Benin's Digital Health ID

Providing mobile-enabled healthcare benefits to the underserved - Kea Medicals

September 2020

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Digital Identity

The GSMA Digital Identity Programme is uniquely positioned to play a key role in advocating and raising awareness of the opportunity of mobile-enabled digital identity and life-enhancing services. Our programme works with mobile operators, governments and the development community to demonstrate the opportunities, address the barriers and highlight the value of mobile as an enabler of digital identification.

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Contents

Abbreviations and terminology

B2B	Business to business. Refers to business conducted between companies rather than between a company and a consumer.
B2B2C	Business to business to consumer. A business model in which a company accesses consumers via another business.
B2C	Business to consumer. The process of selling products and services directly to consumers who are the end users.
B2G	Business to government. Businesses that sell to governments.
Computer-Assisted Telephone Interviewing (CATI)	A telephone surveying technique in which the interviewer follows a script provided by a software application.
Low-Middle Income Countries (LMICs)	Countries defined by the World Bank as low-income economies (USD 1,005 or less GNI per capita) or as lower-middle income economies (USD 1,006 to USD 3,955 GNI per capita).
Monitoring & Evaluation (M&E)	A process used to assess the performance of projects and programmes. The goal is to improve current and future management of outputs, outcomes and impact. There is an M&E team within the GSMA.
Mobile-enabled Digital ID	An official identity stored electronically on a mobile phone. This may include demographic attributes such as name or date of birth, as well as transactions and user data. A digital ID typically gives one access to life-enhancing mobile services, such as mobile money, voting or social benefit payments.
Mobile-enabled Digital Health ID	An electronic form of identity stored on a mobile phone and used specifically to access health services and medical records.
Mobile Money	A service in which a mobile phone is used to access financial services.
Mobile Money Provider (MMP)	A company, typically also a mobile network operator (MNO), that has a licence issued by a central bank to provide financial services through mobile devices.
Mobile Network Operator (MNO)	A company that has a government-issued licence to provide telecommunications services through mobile devices.
Non-governmental Organisation (NGO)	A non-profit organisation that operates independently of any government and whose purpose is typically to address a social or political issue.
QR Code	A machine-readable code consisting of an array of black and white squares, typically used for storing URLs or other information that can be read by a smartphone camera.
Remote functionality	The ability for an authorised person to access and connect to a system or service (e.g. doctor consultation) from a geographical distance through a mobile network connection.
User Interface	The means by which a person controls a software application or mobile device.
USSD	Unstructured Supplementary Service Data is a communications protocol used by GSM mobile phones. It is one of the best available mobile communications technologies to deliver mobile financial services (e.g. mobile money) to low-income customers and those without smartphones.

