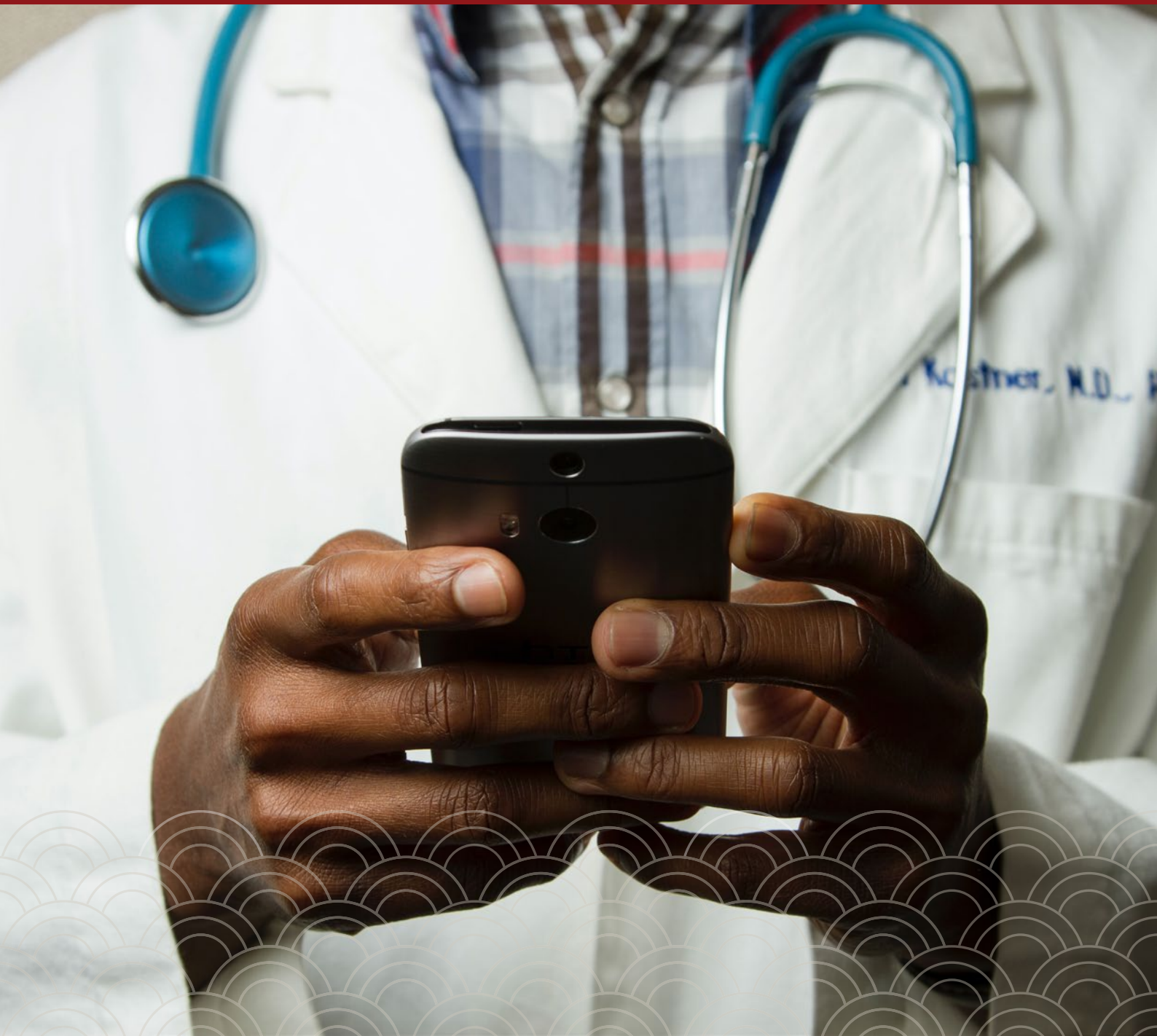


Case Notes From the Frontier

Five case studies of South African telemedicine providers



CONTENTS	2
LIST OF FIGURES	3
INTRODUCTION	4
1. CASE STUDY APPROACH	7
2. INTERCARE AND STONE THREE SHOW THAT CENTRING THE USER EXPERIENCE OF HEALTHCARE PRACTITIONERS IS A KEY TO SUCCESS	8
2.1 USER EXPERIENCE	10
2.2 INTEGRATION CAPABILITY	11
2.3 SCALABILITY AND SUSTAINABILITY	12
2.4 EFFICIENCY AND IMPACT	13
2.5 KEY LESSONS	14
3. HEALTHFORCE ALLOWS NURSES TO LEAD	15
3.1 USER EXPERIENCE	17
3.2 INTEGRATION CAPABILITY	17
3.3 SCALABILITY AND SUSTAINABILITY	18
3.4 EFFICIENCY AND IMPACT	19
3.5 KEY LESSONS	20
4. PHULUKISA OFFERS A PRIMARY HEALTHCARE FACILITY IN A BACKPACK	21
4.1 USER EXPERIENCE	23
4.2 INTEGRATION CAPABILITY	23
4.3 SCALABILITY AND SUSTAINABILITY	23
4.4 EFFICIENCY AND IMPACT	24
4.5 KEY LESSONS	24
5. QUORO MEDICAL CREATES "VIRTUAL WARDS" THROUGH HOME-BASED ACUTE CARE	25
5.1 USER EXPERIENCE	26
5.2 INTEGRATION CAPABILITY	27
5.3 SCALABILITY AND SUSTAINABILITY	27
5.4 EFFICIENCY AND IMPACT	27
5.5 KEY LESSONS	28
6. ALLEGRA PARTNERS WITH BONITAS TO OFFER VIRTUAL CARE	29
6.1 USER EXPERIENCE	31
6.2 INTEGRATION CAPABILITY	32
6.3 SCALABILITY AND SUSTAINABILITY	32
6.4 EFFICIENCY AND IMPACT	32
6.5 KEY LESSONS	33
7. CONCLUSIONS	34
REFERENCES	35

List of Figures

FIGURE 1: MARKET PLAYERS IN SOUTH AFRICA	6
FIGURE 2: WHERE ARE INTERCARE AND STONE THREE SITUATED IN THE SOUTH AFRICAN TELEMEDICINE MARKET?	8
FIGURE 3: PERCENTAGE OF INTERCARE PATIENTS THAT WERE VERY SATISFIED THAT THE VIRTUAL CONSULTATION ADDRESSED THEIR MEDICAL CONCERNS AND/OR NEEDS	10
FIGURE 4: VIRTUAL CONSULTATIONS CONDUCTED BY INTERCARE DOCTORS FROM APRIL TO SEPTEMBER 2020	12
FIGURE 5: WHERE IS HEALTHFORCE SITUATED IN THE SOUTH AFRICAN TELEMEDICINE MARKET?	15
FIGURE 6: WHERE IS PHULUKISA SITUATED IN THE SOUTH AFRICAN TELEMEDICINE MARKET?	21
FIGURE 7: CLOUD-ENABLED BACKPACK WITH SCREENING TOOLS	22
FIGURE 8: WHERE IS QURO MEDICAL SITUATED IN THE SOUTH AFRICAN TELEMEDICINE MARKET?	25
FIGURE 9: WHERE IS ALLEGRA SITUATED IN THE SOUTH AFRICAN TELEMEDICINE MARKET?	29
FIGURE 10: CUSTOMER SATISFACTION OUTCOMES FOR ALLEGRA VIRTUAL CARE APP	33

Summary of the main findings

- + **Although Covid-19 has created a use case, further uptake of telemedicine requires training of healthcare practitioners.** The usage of telemedicine has increased significantly under Covid-19, but the numbers show that healthcare practitioners need to be correctly trained to deliver these services. There is usually a big gap between the number of healthcare practitioners who sign up for telemedicine apps relative to the number who actually use them. Appropriate practitioner training is crucial for increasing telemedicine usage, and to ensure that patients have a positive experience of the service and will want to use it again.
- + **Telemedicine can improve value by reducing costs to the health system.** Whether it is through technology-enabled task shifting which allows community health workers and nurses to provide more comprehensive care to patients, or more effective triaging that prevents unnecessary doctor consultations or health facility visits, telemedicine can play an important role in reducing costs in the health system.
- + **Value-based reimbursement is key to driving uptake among doctors.** Without appropriate compensation, doctors will not be incentivised to provide telemedicine services. Compensation should be more closely tied to patient health outcomes (i.e. the quality of care), and not simply the mode by which care is delivered.
- + **A positive user experience for healthcare practitioners is important for ensuring their sustained usage of telemedicine services.** Healthcare practitioners need to be supported in transitioning to using the technology. When they are comfortable using it, the patient experience and quality of care provided also improve.
- + **The regulatory environment needs to enable innovation.** Covid-19 and the temporary relaxation of telemedicine guidelines have created a window of opportunity for innovation in the South African telemedicine market. This opportunity should be used to observe the growth in the market and increase potential use cases to collect evidence on the potential for telemedicine to increase access to quality healthcare while reducing costs.

- + **P2P^a telemedicine shows how technology can enable task shifting.** D2P and P2P telemedicine services all have their role to play in the continuum of care, but P2P telemedicine shows how technology can enable task shifting, empowering lower-skilled health workers to provide more comprehensive care to patients. In the South African context, where there are relatively low levels of human resources for health, this technology frees up the capacity of highly skilled healthcare workers to treat more patients who need specialised care, thus lowering the overall cost of healthcare delivery.
- + **Integration is an important part of building better, more innovative solutions that meet the needs of patients.** By leveraging existing patient data and applications, integration allows for a more seamless user experience of telemedicine platforms for both patients and clinicians. Allowing clinicians to have a unified view of patient health records, in a way that is compliant with data protection regulation, allows them to provide better care to patients. It also gives patients more freedom to choose how and where they receive healthcare, without being bound to a single provider. A unified view of patient data also improves efficiency by reducing duplication of services rendered to patients.
- + **Partnerships are crucial to ensuring that the needs of multiple stakeholders are served.** Most of the case studies reviewed here involve partnerships of some kind, between telemedicine providers and medical schemes, hospital groups, and pharmacies, among others. These partnerships not only show how telemedicine can be leveraged to meet the needs of various stakeholders that provide different types of healthcare services, but also show how telemedicine can be leveraged at different stages of the continuum of care.

The Covid-19 pandemic has presented enormous challenges for healthcare systems around the world and South Africa is no exception. However, these challenges have created an impetus for innovation and the adoption of new technologies for healthcare delivery.¹ Given the nature of how Covid-19 is spread and how infectious the disease is, telemedicine has created an opportunity for delivering healthcare in a way which protects both patients and healthcare workers.²

Telemedicine is defined by the World Health Organization (WHO) as the remote delivery of healthcare services by healthcare professionals, where distance is a defining factor, using information and communication technology (ICT) for the exchange of information.³ It has the ability to expand access to quality healthcare, particularly to those who need it the most, such as people living in remote rural areas and people who are frail and struggle to access healthcare facilities.^{5,6} Telemedicine also has the potential to accelerate the path to universal health coverage.⁶

In South Africa, telemedicine has existed for over 20 years,⁴ but numerous regulatory, implementation and market-related obstacles have hampered the usage at scale^b. In order to better understand the changes in the South African telemedicine market triggered by Covid-19 and the concomitant regulatory changes, we conducted interviews with a wide array of telemedicine service providers that spanned the spectrum of different needs of patients and healthcare workers. The purpose of these interviews was twofold: firstly, to establish the nature and scale of innovation happening in the telemedicine market, and to get a view of how telemedicine providers were responding to the opportunities presented by the pandemic; and secondly, to collect evidence of telemedicine efficacies and efficiencies which can inform how to better regulate for innovation in the telemedicine sector. Figure 1 describes how the South African telemedicine providers that we interviewed can be classified as either telemedicine or care navigation models.

