MANAGING CHRONIC DISEASES IN SOUTH AFRICA

moving from fragmented to coordinated, evidence-based care

BETWEEN 2006 AND 2015 STROKES AND HEART DISEASE COST SOUTH AFRICA
R25 BILLION[2]

PREVALENCE OF THE TOP THREE CHRONIC DISEASES IN THE 2013 SOUTH AFRICAN POPULATION COVERED BY MEDICAL SCHEMES[5].

- Hypertension: a prevalence rate of 87 per 1000 members amongst all beneficiaries; beneficiaries over the age of 55: **>200 PER 1000 MEMBERS** – a 33% increase in the five years since 2008, and rising.
- Hyperlipidemia: **35 PER 1000 MEMBERS**
  – a 25% increase since 2008 and rising. Spiking to >200 in females aged 75 to 85 and >300 in males aged 70 to 80.
- Type 2 diabetes mellitus: **27 PER 1000 MEMBERS** – a 65% increase since 2008!

55% OF DEATHS
IN SOUTH AFRICA DURING 2015 WERE DUE TO CHRONIC DISEASES OF LIFESTYLE[6]

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The problem

A 2011 World Economic Forum report, put out by the Harvard School of Public Health, states that:

> "Non-communicable diseases (NCDs) have been established as a clear threat not only to human health, but also to development and economic growth. Claiming 63% of all deaths, these diseases are currently the world's main killer. Eighty percent of these deaths now occur in low- and middle-income countries"[1].

The report predicts that during the next 20 years, on a global scale, NCDs will cost more than US$30 trillion (48% of global GDP in 2010) which will contribute to pushing millions of people below the poverty line. Similarly, a 2014 South African Medical Journal article forecasts that NCDs will be responsible for five times as many deaths as communicable diseases in low- and middle-income countries by 2030[2].

In South Africa (SA), accumulated losses to our GDP between 2006 and 2015 from diabetes, stroke and coronary heart disease alone are estimated to have cost US$1.88 billion[2] (approximately ZAR25 billion). The health and economic productivity of our nation urgently require better management of chronic diseases and their outcomes. To quote our current Minister of Health, Aaron Motsoaledi: "Health budgets will break because of the cost of amputations, artificial limbs, wheelchairs and cardiac surgery"[3].

In the South African private healthcare sector, statistics from funders suggest that approximately 6% of beneficiaries generate 20 to 25% of funders' medical costs. This 6% is made up of 'high-risk patients' who suffer from chronic diseases[4].

The Council for Medical Schemes released a report in 2015 entitled 'Prevalence of chronic diseases in the population covered by medical schemes in South Africa'[5]. Their findings are summarised below:

The 10 most prevalent chronic conditions in South African private medical schemes (at least three per 1000 beneficiaries):

1. hypertension
2. hyperlipidaemia
3. diabetes mellitus 2
4. asthma
5. hypothyroidism
6. HIV/AIDS
7. coronary artery disease
8. epilepsy
9. cardiomyopathy
10. bipolar mood disorder

The top three conditions have a prevalence rate of 20 per 1000 beneficiaries.

This number continues to rise and the Council for Medical Schemes report (2017) concludes that the resulting negative impact on risk profiles should concern medical schemes.

Statistics SA released information on 19 April 2017 stating that 55.5% of deaths in SA during 2015 were due to chronic diseases of lifestyle[6].

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NCD EPIDEMIC IS DETRIMENTAL TO THE SA'S ECONOMIC HEALTH

Source: Biz Community **Published on:** 19 April 2017

A recent Statistics South Africa analysis of mortality and causes of death found that non-communicable diseases (NCDs), such as type 2 diabetes, stroke and cardiovascular diseases, were responsible for 55,5% – more than half – of all deaths in this country during 2015. These diseases related to unhealthy lifestyles and poor diets represent a growing health and economic burden in South Africa that requires most urgent attention.