Executive summary

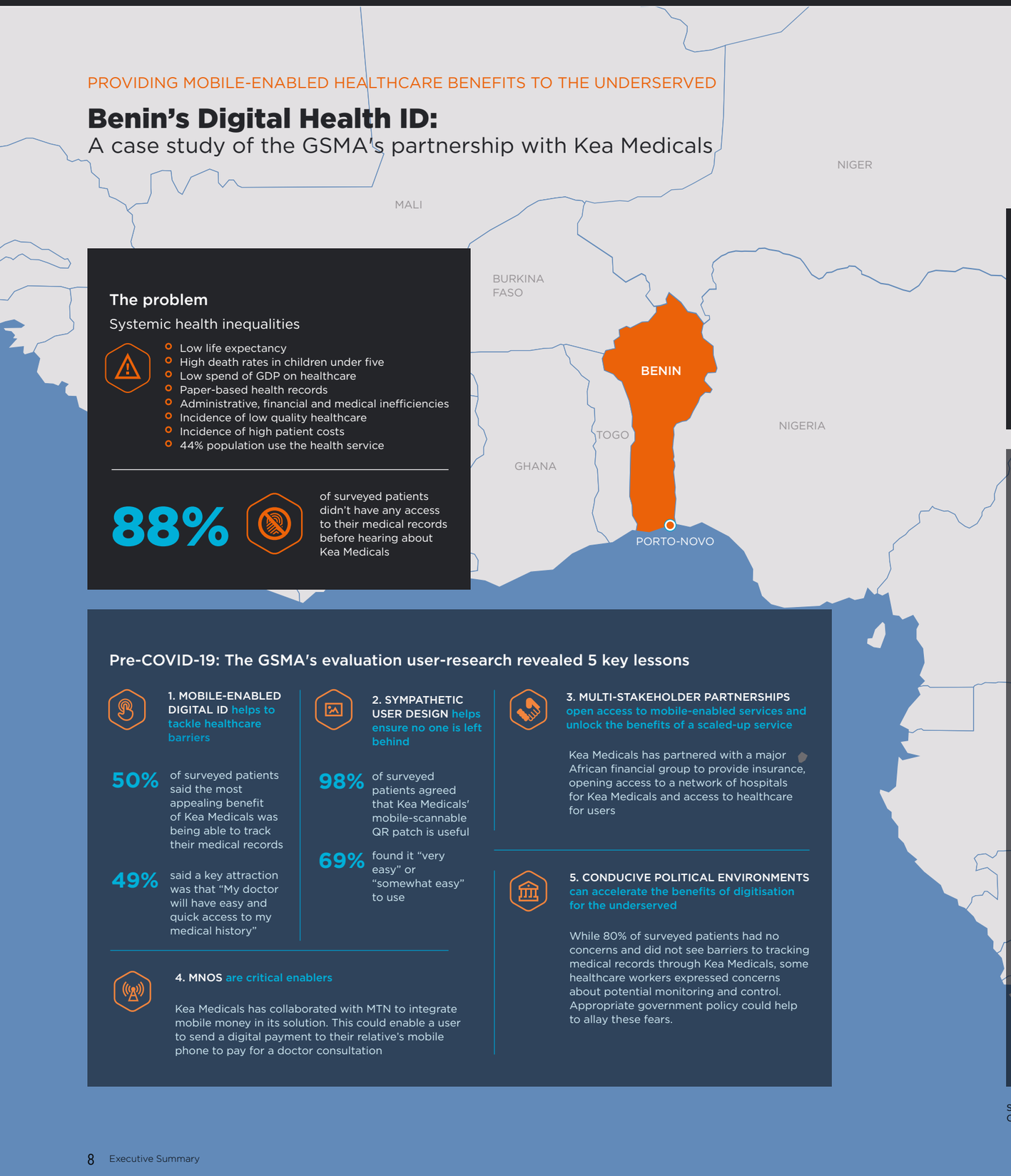
Kea Medicals (Kea) is a Benin-based start-up that has developed a mobile-enabled digital health solution that allows patients to create a unique digital health identity (ID) that holds their emergency medical information and medical history. This is supplemented by an innovative mobile-scannable QR code that allows patients to control access to their medical records. The solution also enables hospitals to digitally manage their financial, medical and administrative operations.

Digital health identity helps to improve the quality of healthcare and expand patient access to healthcare and insurance coverage, particularly in developing countries. In 2018, Kea received a grant from the GSMA Ecosystem Accelerator Innovation Fund to deploy its mobile-enabled integrated health solution in Benin. In October 2019, the GSMA's central monitoring and evaluation (M&E) team commissioned an evaluation of the solution to help improve design and implementation.

A mixed methods approach was used to understand users' experience with the solution and learn more about the relevance and effectiveness of the service, as well as the potential for partnerships. Primary qualitative and quantitative data were combined with secondary data from the Kea Medicals team to provide strategic guidance on future iterations and to scale the solution further.

