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Quali Health: Creating Access to Quality Healthcare for South Africa's Excluded Majority[5,6,7]

"I see 60 to 80 patients every day. All of them are babies sitting on their mothers' laps. I tell the mothers that their child has a hole in the heart and the child needs to be operated on. And the mothers have only one thing to ask me: 'How much would it cost?' I put a price on lives. That's exactly what I do every day."

Dr Devi Prasad Shetty, Chairman of Narayana Hrudayalaya

1. A COUNTRY IN POOR HEALTH

Dr Nthabiseng Legoete listened intently as the economics professor flicked health rankings drawn from *The Global Competitiveness Report* up onto the lecture room screen and began explaining his Six Pack model of economic development to his class. The discussion soon turned to healthcare in South Africa, as students grappled with the grim picture painted by the data. The South African government was by no means a small spender on public healthcare. Despite this the country ranked poorly in terms of health outcomes. Of the 144 countries surveyed in the report, South Africa ranked in position 143 for cases of tuberculosis per 100,000 people. HIV prevalence, which stood at 17.9 percent of the adult population, translated into a ranking of 140 out of 144; and in measuring infant deaths per 1,000 live births the country ranked at 105 out of 144. In turn, the country's dismal state of health translated into poor socio-economic outcomes. South Africa's life expectancy stood at just 56.1 years. In actuarial terms this meant that, on average, South Africans died before they reached retirement age. In the same vein, the business impact of HIV/AIDS – a barometer for the relationship between health

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and economic growth – was a concerning story, with South Africa coming in at position 136 in *The Global Competitiveness Report*, just eight places off of the bottom of the world table.[8]

This focus on health in an economics class was important, as the physical and mental health of a country's population is one of the Six Pack model's critical components required to support and sustain economic growth and promote wellbeing in all economies.[9] Alongside (i) healthcare, the other elements in the Six Pack include (ii) an elevated savings rate that funds productive investments; (iii) access to functional and improving education; (iv) stable macroeconomic policies and capable institutions; (v) supporting demographic structures; and (vi) the ability to connect to others through the movement and flow of goods, services, people, capital, "know how" and, ultimately, "know why" across city, country and regional borders.

These numbers and their implications jolted Nthabiseng. She paused in her note taking – the numbers didn't seem to make sense. Other countries that scored as poorly in national health generally were war ravaged and exceptionally poor. Examples included the likes of Chad, the Democratic Republic of Congo, Haiti, Mozambique, Sierra Leone and Timor-Leste. By contrast, South Africa's *per capita* income placed the country in the middle of world income tables, and its institutions and infrastructure were much stronger than these other economies. More specifically, with an income per person of $13,209, adjusted for purchasing power, South Africa ranked in position 87 out of the 186 countries for which data are available.[10]

Equally difficult to reconcile was the fact that South Africa's spending on public sector healthcare stood at 4.2 percent of gross domestic product (GDP).[11] A figure comparable to many middle-income economies, and ranking South Africa 75th in the world in terms of public health spending as a percentage of GDP. By contrast, other countries with poor primary health outcomes – such as Chad, the Democratic Republic of Congo, Haiti, Mozambique, Sierra Leone and Timor-Leste mentioned above – spend on average just 2.0 percent of GDP on public healthcare.[12] If one added in private spending on healthcare (4.1 percent of GDP), foreign aid and the non-governmental organization sector (0.2 percent of GDP), the country's total spending on healthcare makes up a total of 8.4 percent of the economy. By contrast, the World Health Organization (WHO) recommends that countries spend just five percent of GDP on health, and average expenditure for all middle-income countries is 5.8 percent (Bernstein, 2011, 8-9). Based on these numbers, the level of healthcare spending did not appear to be South Africa's problem.

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[8] See Exhibit 1 in the Appendix.

[9] The Six Pack model is based on a study of 160 countries over a period of 60 years as the basis for identifying factors common to countries that have achieved and sustained elevated economic growth and inclusive development. The results of this work were first presented by the author, Adrian Saville, in 2009. See, for example, bit.ly/2kiAIhT.

[10] *Per capita* income is reported using current Geary–Khamis dollars, more commonly known as international dollars, adjusted for purchasing power parity and based on 2015 prices using World Bank data. At the time this case was prepared, the Rand traded in the region of R15.00 to the US dollar. However, as a liquid emerging market currency, the rand tends to be volatile, and through the timeline of this case the rand traded as strong as R13.50 to the US dollar and as weak as R16.00 to the US dollar.

[11] This figure is based on World Bank data for 2014. Public health expenditure consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organisations), and social (or compulsory) health insurance funds.

[12] See Exhibit 2 in the Appendix.