^a For the sake of brevity, telemedicine, where information is shared digitally from one healthcare practitioner to other healthcare practitioner(s), is referred to as **P2P** telemedicine, and direct doctor to patient or direct to patient telemedicine is referred to as **D2P** telemedicine in this brief.

^b For a detailed description of the South African telemedicine market and the changes in telemedicine regulation, please see [The nurse can see you now: Reflections from the South African telemedicine market in light of Covid-19](#)³²

Figure 1: Market players in South Africa

Source: Framework and definitions adapted from McKinsey & Company⁷ to contextualise the South African market

CATEGORY	MARKET DISTRIBUTION	
Telemedicine	<p>Synchronous: Live, two-way remote interaction between patients and providers (D2P)</p> <p>e.g. Allegra^{**}, ClickDoc, Counselling Hub, Doctors on Call, DrConnect, Get Tested, Healthbridge, Hello Doctor, Signapps, Stone Three and Intercare^{**}, Guardian Health, and Talamus*</p>	<p>Synchronous: Live, two-way interaction between healthcare providers (P2P)</p> <p>e.g. eHealth Group, Healthforce^{**}, Phulukisa^{**}, Signapps, Stone Three^{**}, and Vula*</p>
	<p>Asynchronous: D2P transmission of patient information</p> <p>e.g. Get Tested, Healthbridge, Phulukisa^{**}, Signapps, SystemOne*, Guardian Health, and Talamus*</p>	<p>Asynchronous: P2P transmission of recorded health history</p> <p>e.g. DrConnect, Get Tested, Phulukisa^{**}, Signapps, Stone Three^{**}, Guardian Health, Quro^{**}, Healthforce^{**}, and Vula*</p>
	<p>Remote patient monitoring: Collection of electronic health data which is transmitted for review by a remote provider</p> <p>e.g. e-mutakalo* and Quro^{**}</p>	
Care Navigation	<p>Patient self-directed care: Patients accessing their own information</p> <p>e.g. DrConnect and ThinkMD*</p>	<p>E-triage: Tools that provide appropriate support in searching for and scheduling appropriate care based on symptoms/ conditions, as well as price and quality of providers</p> <p>e.g. Phulukisa^{**}, Allegra^{**}, DrConnect, Hello Doctor, Kimi from Momentum, and ThinkMD*</p>

*these providers were not interviewed as part of this study

**providers profiled in case studies below

From the range of interviews we conducted, we selected six telemedicine service providers that provided interesting use cases and examples of the variety of telemedicine service offerings currently in the South African market. The service providers are Stone Three, Intercare, Phulukisa, Healthforce, Quro, and Allegra. They offer services that are scalable or have already achieved scale, and represent examples of both synchronous and asynchronous P2P and D2P telemedicine solutions, and remote monitoring in the case of Quro.

Case study approach

In the five short case studies (Stone Three and Intercare are described together) presented in this document, we used four descriptors to illustrate the features of services provided by different telemedicine models:

- **User experience:** This refers to both the patient and the health worker. Here we evaluate the ease of use, whether communication is synchronous or asynchronous, the affordability of the service, and how the patient journey is impacted (for example, does the telemedicine service change where the patient engages with the healthcare system).
- **Integration capability:** This relates to how well the service links with other systems, both horizontally (across different health service providers) and vertically (across the health system or continuum of care). This, for example, may include the integration of data systems of health service providers and/or medical schemes, or the use of open application program interfaces (APIs)^c.
- **Scalability and sustainability:** Scalability refers to the ability or potential of the service to expand its reach beyond the current service offering. Sustainability refers to the post-Covid-19 viability and also financial sustainability of the service (i.e. is there a business case for this service or will it always rely on donor or government funding?). We also explore the existing or potential barriers to achieving scalability and/or sustainability.
- **Efficiency and impact:** This refers to how well the telemedicine service utilises resources and eliminates bottlenecks within the healthcare system, and how cost effective it may be to patients, providers, and/or the health system as a whole. Whether the service expands reach or access to health services to people who otherwise would not have access to it, and whether clinical outcomes can be improved due to this telemedicine service is also considered. We look at the potential for service providers that have not achieved scale to improve efficiency. Here we take both a retrospective and prospective view.

At the end of each case study, the key lessons are highlighted, with an explanation on why these learnings are important for the telemedicine market. All information presented in these case studies about these companies derive from the interviews conducted, data shared by the providers, and data or information publicly available.



^cAPI are the sets of rules or requirements that govern how applications transfer information, interact or interface with one another. An open, or public, API is one which is publicly available and allows software developers access to its back-end data which can be used to enhance developers' own applications. An example of this is being able to use one's Google or Facebook account to create a profile or log into LinkedIn – in this example Google and Facebook's open API makes this possible.

SECTION
2

Intercare and Stone Three show that centring the user experience of healthcare practitioners is a key to success

Figure 2: Where are Intercare and Stone Three situated in the South African telemedicine market?

CATEGORY	MARKET DISTRIBUTION	
Telemedicine	<p>Intercare and Stone Three’s partnership is a synchronous D2P model because Stone Three’s Pathways platform facilitates a live, two-way remote interaction between patients and Intercare doctors</p>	<p>Stone Three’s Pathways product is also used for synchronous P2P telemedicine because among their US-based clients and with their occupational care clients, they provide a two-way interaction between health workers, usually a nurse and a doctor</p>
	<p>Asynchronous: D2P transmission of patient information</p>	<p>Stone Three’s auxiliary medical devices which interface with their Pathways platform are used for asynchronous P2P telemedicine. They capture patient data and incorporate it into the patients’ electronic health records (EHR) making it possible for clinicians to share data between each other asynchronously</p>
	<p>Remote patient monitoring: Collection of electronic health data which is transmitted for review by a remote provider</p>	
Care Navigation	<p>Patient self-directed care: Patients accessing their own information</p>	<p>E-triage: Tools that provide appropriate support in searching for and scheduling appropriate care based on symptoms/ conditions as well as price and quality of providers</p>

[Intercare Group](#) was established in 2000.⁸ They own and operate 31 healthcare facilities which include primary healthcare facilities (with GPs, dentists, pathologists, dieticians, physiotherapists, psychologists, and radiologists) and hospitals (sub-acute and day hospitals).⁸ Across these health facilities, Intercare receives more than 800,000 patient visits per annum. As part of their digital transformation, which began over two years ago, Intercare began developing capabilities for virtual consultations with their doctors. When the Covid-19 lockdown began in South Africa, they were well positioned to launch a virtual consultation option for their patients in May 2020.⁹

Intercare's health facilities have remained open throughout the lockdown, and although they did not mandate that doctors should offer virtual consultations, they have seen considerable uptake of the service. Of the approximately 165 GPs in their hospital network (both part-time and full-time), 95 (57%) of them were offering virtual consultations by May 2020. Despite the nascence of the service, from May to mid-October, Intercare had already facilitated almost 12,000 virtual consultations, and by October only about 10% of their doctors were not registered to offer telemedicine consultations.



To enable their virtual consultation, Intercare partnered with the Cape Town-based health technology company, Stone Three as a service provider. Stone Three was founded in 2000 with the aim of creating accessible, and affordable innovative technology to offer a better way to do business, and a better quality of life.¹⁰ Stone Three started out by providing software and artificial intelligence (AI)-driven technology for clients such as PPO Serve and the CSIR. They maintained this technology for clients, while they have continued to expand further into the health technology business.

Stone Three entered the telemedicine space through the development of a teleconsultation service for a client based in rural United States. Much like South Africa, their US-based client was trying to find a solution for delivering healthcare to sparsely populated rural areas where there were few doctors. To this end, Stone Three developed their nurse-led teleconsultation service called Pathways. In addition to this they developed their first medical device product called TeleSensi™. TeleSensi is a stethoscope that streams clinical-quality audio to a remote doctor. This technology is built to integrate into existing telemedicine platforms, not just those of Stone Three. Using devices such as TeleSensi and dermatological cameras, which capture high resolution photographs that doctors can store as part of the patient's file, the nurses act as the hands and eyes of the doctor, while doctors are able to see and interact with the patient via a camera in real time. Intercare has been using Pathways since they launched their telemedicine service in May 2020 in order to provide a direct D2P teleconsultation which did not require a nurse to be present.

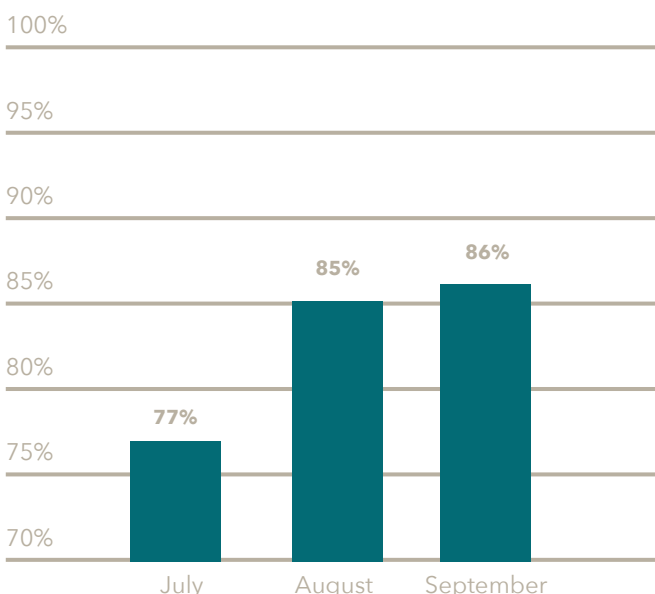
Stone Three's teleconsultation platform is license-based, and clients can choose between three licencing options: a flat fee, per doctor, per month; a pay-per-use option, where Stone Three will charge a percentage of the consultation fee of about 1-2%; or a combination of the two.

2.1 User experience

Stone Three consider Intercare to be one of their biggest success stories in South Africa. They believe that the key to this success is the level of real time support Intercare has provided for their doctors. Intercare has prioritised ensuring that Pathways fits effortlessly into their doctors' workflow. Billing, note-taking, and other administrative and clinical functionalities are integrated into the platform, making the user experience seamless. Although Stone Three still provide technical support to Intercare in terms of maintaining the Pathways platform, Intercare have fully internalised the support function for patients and doctors. Intercare created a designated technical support team tasked with familiarising doctors with the platform, encouraging behaviour change, and providing real time technical support to both doctors and patients where needed. This has made doctors' user experience more positive, which in turn has encouraged both initial uptake and continued usage of the service.

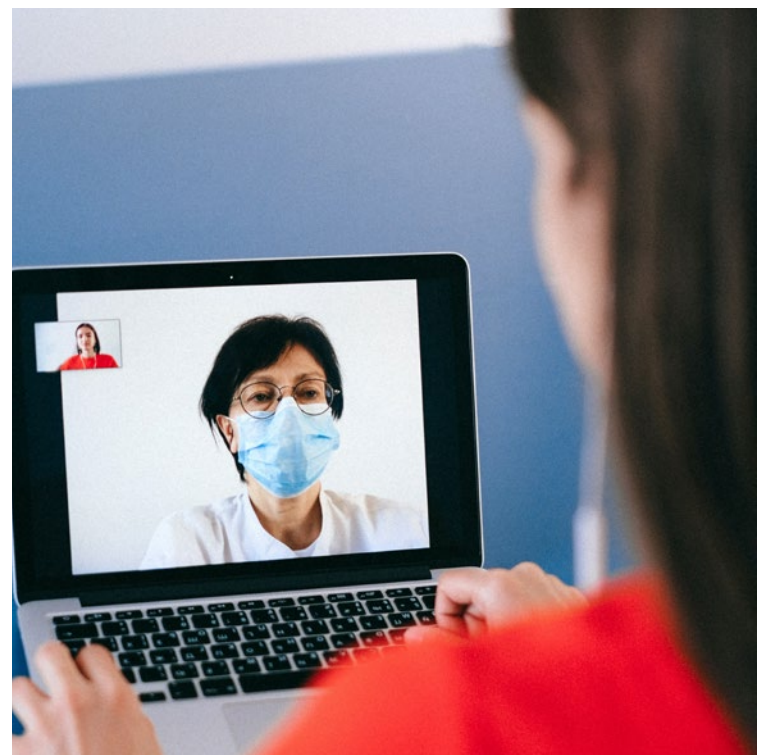
Via the Intercare website a patient can book an appointment with their own Intercare doctor online. Once the appointment is booked, the patient will receive a link on which they can click to initiate the consultation at the booked time.