PROVIDING MOBILE-ENABLED HEALTHCARE BENEFITS TO THE UNDERSERVED

Benin's Digital Health ID:
A case study of the GSMA's partnership with Kea Medicals



The problem

Systemic health inequalities

- Low life expectancy
- High death rates in children under five
- Low spend of GDP on healthcare
- Paper-based health records
- Administrative, financial and medical inefficiencies
- Incidence of low quality healthcare
- Incidence of high patient costs
- 44% population use the health service

88% of surveyed patients didn't have any access to their medical records before hearing about Kea Medicals

The solution

Kea Medicals launched a mobile-enabled digital health ID

100,000+ registered users*

Numerous healthcare professionals registered

Numerous hospitals registered

*As of July 2020, GSMA research

Pre-COVID-19: The GSMA's evaluation user-research revealed 5 key lessons

1. MOBILE-ENABLED DIGITAL ID helps to tackle healthcare barriers

50% of surveyed patients said the most appealing benefit of Kea Medicals was being able to track their medical records

49% said a key attraction was that "My doctor will have easy and quick access to my medical history"

2. SYMPATHETIC USER DESIGN helps ensure no one is left behind

98% of surveyed patients agreed that Kea Medicals' mobile-scannable QR patch is useful

69% found it "very easy" or "somewhat easy" to use

3. MULTI-STAKEHOLDER PARTNERSHIPS open access to mobile-enabled services and unlock the benefits of a scaled-up service

Kea Medicals has partnered with a major African financial group to provide insurance, opening access to a network of hospitals for Kea Medicals and access to healthcare for users

4. MNOS are critical enablers

Kea Medicals has collaborated with MTN to integrate mobile money in its solution. This could enable a user to send a digital payment to their relative's mobile phone to pay for a doctor consultation

5. CONDUCIVE POLITICAL ENVIRONMENTS can accelerate the benefits of digitisation for the underserved

While 80% of surveyed patients had no concerns and did not see barriers to tracking medical records through Kea Medicals, some healthcare workers expressed concerns about potential monitoring and control. Appropriate government policy could help to allay these fears.

During COVID-19: Kea Medicals has pivoted in response to the crisis

25,000+ mobile-enabled remote doctor consultations per month*

Impact of COVID-19 on traditional healthcare

Unable to handle **physical IDs**

Delays in accessing records, especially due to COVID-19 backlog

Delayed healthcare in part due to the impacts of COVID-19 on healthcare

Hospital access affected by inability to travel due to restrictions on movement and social distancing

In-person consultations curtailed due to social distancing and travel restrictions

Lack of insurance or inability to afford insurance exacerbated in part by economic and financial impacts brought on by COVID-19

Inability to make **physical payments** and use cash due to social distancing and potential for infection

KEA MEDICALS

Kea Medicals' mobile-enabled digital health ID solution mitigates impacts of COVID-19

