambique
MISAU	Ministério de Saúde (Ministry of Health)
NIDDM	Non Insulin Dependent Diabetes Mellitus (Type 2 diabetes)
RAP	Rapid Assessment Protocol
RAPIA	Rapid Assessment Protocol for Insulin Access
UCB	Universidade Católica Beira (Catholic University Beira)
WHO	World Health Organisation

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Figure 1 – Map of Mozambique

Source: www.un.org/cyberschoolbus/banmines/schools/mozambique.asp



Areas where study took place

Executive Summary

This report, prepared by the IIF, highlights the main findings and recommendations based on the implementation of the Rapid Assessment Protocol for Insulin Access in Mozambique. This report was presented to the Ministry of Health, Clinicians and National Diabetes Association in Mozambique as a first stage in a collaborative process between different stakeholders both at a national and international level to find creative means to improve the welfare of people with Type 1 diabetes in Mozambique. The IIF aims to mobilise different areas of expertise and resources to frame practical proposals to help Mozambique provide the care that people with Type 1 diabetes require. In parallel this report hopes to contribute positively to the issues of chronic diseases in Mozambique in general.

Introduction

Type 1 diabetes is considered a rare disease in Africa estimated by the International Diabetes Federation (IDF) as affecting 108,000 people, 928 of these in Mozambique. Since survival in many is short this probably greatly underestimates the true incidence and the potential care needs.

Key Findings

- There is no exact information about how many people in Mozambique develop Type 1 diabetes each year (incidence) nor how many there are with the disease at any one time (prevalence).
- There is much variation in estimates of Type 1 diabetes prevalence between different areas of Mozambique. In comparing the three regions of the study, Maputo, Beira and Lichinga, there is a difference between the estimated number of people with diabetes. Using Maputo as a benchmark Beira has only 56% and Lichinga only 15% of the expected number of patients. The proportions due to true variation, to inadequate ascertainment and to curtailed survival are unknown.
- The lack of information about disease prevalence and incidence leads to problems in the quantification of insulin needs and resource allocation for diabetes.
- In 18 months between 2001 and 2003, Mozambique spent US\$ 603,824.00 on insulin which represents 10% of government expenditure on medicines.
- 77% of the national insulin supply is for Maputo Province. This quantity would suffice for over 19 times the number of expected people with Type 1 diabetes present (assuming patients use 35 units per day). For other provinces the quantities ordered appear inadequate for the estimated number of people with Type 1 diabetes.
- Communication and coordination problems between the Medicine Importation Agency (Medimoc) and Central Medical Stores (CMAM) with end users of insulin create problems with supply of insulin.
- According to the Regulations of the Social Fund for Medicines and Food Supplements, Boletim da Republica, 4 Suplemento, Decreto no. 16/88, 27th December, 1988, patients are supposed to be able to receive insulin for free or at a subsidised cost. All outpatients have to buy insulin even at a subsidised price of US\$ 0.5 per 10 ml 100IU/ml vial from state

pharmacies. This insulin is often not available at this price and patients pay as much as US\$ 24.20 per vial on the open market.

- Supply of insulin and other associated consumables such as syringes and needles is irregular and prices vary greatly between the private and public sectors.
- Insulin availability and informed care for people with diabetes is limited to Provincial and Central Hospitals. This means large distances to travel for some and may explain the “missing patients”. Diabetes clinics are only held at the three Central Hospitals.
- Diagnostic tools are not always present at Hospitals and even when they are the lack of trained staff means that some patients may fail to be diagnosed. Individual patients did not have access to their own monitoring equipment.
- "Diabetes is part of the curriculum, but doctors know what they see." All healthcare workers had heard about diabetes, but very few will actually come across, let alone treat, a patient with diabetes. This blunts awareness in healthcare workers and patients escape diagnosis.
- Even after diagnosis the lack of trained care providers, guidelines for care and referral pathways means that patients often fail to be satisfactorily managed.
- AMODIA is active in only Maputo and might play a greater role in the diabetes arena in Mozambique.
- A general lack of knowledge about diabetes in the general population and government agencies was also highlighted.
- Traditional Healers are a source of care for all diseases throughout the country.
- Lack of information about diet, insulin availability and diabetes management in general were major concerns for patients with diabetes and their carers.

All these issues need to be placed in Mozambique’s general health care context where problems of staff, infrastructure and resources are omnipresent.

Recommendations

Keeping in mind the resource restrictions present in Mozambique the following recommendations aim to make best use of limited resources and also to benefit other areas of the health system in Mozambique. (In parentheses stakeholders involved in recommendation (see Abbreviations on page 2))

- Creation of a register/surveillance system for all diagnosed diabetes patients (MISAU, WHO)
- Better reporting and control mechanisms between Medimoc/CMAM and end users (Medimoc, CMAM, MISAU Pharmaceutical Department, WHO)

- Clarification/enforcement of Regulations of the Social Fund for Medicines and Food Supplements, Boletim da Republica, 4 Suplemento, Decreto no. 16/88, 27th December, 1988 (MISAU)
- Improvement of access to insulin and syringes for patients (MISAU, CMAM, Medimoc, WHO)
- Increase in availability of diagnostic tools where necessary (MISAU, Donors)
- Improve existing training for healthcare workers and train specialists in the area of diabetes (MISAU, WHO, IDF)
- Empowering patients and their families through the establishment of teaching and training facilities (IDF, AMODIA, WHO)
- Create guidelines and referral pathways for the treatment of patients (MISAU, Physicians, IDF, AMODIA, Tanzania Diabetes Association)
- Identify specialists and creation of specialised diabetes clinics (MISAU, AMODIA, IDF, WHO, Tanzanian Diabetes Association)
- Clear statement of role and purposes of AMODIA as a Diabetes Association with requests for support (AMODIA, IDF, National European Diabetes Association, Tanzanian Diabetes Association)
- Organise awareness campaigns, e.g. for World Diabetes Day (MISAU, AMODIA, WHO, IDF)
- Involve and develop special guidelines for Traditional Healers. (MISAU, WHO)
- Create proper environment for health of people with diabetes (All stakeholders)
- The above recommendations should be included in a feasible 5-year plan for Diabetes in Mozambique (MISAU, AMODIA, WHO, IDF)

1. Background Information

1.1. Diabetes

Type 1 diabetes or Insulin Dependent Diabetes Mellitus (IDDM) is a life-long condition, affecting children, young people and adults world-wide. The disease is recognised by a loss of control over the use of the body's glucose and other fuels and due to the destruction of insulin producing cells in the pancreas (pancreatic islet beta cells). Inadequate care leads to serious health complications such as blindness, kidney failure, nerve disease, limb amputation, heart attacks, strokes and premature death.

Insulin is vital for the survival of people suffering from Type 1 diabetes and in some people suffering from Type 2 or Non Insulin Dependent Diabetes Mellitus (NIDDM). However, also of central importance is the means to administer the medication (syringe/needles), the means to monitor the response to insulin (blood/urine tests) and an understanding of how insulin acts and

affects life and work of the individual.

1.2. Insulin

Insulin is the body's hormone, normally made by the pancreas, that regulates glucose metabolism. Insulin is a treatment for diabetes and not a cure and is administered by daily injections throughout the life of the patient. Dosage of insulin injected by the patient varies from person to person based on, age, nutritional status and activity.

Without insulin, people with type 1 diabetes die very quickly, daily injections of insulin is necessary for life. Some people with type 2 diabetes need insulin for good metabolic control, but there is not the same urgency.

1.3. Type 1 diabetes and insulin in developing countries

Leonard Thompson, a Canadian child, was given his first injection of insulin on 11 January 1922. He was the first patient to be treated with insulin for Type 1 diabetes. Having survived some 2½ years from his diagnosis, he had done better than most Type 1 diabetic patients in the pre-insulin era.

The IDF estimates that in Africa there are approximately 108,000 people with Type 1 diabetes. [1] With the restricted availability of insulin, the life expectancy of a child with newly diagnosed Type 1 diabetes in much of sub-Saharan Africa may be as short as one year or less. Restricted access to insulin also results in debilitating complications such as amputations, blindness and a much reduced life expectancy.

Restricted access to insulin is not only due to lack of availability, but also cost. Chale and McLarty [2] found that the annual direct cost for an insulin requiring patient was equivalent to US\$ 229, with almost 70% of this amount was for the purchase of insulin.

1.4. Incidence and Prevalence of diabetes

Incidence is the measure of how many people within a certain population will get a disease within a certain time. The incidence of diabetes in children varies greatly from country to country. For Mozambique the incidence of diabetes is estimated by the IDF as 1 per 100,000 people per year [1].

The prevalence states the proportion of a population at a given time which has a certain disease. This will depend, as well as on the incidence, on how long someone with the condition survives after being affected. Before the discovery of insulin the prevalence of Type 1 diabetes was very low, although the incidence may have been high. This is because the new cases of diabetes were dying very soon after disease onset as there was no appropriate treatment for them. In developing countries, the incidence is difficult to assess, as survival may be very short, and many people will die undiagnosed.