Figure 3: Percentage of Intercare patients that were very satisfied that the virtual consultation addressed their medical concerns and/or need



“86% of patients who used virtual consultations felt that these consultations addressed their medical needs”

This link can work on both a mobile device and computer, and on any browser – it does not require the patient to download an additional application. The combination of training the doctors and ease of use has resulted in a favourable user experience. Figure 3 shows that the vast majority of Intercare patients who had virtual consultations with their GPs felt that their medical concerns were addressed in these consultations. In May 2020, 77% of patients were very satisfied that the virtual consultation addressed their medical needs, and by September 2020, this number had increased to 86%. This increase in patient satisfaction may be attributable to the ongoing training and support that doctors received which may have improved their “digital bedside manner,” in addition to a greater willingness among patients to use telemedicine as the risks associated with Covid-19 infection became more salient.



2.2 Integration capability

Pathways provides an integrated online platform where doctors can easily schedule appointments with patients and conduct video consultations. Doctors can fill in an electronic patient encounter form and e-script which can be integrated into the patient's EHR using the doctors' existing electronic record and billing system. For Intercare, this was one of the key advantages of partnering with Stone Three: they were willing to integrate with Intercare's existing practice management administrative (PMA) systems as opposed to requiring that Intercare overhaul their PMA system in order to integrate Pathways.

Stone Three is in the process of building an open medical record system (MRS) which is part of an international movement to make health records more accessible. They are also looking to integrate more devices which could be used in nurse-led telemedicine consultations to automatically update information on the patient's EHR i.e. without the healthcare workers having to fill in the records manually.

Stone Three has also made efforts to integrate their billing platforms with those of medical schemes but have met some resistance from certain schemes that have launched their own telemedicine applications.



2.3 Scalability and sustainability

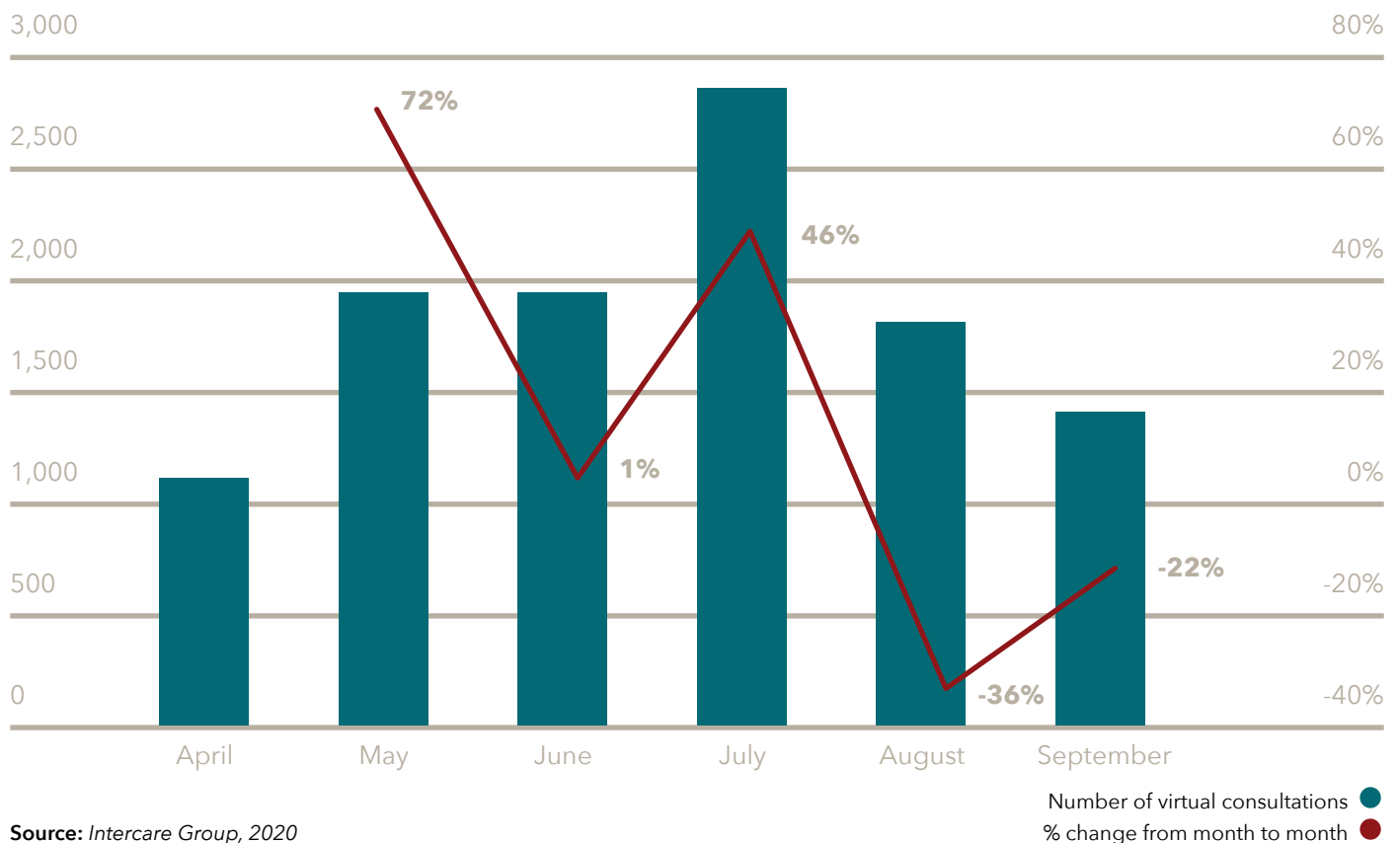
Stone Three’s technology, both for consultations and medical devices, can be used across the continuum of care, from primary healthcare (PHC) facilities to hospitals. This is why they are well suited to servicing doctor and hospital networks such as Intercare, and have expanded into providing their services to networks offering mental healthcare, managed care, and to a hospital network which serves the uninsured and underserved communities called [Quali Health](#).¹¹ This type of technology certainly has use cases beyond Covid-19 and can be leveraged to increase access to PHC and specialised care in remote areas, as Stone Three has done in the rural United States. Stone Three’s products are also suitable for non-clinical settings, such as occupational health, where mining companies are their primary clients.

When South Africa went into lockdown in March 2020, Intercare’s primary concern was ensuring that their doctors were able to continue to deliver care to their patients, and Pathways enabled them to do this remotely. By empowering their doctors

to provide teleconsultations as well as in-person consultations, Intercare enabled them to continue to receive additional revenue to supplement what they may have lost in the midst of the pandemic while reducing the risk of infection to both patients and doctors. According to Intercare, between 10-15% of GP consultations have taken place virtually since the service launched.

Figure 4 illustrates the relative month on month growth of telemedicine consultations from April to September conducted by Intercare doctors. In total over 12,000 consultations were facilitated virtually over six months. The number of virtual consultations more than doubled between April and July, and then began to steadily decline. This decline is likely attributable to the easing of lockdown restrictions over this period,¹² which may have made patients and doctors more comfortable with face-to-face consultations again. However, the decline in virtual consultations may also be attributable to load shedding in some areas over this time,¹³ which would have meant disrupted electricity supply for some patients, making virtual consultations infeasible.

Figure 4: Virtual consultations conducted by Intercare doctors from April to September 2020



Source: Intercare Group, 2020

Despite the fact that medical schemes are reimbursing doctors at a lower rate for virtual consultations,¹⁴ reimbursement was not the determining factor for Intercare in deciding whether telemedicine should be used as a mode of healthcare delivery during or after the Covid-19 pandemic. However, Intercare doctors, and many doctors providing teleconsultations during this pandemic, still have their physical practices open and have overheads to cover, so their expenses may not meaningfully reduce when offering virtual consultations. For Intercare, the virtual consultations are not designed to completely replace face-to-face consultations, but rather to provide patients with more convenience option. Virtual consultations are a complementary part of the continuum of care that could improve quality and outcomes. Intercare sees telemedicine as an aspect of their ongoing digital transformation and it will remain part their care offering beyond Covid-19.

2.4 Efficiency and impact

Given people's apprehension to leave their homes due to the risk of infection from Covid-19, particularly for vulnerable immunocompromised groups, one could argue that the 10-15% of Intercare GP consultations which were conducted virtually may not have otherwise happened. Doctors would have lost out on this business had they not had a virtual option. Virtual consultations potentially created an alternative revenue stream, and patients who may have not been able to access care without a virtual option were still able to be treated.

Figure 3 shows that by September 2020, 86% of Intercare patients that responded to the customer satisfaction survey felt that their medical concerns and needs had been resolved with the virtual consultation. This indicates that virtual consultations can provide quality care, while also protecting doctors and patients from potential infection, particularly if patients present with

Covid-19 symptoms. Virtual consultations also allow for the continuity of care and care management, ensuring that patients with chronic illness or who have conditions which require regular monitoring are still able to receive care during the pandemic.



2.5 Key lessons

A deliberate onboarding and real-time support process are required for uptake: One of the key lessons from this case study is that the uptake of teleconsultation services among healthcare practitioners is not always going to be demand-driven – there has to be an intentional onboarding and real-time support process. The telemedicine service provider needs to fully understand the healthcare practitioners' user experience, and support accordingly. Intercare and Stone Three have been very deliberate about driving uptake among doctors at Intercare PHC facilities. Intercare wanted to ensure that all their practices were able to deliver video consultations, and deployed teams to train doctors in how to use the Pathways platform. For Intercare doctors who were not using Pathways, the on-the-ground support teams followed up with them to find out why they were not using the services, and further help was offered to them. By October 2020, only 10% of Intercare doctors were not registered for telemedicine consultations, which highlights the effectiveness of communicating the value of telemedicine to healthcare workers, and being deliberate about getting their buy-in for the platform.

“Teleconsultation services among healthcare practitioners are not always going to be demand driven – there has to be an intentional onboarding and real-time support process.”

“To ensure that healthcare practitioners have a positive experience, telemedicine platforms need to have easy-to-use interfaces which integrate seamlessly into their existing workflow.”

An easy-to-use interface and integrated platform encourages uptake and sustained use: The user experience of healthcare practitioners is key to uptake and sustained use. To ensure that healthcare practitioners have a positive experience, an easy-to-use interface for their platform which integrates seamlessly into their existing workflow is necessary.

Telemedicine can provide an alternative source of revenue for healthcare practitioners, but reimbursement should be outcomes based: Approximately 10-15% of consultations with Intercare doctors were conducted virtually between May and October 2020. These consultations may not have happened had a virtual option not been available, and one could argue that the lower reimbursement rate offered by medical schemes for these consultations is better than nothing. However, if a patient's health concern is sufficiently resolved through a virtual consultation, without needing an in-person follow-up consultation, then it may also be fair to argue that reimbursement should be based on patient outcomes, as opposed to the medium through which the consultation happens. This also ensures that the incentives of the healthcare practitioner, the patient, and/or the payer of the health service are aligned, as the health practitioner is rewarded for ensuring a high-quality experience for the patient.

SECTION
3

Healthforce allows nurses to lead

Figure 5: Where is Healthforce situated in the South African telemedicine market?