2. A DYSFUNCTIONAL INDUSTRY

By every measure the health outcomes Nthabiseng was looking at were appalling. Moreover, they didn't square up with the country's income status nor did they reconcile with the level of public sector spending on health. As the professor went on to suggest, the structure of South Africa's healthcare system could go a long way in explaining the country's poor health outcomes. As the economic evidence was presented to the class, Nthabiseng's industry experience corroborated the arguments. Being a medical doctor, studying for a Master of Business Administration (MBA) degree, and having spent a decade working in medicine in the public and private sectors, she had a good sense of the structure of the country's healthcare industry.

To this end, South Africa's private healthcare sector is made up of a small number of large players that deliver services which are widely regarded as globally competitive in terms of quality. But access to the private sector is funded mainly through private medical insurance schemes, whose membership extends to only 18 percent of the total population. Affordability of private sector care is the primary barrier to entry. The private sector is dominated by just three large hospital groups, which account for some 80% of hospital beds and 90% of admissions. The price of a consultation with a general practitioner in private practice varies by location, but averages well above R400 (approximately $27) and does not include medicine.

By contrast, public health services are affordable to almost all South Africans. The price to visit a public health clinic at state-run hospitals is about R13 per visit, equivalent to about US$1 per person. But the public sector is severely under-resourced, highly inefficient and poorly managed. To access most primary health clinics for basic services requires a person to start queuing no later than 6.00 am to only get seen many hours later (if at all).[13] As a result, South Africa's healthcare industry is a two-legged animal with a private sector that caters to a minority of the population through channels that are effective yet expensive and exclusive. The public sector, on the other hand, looks after the 82 percent of the population that is unable to afford medical insurance. This leaves the majority at the mercy of a government-run system that is under-resourced and grossly ineffective. The result is a huge social drain and high economic burden that is imposed on the parts of South African society that can least afford the cost of a public health system that is failing the country. In turn, this sets a poverty trap that perpetuates economic underdevelopment and exacerbates social marginalization in a country that already displays one of the world's highest levels of income inequality.[14]

As Nthabiseng progressed through her MBA, she took electives in competitive strategy, consumer behavior, corporate finance, entrepreneurship, innovation, organizational design and operations. As she progressed through these courses, the idea of building a business that offered affordable and effective healthcare to the South African market steadily crystalized.

Then came the personal experiences which galvanized her resolve. Nthabiseng's domestic worker, who resides in a low-income township called Diepsloot, returned to work on Monday and described a nightmarish weekend. She had tried desperately to get treatment for her fourteen-year-old son who had come down with gastroenteritis. She eventually found help by

[13] See Exhibit 3 which shows photographs of patients queuing at one of South Africa's public healthcare facilities.
[14] See Exhibit 4 in the Appendix.

having to travel to a facility 45 kilometers away. The final driver of the urgency with which Quali Health was started was even closer to home. Nthabiseng's fifty-two-year-old, economically active and previously healthy uncle passed away on 28 July 2015 because he was not able to access quality healthcare timeously. Being a contract worker, he felt that he could not take time off to access healthcare, as queuing at public clinics meant an unaffordable loss of wages, but private rates for his condition were too expensive. He did what many South Africans in his position do: he deferred treatment. This landed him in an intensive care unit with multi-organ failure within six weeks of first falling ill. Reflecting on this experience Nthabiseng observed: "It hit me really hard that despite being a medical practitioner, I was rendered powerless in trying to save my uncle."

Nthabiseng's professional experience had been in the private and public areas of the healthcare sector. Through her time treating patients and a spell working for a pharmaceutical company, she was struck by the vast gap between the service that the more affluent, insured population received compared to that which contributed to the tragedy that befell her uncle and the fate faced by her domestic worker's child. She knew that access to the private sector – or something close to those standards – would likely have saved both of their lives. Her medical background, sense of personal loss, and newly acquired business know-how together fueled her burning drive to create a solution.

The business that was soon born out of these experiences and vision was registered under the name Quali Health at the end of 2015, around the same time that Nthabiseng completed her degree. With the company registered, her plan was to open a clinic that would offer quality primary healthcare at an affordable price to the grossly under-serviced South African market.

3. BORN IN A POOR PLACE

After finishing her degree and six months of desktop modelling and budgeting, complemented by conversations with focus groups, Nthabiseng identified Diepsloot – the home of her domestic worker – as an ideal location for Quali Health's pilot facility. Located 40 kilometers north of Johannesburg, and not far from the wealthy suburb of Dainfern, Diepsloot was established in 1995 as a transit camp for squatters who had been forcibly removed from the farm Zevenfontein. At the time, 1 124 plots were made available, with the proposal being that people were to stay in a transit camp until land elsewhere became available. For many, this camp became a permanent home, and today Diepsloot is one of South Africa's largest townships, home to 798,000 people, almost all of whom are black.

