

## Diabetes in Africa: the dark tunnel

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### Introduction

As a major non-communicable disease (NCD), diabetes is becoming an important health problem, not only in Africa, but globally. Currently there are 346 million people with diabetes<sup>1</sup> and this number is projected to jump to 436 million in 2030.<sup>2</sup> Observers might notice that despite the rising rates, little attention is paid to the problem in the developing countries, especially in Africa.<sup>3</sup> Here, the burden of the disease is becoming significantly important because of its association with tuberculosis (TB), in that diabetes is found to increase susceptibility to TB.<sup>4</sup> It has also been found that some antiretroviral drugs increase the risk of developing type 2 diabetes.<sup>5</sup>

Diabetes is different from top priority infectious diseases, such as TB and HIV, regarding treatment and care. Diabetes requires a multi-disciplinary approach at the level of healthcare provision, and a multi-dimensional social approach at the level of the community. Management requires appropriate and sustainable stocks of medicines, sophisticated laboratory tests and equipment, trained health personnel, and clear feasible policies. At the community level, accessible and affordable care, good knowledge and correct personal care practices – including nutrition and proper storage and administration of drugs – are the major challenges.

### Epidemiology

In Africa, in the year 2011, the number of people living with diabetes was estimated to be 14.7 million.<sup>6</sup> The major type in the continent is type 2, which accounts for over 90% of diabetes in Africa, with the remainder being type 1.<sup>7</sup> Current prevalence rates do not reflect the real figure as in Africa there is a high rate of undiagnosed diabetes.<sup>8</sup> The global prevalence is expected to double by 2030.<sup>9</sup>

Until recently, diabetes was considered a disease of industrial countries and Africa in a safer position. But now Africa, among the low- and middle- income countries, carries a high burden of disease. The rapidly rising incidence is attributed to global population growth and aging,<sup>10</sup> and Africa has an additional disadvantage of rapid urbanisation, obesity, and inactivity.<sup>7</sup> The diabetes mortality in Africa is about 6% of all deaths with the majority below 60 years.<sup>6</sup>

### Prevention and care

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Africa is still in its infancy regarding diabetes care, partly because of the very limited resources that the continent has and partly because of not setting diabetes as a priority health problem in many countries. There have been very few studies about diabetes care in Africa and management often appears to be sub-optimal.<sup>11</sup>

Diabetes prevention and care requires, in addition to technical inputs, political will and positive policy enforcement, and community and civil society involvement, if we are to utilise the few resources available for better care.<sup>12,13</sup> Prevention and care requires resources that are frequently simply unavailable. However, a pilot specialised health centre can be established and can show promising results, as has happened in Eritrea.<sup>14</sup> The few studies about diabetes care in Africa suggest that solid and well-organised health systems with multi-sectoral approach and sustainable resources are needed to improve diabetes care and prevent complications.<sup>7,8</sup> Africa has many paradoxical phenomena, for example, the continent carries about 60% of the global burden of disease, yet it spends only 1% of the global expenditure on health.<sup>15</sup>

### Diabetes, HIV/AIDS, and TB

The interaction between these three diseases is well established globally and in Africa specifically. AIDS patients are at higher risk of diabetes due to the toxic side-effects of treatment.<sup>16</sup> Also, diabetes has been confirmed to be a major risk factor for TB.<sup>17-20</sup> These three epidemics are not happening in isolation or just linked by TB, rather they are inter-relating and affecting each other (see Figure 1).

### Life in Africa

People in rural Africa have poor access to clean water and electricity, as well as healthcare services. The current approaches to diabetes management require and use systems difficult to place in rural areas where most of the population live. Among the inputs that are needed are well-trained health personnel, improving availability and sustainability of medicines and laboratory services,



Figure 1 The inter-relation between diabetes, TB, and HIV/AIDS

health education and screening for and early detection of complications, and glycaemic control. Adequate numbers of health professionals to meet the need are rarely available.<sup>21-23</sup>

### Expenditure on diabetes

The African economy is fragile. Also, the 70% who dwell in rural areas benefit less from public expenditure on health in general, while urban dwellers are advantaged. Subsidised healthcare services are concentrated in urban areas, thus the majority receive less and the minority more.<sup>24</sup>

The expenditure on diabetes was estimated to be 11% to 12% of the global expenditure on healthcare in general. The global per capita spending was estimated at US\$1330 in 2010. Of course, this figure varies between regions and countries with US\$5063 per person in high-income countries and US\$271 in low- and middle-income countries. The total expenditure in 2010 was anticipated to be US\$376 billion and US\$490 billion in 2030. Low- and middle-income countries receive only 20% of the cake while 80% of the burden lies there – another paradox. Africa was estimated to have spent only US\$2.8 billion during 2011 and that clearly shows that Africa has the least expenditure on diabetes care. Although the prevalence is expected to double by 2030, the expenditure is anticipated to increase by 61% making the tunnel even darker.<sup>25,26</sup>

### Health education

Illiterate people are more prone to the serious effects of the diabetes epidemic. They are at higher risk of remaining undiagnosed and untreated, and less likely to cope with and adhere to the management protocols.<sup>27</sup>

Diabetes education in Africa is an effective tool and is not attracting the attention it deserves. It is also crucial for health professionals to be aware and involved in the campaign, and, not only patients but also their families to be educated. We do not have detailed information on the appreciation of the disease among health professionals, but as an example, diabetes is rarely an item for discussion at hospital clinical meetings.