One other factor which comes into play in influencing both incidence and prevalence is whether patients developing the disease are diagnosed. In some parts of the developing world, patients with weight loss, fatigue and other symptoms of type 1 diabetes may be misdiagnosed, for example with AIDS. This will artificially reduce the figures for both incidence and prevalence.

1.5. International Insulin Foundation

The International Insulin Foundation (IIF) was established by leading academics and physicians in the field of diabetes with the aim of prolonging the life and promoting the health of people

with diabetes in developing countries by improving the supply of insulin and education in its use.

In order to achieve these objectives, a clear analysis of the constraints to insulin access and diabetes care is needed. The IIF's view is that increasing the supply of insulin through donations or other means, however generous, may offer only temporary relief and that the root of the problems of insulin supply and diabetes care need to be identified and tackled. This led the IIF to develop the Rapid Assessment Protocol for Insulin Access (RAPIA).

1.6. Rapid Assessment Protocol for Insulin Access - method of assessment

The aim of Rapid Assessment Protocols for Insulin Access (RAPIA) is to serve as a practical field guide to assist teams in the collection, analysis and presentation of data to evaluate and inform the development of health care services for diabetes management in low and middle income countries.

The RAPIA was developed using existing RAPs, such as the Protocol for the Assessment of National Communicable Disease Surveillance and Response Systems created by the WHO[3], International Nutrition Foundation for Developing Countries' Rapid Assessment Procedures - Qualitative Methodologies for Planning and Evaluation of Health Related Programmes [4] and Report to the Open Society Institute Soros Foundation New York on Availability and Accessibility of Insulin and Insulin Supplies in Central and Eastern Europe [5].

The approach to the evaluation of health care services of the RAPIA draws on the principles of Rapid Assessment Protocols (RAP) which have been developed and implemented in different areas. The method of RAP has been used extensively to assess services for communicable diseases, including malaria, tuberculosis and STIs, for the purpose of developing interventions.

The main principles of the RAP are:

- Speed - the methods are intended to provide relevant information quickly, upon which decisions about health care interventions can be made.
- Use of multiple data sources - different methods are used to access different sources of data to get a balanced overview.
- Pragmatism - the methods should provide adequate information, without necessarily being 'scientifically perfect'. Triangulation or cross-checking between different sources of data is used to establish the validity and reliability of the data collected.
- Cost-effectiveness - the focus is on research instruments that provide information cheaply, and are not labour and time intensive. Where possible, use is made of existing data.
- The aim of the RAPIA is to attempt to investigate possible barriers to insulin access that exist in a particular country. The questionnaires developed below serve as a guide to aid the RAPIA teams in the collection, analysis and presentation of data.

A comprehensive literature search of diabetes programmes, diabetes in developing countries, care for chronic diseases in developing countries and the input from the Trustees of the IIF¹ and led to an outline of the RAPIA.

¹ **Dr. Maximilian de Courten** (epidemiologist and Public Health physician working with the World Health Organisation with substantial experience on insulin supply to developing countries), **Dr. Geoff Gill** (Senior Clinical Lecturer, University of Liverpool, extensive research in diabetes in both developed and developing countries), **Professor Jak Jervell** (Honorary President of the International Diabetes Federation (IDF) and is Medical Adviser to the Norwegian Diabetes Association), **Professor Harry Keen** (Professor Emeritus King's College London has been active in the field of diabetes holding many positions in British (Diabetes UK, DH), European (European Association for the Study of Diabetes, Euro WHO and IDF) and

The RAPIA was structured as a multi-level assessment of the different elements that influence the access people with diabetes have to insulin in a given country. The framework of the RAPIA will study the path of insulin from its arrival in the country to the point that it reaches or fails to treat the patient effectively and thereby identify how and where the system works and/or falls short.

In looking at problems that could occur with the “flow” of insulin from the moment it entered the country until it reached the patient, the problems were divided into three categories:

- Macro
- Meso
- Micro

In identifying key issues that would impact the supply of insulin and provision of diabetes care at all of these levels, specific questionnaires were developed aimed at different people. The aim of this was to get a better picture of the “flow” of insulin through a country and to see where this any areas that this flow was either slowed or stopped.

This initial work lead to the development of different questionnaires targeted at different stakeholders in a given country, with the aim of conceptualising the path of medicines and care.

The questionnaires developed were:

- Ministry of Health
- Ministry of Finance
- Ministry of Trade
- Private sector (companies importing medicines and/or medical supplies)
- National Diabetes Association
- Central Medical Store
- Educators
- Regional/District Health Organisation
- Hospitals, Clinics, Health Centres, Dispensaries, etc.
- Pharmacy/Drug dispensary
- Health Workers
- Traditional Doctors
- Patients

These questionnaires were reviewed by different people for clarity and construct.

Each questionnaire had some overlapping themes/questions, but each aimed to get the perspective of the person on what problems their country faces getting insulin and proper care to patients.

Once the questionnaires were developed they were sent for comments to the Trustees of the IIF. Once these comments had been integrated, each questionnaire was piloted with people from different organisations, doctors, nurses and lay people.

international (WHO, IDF) organisations), **Professor Jean-Claude Mbanya** (Senior diabetologist and medical academic in the Faculty of Medicine University of Yaoundé I, Cameroon, Chairman of the Insulin Task Force of the IDF), **Dr. Kaushik Ramaiya** (Senior diabetologist and medical academic in Dar es Salaam, Tanzania, Chairman of the African Region of the IDF and the Secretary of the Tanzania Diabetes Association) and **Dr. Peter Watkins** (Consultant Physician at King's Diabetes Centre, King's College Hospital)

The aim of the pilot was to look to see if the questionnaires were comprehensible, lacking any information and collected the right information.

Once this process was done the questionnaires were again modified accordingly. A list of interviews needed to be carried out was established as a guide.

The questionnaires were also submitted to the UCL Committee on the Ethics of Non-NHS Human Research and was accepted. An informed consent form and patient information sheet were developed for use with each questionnaire as required by the Committee.

In Mozambique the RAPIA provided information in the categories of:

- Health service structure and functioning with regards to procurement of medicines, diabetes management
- Diabetes policies written and enacted
- Reported practice for Type 1 diabetes management
- Observed practice for Type 1 diabetes management
- Availability of insulin, syringes and monitoring equipment
- Existence of distribution networks for insulin
- Insulin supply-related knowledge and attitudes amongst people with diabetes and their carers.
- Other problems that hamper the access to proper insulin and care

1.7. Mozambique

Mozambique's almost 19 million inhabitants, live in 10 provinces, divided into 3 regions (South, Central and North) spread over 799,380 km².

When Mozambique gained independence in 1975, after 500 years as a Portuguese colony, it was beset by a prolonged civil war, which ended in 1992. This combined with regular droughts and floods have left the country ranked 170 out of 173 on Human Development Index with a GDP per capita (PPP) US\$ 854 [6]. This of course has had an impact on the population's health and the country's health care infrastructure.

After 1992 the government embarked on a reconstruction of the health sector under Health Services Recovery Programme. In parallel it established key relationships with donors and the health sector in order to co-ordinate efforts to improve the health of people in Mozambique.

Of Mozambique's total government budget 55-60% is covered by donors. The remainder comes from National revenues. Each ministerial budget is discussed to see what can and will be covered by donors and by the government. Most donors provide funds for specific areas, such as Health, Environment and Education.

Mozambique has launched an Action Plan for the Reduction of Absolute Poverty (PARPA). The plan has its strategy to:

- Generate rapid and sustainable growth
- Invest in human capital through improved delivery and quality of social services
- Develop a program including safety nets that fosters the social and economic integration of the most vulnerable groups [7]

This plan has 6 priority areas one of which is health.

1.8. Healthcare in Mozambique

The health system in Mozambique is provided by the “Ministério de Saúde” (MISAU), Ministry of Health through hospitals, health centres and health posts. MISAU spent approximately (at the average exchange rate) US\$ 167,796,000 or US\$ 9.00 per capita in 2001.

The Health budget is a priority for Mozambique, it will cut from other areas before cutting from health. MISAU has 2 areas of expenses:

- Current (medicines and salaries)
- Investment

Donors sometimes give funds for specific programs. This can either be by Mozambique providing a specific project and then finding a donor or the project proposed by MISAU is part of strategy of donor. Sometimes donors fund part of a project and ask government to fund another part, this sometimes limits some projects. For example donors will help with building hospital, but not recurrent costs.

The current financing policy is based on the principle that all Mozambicans should have access to quality care at an equitable price. [7]

The public sector is complemented by services being provided by the Private sector (mainly in large cities) and NGOs.

There are 3 levels of organisation of health, national, provincial and then finally at the district level.

Mozambique has 3 main Central hospitals in each region located in Maputo (which is also the final referral hospital for the whole country) for the Southern region, Beira for the Central region and Nampula for the Northern region.