The township is a melting pot of "Johannesburgers", national migrants seeking opportunities in urban areas and economic migrants, many of whom hail from neighboring Zimbabwe, Mozambique and Malawi and other from even further away, including Somalia, Pakistan and even Bangladesh.[15] Today, Diepsloot is made up of an estimated 62,900 homes which include fully government-funded housing, brick houses built by landowners, partially government-subsidized houses and informal settlement areas of "three-by-two" shacks assembled from scrap metal, wood, plastic and cardboard.[16] About half of residents rent their property from a landowner who has subdivided their stand. The majority of housing, however, is informal and

[15] See Exhibit 5 in the Appendix.

[16] A "three-by-two" refers to shacks that have the typical dimension of three meters by two meters.

residents use paraffin and electric stoves for cooking. According to official figures from the 2011 census (the most recent), 18.4 percent of dwellers have piped water inside their dwelling, 61.2 percent have electricity and 74.1 percent have access to a flush toilet connected to the sewage system. Many toilets, however, are communal, in a state of disrepair and shared by as many as 20 households. Ask most residents about their state of living and, contrary to official statistics, the reply comes back that they live without electricity and running water. Government does little to maintain sanitation in the area. Although some of the more formal extensions that make up the township have tar roads, drainage and streetlights, the reality is that maintenance tends to be poor and flooding is a regular event in the rainy season. Informal settlement areas have few or no fully working services.

A recent World Bank report found that sixty percent of South Africa's unemployed reside in townships and informal settlements.[17] The township is economically poor which manifests in a low cost of living. In the case of Diepsloot, although it is estimated that 76.5 percent of households are economically active, and that 77.4 percent of the population is of working age, much like many other townships, unemployment is high, and incomes are low. Diepsloot's unemployment rate is estimated at 30 percent and income per person is a fraction of South Africa's average (Mahajan, 2014). These numbers compare poorly with South Africa's already-high unemployment rate, which has fluctuated around 25 percent for the past ten years, and average real income of US$6,600 per person per year (and not adjusted for purchasing power parity). Diepsloot also suffers from huge gaps in the delivery of public services, including healthcare and education. There are two public clinics and eight general practitioners servicing the population of almost 800,000 people. Given its challenges, to Nthabiseng, Diepsloot looked like the perfect place to make a stand and begin to turn the tide against poor primary healthcare. It is equally possible, however, that selecting Diepsloot as home to her pilot site could turn into a business disaster given entrenched unemployment, low income levels, high crime rate and endemic poverty.

After failing to convince risk-averse investors of her vision to provide affordable and effective healthcare to low-income communities – not just in Diepsloot, but for the country more widely – Nthabiseng self-funded the pilot site. The site that was selected is in a strip mall, opposite a busy butchery that is located on the main road running alongside the township. Once the site had been secured, the installation was completed in six weeks using a community-based contractor who had started his own business six months prior. At 7.00 am on 1 May 2016, Quali Health's doors swung open, providing a poor and underserviced community access to quality health at an affordable price; this would be a first-time experience for almost every person that would come to Quali Health.

Contrary to her expectation, the first few weeks after opening the clinic proved to be incredibly trying. Numbers were extremely disappointing, causing Nthabiseng to question her assumptions and wonder about the viability of her proposal. Based on her desktop models, the facility needed about 2,500 clients per month to achieve breakeven. In the first month of operation the clinic attended to just 798 clients. This translated into an operating loss of

[17] Mahajan, S. (ed.) (2014) *Economics of South African Townships: Special Focus on Diepsloot*. A World Bank Study. Washington, DC; World Bank Group

R246,400.[18] At this burn rate Nthabiseng's capital would be exhausted quickly. Almost overnight, the fairy tale story she envisioned seemed to have turned into a nightmare. Almost all staff were drawn from the local community and had been unemployed. Thus, the pain of failure would extend to her newly appointed staff, they would be thrust back into the world of unemployment. This was a frightening thought to the founder. But the positive feedback from the patients that experienced the facility encouraged her to push on. Patients readily expressed what Quali Health was affording them. They no longer had to compromise employment for healthcare or *vice versa*. They used words such as "dignity", "value" and "respect" when referring to the service. This affirmed to Nthabiseng that, despite the underwhelming numbers, she was onto something and that the value proposition was real.

The decision to push on was soon to be vindicated. The second month of operation saw client visits grow to 1,056. Through the rest of 2016 client visits increased without interruption on a month-on-month basis. Even the traditionally quiet month of December saw client visits grow compared to November. Final tallies for December 2016 saw 3,556 clients visit Quali Health. This translated into an average of 115 client visits per day in the last month of the year. Whilst this was below the installed capacity of 280 clients per day or about 8,400 clients per month, it meant that the pilot site ended 2016 profitable and cash flow positive, having crossed through the breakeven mark in September 2016, the site's fifth month of operation.[19]

4. A MODEL FOR HEALTH

An effective solution required a healthcare model that filled the market void between the expensive private system and the cheap but dysfunctional public system. Nthabiseng knew this meant she had to break rules and innovate. She started by addressing the inefficiency of paper-based administration. This was a legacy issue in both public and private healthcare that contributed heavily to wasted time and money. There seemed to be endless filling in of forms at every stage of a patient journey. Paper records were then expensive to store, slow to retrieve and created scope for errors and mismanagement.

