

Economic impact and inequalities in diabetes in South Africa

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Valorisation Addendum

Diabetes is a major threat to global health that affects one in eleven adults between the ages of 20 to 79 years. Global estimates indicate an increase in prevalence from 463 million in 2019 to 700 million in 2045. It is expected that the increase in the prevalence of diabetes within low- and middle-income countries will be faster when compared to high income countries. Diabetes is also a major threat to economic activity as it mostly affects the working age population (3 out of 4 people with diabetes). Diabetes is also one of the leading causes of mortality globally. In South Africa it was recorded as the second biggest underlying cause of death in 2016. Without strong, targeted, evidence-based interventions diabetes has the potential to consume huge health budgets and overwhelm the country's health care system.

The South African government's Strategic Plan for the Prevention and Control of NCDs in South Africa provides direction for reducing the morbidity and mortality from non-communicable diseases, such as diabetes. As set out in the plan, one of the three primary approaches identified to minimise the burden of NCDs, such as diabetes, is the expansion of monitoring, surveillance and research of NCDs and their risk factors (National Department of Health, 2013).

This dissertation builds on the above by providing knowledge and insight that may influence policy or interventions targeted at the prevention and control of diabetes and its health outcomes. The overall goal of the dissertation was to evaluate the economic impact and the inequality aspects of diabetes in South Africa. The empirical analyses of this dissertation are based on two datasets: (1) the 2012 South African National Health and Nutrition Examination Survey (SANHANES-1); (2) primary data collected from three diabetes health care clinics in Tshwane health district in the Gauteng Province.

Once scientific research is completed, the dissemination of its results becomes critical to the prevention and control of diabetes. To achieve the targets set out in the Sustainable Development Goals targeted for 2030, it is important for the research to reach various stakeholders such as fellow researchers, people living with diabetes, their families, health care professionals, and policy makers. The PhD regulations at Maastricht university in 2018 define the process of valorisation as "the process of creating value from knowledge, by making knowledge

suitable and/or available for social (and/or economic) use and by making knowledge suitable for translation into competitive products, services, processes and new commercial activities". Hence, the purpose of this chapter is to provide an overview of the value of the results presented in this dissertation and how they can be put into practice.

Relevance for researchers

To promote further research, the results from this dissertation must be made available to fellow researchers and practitioners. To allow for this, five out of the six articles described in this dissertation have been published and the remaining one is currently under review. The five published articles are available in open access journals. In addition to stimulating debate, gathering additional information and obtaining additional insights, the results from some of the studies were presented at various conferences such as the African Health Economics Association conference in Ghana, the Public Health Association of South Africa conference and the Human Sciences Research Council conference in South Africa, before publication.

The studies described in this dissertation are relevant for researchers in the field of diabetes, cost of illness and socio-economic inequalities in health. Whilst the entire dissertation is relevant for all researchers interested in diabetes, Chapters 2 and 3 focus on cost of illness and Chapters 3, 4 and 5 assess the various inequality aspects of diabetes. The systematic review presented in Chapter 2 makes researchers aware of the shortcomings of cost of illness studies but also highlights their important role in conducting full economic evaluations of treatments and other health care interventions. Our results from Chapter 3 also point out to researchers the shortcomings of the various methods used within literature to measure catastrophic health expenditure and impoverishment. For robustness, our study employs two different methods in the estimation of catastrophic health expenditure and impoverishment. The study also applies various thresholds in the estimation of catastrophic health expenditure, leaving it to the reader to determine their selection. Whilst providing an overview of the economic impact of diabetes and inequality aspects in diabetes, the dissertation provides knowledge gaps in each chapter. This may guide future researchers to close these gaps in research. In addition to its contribution to the current scientific knowledge on the topic, the research may provide a reference case for future studies fellow researchers might conduct.

Relevance for people living with diabetes, people without diabetes, and health care professionals

The studies presented in this dissertation are relevant to people living with diabetes and people without diabetes as well as health care professionals. Whilst diabetes self-care is mostly the patient's responsibility (Funnell & Anderson, 2000), it is well established that health care professionals play a role in supporting diabetes self-care by patients and ultimately, in improving clinical outcomes. Healthcare professionals have the role of providing diabetic education and advice regarding self-care practices. There is increasing recognition that there is need for health care professionals to facilitate patient empowerment by focusing on the understanding the patient's diabetes experiences and treatment goals. An identification of the challenges that patients face in diabetes self-care (Chapter 5 and Chapter 6), presupposes health-care professional and patient interactions to be collaborative rather than directive. Such interactions encourage patient involvement in the care process, and promotes shared decision making.

The studies presented in this dissertation are also relevant for people living with diabetes and people without diabetes. Although it may be unrealistic to expect everyone to understand the studies presented in this dissertation completely the conclusions have been presented in a comprehensible way. It is important for both people living with diabetes and people without diabetes to be aware of: (1) the role that lifestyle factors play in the progression of socio-economic inequalities in both the onset and progression of diabetes (Chapter 4 and Chapter 5); (2) the factors that influence diabetes cardio-vascular disease comorbidity (Chapter 7); and (3) the economic implications of diabetes (Chapter 3). Such awareness may influence actions that prevent the development of diabetes or diabetes related complications. Being acquainted with diabetes and its challenges may mean family members are better equipped to participate in diabetes management. In the long run, people living with diabetes and people without diabetes do benefit from the policy implications of the scientific research reported in this dissertation.

Relevance of policy makers

For policy makers, the dissertation provides information on the economic impact (Chapter 3) and inequality aspects of diabetes (Chapters 4 to 7) in South Africa. The systematic review provided in Chapter 2 highlights to policy makers the huge economic impact (direct and indirect) of

diabetes in African countries. The review may inspire and give a message regarding the importance of addressing such costs, which impact economies, health care systems, societies, and individuals. Evidence generated from this dissertation provides policy implications for the renewed commitment to ensuring that the health care system offers financial protection from risks of catastrophic expenditure or impoverishment due to diabetes related health care payments. The dissertation suggests that financial protection of people with diabetes in public hospitals is limited highlighting the weaknesses of the current uniform fee payment schedule. This finding points to the need to eliminate user fees for diabetes patients who access public hospitals. This is particularly important for the achievement of universal health coverage in South Africa.

In addition to facing costs related to accessing healthcare, people with diabetes are faced with financial difficulties in adhering to some self-care practices. These challenges are discussed in Chapter 5 of the dissertation. The results suggest that individuals are often faced with financial difficulties in adhering to diet recommendations, medication, and glucose monitoring costs. Whilst pointing to the economic challenges faced by many individuals these challenges also highlight the need for a National Health Insurance Scheme that ensures distribution of chronic medication and glucose monitoring kits for people with diabetes.

The huge income inequalities in South Africa are intertwined with inequalities in health. Persisting social disparities, poverty and inequality in socio-economic status continue to influence the disproportionate distribution of social determinants of health and ultimately exacerbate inequalities in health and well-being (Ataguba et al., 2011). The dissertation suggests that in South Africa, differences in socio-economic inequalities exist in terms of diabetes prevalence, diabetes health care costs and diabetes self-care practices. We also find that socio-economic status has a role to play in the distribution of diabetes cardio-vascular disease comorbidity. These findings are important to policy makers in terms of informing the design of effective strategies and policies for addressing income inequalities and encouraging healthy lifestyles.

In the fight against diabetes South Africa could also draw lessons from the huge HIV programme within the country. Adherence clubs, community level programmes, facility-based interventions

and the introduction of case managers may be useful strategies for the promotion of healthy lifestyles, which are essential to the prevention and control of diabetes.