CATEGORY	MARKET DISTRIBUTION	
Telemedicine	Synchronous: Live, two-way remote interaction between patients and providers (D2P)	Healthforce is an example of synchronous P2P telemedicine because they enable a live, two-way interaction between an attending nurse and a doctor
	Asynchronous: D2P transmission of patient information	Healthforce is an example of P2P asynchronous telemedicine because patients can consent to allowing their EHRs to be shared between clinics and pharmacies that are supported by the Healthforce platform
	Remote patient monitoring: Collection of electronic health data which is transmitted for review by a remote provider	
Care Navigation	Patient self-directed care: Patients accessing their own information	E-triage: Tools that provide appropriate support in searching for and scheduling appropriate care based on symptoms/ conditions as well as price and quality of providers

[Healthforce](#) is a nurse-led PHC telemedicine provider and clinic management system.¹⁵ They have over 440 clinic rooms in more than 250 pharmacies (Medicare, Dischem, and independent pharmacies) in all provinces across South Africa.¹⁵

In Healthforce’s telemedicine model, patients consult with nurses at a clinic in one of the pharmacies or primary healthcare facilities within their network. The nurse does all the necessary physical examinations, such as checking blood pressure. If the nurse needs assistance with deciding what the appropriate treatment is, they

will initiate a video teleconsultation with one of Healthforce’s affiliated GPs, who are trained by Healthforce and have experience in providing remote consultations. GPs and nurses are also able to capture notes on patients’ diagnoses and prescribed treatments using Healthforce’s web-based clinic practice management system. Nurses are employed by the pharmacy and Healthforce provides the teleconsultation platform, the clinic practice management system and the doctors. In addition to advising on treatment, the Healthforce GPs can write prescriptions for medications up

to Schedule 4, write referrals for blood tests and consultations with specialists, and dispense sick notes. Healthforce's policy is that their doctors do not prescribe medication classified higher than Schedule 4, as they believe these medications require in-person examination by a clinician or should be prescribed by specialists (e.g. narcotic painkillers and psychoactive medications). Nurses are free to administer treatment and prescribe medication in line with the South African Nurses Council scope of practice. Healthforce's policies also allow their nurses to examine children under two years of age, but if further examination is required then they are referred directly to a paediatrician and not a Healthforce GP so that the client does not have to pay for two doctors' consultations.

Healthforce aims to build a ubiquitous entry point into primary healthcare, by extending into community care through the nurse-led PHC model. This model supports the health system in providing a high-quality and low-cost entry point that can effectively treat patients. Healthforce believe that the nurses need to have a more prominent role in the healthcare value chain. By situating care at the lowest skills and cost level that it can comfortably be provided, that is, by incorporating the nurses' skills with virtual assistance from GPs where needed, they hold that this model can unlock increased access to affordable primary healthcare.

A good rapport between doctors and nurses is essential for the Healthforce model to work optimally. They select their affiliated doctors and nurses very carefully to ensure that there is a high level of trust and mutual respect between them. The nurse is understood to be the patient's main healthcare provider, and the doctor is there to assist.

Healthforce's nurse led clinics have seen over 590 different health conditions, both chronic and acute, through their GPs, and only 4.6% of these have resulted in referrals to in-person GP consultations or specialists. Waiting times for nurses and doctors at Healthforce clinics are also much shorter than many public PHC facilities – once a patient

is consulting with a nurse, it takes on average two minutes to get a doctor online for a virtual consultation, with no prior booking required.

Healthforce have conducted over one million consultations with nurses and over 95,000 teleconsultations with GPs. On average, they facilitate 80,000 nurse-led consultations per month; and of these only 20% lead to a GP being dialled in to advise the nurse. Nurses have the capacity to do 15 to 20 consultations per day, depending on factors which affect the volume of footfall within pharmacies, such as their location, whether there is a shortage of GP practices in these locations, and the time of the month. Healthforce clinics are busiest at the end of the month, and pharmacies located in busy malls receive more patients.

Given that Healthforce is a P2P telemedicine model, they were not impacted by the changes in Health Professions Council of South Africa (HPCSA) regulation as they were already compliant. Therefore, despite the changes in the telemedicine guidelines which temporarily allow for D2P teleconsultations, Healthforce did not adjust their model to accommodate this, nor do they plan to in the future. As a result, during lockdown utilisation rates of Healthforce clinics declined significantly due to reduced footfall in pharmacies, in line with the decline seen in many GP practices, despite pharmacies remaining open. However, according to Healthforce, these numbers have since recovered to a level higher than pre-Covid-19.

Healthforce do see a space for D2P services but they believe that their nurse-led model provides more value as there is limited scope for what doctors can assist patients with via a D2P teleconsultation. They believe that the nurse-led teleconsultation model leverages PHC resources in an optimal way.

While nurse-led consultation models are standard in the South African public health sector, they are not the norm in the private sector. Therefore, there is significant potential in the private sector for cost savings and increased efficiency in a model that only brings a doctor into a PHC consultation when necessary.

3.1 User experience

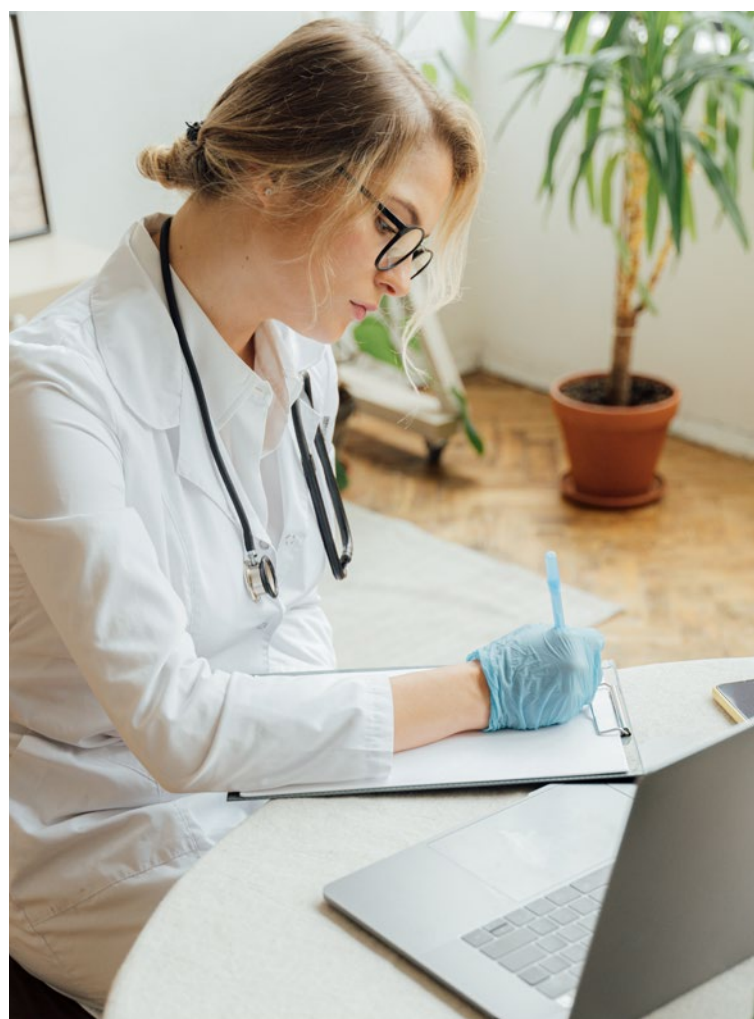
Healthforce provide a low-cost entry point to private, high-quality PHC. Since they have over 400 clinics, many of which are in pharmacies in major malls, they are easy to access and often close to public transport. As described in more detail below, most of the patients' healthcare needs are met when they consult with a nurse. Should they need to consult with a doctor, Healthforce claim that waiting times are on average two minutes without a prior booking required.

Good rapport between nurses and doctors is recognised as an important part of Healthforce's nurse-led PHC model. As a result, nurses and doctors are required to provide ratings of one another. Patients can also provide ratings of the care they receive, and on average these patients have scored their Healthforce experience as 4.95 out of 5. However, there may be selection bias in this result as only 8% of patients provide customer satisfaction feedback. On average patients return to Healthforce clinics at a rate of 1.45 times per year.

3.2 Integration capability

Healthforce keep an electronic record of their patients' health data which can be shared across Healthforce clinics with the patients' consent. This means that regardless of the Healthforce clinic a patient visits, their medical history will be available to the attending nurse, doctor, or pharmacist. In addition to this, Healthforce has integrated with a number of other customer relationship management (CRM) systems and EHRs, including SAP^d, for the sharing of required patient information.

They have also integrated digital otoscopes which can be used by the nurse to enable the doctors to see inside a patient's ear, nose, and throat, as well as taking high resolution pictures of their skin. Nurses can use a specialised application on their phone which enables them to upload pictures of the patient to their computer and share them with the consulting doctor, and without saving these sensitive images onto their phone. This has proven to be a cost-effective way of sharing more detailed patient information with doctors to assist them in making more accurate diagnoses, while also protecting the privacy of patient data.



^dSAP is a centralised data management software which allows companies to manage complex business processes across multiple business functions.³³

3.3 Scalability and sustainability

Although Covid-19 has reduced the utilisation of Healthforce clinics, they say that the pandemic has created new use cases for their platform. For instance, there has been an increased demand for nurse-led standalone PHC clinics in retirement homes, among corporate clients, and from other types of home-based care service providers. Essentially, there are use cases wherever there is a site for primary healthcare where the offering needs to be enhanced, or where there is a requirement for nurses to assist in providing specialist care. They are also in talks about partnering with more pharmacy chains.

Healthforce have made it clear that they aim to expand their footprint beyond urban areas in order to provide access to high-quality, low-cost healthcare to more remote communities. However, in clinics or pharmacies where margins are already

low, the upfront investment in equipment can make this a challenge. A Healthforce nurse-led clinic requires a laptop, a large monitor or screen on which the patient can see the doctor, and an internet connection. These hardware costs all need to be covered within the consultation fee. However, once the initial investment is made, they say, additional revenue earned from consultation fees can quickly recoup this spend.

Healthforce have been in discussions with provincial governments in the Western Cape and Gauteng about the potential for piloting Healthforce clinics in the public sector. However, the government health departments' reliance on paper-based systems has caused hesitance in adopting Healthforce's entirely digital solution. The onset of Covid-19 has also shifted the focus and resources of these health departments, therefore, as of yet little progress has been made.





Pharmacies pay a monthly licencing fee for the Healthforce platform, which they claim is 40% cheaper than comparable licencing fees in the market. The fee paid for a nurse consultation goes entirely to the clinic or pharmacy. GPs also pay a percentage of the fee per consultation to Healthforce for facilitating access to nurses and patients.

One Healthforce doctor we spoke to said that he can see about six or seven patients per hour (or 60 patients per day) at full capacity, compared to a maximum of about four patients per hour when he is consulting in person. This is because much of the initial part of the consultation, such as greeting the patient, ascertaining their health concern, and/or taking vital measurements, is conducted by the nurse. Therefore, all the doctor is left to do is to give advice or write a prescription where needed.

When clinics are using Healthforce's system at full capacity, only about 20% of Healthforce nurse-led consultations result in a teleconsultation with a doctor – the remainder are resolved by the nurse. Less than 5% of consultations result in a referral to an in-person consultation with a GP or a specialist. This means that just over 95% of the time, the Healthforce nurse and/or doctor can meet their patients' needs.

When one considers that Healthforce patients would alternatively have consulted with a private GP directly (which would have been significantly more costly), visited a state PHC facility where they would potentially have waited much longer to receive treatment, or not sought care at all, the benefits to the patient and the health system of Healthforce's model become clear. In this model, the resources of GPs are also being used more optimally as they are only consulted when their skills are required, and even then, for a much shorter period of time, resulting in efficiency gains for the health system.