Quali Health, by contrast, employs a fully digital system. Patient information is captured biometrically using a tablet computer upon arrival. This information then "follows" the patient electronically as she progresses through stages of treatment. Relevant information is available to each caregiver at the touch of a button. Likewise, each caregiver can update information, such as doctors' notes, in real time. Granular, up-to-the-minute data enables monitoring of the system for blockages, customer pain points and stresses to costs. Longer term, electronic records of patient histories and reactions to drugs are powerful tools for building trust, managing a customer relationship and providing the customer-centricity sorely lacking in public health facilities.

Further efficiencies are achieved by the stage-gated process through which patients proceed seamlessly in a unidirectional manner, with a communal consultation space divided into multiple private cubicles. The clinic's most expensive and scare recourse, the doctor, is "managed down". Doctors only see patients for a few minutes at a time. Patient management

[18] In May 2016 the South African rand traded at an average of R15.50 to the US dollar, which translates into a burn rate of US$16,000 per month or about US$200,000 in per year.
[19] See Exhibit 6 in the Appendix.

and other clinical duties are taken care of by appropriately trained professionals. In this way, Quali Health benefits from a state programme that invested billions of rands in training auxiliary nurses to help alleviate the skills gap in healthcare. These are first-level nurses, capable of providing basic nursing care. Despite governments intentions, private and public healthcare systems have been unable to absorb auxiliary nurses. A recent survey revealed that the unemployment rate of nursing auxiliaries is 72.4 percent.[20] Quali Health employs a number of auxiliary nurses, where they are responsible for clinical duties such as taking patients vitals, including blood pressure, pulse, saturation, temperature and glucose readings. They also assist doctors with general nursing care in examination cubicles.

Whilst the stage-gated process and digital information management create efficiency, they do not come at the expense of the quality of customer experience. Nthabiseng knew how important the human element would be, especially considering how patients felt a lack of dignity at public hospitals and clinics. Each patient is warmly welcomed upon arrival and seated comfortably. This personal attention is maintained as patients progress through treatment. A dedicated relationship manager overseas respectful client engagement across the facility's touchpoints. The journey begins as a trained operator captures client data in under five minutes. Here the digital system assists in a more subtle way than the multiple efficiencies mentioned above. South Africa's numeracy and literacy ranks near the worst in the world. According to the 2016 Progress in International Reading Literacy Study (PIRLS), an international comparative reading assessment, nearly eight in ten South African children in Grade 4 are not able to read for meaning (Mullis, Martin, Foy, & Hooper, 2017). South Africa's basic education department's own academic assessments revealed in 2013 that just three percent of school pupils in Grade Nine had achieved more than 50 percent in mathematics (Wilkinson, 2014). Quali Health staff are trained to assist the many patients who are unable to input their own data into the digital system.

This attention to detail extends to hygiene and atmosphere at facilities. The emphasis on making sure the site is spotless, fresh and presentable is captured by the clean lines, swept floors and bright colors of the facility. To ensure this crisp, hygienic, professional image Quali Health employs six cleaners and four facility maintainers to look after the site. Typical of her approach, on one visit Nthabiseng noted: "If I see dirt it's too late". She went on to comment "Every patient deserves to find the facility in a pristine condition. The examination cubicles always need to be spotless. Sheets should be changed even when there is a hint of dirt."

This speaks to Nthabiseng's leadership style. Whilst she was the visionary when it came to inception and launch, she was intimately involved in the daily functioning on the ground. She was hands-on in designing and implementing the customer journey. Nthabiseng spent a great deal of her time at the figurative coalface of the Diepsloot facility, monitoring and directing activities, ensuring the efficiency and cleanliness she knew was critical to success.

A recent innovation saw the addition of a "life coach" session that clients could access once the formal examination and treatment protocol has been completed. Customarily, many South Africans spend money on traditional healers and traditional remedies. Whilst the scientific benefits of traditional healthcare are open to debate and/or not fully established, research

[20] South African Nursing Council data estimated for 2015. See Exhibit 7.

shows that at least one of the reasons why many people spend scarce income on traditional healers is the value derived from the personalized, human connection and empathy. By convention, traditional healers look beyond a patient's clinical symptoms to understand an individual's context, family issues and psychological symptoms. At Quali Health, the conversations that take place with life coaches after treatment help to bridge the gap between traditional healing, informal systems and formal healthcare methods, which can be clinical, alienating and even intimidating for some patients. Oftentimes health issues relate to sensitive issues such as nutrition or sexual behavior. Staff have found that this additional consultation has shifted healing, post-treatment care, compliance and commitment to a health-building process.