The lowest level of care is provided by Health Posts (total of 638, 27,674 people per Health Post [8]). Between the Central Hospitals and the Health Posts there are the following types of health dispensing units:

- Health Centres (516, 34,217 people per Health Centre [8])
- Rural Hospitals (total of 25, 706,240 people per Rural Hospital [7])
- Provincial or General Hospitals (total of 12, 1,471,333 people per Hospital [7])

These different centres provide different services and have different types of personnel present. These vary between centres and between cities.

At both hospitals and some health centres the first port of call is the Banco de Socorso (literally Bank of Help). This serves as the equivalent to the emergency room, but unfortunately due to the workload of the health centres and hospitals it is not always used for this purpose.

Resources are not equally allocated throughout the country. The divisions are primarily between urban and rural populations and between the poor and rich. [7] It is important to note that in most instances those who can afford to seek care in South Africa and sometimes even Portugal.

The challenges that Mozambique faces with regards to health are:

- 30-50% of the population have access to basic preventive and curative health services, which means that they live within 10kms of a health facility ([7] and discussions with key stakeholders)
- High level of communicable diseases (13% of adults living with HIV/AIDS, 18,108 cases of Malaria per 100,000[6])
- Lack of staff (599 "Superior Health Personnel" [8] in the whole country, including 400 Mozambican doctors)
- General lack of resources from "paper and desks to medical equipment and medicines"

It is also important to note that Traditional Doctors or Curandeiros, play an important role in providing health care to both rural and urban populations. As many people do not have access to modern medicine, Curandeiros are their only source of care.

In MISAU's 2001-2005 Strategic Plan its aim is to achieve for all Mozambicans health levels close to those of the rest of sub-Saharan Africa with access to basic health services and good quality through a health system that responds to its citizen's expectations. The mission to improve the health services is guided by the following principles:

- Efficiency and equity
- Flexibility and diversification
- Partnership and community participation
- Transparency and accountability
- Integration and coordination

Mozambique's law on Noncommunicable diseases states that care for people suffering from chronic conditions should receive all the aspects of their care for free.

2. Implementation of RAPIA in Mozambique

Mozambique was chosen as a pilot as it is a "Highly Indebted Poor Country" (HIPC). The World Bank has defined an HIPC on the basis that the demands on these countries for debt repayment heavily exceed their ability to generate income, and as a consequence, programmes of social investment including health are suffering.

Implementing the RAPIA in an HIPC was to see how a sustainable solution can be found to the issues of access to insulin and proper diabetes care under extreme conditions of scarce resources in the health sector.

The Project Coordinator together with a team of local interviewers carried out the RAPIA in Mozambique over a period of almost 2 months. The Project Coordinator together with a team of local interviewers carried out the RAPIA over a period of almost 2 months in Mozambique.

The initial step was to get the necessary questionnaires translated from the original English version to Portuguese. This was done as well as a back translation to verify comprehensibility.

A letter from the Ministry of Health was obtained in order to carry out the interviews.

Once this was done training of the interviewers began, using a small guide developed for this purpose. This training took place 3 half days and focused on:

- What the aims of the project were

- How to carry out interviews
- Getting familiar with the questionnaires

In parallel key people to interview were identified by local partners.

In total 76 interviews and approximately another 30 informal meetings and discussions were held in three distinct geographical areas in Mozambique - Maputo, Beira and Lichinga and their surroundings. These three areas were chosen by local stakeholders due to their geographical distribution and differences in economic situation.

Each interview had as its main aim to obtain the person's perspective on the problems faced by people with diabetes in Mozambique in gaining access to insulin and proper diabetes care, rather than seeking precise statistical information.

Certain documents such as past reports and publications of the Ministry of Health were also reviewed. These were either documents that were mentioned during interviews or documents found in the documentation centre and the Ministry of Health.

A debriefing session was held at the end of each week to discuss problems or observations that the team had made during their work.

3. Type 1 diabetes in Mozambique

According to the IDF's e-Atlas [1], Mozambique should have a total of approximately 928 people suffering from Type 1 diabetes. Official statistics on diabetes in Mozambique are absent.

In comparing the IDF estimates with the actual numbers collected from registers there are respectively 25% and 95% of estimated numbers of patients present in Beira and Lichinga. However there are around 75% more Type 1 diabetic patients than estimated by the IDF in Maputo.

Table 1 – Comparison of actual number of people with Type 1 diabetes present versus IDF estimated data

Location	Population	Prevalence of Type 1 diabetes based on IDF Estimate	Register	Proportion present
National	17,656,000	928	-	-
Lichinga ¹	148,560	8	2	25%
Beira ²	397,368	21	20	95%
Maputo ³	2,000,000	104	181	174%

If instead one uses the data from Maputo as a bench mark we see the following.

Table 2 – Comparison of actual number of people with Type 1 diabetes present versus Maputo register data

Location	Population	Prevalence of Type 1 diabetes based on Maputo Data	Register	Proportion present
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National	17,655,000	1,598	-	-
Lichinga ¹	148,560	13	2	15%
Beira ²	397,368	36	20	56%
Maputo ³	2,000,000	181	181	100%

¹ - The register used was kept by a retired employee of Provincial Department of Health. There are a total of 20 diabetics, 2 with Type 1 and 18 with Type 2.

² - A total of 20 Type 1 and 80 Type 2 patients were registered by a physician working at Hospital Central Beira (Beira Central Hospital, HCB).

³ - Data obtained from doctor with major responsibility for treating diabetic patients in all of Maputo. Population figure used was that of the Province of Maputo as it was assumed all patients with Type 1 diabetes would be referred to Hospital Central Maputo (Maputo Central Hospital, HCM).

Note: for both the data from Beira and Lichinga only the populations of both cities are used. This is despite HCB being the referral Hospital for the whole province of Sofala and the Central region of Mozambique. The facility in Lichinga is a Provincial Hospital and thus would receive patients from outside the city.

Using the methods employed by the IDF Diabetes e-Atlas [1], the table below shows that the life expectancy of people with diabetes varies greatly from one area of Mozambique to the other.

Table 3 – Differences in calculated life expectancies (years) for people with Type 1 diabetes from different areas of Mozambique

Age Range	0-14	15+
Mozambique¹		
Life Expectancy	1.5	12.3
Maputo²		
Life Expectancy	3.8	20
Beira²		
Life Expectancy	2.1	11.1
Lichinga²		
Life Expectancy	1.5*	2.9

¹ – Based on IDF calculations and data

² – Based on IIF calculations and data

* – Minimum value for Life Expectancy given by IDF for a person living in a situation with no access to insulin and care, the value calculated by the IIF is 0.6 years

Assumptions:

- 44% of population 0-14 ([8])
- 56% population 15+ ([8])
- Incidence in age range 0-14: 1.0/100,000 (IDF)
- Incidence in age range 15+: 0.67/100,000 (IDF)
- 18% of patients with diabetes are in age range 0-14 (Based on interviews with patients asking age of diagnosis)

4. Mozambique's medicine supply

4.1. Procurement of medicines in Mozambique

Mozambique has an established National Formulary, which serves as a guide for the purchase of medicines. It is based on the World Health Organisation Essential Medicines List and is supposed to be revised every 2 years. The last version still in use is from 1999. Mozambique's expenditure on medicines is about US\$ 30-35 million. US\$6 million is directly from the government budget the rest is covered by donors. Mozambique also receives US\$5.5 million in direct donations of medicine.

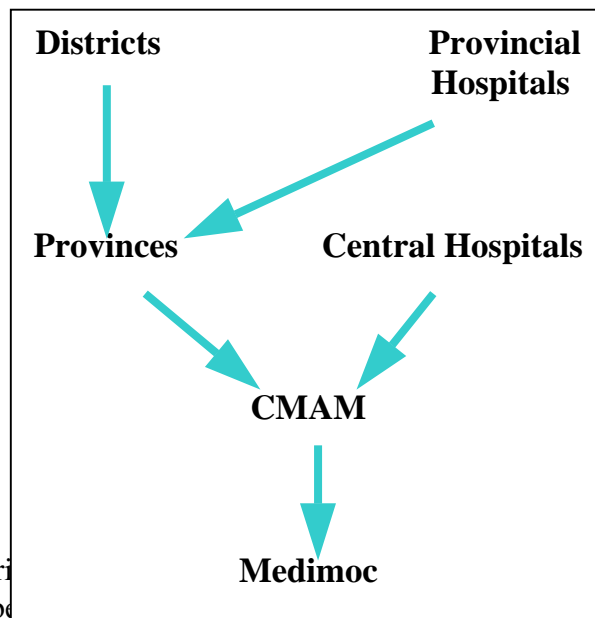
The Central de Medicamentos e Artigos Medicos (CMAM), Central Medical Store is in charge of determining the quantity of medicines and medical supplies needed by Mozambique. It is dependent on the Pharmaceutical Department at MISAU.