3.4 Efficiency and impact

Healthforce's model can easily be leveraged to enhance the quality of care in PHC facilities in remote, resource-poor settings, where nurses can act as the eyes and hands of doctors. It is an example of task shifting in the private sector, where nurses can take over some of the work which doctors would normally do. This saves patients money, as a consultation with a nurse is much cheaper than that with a doctor. Healthforce patients pay R65 to R90 to consult with a nurse, and if a doctor is called during the consultation then the fee is R115 to R225. An average consultation with a GP is R439^e.¹⁶ This means that nurse-led consultations are 20% or less of the average cost of a private GP consultation, or about half the cost if one consults with a Healthforce GP. The nursing consultation fee is decided by the pharmacy, whereas the doctor's fee is decided by Healthforce.

^e This number is based on a small sample of private practitioners in Cape Town and may not be representative of the average across South Africa.



3.5 Key lessons

Nurse-led telemedicine is an effective way of providing accessible and affordable healthcare: Although D2P teleconsultation is an important solution to increasing access to GPs and specialist care, the nurse-led model is one of the most effective ways to provide affordable, quality, community-based primary healthcare, regardless of the availability of doctors in that area. It allows patients to be examined by a healthcare professional and frees up the resources of doctors to deal with crucial cases. Such a model also has a role to play in preventative care, as the lower cost and ease of access to quality healthcare encourages more regular visits.

Technology can empower nurses: Devices like digital otoscopes, and cell phone applications for capturing patient images in a secure way, have empowered nurses with new ways of gathering important data which they can share with doctors to more effectively diagnose patients. This is just one example of how technology can be used to enable nurses to provide better healthcare to patients.

“Technology can empower nurses with new ways of gathering important patient data which they can share with doctors to more effectively diagnose patients.”

SECTION
4

Phulukisa offers a primary healthcare facility in a backpack

Figure 6: Where is Phulukisa situated in the South African telemedicine market?

CATEGORY	MARKET DISTRIBUTION	
Telemedicine	Synchronous: Live, two-way remote interaction between patients and providers (D2P)	Aspects of Phulukisa’s service fall under synchronous P2P telemedicine , because health workers use Phulukisa’s health app to contact clinicians where needed
	Aspects of Phulukisa’s service fall under Asynchronous P2P and D2P transmission of patient information - the EHR which Phulukisa automatically generates is shared with the patient and can be shared with other healthcare professionals where needed	
	Remote patient monitoring: Collection of electronic health data which is transmitted for review by a remote provider	
Care Navigation	Patient self-directed care: Patients accessing their own information	Phulukisa is best described as E-triage because their AI-enabled decision-making application provides support in deciding whether patients require elective or immediate treatment from a healthcare practitioner based on their health risk profile

[Phulukisa](#) is a health technology company which was founded in 2015. It was born out of a need to improve health outcomes in patients in the public health system by being proactive, not reactive. Phulukisa’s ethos is that that preventative care is the most effective way of dealing with South Africa’s disease burden. Therefore promoting pre-emptive screening should be a larger and more

central part of health service delivery, and PHC workers, such as community health workers (CHWs), are best positioned to do this. Phulukisa focuses on pre-emptively diagnosing the major preventative diseases which burden South Africa’s health system¹⁷, in addition to maternal health, mental health, and school feeding.

Phulukisa has developed a cloud-based, machine-learning algorithm, based on existing clinical guidelines for diagnosis, to create the Phulukisa health app, which is an assisted medical decision-making tool.¹⁸ The app aims to mimic and automate a visit to a PHC facility by using the algorithm to detect and predict abnormalities in patient data. The app then assists the health worker with automatically triaging patients, or escalating emergency cases where needed.¹⁸ Minimal health training is required to utilise the app – all the health worker needs to do is go through the screening questions with the patient and administer any required tests. The data points collected are interpreted by the AI decision-making tool to make diagnoses and recommendations to the patient immediately. The data are also used to give patients a risk score from 0-100, which is then used to colour code patients green (low risk), orange (moderate risk), or red (high risk).¹⁹ The colours are used to flag to health workers whether patients need to be seen electively or immediately.¹⁹ Identifying the patients' health risk is central to Phulukisa's preventative healthcare approach.

If a consultation with a clinician is required, the health worker can use the app to call a clinician and consult with them remotely while they are with the patient. The health worker can share data with the clinician in real time and receive advice on what to do. At the end of the consultation, patients receive an abridged copy of their own health record, which they can keep and take to clinic or hospital visits. Patients' contact information is also collected so that they can be reached for follow-up consultations – healthcare workers are automatically notified when these follow-up appointments are missed.

Phulukisa has also developed a cloud-enabled backpack which contains equipment that allows health workers to screen patients outside of health facilities, or even in the comfort of their own homes. The backpack, illustrated in Figure 7,

includes a Microsoft Teams integration, and enables health workers to collect up to 210 data points to effectively triage patients, and screen and test for HIV, tuberculosis, diabetes, stroke, hypertension, and upper respiratory tract infections.^{17,20}

Figure 7: Cloud-enabled backpack with screening tools



Source: Phulukisa, 2020²¹

In addition to the cloud-enabled backpacks, Phulukisa use buses to create "mobile clinics". These mobile clinics are also equipped with their decision-making app and X-ray capabilities to empower health workers with the technology to screen and test patients more comprehensively.²⁰

4.1 User experience

Phulukisa's tech-enabled backpacks allow healthcare workers to screen patients outside of health facilities, and the diagnostic tools with which it is equipped enables them to screen patients more thoroughly than they otherwise would be able to. According to Phulukisa, the use of these devices is easy and requires minimal training for health workers. This allows patients to receive quality preventative care at home if need be, which is especially important for people who live in remote locations or are too frail to travel. Health workers are also empowered to offer health insights that they would not have been able to provide before.

By sharing patients' medical records with them, health workers earn their buy-in with the aim of encouraging them to take an active part in monitoring and maintaining their own health. Giving patients health goals to work towards and empowering them with information could go a long way towards preventing disease.

4.2 Integration capability

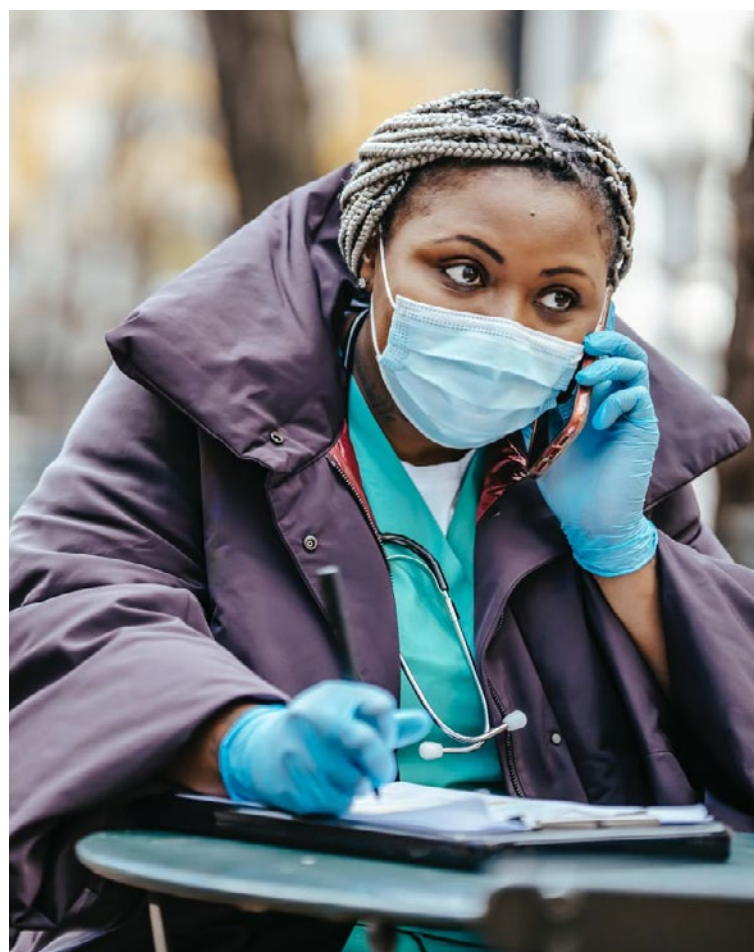
Phulukisa's API allows for the data that is collected using the backpack to integrate into legacy systems and create EHRs for patients.²⁰ The software platform is device-agnostic, so it can be run from both tablets and desktop computers, and the data collection processes are compliant with the Protection of Personal Information (POPI) Act.

4.3 Scalability and sustainability

One of Phulukisa's primary target markets are organisations that are responsible for the health of large groups of people, such as the South African National Department of Health (NDoH), but their technology can also be used for occupational

health or employee wellness programmes. They are currently operational in five provinces: Eastern Cape, North West, Limpopo, Gauteng, and the Free State. Their technology is also used to provide occupational health services in all Anglo-American mines in South Africa.

Despite the ICT connectivity requirements needed for the cloud-enabled backpacks to work, Phulukisa does not see the limited access to internet in some parts of South Africa as a limitation to their ability to scale. Firstly, most South Africans live in urban areas, where there is relatively good internet connectivity; and secondly, in rural areas where connectivity is poor, they can use TV white space^f to run their devices and share patient data – apart from images, most of the data they collect is quite small and does not require much bandwidth.



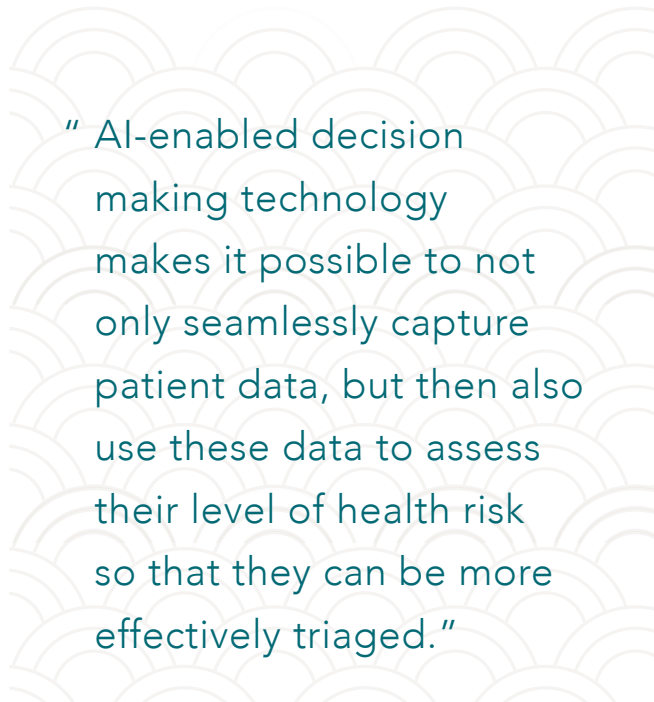
^f TV white space refers to the unused channels between those that are in use on the VFS and UHS radio frequency spectrum.³⁵ This spectrum can be used to provide broadband internet access without disrupting the transmission of TV channels.³⁵

4.4 Efficiency and impact

Currently, there are 8,000 community health workers in Limpopo using Phulukisa's health app. They were initially focused on primary healthcare screening, but they have since been reoriented to support the tracking and tracing of Covid-19 patients.

Phulukisa estimate that pre-emptively screening patients using their assisted decision-making tool can reduce physician consultations by 30%, thus reducing the cost per patient served, decongesting health facilities, and saving patients' time.²⁰ They also estimate that by using their mobile bus and decision-making app, the cost of basic testing, including blood and urine tests, can be reduced by 75% (from R480 to R120 per patient).¹⁹

The data collection process using Phulukisa's assisted decision-making tool allows for immediate and automated data capture. This data can be consolidated and reported daily in one step.