To build on the emphasis on customer satisfaction, every client consultation is followed by a phone call 24 hours after treatment. All Quali Health staff members have turns to take part in these client feedback calls, where patients are asked how they are feeling. Should a patient still feel unwell, they are invited back to the clinic for a free consultation within seven days. The follow-up call also allows Quali Health staff to receive feedback on service delivered, whether patients would come back to the clinic if they needed healthcare services in the future, and if they would recommend the clinic to family and friends.

Perhaps the most impressive disruption initiated by Quali Health is in the realm of financing, by challenging entrenched industry practices. The private healthcare industry applies the fee-for-service model to pricing, whereby treatment is priced in a fragmented manner. Each player in the healthcare value chain from health insurance, drug companies, clinics and doctors, is a profit-maximiser, demanding its own margins. This results in high costs and often in over-servicing that does not necessarily translate into better healthcare outcomes.

By contrast, Quali Health uses a global fee concept. The entire healthcare event – including consultation, procedures and drugs – is bundled in to a single, predictable fee of R250, or just under US$20 for the patient – critical for patients who may otherwise suffer the embarrassment of not having enough money to settle the bill. This is made possible using quality generic drugs and consumables, as well as the fact that Quali Health is foregoing any mark-ups on drugs. One example is intravenous fluid that Quali Health purchases wholesale for R11.44 per unit, but which the private sector provides at upwards of R800 per unit.

For context, the minimum wage for a domestic worker in South Africa was increased in December 2016 by 8.2% to R2,422.54 (approximately $180) per month for those working 27 ordinary hours or more per week in metropolitan areas. This is representative of the Quali Health target market, many of whom work as carers, cleaners, domestic workers, factory workers, shop assistants and gardeners in nearby Johannesburg's northern suburbs.[21]

Of course, there are similar challenges in primary and secondary healthcare in South Africa. Nthabiseng chose to focus (at least initially) only on primary care for several reasons. First, with limited capital, she had to start somewhere, and her money would go further providing primary care. Second, she believed the return on investment (where "return" means social impact) would be greater from preventative and primary care. This effect would be magnified

[21] See Exhibit 8 for prices of a selection of everyday items advertised during 2016-2017 by a local discount store with two outlets in the Diepsloot area.

when the business scaled. Third, providing secondary care would bring more arduous regulatory and resourcing requirements. Being a primary care provider demanded straightforward registration and a dispensing license. Staffing, likewise, was simplified by sticking to primary care. Auxiliary nurses were in plentiful supply, and for an affordable salary of R8,000 per month. Primary care also meant that clinical associates were sufficient for diagnosis and treatment.[22] Their market rate was in the region of R25,000 per month.

Once again, the consistency of pricing at every visit, regardless of the illness, contributes to building a relationship of trust with patients, who are often afraid of the embarrassment of not having enough to pay the doctor. Nthabiseng's attention to detail, sensitivity to context and client centricity permeates the Quali Health model and is the main contributor to the success seen to date.

5. FROM PILOT SITE TO TAKEOFF: SCALING QUALITY CARE IN A LOW-INCOME SETTING

In less than a year since launch, the Quali Health story had gone from an inspired dream, through the crushing reality of operating a novel business model in a tough context, to a place of relative stability that substantiated the concept. More than financial viability, though, Nthabiseng was celebrating the social impact. Her social enterprise had made an impact for some of the many South Africans unable to afford private healthcare and let down by a failing public system.

The low and predictable price was clearly a major part of the success. But Nthabiseng and her staff noticed that many patients nonetheless deferred treatment, often only coming to the clinic once symptoms had escalated. This made treatment more difficult and expensive. Patients delaying their visits also manifested in pay-day rushes, where the clinic was extremely busy towards the end of the month and early in the new month. The team believe this was because income in this segment is not even or consistent, forcing patients to wait until their next paycheck or until they had saved enough money before having problems seen to. Finding a mechanism and business model to even out funds available for healthcare became an important area for the team to innovate on.

A potential business partner had suggested a micro-insurance model. This would address the challenges of both the inconsistency of income for many people in Quali Health's target market and the plain fact that even for those making a steady income, R280 remained a sum that might take some time to gather. During her MBA studies, Nthabiseng had interacted with many fellow students in financial services, including the insurance industry, so she was aware of how sophisticated this sector was in South Africa. Unfortunately, this system leaned heavily towards credit extension, rather than the insurance and investment side, where a micro-insurance product would need to be seated. And in the largely underserved base-of-the-pyramid market, this would require a shift in culture in order to work.

[22] Clinical associates hold a three-year degree and are qualified to assess patients, make diagnoses, prescribe treatment and perform minor surgery under the supervision of a physician. For the purposes of this case, we refer to clinical associates as "doctors".