Mobile digital ID does not require physical contact

Instant medical records allow doctors to respond more quickly

Quicker healthcare is provided in emergencies exacerbated by COVID-19

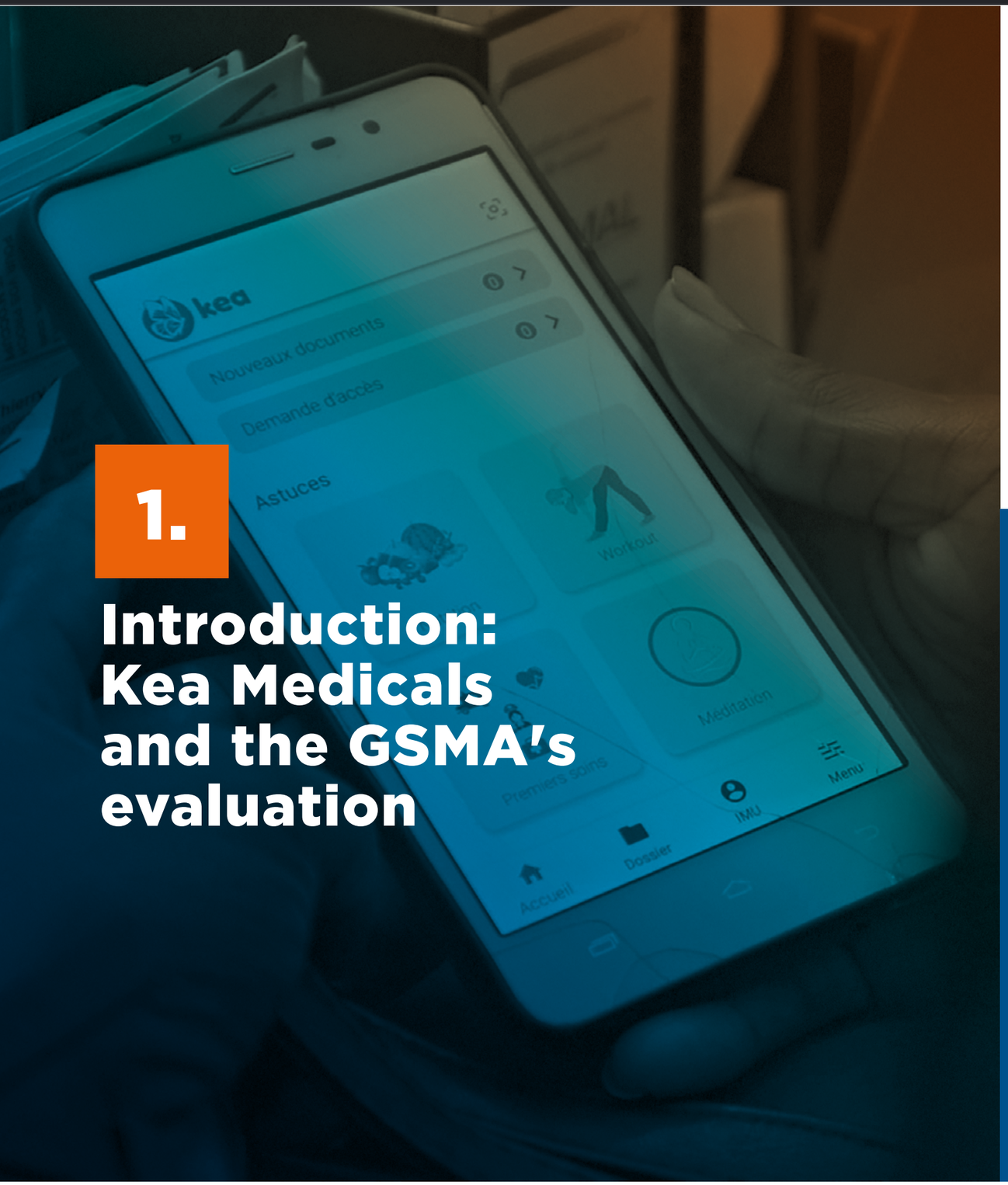
Remote access ensures compliance with social distancing and quarantine restrictions

Virtual consultations can take place at patients' homes

Insurance integrated with the app enables potential for access to remote care

Mobile money empowers patients with a convenient way to pay for healthcare remotely

Source: analysis of GSMA research conducted in Benin between December 2019 and July 2020; UNDP; WHO; The Borgen Project; The World Bank
Country borders or names do not necessarily reflect the GSMA's official position. This map is for illustrative purposes only.



1.

Introduction: Kea Medicals and the GSMA's evaluation

In November 2018, Kea Medicals received a grant from the GSMA Ecosystem Accelerator Innovation Fund to deploy a mobile-enabled (USSD and mobile app) integrated health ecosystem and digital health ID.

Kea Medicals is a grantee alumnus of the GSMA Ecosystem Accelerator Innovation Fund

In October 2019, the GSMA, with the support of the UK Foreign, Commonwealth & Development Office (FCDO), commissioned a formative evaluation to help Kea Medicals take stock of its progress, consult end users and identify the steps it should take to strengthen and scale up its digital health ecosystem in Benin and beyond.