"This figure is most sobering and highlights the challenge that NCDs pose to our country," says Dr Guni Goolab, principal officer of the Government Employees Medical Scheme (Gems). "Millions of South Africans suffer from, and are being treated for, NCDs. Aside from the immense suffering they cause, they represent a significant risk to the local healthcare sector, the successful implementation of National Health Insurance (NHI), as well as the broader economy. "We as a country need to work together in a determined and coordinated manner while there is still time to do so, if we are to mitigate the massive risk that these diseases pose to the sustainability of our entire healthcare system."

Both globally and locally it is well recognised that preventing, postponing, managing and minimising chronic diseases at primary-healthcare level results in better patient outcomes and is substantially more cost-effective than treatment of these conditions at a tertiary level.

Despite this, the management of chronic diseases at a primary-care level in SA remains fragmented, costly, often duplicated, sub-optimal and sometimes even negligent or absent and the incidence of chronic disease is rising.

Some South African Statistics:
Prevalence of the top three chronic diseases in the 2013 South African population covered by medical schemes[5]

- Hypertension: a prevalence rate of 87 per 1000 members amongst all beneficiaries; beneficiaries over the age of 55: **>200 PER 1000 MEMBERS** – a 33% increase in the five years since 2008, and rising.
- Hyperlipidemia: **35 PER 1000 MEMBERS** – a 25% increase since 2008 and rising. Spiking to >200 in females aged 75 to 85 and >300 in males aged 70 to 80.
- Type 2 diabetes mellitus: **27 PER 1000 MEMBERS** – a 65% increase since 2008!

There is no question that, across the world, there is a dire need for effective means and tools to proactively prevent and effectively manage chronic diseases and their concomitant social, emotional and economic burdens.

The problem is clearly documented; the solution is more complex.

Imagine if ...

Imagine if a well-adopted, well-designed, interoperable and user-friendly technological solution could help to manage chronic disease in SA. A solution that allows patients, providers and funders to work collaboratively at the level of primary care, from the very first moment of risk, throughout the lifelong journey – moving from fragmented care to coordinated and evidence-based care.

Historically, technology and health have been uneasy yet sometimes phenomenally effective, ground-breaking partners. The rise of Electronic Health Records (EHRs) in clinical systems has been a road chequered with road-blocks, potholes and general inefficiencies. This largely stems from the fact that early systems were designed for data capture and clinical-record keeping instead of with the needs and outcomes of the patient and practitioner in mind.

It has become increasingly clear that for EHRs to work effectively, they should be:
- patient based
- totally user-friendly for both provider and patient, ensuring that the patient remains front and centre of the story
- outcomes driven
- interoperable[7].

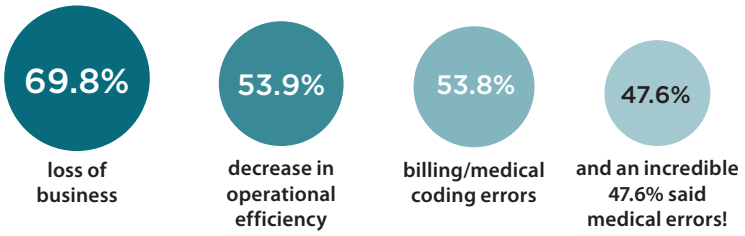
Any technological tool designed to assist in the care of patients suffering from chronic disease needs to keep in mind the lessons learnt during development of EHRs.

This white paper is designed to create discussion and thought leadership around what an effective technological solution for the management of chronic disease at primary-care level needs to look like in SA. What would this chronic-disease-management technological tool (CDM-TT) need to deliver in order to be both valuable and widely adopted in this country?

Lessons learnt from previous technological-solution implementations, research and discussion with stakeholders suggest that the ideal solution would need to include four core features. An effective CDM-TT would need to ensure that these four core features work seamlessly together to provide coordinated, well-managed and up-to-date evidence-based care.