Quantification of Mozambique's needs for medicines is done on the basis of Provincial requisitions sent every 3 months to CMAM. The Provincial Depositories receive the quantities needed from each district every quarter. These quantities are then approved by the Head Doctor of each province. In theory districts receive medicines based on the following 3 criteria:

- Number of average monthly visits to health centre
- Classification of health centre
- Category of health personnel present at Health Centre

However most of the time it is based on estimates that are determined at each level of the diagram below. Storage, procurement and distribution of these medicines is contracted to Medimoc.

Figure 2– Requisition pathway in Mozambique



Medimoc a semi-private company, since October 2000, is owned, since October 2000, by the Government of Mozambique. Medimoc is a semi-private company, since October 2000, owned, since October 2000, by the Government of Mozambique.

Medimoc is a semi-private company, since October 2000, owned, since October 2000, by the Government of Mozambique. Medimoc is a semi-private company, since October 2000, owned, since October 2000, by the Government of Mozambique.

Medimoc's activities are divided between 80% for the government and 20% for the private sector (clinics, pharmacies and NGOs).

Once Medimoc has received the quantities needed from CMAM, it carries out the whole process of preparing tender documents, issuing the tenders and receiving the offers from suppliers.

Mozambique purchases medicines with Tenders, International Tenders, Limited Tenders, Direct Purchase, Shopping (obtains 3 prices for medicines, compares these prices and buys from best offer) and Limited competitive bidding from a list of pre-qualified suppliers. Local Mozambique companies cannot enter the tendering process directly, but they sometimes play an active role in preparing tenders for foreign companies. CMAM also has funds to purchase medicines from the private sector in emergency situations.

These offers are then evaluated by Medimoc, the Pharmaceutical Department of the Ministry of Health and the Société Générale de Surveillance (SGS). The Coopération Suisse helps with the planning of how to acquire medicines and provides financial support.

The proposal is then presented to the Ministry of Health for approval. Medimoc then communicates with the suppliers and opens a letter of credit. The medicines are then shipped to Mozambique and Medimoc deals with the customs procedures, warehousing and distribution.

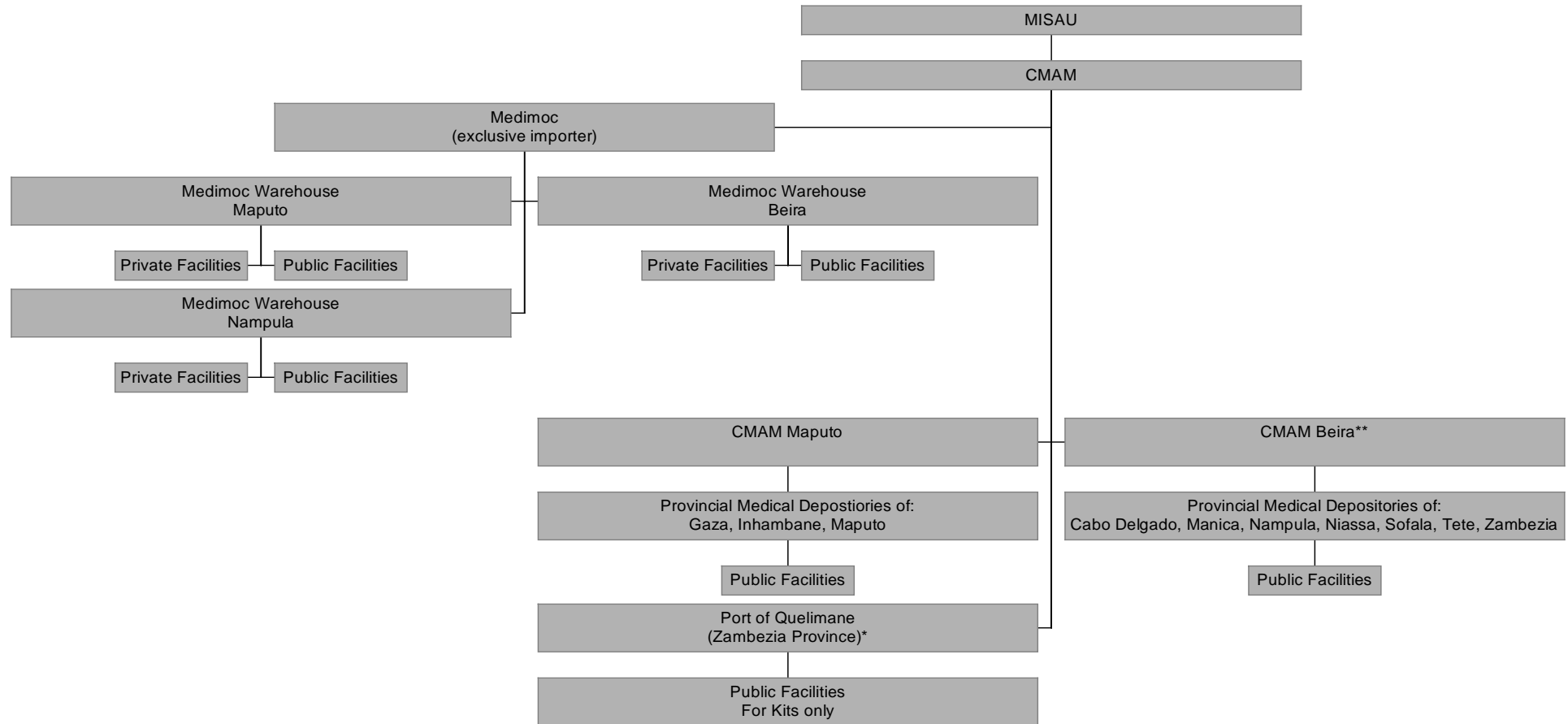


Figure 3 – Distribution of drugs in Mozambique

* - Zambezia Province has a direct supply of Essential Drug Kits as it has a high demand for these

** - The Medimoc Warehouse in Beira assumes some of the functions of the provincial medical depository

In Savelli [9] it was stated that the whole process took the following amount of time:

	Weeks
Need to order/preparation of tender	4
Call for offers	2-6
Evaluation/comparative schedule preparation	1
Decision/tender board decision	2-4
Contracts awarded/suppliers proforma invoice	3
Letter of credit from Ministry of Commerce	2
Foreign exchange available (Bank of Mozambique)	2-10
Preparation of Shipment-Good received in port	8-12
Transport/goods received in port	2-6
Customs clearing of goods	2
Goods received and ready at warehouse	2
Total	30-52 weeks

During the current study no exact numbers were given, but from discussions with various people the time it takes for this process is now shorter.

Mozambique has no special import licenses, taxes or custom duties on medicine and prices are controlled by the government through the National Price list. Medicines are sold at less than 1% of real value in the public sector. In the private sector prices are controlled as they need to be approved by the Ministry of Health Pharmaceutical Department.

Private distributors can have a 13.5% margin on medicines including freight and insurance. Any company wishing to import medicines has to fill in a form listing the active ingredient, MISAU formulary reference, commercial name and calculations of cost. This is then sent to the Pharmaceutical Department of MISAU. Private Pharmacies can have a 75.6% margin.

Medicines, such as insulin, that are heat sensitive are transported by plane. This cost is paid for by Medimoc which uses the money it gets from the sale of medicines for this purpose.

4.2. Mozambique's insulin supply

Rapid, Intermediate, Mixed and Slow acting insulin are present on Mozambique's National Formulary. Medimoc (National company that imports Medicines for the government of Mozambique) buys human 100IU Novo Nordisk insulin either by tender from Novo Nordisk (approximately 85% in last 2 years) or through a private company that acts as the Novo Nordisk representative in Mozambique (approximately 15%).

The table below shows the total sums expended and the unit prices at which Medimoc bought the various types of insulin from the 3rd Quarter 2001 to the 3rd Quarter 2002 and one purchase in 2003.

Table 4 – Prices of insulin Purchased by Medimoc (Data from Medimoc, May 2003)

Quarter/ Year	Type of Insulin	Source	Quantity (vials)	Total Price (US\$)*	Price per vial (US\$)*
03/2001	Slow	Novo Nordisk	1,000	\$9,000.00	\$9.00
03/2001	Rapid	Novo Nordisk	4,000	\$36,000.00	\$9.00
04/2001	Slow	Novo Nordisk	600	\$5,400.00	\$9.00
04/2001	Rapid	Novo Nordisk	200	\$1,800.00	\$9.00
04/2001	Rapid	Novo Nordisk	1,000	\$9,000.00	\$9.00
04/2001	Intermediate	Private Company	10,000	\$67,573.33	\$6.76
04/2001	Rapid	Private Company	5,000	\$33,786.67	\$6.76
01/2002	Intermediate	Novo Nordisk	27,000	\$116,370.00	\$4.31
01/2002	Rapid	Novo Nordisk	14,000	\$60,340.00	\$4.31
01/2002	Slow	Private Company	3,000	\$29,723.00	\$9.91
02/2002	Mixed	Novo Nordisk	18,000	\$82,732.00	\$4.60
02/2002	Slow	Novo Nordisk	1,000	\$4,596.00	\$4.60
03/2002	Rapid	Novo Nordisk	19,000	\$81,890.00	\$4.31
2003	Intermediate	Private Company	12,000	\$65,613.00	\$5.47
Total 2001-2003			115,800	\$603,824.00	

* - CIF (Cost, Insurance, Freight) price quoted inclusive of shipping and insurance

Over 18 months, insulin expenditure for Mozambique represents from 1.7-2% of total expenditure on medicines (US\$ 30-35 million) or 10% of government expenditure on medicines (US\$ 6 million).