Reflecting on what she, her partners and her employees had achieved over the last nine months, Nthabiseng was confident the Quali Health model had unearthed three fundamental learnings that the troubled public healthcare sector could readily adopt to meaningfully improve. For one, it had demonstrated that the resources to provide dignified and effective primary healthcare are available through wise use of auxiliary nurses and clinical associates. Second, Quali Heath had proven what can be done with a shift away from paper towards a digital system to capture, manage and store patient information. Using relatively simple systems and hardware such as tablet computers, the cost and inefficiency associated with paper was vastly reduced. The impact from analysis and machine learning would be exponential when applied at the scale of the state hospital system. Similarly, adopting Quali Health's visionary and rigorous approach to controlling time and motion would no doubt transform public healthcare. While it might take three hours in a queue before taking the first administrative step at a state hospital, Quali Health needed just minutes for input (or retrieval) of patient data, taking of vital measures, consultation and dispensing of medication.

Heading into 2017, Nthabiseng was faced with a number of questions and critical business decisions.

i. The opportunity to develop three sites in the townships of Alexandra, Soweto and Tembisa presented themselves. The experience of Diepsloot suggested that the Quali Health model was financially viable and that it had highly effective, positive socio-economic impacts. But would it make sense to scale so soon after the launch of the pilot site? Should Nthabiseng develop all three sites at the same time to enjoy savings in project management costs and materials costs, or should she phase into the expansion over time? What other ways could she leverage the model she had built to create a positive impact in healthcare in South Africa?
ii. Under any scenario, given that the initial phase of the Diepsloot site was loss-making and that the capital requirement came to about R3.5mn per site, how should she approach the problem of financing her expansion plans?[23]
iii. If she looked to raise funding through equity, how would she value the business?
iv. Nthabiseng was enthused by the idea of micro-insurance. It seemed to have the potential to alleviate a major part of the affordability challenge. However, it was difficult to visualize a viable model in a low-income setting that was overwhelmingly based on a cash economy.

Regardless of the answers to these key questions, it was clear that Nthabiseng had built a powerful model that had the propensity to shake up South Africa's healthcare sector. It was also clear that she had her work cut out.

[23] At the start of 2017, the South African rand traded at roughly R13.50 to the US dollar, which means R3.5mn per site equates to an investment of US$260,000 per clinic.

Appendices:

Exhibit 1A: Key Health and Primary Education Metrics for South Africa (2014)

	Value	Rank/144
Malaria cases/100,000 population	32.5	27
Business impact of malaria	5.1	30
Tuberculosis cases/100,000 population	1,003	143
Business impact of tuberculosis	3.7	136
HIV prevalence, % of adult population	17.9	140
Business impact of HIV/AIDS	3.4	136
Infant mortality, deaths/1,000 live births	33.3	105
Life expectancy, years	56.1	129
Quality of primary education	2.4	133
Primary education enrolment, net %	85.0	118

Source: Schwab (2015)[24]

Exhibit 1B: Key Health and Primary Education Metrics for South Africa (2017)

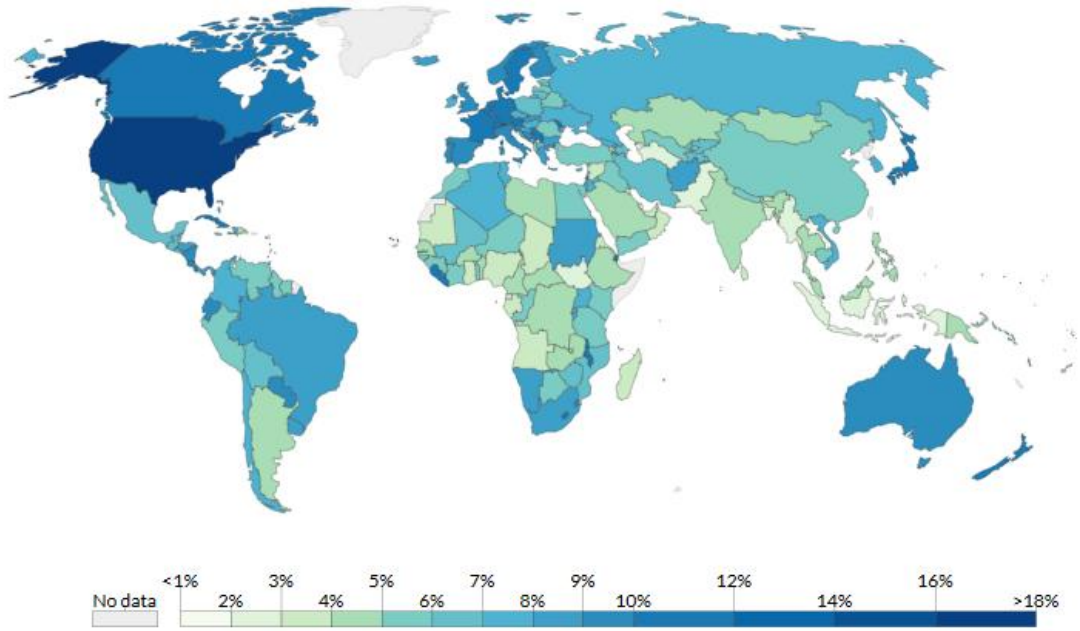
	Value	Rank/137
Malaria cases/100,000 population	21.2	30
Business impact of malaria	4.7	31
Tuberculosis cases/100,000 population	834	137
Business impact of tuberculosis	3.3	132
HIV prevalence, % of adult population	18.9	134
Business impact of HIV/AIDS	3.2	128
Infant mortality, deaths/1,000 live births	33.6	105
Life expectancy, years	57.4	129
Quality of primary education	3.0	116
Primary education enrolment, net %	97.1	50