“ AI-enabled decision making technology makes it possible to not only seamlessly capture patient data, but then also use these data to assess their level of health risk so that they can be more effectively triaged.”

According to Phulukisa this improves efficiency in the turnaround and throughput of patients. The automated data collection process also creates a unified EHR which is stored in the cloud and is accessible at any health facility where the patient goes, therefore reducing the need to create a new health record for the patient when they attend a new health facility.

4.5 Key lessons

AI can be used for preventative care and more effective triaging: Phulukisa's AI-enabled decision-making technology makes it possible to not only seamlessly capture patient data, but then also use these data to assess their level of health risk. Knowledge of patients' health risk is essential to preventing illness and complications which impair their health outcomes and are costly to the system. Knowledge of these health risks allows for more effective triaging which can reduce unnecessary physician consultations and translate to significant savings to the health system.

Technology for task shifting: Phulukisa is an illustration of technology-enabled task shifting, where ICT is being leveraged to deliver healthcare within communities, even in remote areas. In South Africa, and Africa more broadly, where there is a shortage of healthcare personnel in the areas where they are most needed, this type of technology enables primary healthcare services to be delivered with minimal training. This has the potential to improve health access, and improve health outcomes through preventative screening, while improving efficiency in the health system by removing bottlenecks at PHC facilities.

SECTION
5

Quoro Medical creates “virtual wards” through home-based acute care

Figure 8: Where is Quoro Medical situated in the South African telemedicine market?

CATEGORY	MARKET DISTRIBUTION	
Telemedicine	Synchronous: Live, two-way remote interaction between patients and providers (D2P)	Healthforce is an example of synchronous live, two-way interaction between providers and providers (P2P)
	Asynchronous: D2P transmission of patient information	Aspects of Quoro’s service fall under asynchronous P2P transmission of recorded health history, because they share patients’ medical data with their attending doctors
	Quoro is a remote patient-monitoring model of telemedicine because they use wearable devices to collect electronic health data which are transmitted for review on Quoro’s software platform	
Care Navigation	Patient self-directed care: Patients accessing their own information	E-triage: Tools that provide appropriate support in searching for and scheduling appropriate care based on symptoms/ conditions as well as price and quality of providers

The delayed discharge of patients is a major cost to the health system.^{22,23} Since patients cannot be adequately monitored when they are not in hospital, doctors are often hesitant to discharge them due to concerns about their safety or ability to receive adequate care from home. This often results in patients remaining in hospital far longer than they need to. However, there is evidence to show that home-based care can deliver superior

clinical outcomes, as patients are able to recover in the comfort of their homes, and may be a cost-effective alternative to extended hospitalisation.^{22,24}

It is this gap in high-quality, home-based acute care which Quoro Medical aims to fill. Quoro leverages wearable technology to monitor patients after they have been discharged from hospital, as well as pre-admissions care to patients as an alternative

to hospitalisation. This means that specialists and GPs can opt for home-based care for their patients as opposed to admission/hospitalisation. Their technology is wireless, provides continuous monitoring, and is automatic, so patients are monitored minute by minute on a live portal. These data are interpreted within Quro's software platform and gives an early warning if the patient's vital indicators begin to deteriorate. Because patients are monitored continuously, any adverse vital indicators are caught almost immediately, as opposed to between ward rounds, so the patient is arguably even safer and more closely monitored in their own home.

Quro only onboards patients to their system once they have had an initial consultation with their doctor. The Quro team sets up the patient with their proprietary wearable devices, and the patient is shown how the devices work. Quro then takes over the monitoring of the patient on behalf of the doctor, but the data is shared with the doctor. A Quro healthcare worker is also sent to the patient's home when needed for care, and general maintenance of the equipment. Quro essentially takes on the role of a general ward, virtually, so patients do not need to be admitted to hospital for extended periods of time.

Quro had not launched prior to the Covid-19 pandemic. They had initially planned to launch in August 2020 but given the need to move high-risk patients out of hospitals, due to the risk of Covid-19 infection, and the increased need for home care, they launched earlier than expected. With the lockdown in place, many doctors signed up to Quro's platform because they could not keep up with monitoring their patients while social distancing. This allowed Quro to prove their value proposition: that high quality, affordable acute care could be provided in the home. This also allowed medical schemes to fast-track the reimbursement of Quro and their affiliated doctors.

5.1 User experience

In a hospital setting, doctors, particularly specialists, are paid for their input and oversight on clinical decisions about patients based on vital data which is collected by nurses and medical equipment. Quro enables doctors to deliver essentially the same service remotely, by collecting this same vital data, continuously, in real time, and with additional intelligence using their wearable technology. This technology enables doctors to make more accurate decisions than they would in a normal video consultation and provides the same standard of care as an in-person consultation. Quro was able to make this case to medical schemes, and as of September 2020, they became South Africa's first reimbursable technology-enabled, at-home offering with Medscheme, South Africa's largest administrator of medical aid schemes.²⁵

Doctors that are signed up with Quro are reimbursed at their full rate. As a result, much of the growth in Quro's network of doctors has been through word of mouth i.e. doctors referring other doctors. This means that their affiliated doctors have found value in using their service, and one should not underestimate how important this type of buy-in is. One of the major barriers to the scaling of telemedicine services is that the reimbursement structure does not incentivise uptake. Medical schemes are generally not willing to pay doctors their full rate for teleconsultations, and as a result, many doctors do not want to offer teleconsultations and other telemedicine services as there is no financial incentive for them to do so. Quro have solved this problem. Given that the care and monitoring is done from a patient's home, medical schemes do not have to pay for extended hospital stays which saves them money. Therefore, if the doctor is providing the same quality of care, and the medical scheme is saving money, there is little reason why doctors should not be reimbursed at their full rate.



5.2 Integration capability

Quro's technology platform and wearable technology has been customised with APIs which allow for easy integration with other platforms. Quro holds all their patients' data on Amazon's Web Services cloud so that their patients' doctors are also able to access this data. Quro's platform is designed to be an EHR, but they have also made efforts to integrate with other types of EHRs. However, given the vast number of different types of EHR systems, integration is sometimes a challenge.

5.3 Scalability and sustainability

Quro have recently started operations, but they have already experienced significant growth in the number of patients in their care since going live. They are also hoping to expand into the public sector. Since Quro patients are cared for at home, doctors are not limited to caring for patients that are only admitted to the hospitals in which they work. Therefore, these doctors can care for more patients than they would normally have, which has the potential to expand the reach of quality acute care to people who do not live close to hospitals. Using the increased capacity for doctors to care for more patients, and the fact that patients can receive acute care in their own homes, Quro's aim is to create a large scale "virtual" hospital.

Quro's partnership with Medscheme allows them to leverage Medscheme's significant market. Medscheme looks after a total of 3.7 million lives and they administer 20 medical schemes including Bonitas, Fedhealth, GEMS, Polmed, Nedgroup and MBMed, among others.²⁵ This partnership, along with the reimbursement of doctors at their full rate, creates buy-in from both funders and doctors, making Quro's business model more sustainable.

5.4 Efficiency and impact

Quro believe that their major value proposition to medical schemes is that they are highly cost effective. According to their own estimates they can save medical schemes 40-70% of the cost of hospital admissions, while still improving patient outcomes. This level of cost saving has meant that medical schemes were happy to reimburse Quro's affiliated doctors at their full rates for remote consultations, as opposed discounted rate at which they usually reimburse. Therefore, Quro's doctors can care for more patients, without having to take the cut in remuneration. This solution also presents interesting possibilities for the public sector, where there is a real need to free up capacity in hospital wards.^{26,27}

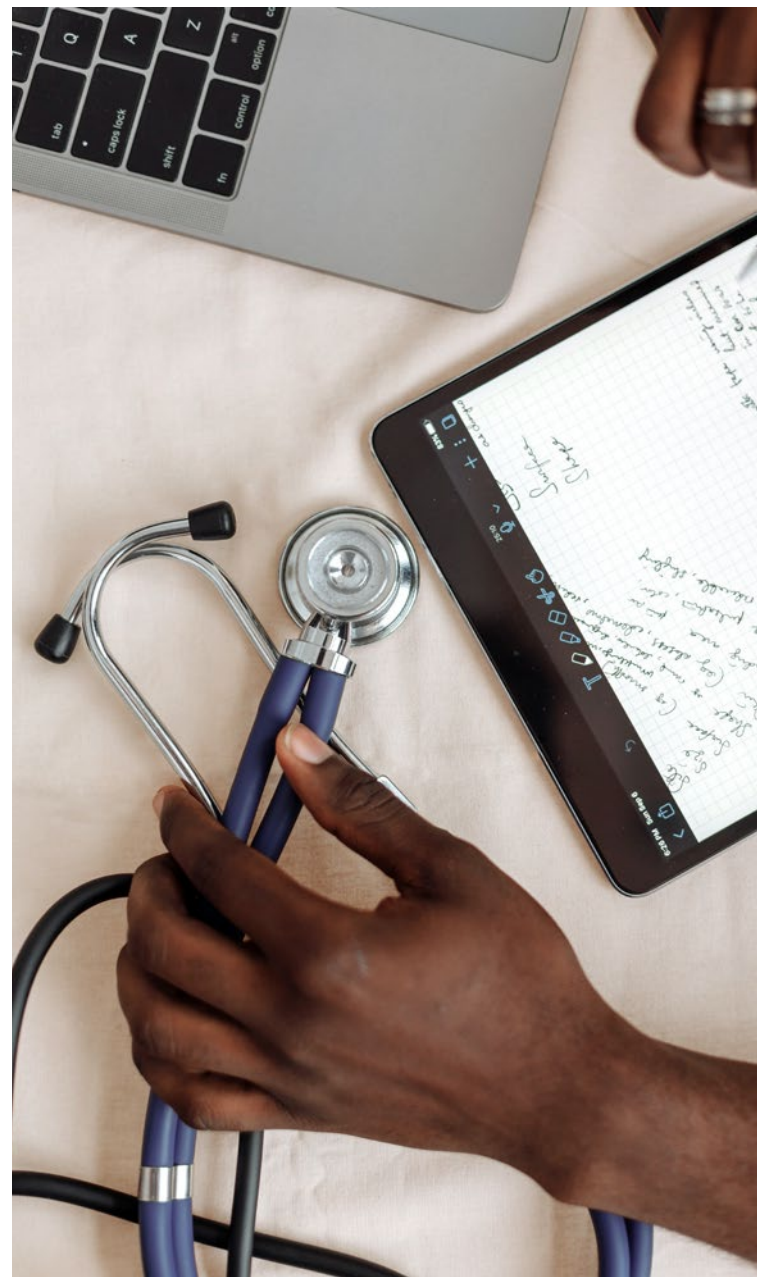
Since Quro has only just begun providing acute home-based care services using telemedicine technology, it is still too soon to assess impact, but it is clear that this type of care has the potential to save costs for the health system as a whole. By reducing unnecessary extended hospital admissions, while potentially improving the health outcomes of patients, or at the very least, allowing patients to recover in the comfort of their homes as opposed to sterile hospital environments.

“Remote monitoring of acute patients has the potential to decongest hospital facilities, allowing patients to recover in the comfort of their own homes, while potentially providing significant savings to the health system.”

5.5 Key lessons

Home-based care can be both cost effective and improve the clinical outcomes of patients: Quro was able to solve the reimbursement conundrum for their affiliated doctors by effectively making the case that their doctors are able to provide the same standard of care to their patients remotely, while saving medical schemes money. This remote monitoring of acute patients has the potential to decongest hospital facilities, allowing patients to recover in the comfort of their own homes, while potentially providing significant savings to the health system.

Solving the reimbursement issue is key to uptake of telemedicine: Doctors will not take up telemedicine services if they are not incentivised to do so. Many doctors will be disincentivised to provide telemedicine if they feel that they will not be fairly compensated. By communicating to medical schemes that Quro’s doctors can provide the same standard of care, using Quro’s wearable remote monitoring devices, Quro could make the case that doctors were providing essentially the same service therefore they should be remunerated accordingly.