Based on Novo Nordisk's LEAD initiative (Leadership for Education and Access to Diabetes care)[10] Novo Nordisk has established a new "best pricing" policy which offered insulin to public health systems in the 50 poorest countries at prices not to exceeding 20% of the average price in North America, Europe and Japan. This led to a change in price from US\$ 9 in 2001 to prices of US\$ 4.31 (-52%) and US\$ 4.60 (-49%) in 2002. The Novo Nordisk Representative in Mozambique stated that this decrease would lower costs by 55-60%. These decreases may not correspond exactly to the exact values above, as Mozambique has to pay carriage and insurance.

Insulin like all other medicines is exempt from any taxes and duties and is provided in the public sector with a prescription.

Mozambique has a policy of only purchasing generic versions of medicines. Insulin was the only medicine seen during the study that carried the name of a "Large" pharmaceutical company.

The table below shows a comparison of what Mozambique pays for 1 vial of insulin compared to what it spent in 1997 on drugs per person.

Table 5 – Comparison of drug expenditure and cost of insulin

Province	Drug expenditure per person (US\$)	Quantity of insulin this buys (vials)²
Nampula	\$0.54	0.13
Zambezia	\$0.65	0.15
Niassa	\$0.77	0.18
Cabo Delgado	\$0.82	0.19
Maputo Province	\$1.04	0.24
Gaza	\$1.31	0.30
Inhambane	\$1.30	0.30
Manica	\$1.38	0.32
Tete	\$1.50	0.35
Sofala	\$1.61	0.37
Maputo City	\$4.30	1.00

¹- [7] p.14

²- using lowest price of insulin purchased in 2001 (US\$ 4.31)

4.2. Quantification

The main problem with the supply of insulin in Mozambique is quantification of needs. This is due to a lack of data on the number of people with diabetes within the country and to less than perfect communication between the different levels of the system. From discussions with various stakeholders quantification of insulin was based on a mix of estimates, past consumption trends and past orders. This leads to a surplus or shortage of insulin in different areas. In an interview with someone from Central de Medicamentos e Artigos Medicos (Central Medical Store, CMAM) CMAM it was stated that for insulin there was “no requests for a certain time and then requests.”

Table 6 – A comparison of insulin needs versus actual orders and the number of patients these quantities are for

Province	Population [8]	Estimated number of people with Type 1 diabetes based on Maputo data	Insulin needed per year in vials for all Type 1 patients ¹	Insulin Ordered (percentage of total) ²	Insulin surplus or shortage	Number of people with Type 1 diabetes based on insulin ordered ¹
Niassa	893,000	81	1,051	150 (0.3%)	(901)	12
Cabo Delgado	1,495,000	135	1,759	1,500 (2.5%)	(259)	115
Nampula	3,337,000	302	3,927	2,550 (4.3%)	(1,377)	196
Zambezia	3,395,000	307	3,995	3,380 (5.7%)	(615)	260
Tete	1,353,000	122	1,592	1,600 (2.7%)	8	123
Manica	1,172,000	106	1,379	1,200 (2.0%)	(179)	92
Sofala	1,485,000	134	1,747	1,697 (2.8%)	(50)	131
Inhambane	1,291,000	117	1,519	500 (0.8%)	(1,019)	38
Gaza	1,234,000	112	1,452	950 (1.6%)	(502)	73
Maputo Province	2,000,000	181	2,353	46,130 (77.3%)	43,777	3,548
Total	17,655,000	1,598	11,960	59,657	47,697	4,589

¹ - Based on consumption of 35 units of insulin per day with 100 IU/ml vials. Each vial contains 1,000 units, therefore per year one person would consume about 13 vials of insulin.

² - Based on quantities requisitioned for 2002 from CMAM

The data above were obtained from Medimoc and CMAM and the analysis was carried out by the IIF. Table 5 shows how most areas have a shortage of insulin supply based on the expected number of patients.

However, on the basis of these figures, it would appear that Mozambique as a whole has a surplus of insulin. The quantity of insulin ordered by Mozambique is enough to treat 4,589 patients for a year which is almost three times as many Type 1 diabetic patients as estimated using the existing data from Maputo. Insulin ordered in Maputo would be sufficient for 19 times as many patients as expected. This is assuming that all insulin is used for patients with Type 1 diabetes². Some of this insulin may be consequent upon a wider catchment population for the Central Hospital than Maputo City and Province. Also substantial amounts of insulin in Maputo may be employed in treating patients with Type 2 diabetes, on present patterns of ordering any such use of insulin elsewhere in Mozambique would further constrain the availability of insulin for Type 1 patients. The analysis of these numbers is based on assumptions with regards to the accuracy of the data provided and the number of people with Type 1 diabetes. All these problems would be solved with appropriate quantification and consumption control mechanisms in place.

² Exact data on patients with Type 2 diabetes is not present. Using data from HCM there is a total of 133 Type 2 patients using insulin (27.1% of total number of Type 2 patients). This would only add 1,729 vials of insulin used per year in Maputo.

It should also be noted that sometimes provinces buy directly from the Private sector. Data on the size of these purchases is unavailable.

The only monitoring system of quantities of insulin, seen during the project, was a database kept at HCM, which was created in 2002. The database contained the following information:

- Name of patient
- Date of patient visit
- Formulary code for insulin
- Type of insulin
- Concentration
- Where prescription came from
- Quantity dispensed in vials

As the HCM pharmacy attends to people from all over Mozambique this database was aimed to keep track of the quantities of insulin needed. In looking at this database, for some people there is only one entry, meaning either that they had not subsequently returned or that their last visit to the pharmacy was not recorded.

Even though there is an apparent oversupply of insulin (Table 5), people with diabetes and hospital workers often complained of a general lack of insulin at public pharmacies. This was said to be due to insulin simply not being present and in consequence doctors limited the amount prescribed. This was said to be partly because of fears that insulin they were prescribing was being sold to other patients or in South Africa.

4.3. Communication and coordination between Medimoc/CMAM and end users

In parallel to the problem of quantification, there is a lack of communication and coordination between Medimoc/CMAM and end users of insulin. An example of this is that at the Medimoc warehouse in Beira over 1,000 vials of Rapid and 360 vials of Slow acting insulin were present, yet the Pharmacist at HCB stated that there was a lack at his pharmacy.

It seems that the last step of the distribution process from the Provincial Medical Depositories or the Medimoc/CMAM warehouses is where the problem lies. Clear reasons for this problem were not apparent during the research.

4.4. Price of insulin

In the Regulations of the Social Fund for Medicines and Food Supplements, Boletim da Republica, 4 Suplemento, Decreto no. 16/88, 27th December, 1988, it is stated that “The Social Fund for Medicines has, as its objective, to subsidise totally, or in part, the acquisition in National Health Service pharmacies, of medicines for population groups needing economic support, namely: Patients with chronic illnesses who need permanent treatment and for whom the cost of that treatment represents an economic burden incompatible with the family income.”

During the interviews it was stated that for inpatients insulin is free and outpatients had to pay a small price. Many health workers stated this in reference to what they called the “Law on Chronic Diseases” However, in discussions with patients and looking at the table below we see that the prices that patients have to pay to get their insulin vary greatly. As Hospitals frequently have no insulin, patients need to find innovative ways, such as private pharmacies, sources in

other countries, purchasing expired insulin from health workers, etc. to get their insulin. One story that was told was of a patient who lived 600 km away from the closest source of insulin. This patient would sometimes travel that distance to get his medicine or his church group would get someone to send it from Malawi.