Core feature one: Interoperability

Whilst many providers regard their EHR systems as having excellent functionality, 51% of respondents in a recent American survey reported that they are unable to use the power of this functionality because interoperability is weak[8]. The impact of this poor interoperability was quantified in a different survey which asked, "Over the past 3 years, have your organisation's current methods of sending/receiving information resulted in any of the following? loss of business; decrease in operational efficiency; billing/medical coding errors; medical errors"[9]: The percentage of respondents who answered yes to these questions is illustrated below:



Taken from 'The rocky road to information sharing in the health system'[9].

These results highlight how crucial interoperability is, both for continuity of chronic-disease care and for well-managed cost structures.

A CDM-TT would therefore need to comply with all national interoperability guidelines and as many international guidelines as possible. The management tool would need to interoperate seamlessly between all stakeholders in the South African healthcare landscape to avoid experiences like Michael's below.

Michael's story

Michael was born with a congenital heart condition which was surgically corrected in the first year of his life. His surgery was extremely successful and he made a full recovery. Post-surgery, baby Michael was given a low dose of an ACE-inhibitor to help his heart to recover and he continued to be given the medication thereafter as his cardiologist felt it would reduce the load on his heart.

Three years later, four-year-old Michael became extremely ill and extensive testing revealed that he had developed a severe, auto-immune acute interstitial nephritis (AIN) in response to the ACE-inhibitor. Fortunately, because it was an optional treatment, he was able to stop taking it and did not have to replace it with any other medication. His AIN settled immediately and his health normalised.

Michael grew up to be a strong, sporting young man. He stopped wearing his allergy bracelet when he was a teenager as he really didn't like it and didn't feel that he needed it. Later he married and had three children. The family moved cities four times and changed healthcare provider numerous times. Unbeknownst to Michael, although his initial healthcare records clearly stated his allergy to the ACE-inhibitor, this information was lost over the years.

Aged 55, Michael attended a routine medical exam required by the corporate he worked for. His current GP conducted the exam. The exam showed that Michael was suffering from high blood pressure. His GP asked him to return for a few repeat tests which confirmed a diagnosis of hypertension. The GP had no centralised medical information about Michael to check and did not ask his patient about any allergies. Michael didn't think to mention the story of his AIN more than 50 years earlier – he couldn't even remember the name of the medication anymore. The GP prescribed an ACE-inhibitor for Michael to manage his hypertension.

Within 10 days Michael was in hospital suffering from a severe AIN. He then recalled his childhood experience and told his GP, who immediately took him off the ACE-inhibitor and replaced it with a different medication. The doctor then carefully monitored Michael for any reactions, clearly noting his allergy to ACE-inhibitors in his current records. Both he and the GP were shaken by the experience.

While Michael fortunately made a full recovery, he had spent five days in hospital, undergone extensive diagnostic testing and was unable to work for four weeks. The direct and indirect costs related to this medical event were substantial. In addition, Michael and his family had been extremely worried and stressed.

Who is responsible for these costs?

Imagine a technological tool that allows the GP to easily, quickly and effectively log into Michael's medical history, flag his previous allergies and medical incidents and then make appropriate medication choices. Even better, a tool that has a repository of Michael's information already stored in it, via his Personal Health Record. When the doctor starts generating Michael's prescription, the intelligent tool picks up the allergy information and risk to the patient and notifies the doctor immediately.