SECTION
6

Allegra partners with Bonitas to offer Virtual Care

Figure 9: Where is Allegra situated in the South African telemedicine market?

CATEGORY	MARKET DISTRIBUTION	
Telemedicine	Allegra’s Virtual Care application is best described as synchronous D2P telemedicine because it allows patients to consult with doctors in a live, two-way remote interaction	Synchronous: Live, two-way interaction between providers and providers (P2P)
	Asynchronous: D2P transmission of patient information	Asynchronous: P2P transmission of recorded health history
	Remote patient monitoring: Collection of electronic health data which is transmitted for review by a remote provider	
Care Navigation	Patient self-directed care: Patients accessing their own information	The ER24 functionality of Allegra’s Virtual Care app falls under e-triage because it provides appropriate support to patients in deciding whether they need to go to a health facility, or if their issue can be resolved telephonically with a nurse

[Allegra](#), founded 18 years ago, specialises in healthcare management and has extensive experience with integrating the back-end systems of different players in the healthcare sector. Allegra is a technology provider that is an “all-in-one computer system that contains large amounts of clinical data and provides healthcare professionals with access to electronic health records, patient history, as well as digital diaries.”²⁸ They aim to

enhance the management of clinical information and patient care using software which integrates pharmaceutical management, primary care management, practice management, and wellness management into a single comprehensive solution.

Their merger with [AfroCentric Group](#)⁹ seven years ago gave them access to a financial switch which enables the seamless integration and processing

⁹ AfroCentric is a JSE-listed investment holding company. They own a diverse range of companies which provide health services and products such as Medscheme, Pharmacy Direct, and including Allegra. They have operations in South Africa, Namibia, Botswana, Eswatini, Zimbabwe and Mauritius.³⁶

of payments across medical schemes and their healthcare network. They process over three million financial and clinical transactions per month for over 10,000 pharmacies and healthcare providers across Southern Africa that are linked to their system.

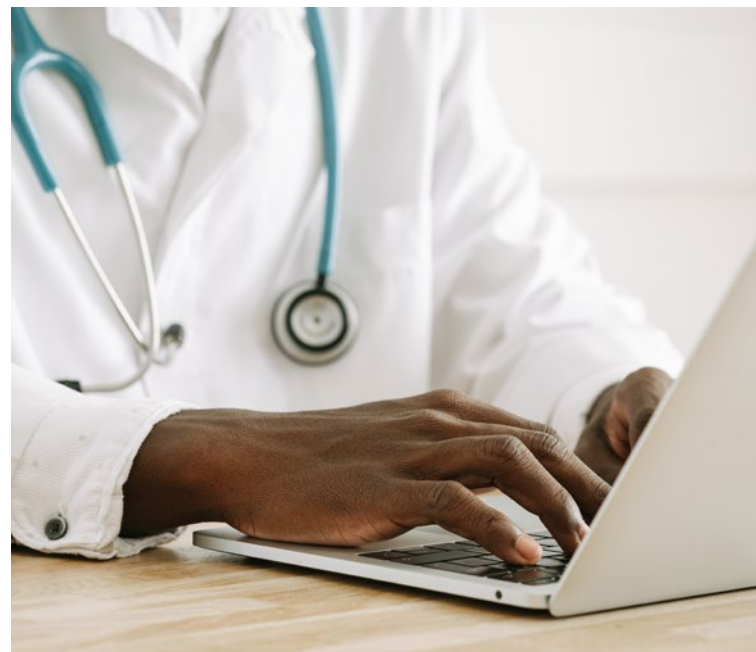
They began the development of a virtual telemedicine application two years ago, but since first time D2P virtual consultations were still in contravention of the HPCSA guidelines at the time, they developed a P2P application instead, called Virtual Care. They developed a system that could be used by pharmacy clinics for consultations with nurses which became operational in August of 2019. Before the Covid-19 pandemic they were in 100 pharmacies, but unlike Healthforce, Allegra only developed the software systems to enable the P2P consultation, they do not manage the service or doctors. Allegra is a platform provider (akin to Stone Three), and healthcare providers purchase these platforms from them.

Two years ago, Allegra also built a mobile application which enabled consumers to manage more of their healthcare needs, such as booking doctors' appointments, wellness tracking, and more. The application piqued the interest of medical schemes who then licensed it as their own virtual wellness app by applying their own branding.

When the Covid-19 pandemic hit and the HPCSA relaxed the D2P restrictions of the telemedicine guidelines, Allegra was well-positioned to integrate D2P features with their existing platforms and application. They merged the functionality of their P2P Virtual Care teleconsultation software with the appointment booking functionality of the medical scheme mobile apps and relaunched Virtual Care as a D2P teleconsultation platform. The redesigned Virtual Care app provides doctors with an e-diary to capture notes, scripts and issue sick notes to the patient. The Virtual Care mobile

app for patients allows patients to see what the nurses at the clinic-based pharmacies could see when facilitating consultations between patients and doctors. However, the difference is that patients were now able to directly interact with the GP. The app also allows doctors to log into the virtual care platform and register the times when they are free to consult with patients, visible in the app. Patients will choose convenient times for them, join a virtual queue, and wait for doctors to accept their booking.

During the Covid-19 lockdown, Bonitas, the second largest open medical scheme in South Africa, approached Allegra to build a D2P teleconsultation app for them. Bonitas already had an application which allowed its members to manage their medical aid. Therefore, Allegra integrated Virtual Care into Bonitas' existing app which then allowed patients to book virtual consultations with their GP. Since 9 April, Bonitas has been offering the Virtual Care service free of charge to all South Africans to enable people to consult with GPs from home and promote social distancing. Patients needed to download the app, and Bonitas covered the cost of the virtual consultation with the affiliated doctors.



For the Bonitas Virtual Care app, Allegra added an interface with ER24, a 24-hour emergency service, which allows customers to call this service through the application if they need medical assistance outside of doctors' consulting hours.

Allegra noted that, although uptake of the virtual consultation app among doctors was initially slow, with notable resistance from older doctors, the extension of the Covid-19 lockdowns, and loss of revenue to their practices, created an incentive for more doctors to take up teleconsultation. It also allowed doctors who had been exposed to Covid-19 and were self-isolating to continue working.

Since its launch, until mid-October 2020, the Bonitas Virtual Care app has onboarded about 200 doctors. However only about a quarter of these doctors have facilitated a video consultation. In fact, of the nearly 5,500 video consultations facilitated since the app's launch, almost 90% of them were conducted by about 5% of their registered doctors. This means that although many doctors have signed up for this app, very few of them are using it. Also, much like Intercare, Allegra has seen the usage of virtual consultations decline with the easing of lockdowns.



6.1 User experience

When Bonitas launched its Virtual Care app in April 2020 they partnered with ER24 to offer free D2P virtual consultations to app users 24 hours a day, for a limited period.^{29,30} When patients use Allegra's Bonitas app to book an appointment they can choose from a list of doctors, including their own if their doctor has signed up to consult on the app. Allegra has made it possible for patients to see the doctors' availability and request an appointment for whichever available time suits them best. But like with many online bookings, doctors sometimes forget to accept appointments or update their availability. Outside of doctors' consultation hours, patients are able to call ER24's call centre for medical advice.

Much like other D2P telemedicine service providers, Allegra has found that doctors must be trained in their "digital bedside manner" when conducting teleconsultations, as doctors are often not aware that they cannot consult the same way in person as they do on camera. For instance, on camera doctors are required to be more deliberate about maintaining eye contact with patients, instead of keeping their heads down and taking notes – even these small issues feedback into patients' experiences with video consultations.

Patients can rate their experience of the teleconsultation and the feedback is collected by Allegra. Feedback has generally been positive, and Allegra have used it to create a dashboard for their doctors to use and improve their service. Allegra's data shows that 90% of patients say that they would use the service again, and 80% said that they felt that face-to-face consultations with their doctors are not necessary.

6.2 Integration capability

Allegra's strength is their ability to integrate multiple systems and platforms. Their integration of different services, such as ER24, and functionalities, such as wellness programmes, teleconsultations, and billing, into one application which works for both patients and doctors is compelling. However, it should be noted that given Allegra's ownership structure, much of this integration is vertical rather than horizontal. For example, Bonitas outsources their managed care to Medscheme,³¹ and Medscheme, like Allegra, is owned by Afrocentric Group, therefore the integration is between the same group of companies.

Allegra, however, state that they believe it is important for telemedicine technology to avoid a siloed development, and that integration should be encouraged. To this end they have stopped developing end-to-end teleconsultation platforms, but rather applications that doctors and other platforms can link into using their open API.

6.3 Scalability and sustainability

The Virtual Care application which Allegra has created for Bonitas was initially offered for free to allow patients to consult with their doctors while staying at home, during the lockdown. Although the uptake of consultations increased significantly over the lockdown period, these numbers have declined since the easing of the lockdown. The service is currently free, and uptake and usage may decline once clients have to pay. But given that Bonitas have included the Virtual Care app as part of their benefits options for 2021 and many of their clients would have had experience using it, there may still be potential for growth in uptake and usage of teleconsultations by both patients and doctors.

Allegra is looking to add functionalities which will allow patients to track their own vitals so these can be shared directly with their own doctors using Virtual Care. They also plan to add more health workers, such as mental health providers, to the network of providers on their app.

The Virtual Care application has piqued interest outside of medical aids as well. It has been integrated with GoodX practice management software and Europ Assistance insurance. Allegra is also in the process of partnering with medical schemes in Namibia, Botswana and Zambia to provide similar telemedicine applications.