Diabetes education in the continent faces many challenges. de Clerk mentioned some of these challenges: poor communication between health professionals and patients, lack of funding and awareness, and inappropriate materials. Most of the available materials are produced in developed countries and do not match African characteristics and cultural needs.<sup>28</sup>

### The NCD Alliance/CNCD Africa

The NCD (non-communicable disease) Alliance is an advocacy body founded by four NCD organisations: The International Diabetes Federation, Union for International Cancer Control, World Heart Federation, and The International Union Against Tuberculosis and Lung Disease. Its core business is to put NCDs on the global

agenda. The Alliance believes that NCDs are a vital part of the Millennium Development Goals.

The CNCD Africa is a consortium initiated by the International Union for Health Promotion and Education (IUHPE) and the African Institute for Health and Development (AIHD). Its main objective is to support sub-Saharan African countries to advocate and maximise their efforts for NCD prevention and control.

### Conclusions

In conclusion, the newly emerging diabetes epidemic will be a major challenge to Africa in the next 10–15 years. The amount of research about diabetes in Africa is still failing to explore all aspects of the problem. The incidence and prevalence of the disease is rising and affects all social classes. The current health system capacity is far less than can address and tackle the problem. The co-occurrence of diabetes, TB, and HIV/AIDS – and the complex interaction of these conditions – is a further emerging and increasing problem.

### Discussion

If we compare the NCD epidemic with that of communicable diseases it is likely that for some time at least Africa will be underfunded. Unlike communicable diseases, NCDs prevail throughout the world, though with varying prevalence and incidences, which mean even the developed countries will compete to get as much as they need, especially in research and technology development.

### The way forward?

A robust Africa-tailored research system which covers all aspects of diabetes care is urgently needed. Scientists should alert and mobilise the political will in order to table diabetes for discussions and policy formulation. Diabetes associations in all Africa should play their role and lead the change. More collaborations and partnerships are urgently needed.

Integration of chronic diseases is essential, and TB/diabetes bi-directional screening is a good way of early detection of these two diseases. It is also important to encourage scientists and health institutions to invest in innovating new strategies and therapies, and these should be cost-effective and affordable. Africa needs to strategically and collectively plan for future as well as current problems, otherwise the disease will devastate our people and economies.

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# Review Article

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# Diabetes News

## IDF and its partners launch new programme to reduce the burden of lower-limb amputations in sub-Saharan Africa

The International Diabetes Federation (IDF) and its partners have launched a new programme aimed at preventing lower-extremity amputations in sub-Saharan Africa. The Diabetes Africa Foot Initiative (DAFI) is a multi-stakeholder partnership that will develop a comprehensive, affordable, and sustainable foot screening programme for the region.

The diabetic foot carries a high morbidity and mortality rate in Africa, and is increasing as the burden of diabetes continues to rise. Amputations remain high, despite intensive training of health workers in traditional preventive methods. DAFI aims to address the lack of a common, regionally accepted, sustainable, and comprehensive approach for diabetes foot care in the region.

The programme will be implemented in 10 countries: Cameroon, Ghana, Guinea, Kenya, Madagascar, Republic of Congo, Rwanda, Senegal, Tanzania, and Uganda. The first phase of DAFI will develop and implement a Risk-Stratification and Intervention Tool and its associated protocol in 10 selected diabetes centres. Health workers from these institutions will be trained in diabetes foot care and certified as Diabetes Foot Care Assistants.

## Popular diabetes drugs may harm the pancreas

Type 2 diabetes patients who are on incretin therapy have a higher risk of developing abnormalities in their pancreas compared with their counterparts on other types of diabetes therapies, researchers from the Larry L Hillblom Islet Research Center at UCLA and the Diabetes Center at the

University of Florida reported in the journal *Diabetes*.

The scientists explained that patients on incretin therapy were more likely to have rapid multiplication of pancreatic cells that may be associated with a higher risk of neuroendocrine tumours.

While analysing the organs of deceased donors who had type 2 diabetes, the researchers found that those who had been treated with incretin therapy had about 40% more cell mass in their pancreases.

Incretin therapy takes advantage of the action of the intestinal hormone GLP-1 (glucagon-like peptide 1) to reduce blood-sugar levels.

There have been several reports on what the effects of incretin therapies are on the pancreas in animal studies, and with conflicting results. The authors in this study say that theirs is the first to identify alterations in the human pancreas.

## Merck and Pfizer collaborate to develop new diabetes drug

Two pharmaceutical companies – Merck & Co Inc. and Pfizer Inc. – have announced that they have partnered up for the development of the type 2 diabetes drug ertugliflozin (PF-04971729), an investigational oral sodium glucose cotransporter (SGLT2) inhibitor. SGLT2 inhibitors work by excreting glucose in urine, which helps stabilise sugar levels.

There has been a huge rise in the number of treatment options for people suffering from diabetes over the past years. Demand for more effective medications continues to grow as many patients currently have to take more than one medication to regulate sugar levels and insulin.