In March 2020, the GSMA's central monitoring and evaluation (M&E) team concluded a mixed methods evaluation of Kea's business in Benin, gathering primary quantitative and qualitative data in addition to secondary data. This case study features some of the main lessons from the evaluation, and seeks to add to the evidence base for digital identity, which is currently limited.

December 2019 - March 2020

The GSMA's Monitoring and Evaluation team conducted a mixed-methods evaluation

15 hospital staff, patients and partners

216 users

Qualitative Research **In-depth interviews** + Quantitative research **CATI** + Secondary research **Data and reports**

This generated insights into:

- Kea Medicals' business;
- User interface design;
- Effectiveness and relevance of the solution; and
- Strategy and readiness to scale.

By March 2020, Kea had rolled out its solution to:

24,000+ users and numerous health professionals in Benin, with plans to expand to Côte d'Ivoire, Gabon and Mali

2.

Kea Medicals' mobile-enabled digital health ID

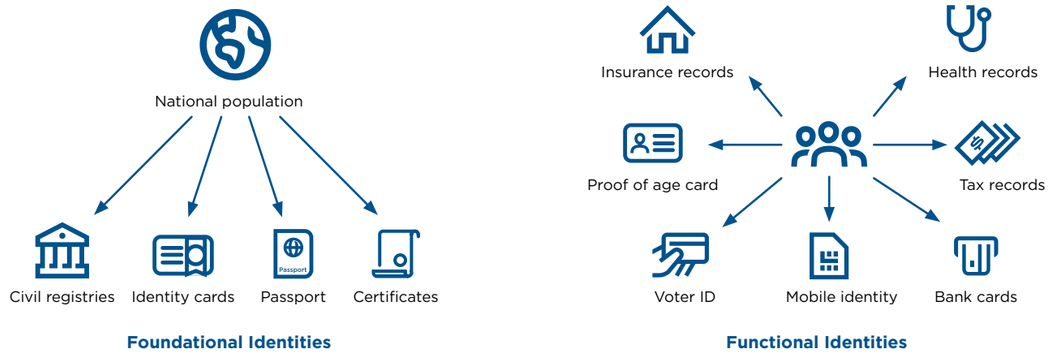
2.1 What is a mobile-enabled digital health ID?

A person's ability to prove their unique identity is vital to their economic, financial and social development. Without proof of identity, they are less likely to access services like healthcare, assert their rights, vote in elections or fully participate in the analogue or digital world. However, The World Bank estimates one billion people do not have formal identification, 80 per cent of whom live in Sub-Saharan Africa or South Asia.[1]

Formal identification may be classified as either foundational or functional (Figure 1). A **foundational identity** is an official, legal or formal identity that is recognised by the government, has multiple purposes and may be universally available to citizens. Increasingly, it is offered in digital form. Providers of such identities are typically national governments interested in providing a way for their citizens to prove who they are, for example, through civil registries, identity cards, passports or birth certificates.[2] A **functional identity** is typically digital and used for a specific purpose or use case, such as accessing a medical record or for a health application.[3]

Figure 1

Comparison of foundational and functional identities



A mobile-enabled digital identity is an electronic form of official identity stored on a mobile phone. A digital ID may include demographic attributes such as age or gender, as well as transactions and user data. It typically opens access to life-enhancing mobile services, such as mobile money, voting or social benefit payments.