Source: Schwab (2017)[25]

[24] Accessed via bit.ly/1qy07Qa; date of access 14 January 2017.

[25] Accessed via https://bit.ly/39znxQC; date of access 17 January 2020.

Exhibit 2: Healthcare Expenditure as a Percentage of GDP (2016)



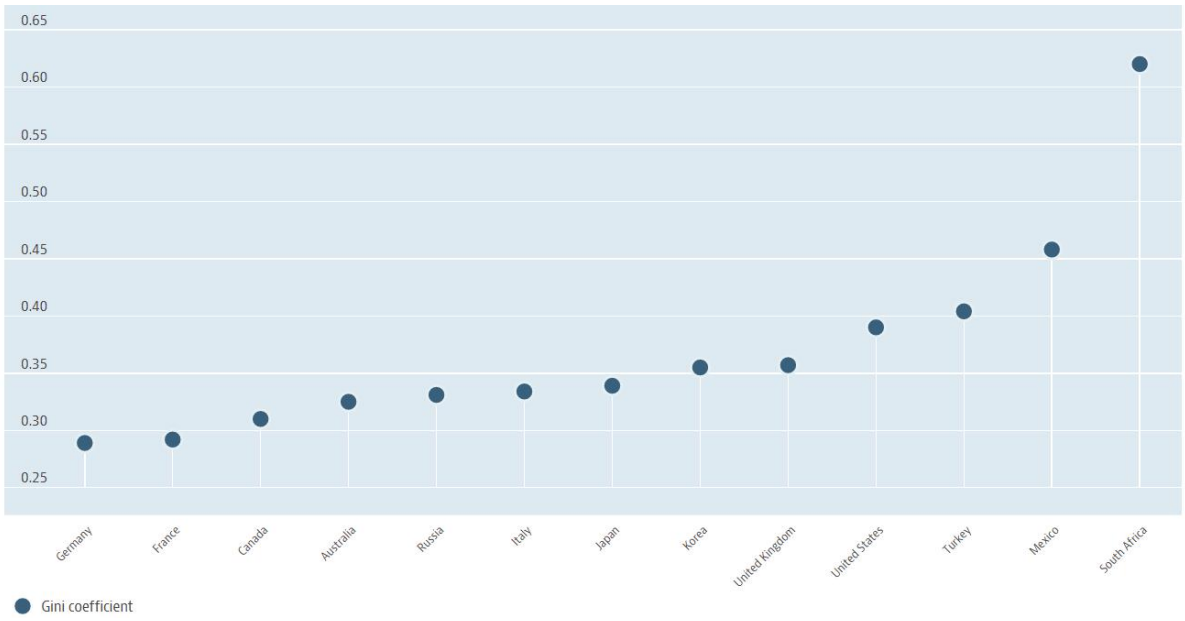
Source: World Bank (2020)[26]

[26] Accessed via https://bit.ly/3bJRj76; date of access 13 February 2020.

Exhibit 3: Examples of South African Public Primary Healthcare Sites

Source: Private library, Dr Nthabiseng Legoete

Exhibit 4: Selected Gini Coefficients[27] by Country (2018 or latest available)



Source: OECD Social and Welfare Statistics (2020)[28]