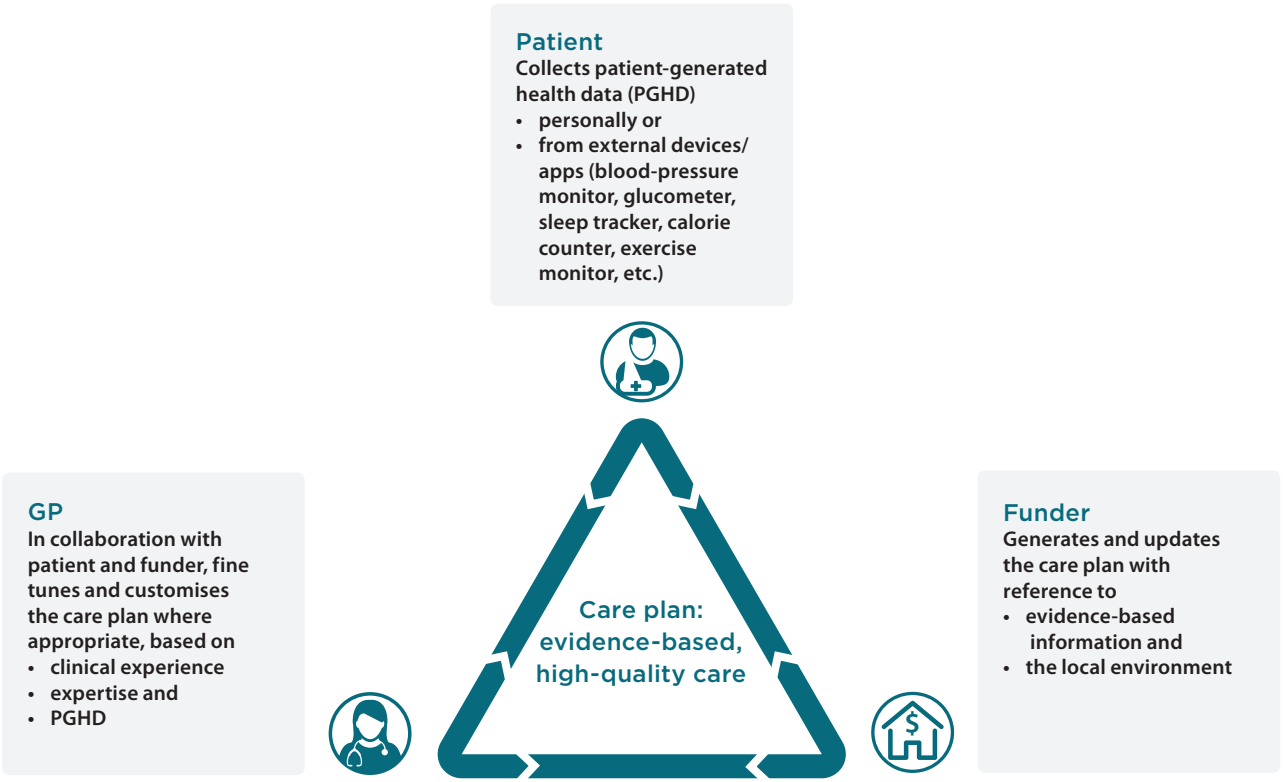
The cost, stress and lost work time could all have been avoided. Right from the start, Michael's journey of managing a chronic condition could have been so different.

Core feature two: Adjustable care plans

At the heart of an effective CDM-TT there needs to be a mechanism which enables the development of adjustable care plans.

The technology behind the CDM-TT should host a generic platform which allows specific funders to set up their care plan of choice as a guide for their providers; a flexible care-plan-creator at their fingertips. Flexible enough to allow adjustments as conditions fluctuate and as evidence and global trends shift. Flexible enough to host single-disease cases as well as patients with multiple co-morbidities.

An integral part of an effective CDM-TT would be a triangle of quality chronic-disease management, with a care plan at its core. This triangle should ensure interoperability between patient, provider and funder.



Core feature three: Continuous care cycle before, during and after consultations

The CDM-TT needs to ensure continuity of care. This feature can be crafted using a before-during-and-after approach to patient consultations, establishing clear roles and requirements for all three stakeholders.