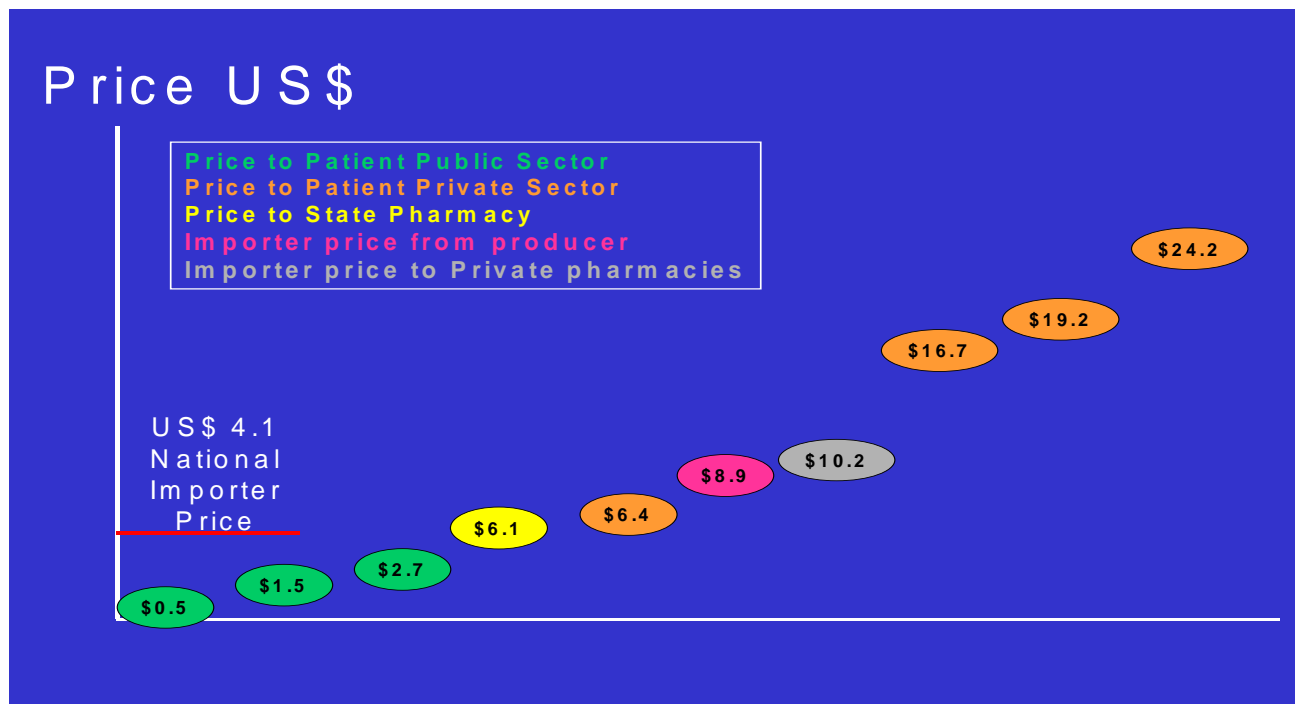


Figure 5 – Price of insulin (per vial) in Mozambique

As the government sources of insulin are unreliable, patients often do not take the prescribed amount of insulin so that their supply lasts longer. The cost of treatment was ranked as the highest concern for patients, but only 13% stated it was the hardest aspect of treatment. This is mainly due to uncertainty as the patient does not know if there will be sufficient quantities of subsidised insulin and syringes.

During the research it was stated that sales of insulin in Private Pharmacies was increasing, which may imply that people with diabetes now regard the Private sector as a more reliable source of insulin.

5. Access to Syringes

Despite problems with insulin, lack of availability and the cost of other necessary materials were also mentioned by many as a hindrance to proper treatment. As was said by one patient, “I am a government employee and this should make things easier, but it doesn't... when I go to a state pharmacy they don't have anything and I can't afford the price in other pharmacies.”

Syringes are not always present at the subsidised price of MZM 1,000 (US\$ 0.04) and can sometimes be purchased only in private pharmacies at 5 times the price. As sources are unreliable, when asked about how often they change their syringes, answers varied considerably. Some said, “Depends on the needle, when it hurts I change it.” For some it depended on their

supply and how easy they viewed their ability to get new syringes. Their answers ranged from daily, every 5 days, to every 2 weeks. Another issue with syringes is the size and type of syringe available. The problem with syringe supply is again linked to the problem of quantification.

6. Access to insulin and diabetes care

According to the National Formulary insulin should be present at Health Centres and can be prescribed by medical technicians. However, the only location where insulin was available at highly subsidised costs was at Central and Provincial Hospitals (where adequate storage facilities are present) and only Doctors are adequately trained and knowledgeable for its prescription.

The same is true for diabetes care where a lack of infrastructure and resources is present in all settings except at Provincial and Central Hospitals.

HCM provides a good level of care with diabetes consultations, has the adequate testing facilities, staff and, sometimes, insulin. Two other General Hospitals in the vicinity of Maputo have the basic tools for diagnosis, but lack the staff and insulin so refer their patients to HCM. As was emphasised by what someone working for the Ministério de Saúde (Ministry of Health, MISAU), "Diabetes is not a problem [where I work] as all patients go to HCM."

In Beira the care is provided by a foreign doctor who holds a diabetes clinic once a week. Staff is in shorter supply and the level of knowledge and training seems to be lower than that of staff in Maputo. The clinic would not exist without the presence of the foreign doctor, which brings up the issue of sustainability. However, Universidade Católica Beira (Catholic University Beira, UCB) is planning to start an outpatient clinic that could work in parallel to the current clinic and in the future replace it.

Finally in Lichinga there is no specialised care for diabetic patients and the lack of staff and training is apparent. This means that patients need to travel to Nampula or even Maputo to receive adequate care.

Besides the care received at Hospitals, Associação Moçambicana dos Diabéticos (Association of Mozambican Diabetics, AMODIA) provides some very basic services only in Maputo. AMODIA is still in its early stages of development. It is funded by donations and a small profit from the sale of medicines, has 124 active members (all of whom are patients) and four people working for it on a regular basis (1 Nurse (paid), and 3 Administrators (1 paid, 2 volunteers)).

AMODIA provides mainly guidance with regards to diet and basic check-ups for patients as it lacks medicines and tools for the treatment and diagnosis of diabetes. For this purpose it has three sources of information (in the form of leaflets or booklets) it provides to patients. It was known only by certain physicians in Maputo, who were actively involved in its establishment and management. Others did not know of its existence. Similar organisations do not exist elsewhere in Mozambique, but most patients said they would welcome the support an association could offer.

7. Diagnostic issues

The data in Tables 1 and 2 suggest that many people with diabetes are not being diagnosed. According to the health care workers interviewed this is mainly due to a lack of tools such as glucometers and urine test strips. As one health care worker put it "The closer they are [people

with diabetes] to a hospital the better they are." Another comment often heard was that patient's diagnosis was often due to chance. For example one patient said he was diagnosed when he went in for treatment for malaria and the doctor also asked for a glucose test to be done. When patients were asked how they were diagnosed 67% said because of the 3 classical symptoms of Type 1 diabetes (excessive thirst (polydipsia), excessive urine (polyuria) and weight loss), 28% through routine screening and 5% in another way.

In theory when a patient presents to a doctor with the three classic symptoms and the appropriate diagnostic tools are available the person will be diagnosed correctly. There is, however, a lack of urine test strips and glucometers present at all levels of Mozambique's health care infrastructure.

The table below shows data collected from different Hospitals and Health Centres on various tools needed for proper diagnosis of people with diabetes and if they were present (n=37).

Table 7 – Presence of “proper tools” for diabetes diagnosis in different health settings

Item	Present
Blood glucose machine	21%
Are consumables available for the Blood glucose machine	6%
Is there glucose for Oral Glucose Tolerance Testing	0%
Urine testing strips	18%

Besides a lack of consumables, there is also a lack of laboratory and trained staff. There is a large difference in testing facilities between the three areas visited. Laboratory tests for inpatients are free and some outpatients sometimes need to pay some fee. This fee varies, but on average a blood glucose test costs about MZM 5,000 (US\$ 0.21).

8. Training

Most people interviewed highlighted the point that health workers in general recognise the most common diseases in their setting. One interviewee said the following about doctors and their training, "Diabetes is part of curriculum, but doctors know what they see." Fifty two percent of healthcare workers interviewed said they had received some training on diabetes during their medical education, but very few will actually come across, let alone treat, a patient with diabetes. Healthcare workers have also learnt how to treat common diseases well with the resources they have. An employee of MISAU in Beira stated that, "TB is treated well with Directly Observed Treatment programmes as we have staff who were trained by the WHO. Malaria is endemic here and well treated as it is recognised by health care workers and they know how to treat it." This is not the case for diabetes where many administrators, patients and even healthcare workers themselves said that there is a general lack of knowledge of what diabetes is, and how it should be treated. For example most doctors do not know the differences between the different types of insulin and when they should be used.

One issue of medical training is that medical students learn within a protected environment meaning that they are ill equipped to cope with the realities of the Health system in the field Mozambique. They also lack basic communication skills and essential skills in treating patients with chronic diseases .

Adequate training of doctors is essential in diabetes as 89% of patients interviewed were initially diagnosed by a doctor and most viewed doctors as the most helpful in their diabetes management.

9. Lack of guidelines and referral pathways

Care for a patient with diabetes in Mozambique is not standardised as each patient will face different challenges depending on the location where they live, their socio-economic status, family structure, etc. Many doctors discussed the general lack of organisation and control of patients and medicines. This is a generalised problem for all conditions, but has major impact on patients with diabetes as constant follow-up is needed.

Patients are usually admitted to Hospitals, cared for, given basic education about diet and insulin administration and then given a follow-up appointment. This is the path of those patients who are admitted to Hospitals where some appropriate infrastructure is present.