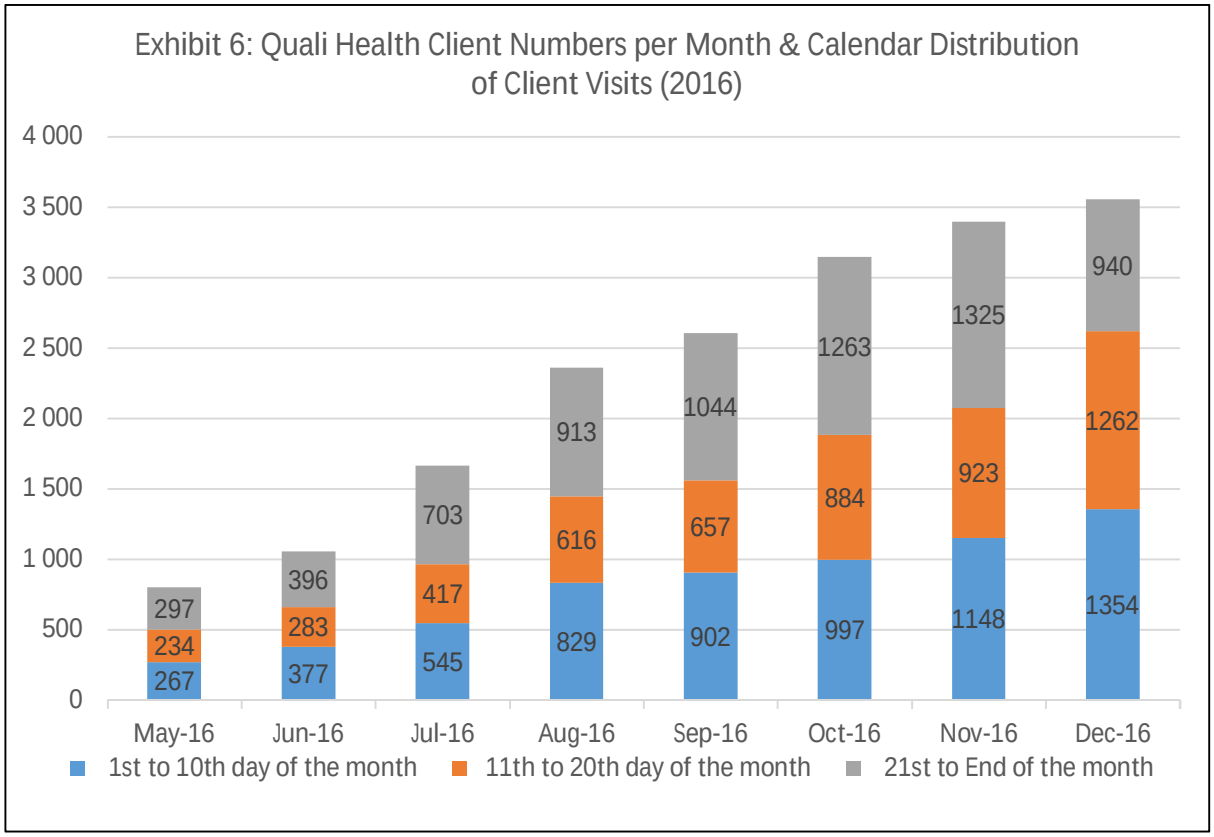
[27] The Gini coefficient is a measure of statistical dispersion used to represent the income or wealth distribution of a nation's residents. The Gini coefficient is the most used measure of inequality. The coefficient ranges between zero and one, with a measure of zero representing absolute equality in income in a population, whilst a score of one represents a state of absolute inequality.

[28] Accessed via https://data.oecd.org/inequality/income-inequality.htm; date of access 7 May 2020.

Exhibit 5: Demographic Numbers for Diepsloot, Alexandra, Soweto and Tembisa

	Diepsloot	Alexandra	Soweto	Tembisa
Population	798,000	1,343,000	3,567,000	1,658,000
Households	62,882	128,737	745,331	356,340
Economically Active Households (%)	76.5	74.9	81.3	77.8
Population Density (persons/square kilometer)	11,532	25,979	6,357	10,820
Working Age (15-64 years) (%)	77.4	73.9	71.0	75.4
Dependency Ratio	29.3	35.3	40.8	32.7
Formal Dwellings (%)	34.5	74.3	84.2	72.5
Female Headed Households (%)	28.6	33.9	40.3	27.1
Housing Owned/Paying Off (%)	21.0	44.5	43.2	28.0
Completed Secondary School (%)	30.7	38.5	38.3	39.9

Source: Mahajan (2014)



Source: Quali Health management accounts (January 2017)

Exhibit 7: Enrolled Nursing Auxiliary Category (2015)

Province	Permanent (%)	Temporary (%)	Unemployed (%)
Gauteng	7.7	18.0	74.4
KwaZulu-Natal	6.0	6.6	87.4
Eastern Cape	18.9	17.8	63.3
Mpumalanga	2.4	4.8	92.9
North West Province	22.5	4.1	73.5
Limpopo	7.5	5.0	87.5
Western Cape	30.8	26.7	42.5
Free State	10.5	31.6	57.9
Average	13.3	14.3	72.4

Source: South African Nursing Council (2015)[29]

Exhibit 8: Everyday Items Advertised at Shoprite (2016-2017)

Source: Shoprite South Africa[30]

[29] Accessed via www.sanc.co.za; date of access 8 October 2019.
[30] Accessed via shorturl.at/nsAJU; date of access 12 February 2020.

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