The 'before' component ensures that the provider has pre-information about a patient prior to the consultation: age, condition, health variables, medications, allergies, medical incidents and timelines. This could be provided by the patient via a Personal Health Record (PHR) which interoperates with the CDM-TT or by a previous medical record if interoperability is good.

The 'during' component is the well-designed, flexible care-plan platform described above. This allows the provider to be 'in the moment' with the patient, focusing on communication and care and on developing a partnership and an effective management plan together. No more trying to remember or look up constantly changing guidelines and requirements for managing the patient's disease and co-morbidities; instead, the freedom to concentrate on the current point of care.

The 'after' component focuses on the steps of the care plan being followed by both provider and patient. It includes the provider monitoring the patient's compliance with the care plan and provision of patient-generated health and geonomic data. The tool should allow this data, whether from external devices or patient biomarkers, to influence care plans where required and appropriate.

A recent **survey of 682 participants** (executives, clinical leaders and clinicians at various organisations involved in the direct delivery of healthcare in the USA), forecasts a shift in the most useful sources of health data over the next five years. Whilst it predicts a 10% decrease in the importance of clinical and claims data, it forecasts a **10% increase in the importance of patient-generated health data (PGHD)** and a **20% increase in the importance of geonomic data**[8].

Taken from 'What data can really do for health care'[8].

The 'after' component of the care cycle also requires an effective CDM-TT to integrate funders with the monitoring process, alongside patient and provider. This will enable funders to track both patients' and providers' compliance and performance measures, as well as eventual patient outcomes. Mechanisms need to be included to ensure that shared data is both relevant and reliable.

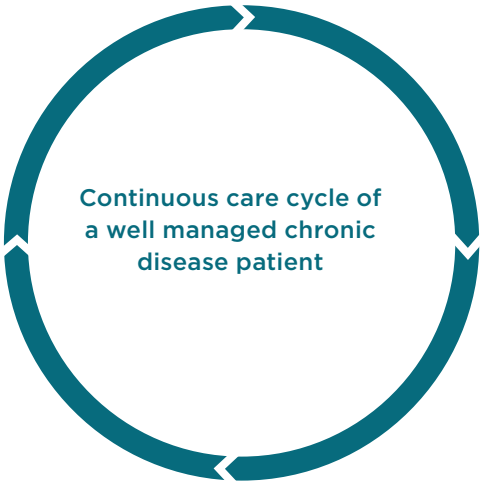
Before a consultation

Patient's pre-information provided by

- **Personal Health Record (PHR)**
- **Other previous, interoperable health records**

After a consultation

- **Targeted patient education**
- **Patient tracks their health variables, creating patient-generated health data (PGHD)**
- **Provider tracks and manages patient compliance and progress**
- **Funder tracks and manages patient and provider compliance and performance**



During a consultation

- **Well-designed, flexible and user-friendly care plan allows provider to be 'in the moment' with a patient, communicating clearly and developing an effective care partnership for the management of their chronic disease**
- **No more having to remember or research constantly changing requirements and guidelines**

A diabetic patient's story

Deepak Patel was very upset when, at the age of 43, he learned that he had type 2 diabetes. "I knew my cousin had been hospitalised with an extremely high blood glucose reading of 27 mmol/L," remembers the IT Executive from Cape Town, "and within four years she had had both her legs amputated above the knee."

For people without diabetes, blood glucose levels generally range between 3.5 and 8.0 mmol/L. Although maintaining levels within the target range is not easy for those who live with this chronic disease, Deepak has managed to do so for over a decade. Now aged nearly 55, he has made lifestyle changes and takes daily medication to help him stay fit and healthy.

Deepak explains that the difference between his story and his cousin's is that, firstly, he has a wonderful treating GP who made sure he understood his disease and, secondly, that he continues to follow a care plan which enables him to monitor and manage it. In his opinion, it's his care plan and the simple things – like taking his prescribed medication, exercising regularly and monitoring his diet – that make the difference.