A digital health ID is also a form of identity stored on a mobile phone, but differs from a mobile-enabled digital ID because it is used specifically to access health services and medical records. The World Bank has identified digital health IDs as a means to improve the quality of healthcare, expand patient access to healthcare and increase insurance coverage, particularly in developing countries where patient identification and health information systems are often weak.[4]

1. The World Bank, ID4D Data: Global Identification Challenge by the Numbers.
2. GSMA Digital Identity (29 November 2017), "Digital Foundation Identities Using Mobile Technology", *Mobile for Development Blog.*
3. GSMA Digital Identity (22 January 2018), "Using Mobile Technologies to Provide Functional Identities", *Mobile for Development Blog.*
4. ID4D/The World Bank and Digital Impact Alliance (2018), The Role of Digital Identification for Healthcare: The Emerging Use Cases.

2.2 Mobile-enabled digital health ID: a response to systemic health inequalities

The constitution of Benin establishes health as a human right,[5] yet life expectancy is low (61.2 years)[6] and the country has one of the world's highest death rates among children under five.[7] Health expenditure accounts for only about 4.6 per cent of GDP, lower than the global average of 9.2 per cent and lower than the average in low-income countries (five per cent).[8]

The healthcare sector in Benin relies on manual, paper-based patient records that are not centralised or integrated, creating communication barriers for different actors in the healthcare system. Without a robust system to track and manage their administrative, financial and medical activity, hospitals experience inefficiencies that result in overwhelmed staff, lower productivity and lower quality healthcare.[9]

Meanwhile, patients experience long wait times to receive diagnosis and treatment, and when their medical history is not available their diagnosis can be inaccurate. They can also incur high costs due to repeat tests and high insurance premiums.[10] According to The World Bank, people in developing countries spend half a trillion US dollars annually (over $80 per person) on out-of-pocket expenditures,[11] and in Benin these high costs have meant only about 44 per cent of the population use the national health service fully.[12]

In response to these systemic issues in Benin, Dr. Vèna Arielle Ahouansou introduced Kea Medicals, a mobile-enabled integrated health solution that allows patients to register and create a unique digital health ID that holds their emergency medical information and history. An innovative mobile-scannable QR code gives patients control over who has access to their medical record. For example, if one were to lose consciousness in public, anyone nearby can scan their QR code (located on the back of their phone or in their wallet, for example) with their mobile phone to alert doctors, friends and relatives. Users are further empowered through access to health insurance, digital payments for treatment via mobile money and the ability to arrange and attend doctor consultations remotely via Kea's mobile app.

5. USAID (February 2016), Health Financing Profile: Benin.
6. UNDP's Human Development Indicators for Benin.
7. WHO's country profile of Benin.
8. The Borgen Project, 10 Important Facts about Life Expectancy in Benin.
9. GSMA evaluation research in Benin.
10. Ibid.
11. The World Bank (27 June 2019), World Bank: People Spend Half a Trillion Dollars Out-of-Pocket on Health in Developing Countries Annually.
12. The World Bank, "Out-of-pocket expenditure (% of current health expenditure) – Benin".

The benefits of Kea's mobile-enabled integrated health solution extend to hospitals across the country. Hospitals are now able to use a digital solution to manage their entire operations, including financial, medical and administrative management. For doctors, healthcare workers, laboratories and pharmacies, the solution allows them to digitise and access patient records, which improves the quality of care with more accurate diagnoses, shorter wait times, better customer service and more personalised and preventive healthcare for patients.

Since Kea Medicals has partnered with the GSMA, they have set out the following **hypothesis to guide its business:**

IF: users and stakeholders adopt and consistently use the Kea Medicals service

THEN: patients will be able to track and control the sharing of their medical history, and hospital management and quality of care will improve