In the two part “Manual do Medicamentos Essenciais – do posto de saúde até ao hospital de referência” (Manual of Essential Medicines – from the Health Post to the Referral Hospital), a copy of which is provided to as many people as possible in the healthcare system, there is no mention of insulin in the section that describes medicines and their use. The entry for diabetes discusses prescribing Chlortalidone, Glibenclamide, oral contraceptives, Prednisolone, Propanolol and Salbutamol to people with diabetes.

The second half includes a section for diabetes. The following information is contained:

- Symptoms
- Description of disease
- Conditions for treatment of IDDM (standard treatment guidelines and insulin administration)
- Therapy and maintenance
- Diet for diabetics
- Infections and other serious illnesses
- Diabetes in children
- Hypoglycaemic coma and Hyperglycaemia
- A table describing the treatment for NIDDM

There is also a special section for diabetes and pregnancy.

10. "Diabetes is not important for the government."

At MISAU there is only one person who deals with Non Communicable Diseases. This lack of resources put to chronic care is not only due to an already overburdened health system, but also, as was emphasised by many, that Mozambique had other priorities than diabetes. One person working for MISAU even said, "Diabetes is not important for the government."

11. Traditional Healers

Traditional Healers, or Curandeiros, play an important role in providing health care to both rural and urban populations. As many people do not have access to modern medicine, Curandeiros are their only source of care. Any new program aimed at improving the health care of Mozambicans needs to include this group of people.

- 60% of those interviewed were members of Mozambican Association of Traditional Healers (AMETRAMO)
- 80% had heard of diabetes

- They treat a wide range of diseases, but refer to “Modern” medicine if patient has:
 - What they termed “Lack of blood and/or water”
 - Heart problems
 - "Invisible diseases" or other diseases that Traditional Healers cannot treat

All Traditional Healers interviewed had seen patients with the three classical symptoms of diabetes. Some treated them with herbal remedies or they referred them on to a Hospital.

80% of Traditional Healers interviewed said that they "Sometimes" referred patients to modern medicine, with the remaining 20% "Always" referring patients. Most, 76%, of Healthcare Workers interviewed said that Traditional Healers "Never" referred patients to them.

12. Other Problems

In discussions with different people the following other problems were noted:

- **“Lack of everything from desks to medicines”:** was something that was repeated many times by health workers.
- **Pharmacy fragmentation and lack of control:** Each department within hospital has their own pharmacy which leads to some hoarding and a lack of control of supplies.
- **No earmarked funds for Chronic diseases/diabetes**
- **Social distance between doctor and patient:** This is two-fold between Mozambican doctors and their patients, as well as between foreign doctors treating Mozambican patients.
- **Lack of coordination between medical staff:** Problems with follow-up as patient is not treated by same doctor all the time or goes to different hospitals for treatment
- **Lack of information:** Most clinics had no information to hand out to patients or visual aids. The only information material that was seen during the study was at AMODIA. Information campaigns, which are mainly in the form of posters in Health Centres, are mainly for diseases with the highest prevalence, such as, Tuberculosis, Malaria and STIs. Some posters for epilepsy were present in some Health Centres. This lack of information leads to patients not having much knowledge about diabetes.

13. Some positive points

The medicine distribution system works well until the last two stages of distribution, getting the insulin from the warehouse to the hospital and then from the hospital to the patient.

There were no noted problems with the cold chain at any level of the study, even though power cuts sometimes occur.

There are no problems with the quality of insulin that Mozambique receives and there was no black market for insulin. A parallel market exists, where people buy insulin from private pharmacies and clinics which sometimes get their supplies from other countries, and also people who buy insulin directly from other countries.

14. Discussion

During our discussions with the people interviewed they became aware of the problem that people with diabetes face. Most patients were grateful and spent a lot of time talking to the people interviewing them. As one interviewer put it, “It was good for patients to talk to someone about their problems.” Through these discussions not only was much information collected, but also hopefully some awareness was created.

In 1901 Dr. Cook wrote in his notes on diseases met in Africa "... diabetes is very uncommon but very fatal...". (Quote taken from Vexiau, F. et al.[11]). Has anything really changed in the past 102 years? Yes and no. Diabetes is more common than in 1901 as it is being recognised by health care workers in Mozambique, but it is still underdiagnosed and still life-threatening due to the lack of access to:

- Insulin
- Syringes
- Appropriate medical care
- Education

15. Recommendations

Keeping in mind the resource restrictions present in Mozambique the following recommendations aim to make best use of limited resources and also to benefit other areas of the health system in Mozambique.

Problem	Solution	Stakeholders	Measures of success
Lack of collaboration, communication and coordination between Medimoc and CMAM with end users	Better reporting and control mechanisms. For example a database system, such as the one present at HCM, should be in place in all pharmacies where it is possible, and if not supply cards need to be kept up to date. The main pharmacy at each hospital should have more control over the distribution of medicines throughout the hospital. This information should then be centralised at Medimoc/CMAM. The problem with the final stages of distribution needs to be solved. Further investigation into this problem may be needed.	Medimoc, CMAM, MISAU, Pharmaceutical Department, WHO	Insulin available at all Hospitals and no complaints by patients of lack of insulin.
Problems with Quantification	Better reporting and control mechanisms and creation of register/surveillance system	Medimoc, CMAM, MISAU, Pharmaceutical Department, WHO	No reported waste or shortage from Medical Depositories and Pharmacies.
Centralised national register for diabetes	Creation of register/surveillance system	MISAU, WHO	Creation of register and ongoing registration of patients.
Lack of resources for adequate diagnosis	Increase tools where necessary	MISAU, Donors	Presence of urine test strips (glucose, ketones) at all Health Centres and at least one Glucometer present at each Hospital.
Regulations of the Social Fund for Medicines and Food Supplements, Boletim da	Clarification/enforcement of Regulations of the Social Fund for Medicines and Food Supplements, Boletim da Republica, 4 Suplemento, Decreto no. 16/88, 27th December, 1988.	MISAU	Clear statement from Ministry of Health and implementation in practice for patients.

Problem	Solution	Stakeholders	Measures of success
Republica, 4 Suplemento, Decreto no. 16/88, 27th December, 1988 not applied in practice			
Absence of guidelines for care	Guidelines for care should also be developed: <ul style="list-style-type: none"> - Advice on diagnosis, and a formal referral system as it not feasible to have each health post provide appropriate care for diabetics - “Emergency measures” to treat people with diabetes that may present in coma - A system for patient follow-up, including educational material for doctors and health workers - Special guidelines for Traditional Healers 	MISAU, Physicians, IDF, AMODIA, Tanzania Diabetes Association, AMETRAMO	Guidelines created and widely disseminated.
Lack of appropriate training for health care workers and other people involved in the provision of care and medicines.	Training for health care workers should focus on: <ul style="list-style-type: none"> - Identification of diabetes and its symptoms - Treatment of diabetes, referral where appropriate - Communication skills - Care for patients with chronic conditions and how it is different from care for communicable diseases - The importance of the patient’s role in caring for diabetes - How to teach patients to lead the “insulin life” - What the different types of insulin are and when and how they should be used <p>Included in this training should be laboratory technicians as a large part of the problem in Mozambique is lack of diagnosis and also pharmacists and logisticians to deal with problems associated to medicine supply.</p>	MISAU, WHO, IDF	<ul style="list-style-type: none"> - Adaptation of medical curriculum to include care for diabetes and chronic conditions - Training of staff at all Hospitals - Training of all staff
Lack of diabetes specialists	Identify and train specialists	MISAU, IDF	Specialists in place and treating patients

Problem	Solution	Stakeholders	Measures of success
Lack of diabetes clinics	There should be formal diabetes clinics established at 3 Central Hospitals in the immediate future with the aim of increasing the scope of these clinics to each Provincial Hospital. These clinics would have trained staff dedicated to them, offer laboratory tests, write prescriptions, provide check-ups for people with diabetes and be a source of information and assistance to patients and families, as well as to the Provincial Hospitals, and ultimately Health Centres. These clinics could be held within the Hospital or be run by AMODIA.	MISAU, AMODIA, IDF, WHO, Tanzanian Diabetes Association	Clinics in place and operational
Lack of definition of AMODIA's role	AMODIA could usefully establish its wider role in the Mozambican diabetes arena. AMODIA could become a national source of information, provider of care, advocate or a mix of these three elements. In any case AMODIA needs to increase its collaboration with MISAU, health workers and also IDF, and have greater involvement with patients.	AMODIA, IDF, National European Diabetes Association, Tanzania Diabetes Association	AMODIA established, active and recognised in the diabetes arena
Lack of knowledge in general public	Organise awareness campaign	MISAU, AMODIA, WHO, IDF	Awareness campaign held
Patients do not have access to subsidised insulin	Improve distribution or create a way for patients to access insulin in the private sector for example with vouchers.	MISAU, CMAM, Medimoc	No patient problems accessing insulin
Other problems such as diet	Create proper environment for health of people with diabetes Develop appropriate dietary recommendations for Mozambique	All stakeholders	

16. Conclusion

For its first field test the RAPIA proved to be a very useful tool. The RAPIA collected information in a structured form which made the data comparable and simple to use for the analysis and report writing.