Right at the start, before their first post-diagnosis consultation, the GP made sure he had Deepak's full medical history available. This meant they could spend the consultation time wisely, focusing on what to do to manage the disease. Deepak will never forget how his doctor and a diabetes educator spent quality time with him during those early appointments, carefully explaining the condition and making sure that he knew how to monitor his health variables and follow his care plan effectively.

Having high blood glucose levels over a period of time can cause damage to small and large blood vessels and to nerves. Through discussions with his diabetes educator, Deepak became well aware of how this can lead to many health complications. As a result, he follows up with his health team regularly and conscientiously. He has his eyes checked annually, sees his dentist and GP every six months and visits a podiatrist every eight weeks. He also checks his blood glucose levels and blood pressure daily.

Deepak also suffers from hypertension and hypercholesterolemia. He diligently keeps copies of the laboratory results provided by his GP and recently downloaded an app to help him keep reliable records of his HbA1c and blood pressure readings. The health variables he monitors are regularly sent from his Personal Health Record to the electronic diabetes-management system that his GP and diabetes educator use, helping Deepak and his health team to prevent complications.

While many people he knows are constantly being hospitalised due to complications from their diabetes, Deepak is so grateful to have a care plan that he can trust and a supportive health team helping him to manage his disease. He also feels empowered by the information they have given him and he has gathered online. He is determined to continue following this path, staying healthy for his wife and two sons. His advice to others is always: "Don't take any shortcuts when it comes to your health."

Core feature four: User-friendly for patient, provider and funder

EHRs are currently viewed by most healthcare providers as a necessary evil. In a recent survey of doctors conducted in the USA, more than half believed that their EHR had a negative impact on cost, productivity and efficiency in their practices and 69% would not recommend their system to a colleague[7].

Any CMD-TT would need to overcome this frustration with technology by being user-friendly and intuitive, helping providers to do their work better, as opposed to adding to their already cumbersome workload. It would also need to improve patients' experience. In a country such as SA, where adoption of new technological systems in healthcare has traditionally been slow and where the burden of healthcare is enormous, this is a critical factor.

To enhance user-friendliness and improve productivity, the CMD-TT should offer seamless integration between provider and funder while the patient's care plan is being refined. The tool should be able to analyse recommended treatments, procedures, consultations and prescribed medications in relation to the patient's funded plan and immediately highlight to both patient and provider which costs will or will not be covered by the funder.

Mrs Moodley's story

Mrs Moodley has recently been diagnosed with Type 2 diabetes. She is working with her GP, Dr Leonard, to determine the next steps in ensuring that her diabetes is managed well.

Dr Leonard's practice uses a CDM-TT which interoperates with his patient's medical-aid funders. During the consultation, whilst Dr Leonard and Mrs Moodley are going over her care plan, the CDM-TT checks Mrs Moodley's funder plan to ensure that all costs related to the care plan's recommended treatments, procedures, consultations and medication will be covered.

Luckily, she has a comprehensive plan with a good medical funder and she is relieved to discover that her recommended care plan's costs will be covered in full. She feels hugely relieved as she has been concerned about the financial burden her newly diagnosed condition might put on her family. She tells Dr Leonard that she is now feeling encouraged to follow the recommended care plan carefully.

Dr Leonard is also delighted. Knowing up front how Mrs Moodley's costs will be covered saves him time and effort and means his patient is more likely to comply with her care plan. He explains to Mrs Moodley that the CDM-TT will track her compliance and will alert them both if any costs start to fall outside the funder-covered amounts, at which point doctor and patient can decide on an effective alternative together.

Additional features

Whilst the four core features described above are critical components of a successful South African CDM-TT, research, reflection and discussion suggest that several additional, related features would also be valuable in the quest for effective chronic-disease management.

The ideal tool would need to:

- be ***flexible*** enough to be used across state, private and corporate sectors
- include the critical component of ***targeted patient education***, ensuring that patients self-manage their diseases wherever possible.