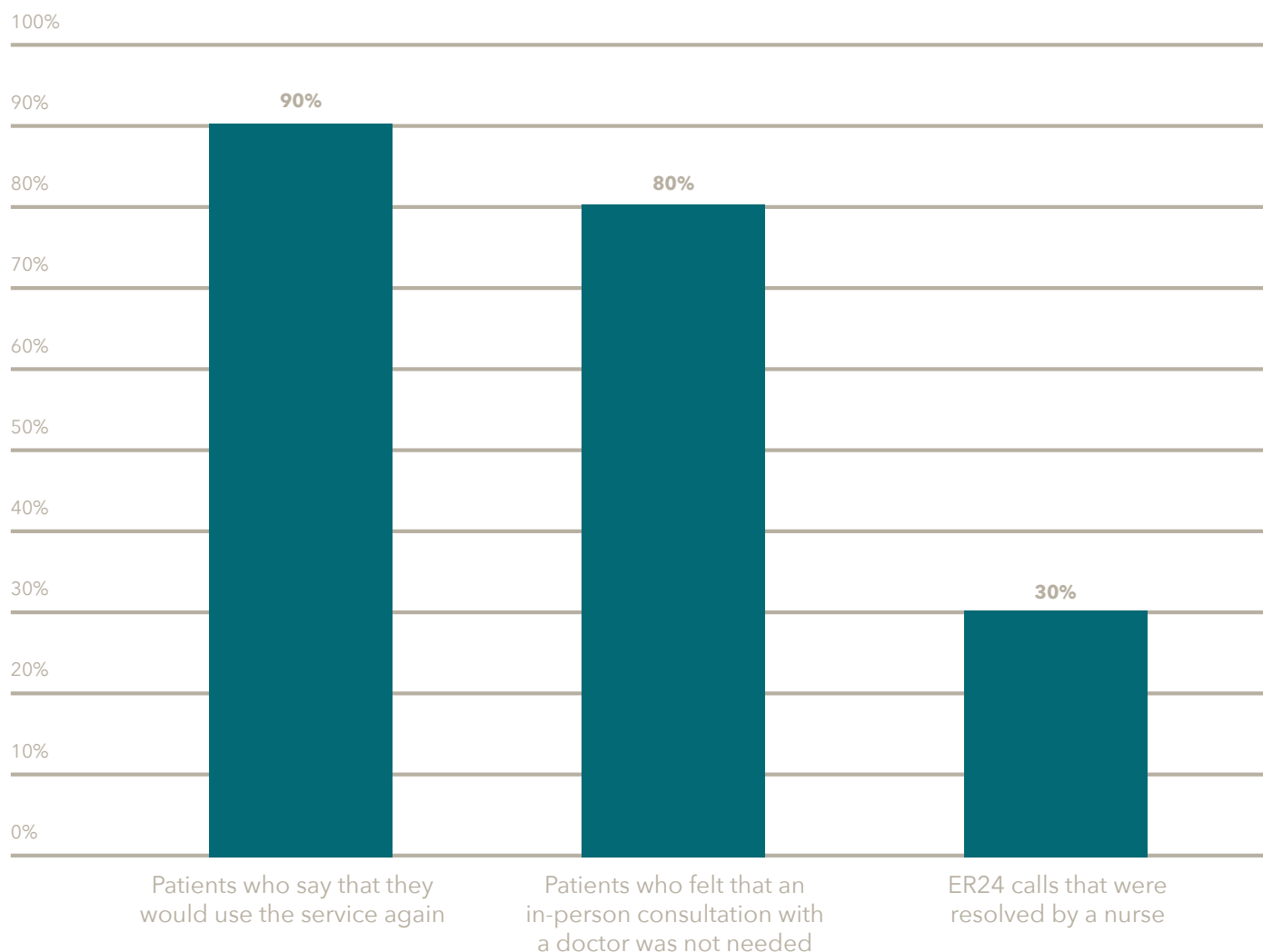
6.4 Efficiency and impact

Allegra have found that of the 5,500 D2P virtual consultations they have facilitated through their app, about 80% are completely resolved virtually, while the remaining 20% are referred for in-person GP consultations or specialist testing. They also found that the 30% of the calls which were made to the ER24 service through their app could be resolved by a nurse within ER24's call centre. This represents a highly effective method of triaging patients out of PHC and hospitals, and could translate to significant savings for both patients and the health system as a whole.



“...it is important for telemedicine technology to avoid a siloed development...”

Figure 10: Customer satisfaction outcomes for Allegra Virtual Care app^h



Source: Allegra, 2020

6.5 Key lessons

Integration enhances the functionality of telemedicine applications: By integrating the functionality of Bonitas’ existing app with Allegra’s Virtual Care and ER24, clients were provided with a single-entry point to managing their healthcare needs. However as noted above, this is still an integration within the same group of companies, and although it exhibits what is possible, integrating across providers outside of Afrocentric Group would show the real potential for leveraging integration to improve user experience. The development of closed telemedicine applications

that require significant effort to integrate limits the development of innovative applications with multiple functionalities that meet the needs of both patients and healthcare practitioners as users.

D2P mobile applications can be used effectively for triage: Allegra found that teleconsultations with doctors and nurses were able to resolve patients’ issues 80% and 30% of the time respectively, through virtual consultations. This presents an opportunity for significant cost saving within the health system, by keeping patients out of health facilities where possible and focusing resources on those who need them most.

^h This data was provided by Allegra. Patients’ perceptions are based on feedback by patients who responded to customer satisfaction surveys. Not all patients provided feedback so these results may be biased.

Conclusions

Since the announcement of lockdown restrictions in March 2020, there has been significant growth and innovation in the South African telemedicine sector. The six companies presented in these case studies show the breadth of innovation which has taken place over the last eight months. However, it must be noted that this potential has existed in South Africa for a long time, but the enabling environment did not always exist for these innovations to fully take root and achieve scale. Covid-19 and the relaxing of the HPCSA telemedicine guidelines has created a unique, natural experiment which has offered a window of opportunity to gather evidence on how telemedicine can improve the access to and the delivery of health services in South Africa. These case studies have also provided a glimpse of what the size and level of growth in the telemedicine sector may be, but more research is still needed. The actual levels of usage of telemedicine in South Africa, its share of the total healthcare market, and how much it is expected to grow are all still unknown. These case studies, and the other reports in the [No More Waiting Room](#) series, are not only a first step in filling these gaps in knowledge, but also a call to action for further research.



References

1. Mars M. The HPCSA's telemedicine guidance during COVID-19: A review. *South African J Bioeth Law*.
2. Wosik J, Fudim M, Cameron B, et al. Telehealth Transformation: COVID-19 and the rise of Virtual Care. *J Am Med Informatics Assoc*. 2020;27(6):957-962. Accessed October 5, 2020. <https://covidaba.com/wp-content/uploads/2020/05/Telehealth-Transformation-COVID-19-and-the-rise-of-Virtual-Care.pdf>
3. World Health Organisation. Telemedicine: Opportunities and Developments in Member States.; 2010. Accessed July 8, 2020. https://www.who.int/goe/publications/goe_telemedicine_2010.pdf
4. Gulube S. Evaluation Report of the First Phase of the SA National Telemedicine System (NTS).; 2000. <http://www.kznhealth.gov.za/telemereport.pdf>
5. WMA. WMA Statement on Guiding Principles for the Use of Telehealth for the Provision of Health Care. In: Amended by the 69th WMA General Assembly, Reykjavik, Iceland, October 2018. The World Medical Association; 2018. Accessed September 27, 2020. <https://www.wma.net/policies-post/wma-statement-on-guiding-principles-for-the-use-of-telehealth-for-the-provision-of-health-care/>
6. World Health Organization. Global Diffusion of EHealth: Making Universal Health Coverage Achievable.; 2016. http://who.int/goe/publications/global_diffusion/en/
7. Fowkes J, Fross C, Gilbert G, Harris A. Virtual health: A look at the next frontier of care delivery. Published online 2020.
8. Intercare. Creating a great healthcare experience altogether. Intercare.co.za. Published 2019. Accessed December 12, 2020. <https://www.intercare.co.za/about>
9. Intercare. Another way of putting our patients first. Intercare co.za. Published 2020. Accessed December 12, 2020. <https://www.intercare.co.za/services/virtual>
10. Stone Three. About Stone Three. Stonethree.com. Published 2019. Accessed December 12, 2020. <https://www.stonethree.com/about/about/>
11. Simpson S. Quali Health: Changing the face of private healthcare in South Africa | by Storm Simpson | The Tempestuous Times | Medium. Medium. Published June 20, 2018. Accessed December 12, 2020. <https://medium.com/the-tempestuous-times/quali-health-changing-the-face-of-private-healthcare-in-south-africa-b39454cfc7b2>
12. South African Government. About alert system | South African Government. Published 2020. Accessed November 4, 2020. <https://www.gov.za/covid-19/about/about-alert-system>
13. Business Tech. Load shedding in 2020 has been the worst on record: graph. Business Tech. Published September 3, 2020. Accessed November 5, 2020. <https://businesstech.co.za/news/energy/431102/load-shedding-in-2020-has-been-the-worst-on-record-graph/>
14. Khan T. Doctors unhappy about low virtual consultation rates. Business Day. Published April 7, 2020. Accessed December 12, 2020. <https://www.businesslive.co.za/bd/national/health/2020-04-07-doctors-unhappy-about-low-virtual-consultation-rates/>
15. Healthforce. Healthforce.io. Accessed December 12, 2020. <https://healthforce.io/>
16. Coetzee I. The cost of being sick in South Africa. Just Money. Published January 18, 2019. Accessed November 4, 2020. <https://www.justmoney.co.za/news/2019/01/18/the-cost-of-being-sick-in-south-africa/>
17. Microsoft. Phulukisa (Satya Nadella 2019 Inspire + Ready Corenote Video) - YouTube. Youtube.com. Published July 17, 2019. Accessed December 13, 2020. https://www.youtube.com/watch?v=Nyw8KZKURVY&ab_channel=Microsoft
18. Singh V. AI & Data in South Africa's Health Sector.; 2020. Accessed December 13, 2020. https://policyaction.org.za/sites/default/files/PAN_TopicalGuide_AIData6_Health_Elec.pdf
19. Phulukisa. E-Triage. – Phulukisa. Published 2020 Accessed December 13, 2020. <https://phulukisa.co.za/e-triage/>
20. Campbell R. Clinic in the cloud: unpacking the possibilities of AI in healthcare. Mint Group.

21. Phulukisa Health Solutions. Facebook.com. Published October 6, 2020. Accessed December 13, 2020. <https://www.facebook.com/phulukisa/photos/a.3373551166025796/3440609605986618/?type=3&theater>
22. Helge Holmås T, Islam MK, Kjerstad E. Between two beds: *inappropriately delayed discharges from hospitals*. *Int J Heal Care Financ Econ*. 2013;13:201-217. doi:10.1007/s10754-013-9135-4
23. Bai AD, Dai C, Srivastava S, Smith CA, Gill SS. Risk factors, costs and complications of delayed hospital discharge from internal medicine wards at a Canadian academic medical centre: *Retrospective cohort study*. *BMC Health Serv Res*. 2019;19(1):935. doi:10.1186/s12913-019-4760-3
24. Gaughan J, Gravelle H, Siciliani L. Testing the bed blocking hypothesis: *Does nursing and care home supply reduce delayed hospital discharges?* *Heal Econ (United Kingdom)*. 2015;24(S1):32-44. doi:10.1002/hec.3150
25. Medscheme. MEDSCHEME ACCELERATES PROVISION OF HOSPITAL-LEVEL CARE AT HOME | Medscheme. Medscheme. Published August 30, 2020. Accessed December 14, 2020. <http://www.medscheme.com/medscheme-accelerates-provision-of-hospital-level-care-at-home/>
26. Jordaan N. Long waiting times, lack of staff and overcrowding at Mamelodi Hospital. Times Live. Published June 11, 2019. Accessed November 5, 2020. <https://www.timeslive.co.za/news/south-africa/2019-06-11-long-waiting-times-lack-of-staff-and-overcrowding-at-mamelodi-hospital/>
27. Molelekwa T. Tembisa Hospital battles massive overcrowding . *Health-E News*. Published March 2, 2018. Accessed November 5, 2020. <https://health-e.org.za/2018/03/02/28164/>
28. Allegra. About Allegra. Allegra.co.za. Published 2020. Accessed December 14, 2020. <https://allegra.co.za/about>
29. Board of Healthcare Funders. Free virtual medical consultations for all South Africans. BHF. Published April 9, 2020. Accessed November 2, 2020. <https://www.bhfglobal.com/2020/04/09/free-virtual-medical-consultations-for-all-south-africans/>
30. Bonitas. VIRTUAL CARE – NOW AVAILABLE 24/7. Published 2020. Accessed November 2, 2020. <https://www.bonitas.co.za/mobile-app>
31. Medscheme. Our Clients | Medscheme. Published 2017. Accessed February 12, 2021. <http://www.medscheme.com/our-clients/>
32. Percept. The nurse can see you now: Reflections from the South African telemedicine market in light of Covid-19. Published 2020. <https://percept.co.za/innovation/>
33. SAP. What is SAP? | Definition and Meaning | SAP Software. Published 2020. Accessed January 8, 2021. <https://news.sap.com/what-is-sap/>
34. WHO. Task Shifting: Global Recommendations and Guidelines.; 2008. doi:10.1080/17441692.2011.552067
35. ICASA. Welcome to the ICASA Reference Geo-location Spectrum Database (R-GLSD). Published 2019. Accessed November 5, 2020. <https://twwhitespaces.icasa.org.za/public/about>
36. AfroCentric Group. Afrocentric Group - Company profile. AfroCentric Group. Published 2020. Accessed December 14, 2020. <http://www.afrocentric.za.com/au-profile.php>



PERCEPT
HEALTH · SOLVE