The RAPIA worked well in three very different settings and that the RAPIA is capable of being implemented in different countries and in different areas of these countries. One major strength of the RAPIA was how useful it was in comparing different areas of the same country.

16.1. Lessons from pilot of the RAPIA in Mozambique

The RAPIA proved to be an extremely useful tool which enabled vital information on the situation that people with diabetes face to be collected.

Some problems with the RAPIA were:

- Some questionnaires were too long
- Some questions were seen as not important
- Some questions were very similar
- Questionnaires were too general
- The questionnaire for health workers, catered to a variety of health workers, but the different levels of knowledge made the questionnaire difficult for some

Some other problems were:

- Language problems as the questionnaires were in proper Portuguese and people do not speak it in rural areas
- People requesting to be paid for information

Other points:

- The people carrying out the interviews, must be able to explain the work they are doing and why they are doing it very clearly.
- Support from the Ministry of Health or local partner, must be more than just a letter, active support is needed.
- The Informed consent form and patient information sheet need to be explained carefully
- Not all key people were available to be interviewed. What happened in this case was that the Project Coordinator explained the project and questionnaire to the person and the person completed the questionnaire when they were able to. Any questions or comments were collected by the Project Coordinator when the questionnaire was collected.

16.2. Changes to the RAPIA

The main changes to the RAPIA are the following:

- Shortening of questionnaires where possible
- Dividing certain questionnaires into more specific “mini” questionnaires
- Re-wording and simplifying some questions
- Some questions in different questionnaires will be added to others or made more similar to others to increase the aspect of triangulation within the RAPIA.

16.3. Next steps in Mozambique

On the 9th of September 2003 at MISAU the IIF presented its results of the RAPIA to a panel of representatives from MISAU, clinicians, delegates from the WHO (Headquarters, AFRO and Mozambique Country Office) and members of AMODIA.

Following this presentation and some meetings with different stakeholders it was agreed that MISAU and AMODIA would meet to discuss their priorities with regards to the recommendations made by the IIF.

It should be noted that one recommendation proposed by the IIF, namely the creation of a surveillance system, is being implemented by MISAU in collaboration with WHO.

17. Action Plan

Based on the recommendations presented in September 2003 a visit by IDF Africa Region represented by Dr. Kaushik Ramaiya and the IIF represented by David Beran in August 2004 to develop an Action Plan with local stakeholders. This Action Plan and the visit report are presented below. Initially a 6-month plan will be developed. After this period an evaluation will be made and the continuation of the support from the IDF Africa Region and IIF will be dependent on these reports.

The assistance provided will be to different stakeholders in Mozambique:

- AMODIA Maputo, Materials
- AMODIA Beira, Materials

The aim of the activities below are to build capacity in an integrated way.

Visit Report – Mozambique

Meetings:

Dr. Silva-Matos, National Director Non-Communicable Diseases, Ministry of Health

Mrs. Maciel, AMODIA

Dr. Iaccubo, Director, Central Hospital Maputo

Dr. Ferro, Director, Central Hospital Beira

Dr. Caupers, Clinician, Central Hospital Maputo

Dr. Teixeira, Director of Pharmacy, Central Hospital Maputo

Prof. Fernandes, Clinician and Head of Department, Central Hospital Maputo

Dr. Manguela, National Director of Health, Ministry of Health

Dr. Durao, Director Department of Pharmacy, Ministry of Health

Mr. Baude, President, AMODIA Beira

Dr. Gomes, Director, Medimoc

Site visits:

Central Hospital Maputo

Central Hospital Beira

AMODIA clinic Maputo

Presentations and discussions:

AMODIA Maputo

AMODIA Beira

Discussion Points

- Role of Diabetes Association in Mozambique
- Relationship between AMODIA and Ministry of Health
- Need for training of healthcare workers
- Need for patient education and information
- Problem of misdiagnosed and undiagnosed patients
- Lack of testing materials and infrastructure
- Development of a National Diabetes Policy within the framework of a National Non-Communicable Disease Policy

Impact of RAPIA and developments in Mozambique

During the implementation of the RAPIA in Mozambique in April-May 2003 there were problems with the supply of insulin to the Hospitals from Central Medical Stores. At the Central Hospital in Beira there was no insulin present. The lack of insulin was the main complaint healthcare workers and patients mentioned. During this visit all stakeholders stated that the supply of insulin had improved substantially and it was present on an uninterrupted basis.

The issue of quantification of needs still remains a problem, but the authorities at a Central level as well as the Pharmacists are aware of the problem and are taking steps to improve this.

Since the IIF's work in Mozambique AMODIA Beira has been created by patients and currently has 100 members. It is extremely dynamic and has the support of the Central Hospital Beira and authorities.

AMODIA Maputo still runs a clinic 3 times a week. A doctor is present once a week, but the majority of clinics are run by a nurse. AMODIA Maputo now has its own office space, but serious refurbishment is needed. There has also been renewed involvement of the Ministry and leading physicians together with a planned meeting in September should be enable it to continue develop its activities further.

At the level of the Ministry, Dr. C. Silva-Matos is extremely dynamic and is championing the cause of diabetes and Non-Communicable Diseases in Mozambique. The RAPIA has provided the Ministry with an initial step towards developing a comprehensive National Diabetes and Non-Communicable Disease programme.

Mozambique has completed the first level of their STEPS assessment and are now analysing the data.

Phase 1 – Plan for AMODIA Maputo

Step 1

Meeting 6 September 2004

Necessary outcomes:

- Interim Committee
- Minutes of meeting
- Contact person for AMODIA
- Establish a structure for integration of other branches in the country
- Plan of action for next 6 months including activities for World Diabetes Day and budget
- Memorandum of agreement with Central Hospital Maputo regarding referrals and prescriptions from AMODIA

Step 2

Shipment of “Start-up Kits” containing:

- 5,000 urine strips
- 1,000 glucose strips
- 1,000 syringes

Provision of monthly stock keeping forms and cash flow chart.

Material to be used by AMODIA to start revolving fund for association activities and further purchase of material.

Monthly reports of stock and cash flow to be maintained and sent to:

- MISAU: Dr. C. Silva-Matos
- IDF Africa: Dr. K. Ramaiya
- IIF: D. Beran

Step 3

6 months after receipt of shipment, AMODIA Maputo will submit a report to:

- MISAU: Dr. C. Silva-Matos
- IDF Africa: Dr. K. Ramaiya
- IIF: D. Beran

containing the following information:

- Activities of Association during the past 6 months
- Description of how material provided has been used
- Compilation of monthly and final statement of stock and cash flow
- Minutes from any meetings held
- Update on numbers of members
- Full financial accounts for all income and expenditure over period
- Action Plan for next period of 1 year

Phase 2 – based on Action Plan provided above

Phase 1 – Plan for AMODIA Beira

Step 1

AMODIA Beira to send constitution, list of officers, plan of collaboration with AMODIA Maputo and Action Plan to:

- MISAU: Dr. C. Silva-Matos
- IDF Africa: Dr. K. Ramaiya
- IIF: D. Beran

Step 2

Shipment of “Start-up Kits” containing:

- 3,000 urine strips
- 500 glucose strips
- 250 syringes

Provision of monthly stock keeping forms and cash flow chart.

Material to be used by AMODIA to start revolving fund for association activities and further purchase of material.

Monthly reports of stock and cash flow to be maintained and sent to:

- MISAU: Dr. C. Silva-Matos
- IDF Africa: Dr. K. Ramaiya
- IIF: D. Beran

Step 3

6 months after receipt of shipment, AMODIA Beira will submit a report to:

- MISAU: Dr. C. Silva-Matos
- IDF Africa: Dr. K. Ramaiya
- IIF: D. Beran

containing the following information:

- Activities of Association during the past 6 months
- Description of how material provided has been used
- Compilation of monthly and final statement of stock and cash flow
- Minutes from any meetings held
- Update on numbers of members
- Full financial accounts for all income and expenditure
- Action Plan for next period of 1 year

Phase 2 – based on Action Plan provided above

Phase 1 – Plan for Ministry of Health (MISAU)

Step 1

Dr. C. Silva-Matos to provide budget for the following activities:

- Translation of IDF Africa Region training modules, patient education templates and other material
- Training of staff at three Central Hospitals
- World Diabetes Day activities
- Other

Memorandum of agreement between MISAU and AMODIA with regards to supply of medical equipment and supplies and purchase of equipment by AMODIA

Update of formulary to include current evidence based treatment guidelines.

Provide Dr. K. Ramaiya's contacts of suppliers of materials and medications to MISAU Department of Pharmacy

Step 2

- Translation of materials
- Training sessions
- Identification and budgeting of specialised training (pharmacies, central medical stores, MISAU)

Step 3

Activity report February 2005, to include:

- Activities during the past 6 months
- Action Plan for next period of 1 year

Phase 2 – based on Action Plan provided above

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- Dr. Paula Caupers
- Dalila Maciel
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- Prof. Julie Cliff
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