> Research suggests that there is one fewer Accident and Emergency visit for every eight asthma patients who complete self-managed, structured education programmes and one fewer hospital admission for every 20 patients who complete such a programme[10].

- include ***decision-support mechanisms*** that may be more or less necessary depending on the situation. Up-to-date, evidence-based decision support could, for example, transform healthcare in a rural clinic in SA staffed solely by nurses.
- ensure ***relevant, customised data*** can be sent to both provider and funder for analysis, outcome tracking and performance measurement. Using filters to ensure only relevant and appropriate data is sent.
- ***interact with third-party applications and software*** to allow tracking of different variables. This would allow the use of the many applications already available to track and report healthcare information.

Overcoming barriers to use in SA

Wide adoption is essential for any level of CDM-TT success. Barriers to entry therefore need to be considered and addressed up front, while the tool is being developed.

Using the other side of the coin

- In environments where EHR adoption is poor but care-plan use is well established, a CDM-TT could give providers an easy way of implementing and tracking their patients' plans. This perspective could in fact be used as a barrier breaker.
- In environments where EHR adoption is strong but care-plan use is poor, a user-friendly CDM-TT which interoperates seamlessly with the EHR could appeal to providers and patients alike.

Including practical features

- The CDM-TT should include simple, practical features that reduce barriers to cost-effective care and enhance stakeholder buy-in. if the provider can, for example, use the tool to immediately sent a prescription to the relevant pharmacy and arrange medicine delivery directly to the patient, both provider and patient efficiency are improved, which in turn assists patient compliance. Door-to-door couriering of anti-retrovirals has been very effectively used to improve patient compliance in SA[11].

Encouraging critical up-front stakeholder buy-in

- Involving providers in the development of the CDM-TT's flexible care-plan platform is likely to assist in promoting the finalised tool's adoption.
- Providers should be incentivised to use the EHR, both financially and through continued medical education.
- Patients should be given devices, or the necessary funds to buy them, to assist their collection of PGHD such as blood pressure and blood glucose measurements.
- The CDM-TT should allow funders the ability to actively and easily track and manage patient and provider compliance and performance, ensuring evidence-based and cost-effective care.

Demonstrating benefits to stakeholders

- Being able to demonstrate the many benefits of using a CDM-TT to stakeholders is vital. The table below highlights some of the key benefits a successful technological tool would bring to chronic-disease management.

Benefits of a chronic-disease-management technological tool to stakeholders in the South African healthcare market:

Patient	Provider	Funder
Improved patient experience and patient outcomes	Ability to provide continuity of care	Improved management of chronic disease at a primary-care level and the substantial associated cost saving
Improved management of chronic disease at a primary-care level and the substantial associated cost saving	Guaranteed follow-up appointments decrease business losses	Ability to track patients' compliance with their care plans
Prevention or slowing of disease progression and/or side effects	Ability to analyse practice's outcome data and success of strategies	Ability to track provider compliance with their patients' care plans and to analyse accurate measures of provider performance
Improved understanding and management of disease	Enhanced ability to focus on the patient at the point of care	Ability to incentivise providers and patients to follow their care plans
Decreased medical costs	Decreased stress associated with keeping up to date with ever-changing guidelines, recommendations and current research	Relevant and reliable PGHD assists with monitoring patient compliance and outcomes and with adjusting care plans if necessary
Continuity of care	Ability to create a partnership with the patient for disease management	
Ability to create a partnership with the provider for disease management	Relevant and reliable PGHD assists with monitoring patient compliance and outcomes and with adjusting care plans if necessary	
Enhanced ability to learn about and manage own condition and PGHD as monitoring and tracking are integrated with funder and provider input		

In closing

This country and many others are in dire need of a new and effective solution for the management of patients suffering from chronic disease. The problem is ubiquitous; the solution is possible …

Imagine if South Africa could lead the way.

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