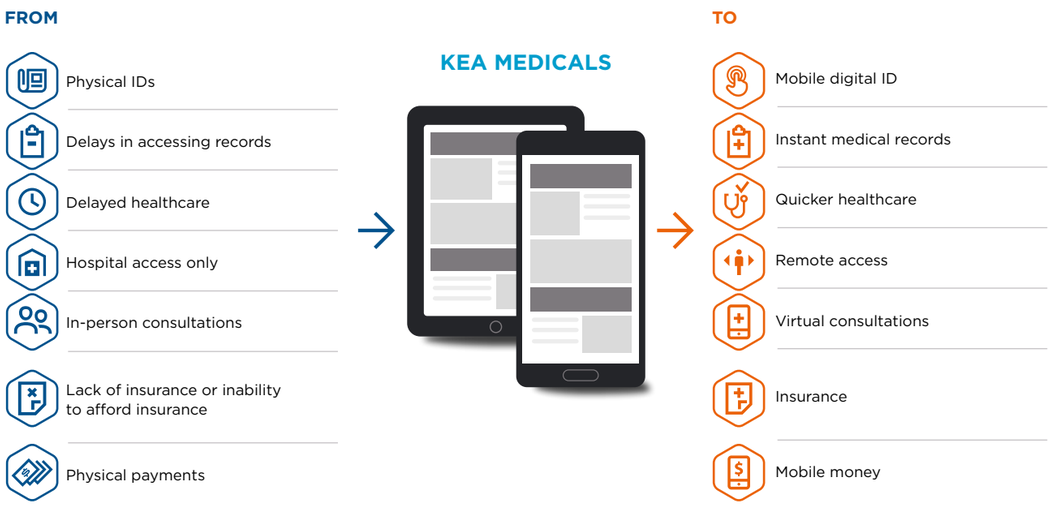
LEADING TO: an increase in the use of evidence-based decision making in the health system and revenue generation, leading to reduction of healthcare costs, increased productivity of hospitals, personalised and preventative healthcare, digitisation of the health system, and a scalable and commercially sustainable social enterprise

THEREBY: contributing to a health system that is inclusive and accessible to all people in Benin, enabled through technology.

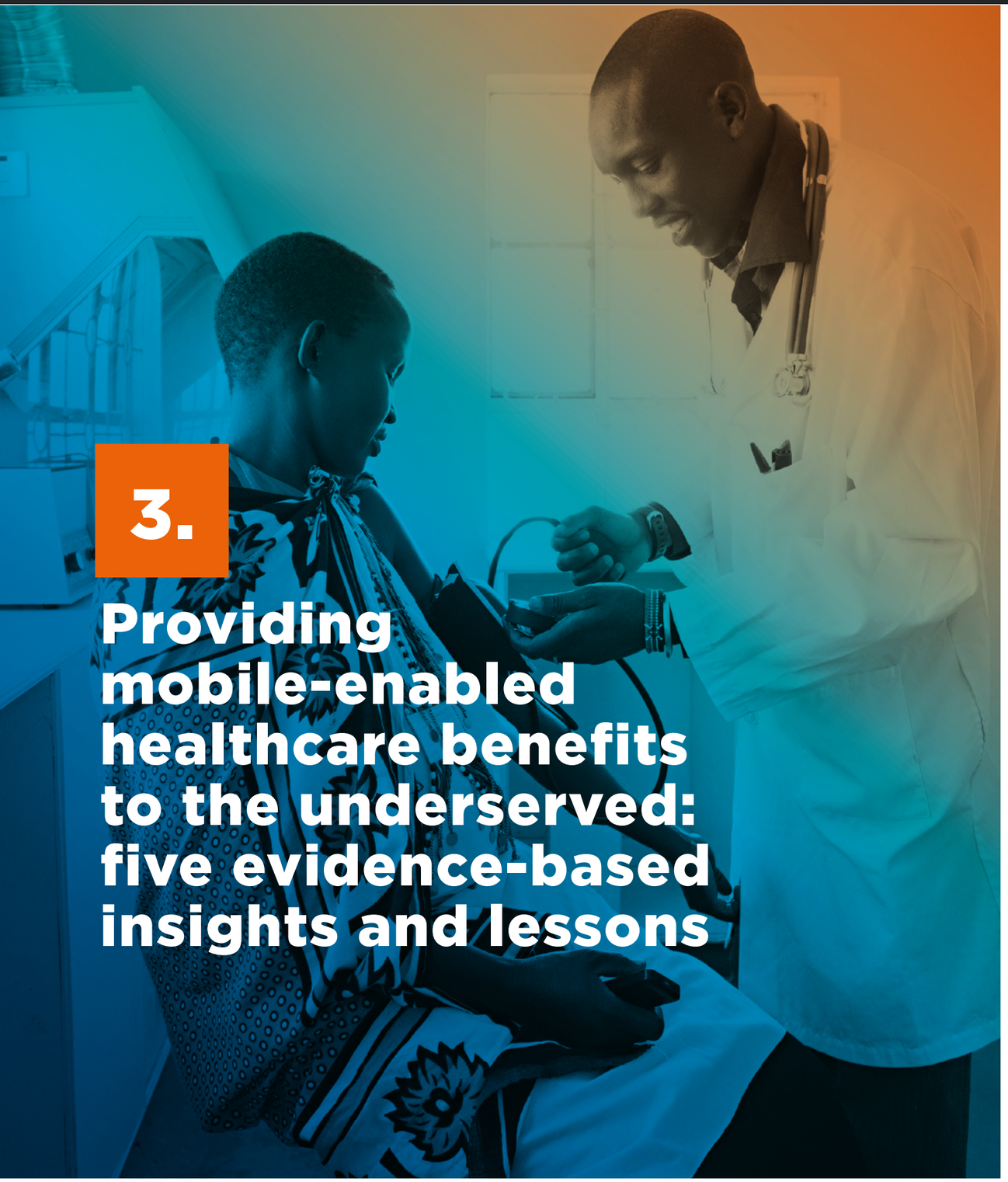
The evaluation commissioned by the GSMA set out to validate parts of this hypothesis.

Figure 2

Comparison of healthcare before and after using Kea Medicals' solution



Note: This diagram illustrates some of the key lessons identified by respondents in the GSMA's evaluation of Kea Medicals.



3. Providing mobile-enabled healthcare benefits to the underserved: five evidence-based insights and lessons

KEY LEARNING 1

3.1 Mobile-enabled Digital ID... is helping tackle healthcare barriers

3.1.1 Motivations for using Kea Medicals

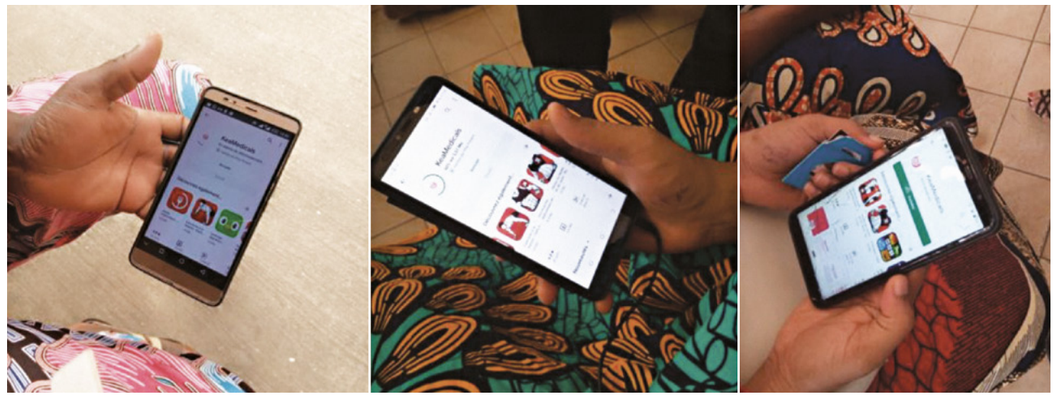
Kea's mobile-enabled digital health ID offers several benefits that help to overcome traditional barriers to accessing healthcare. For the users surveyed, a major motivation to use a digital health ID service like Kea was having access to their personal medical records in an emergency.

While **20 per cent of patients** said a key attraction of Kea Medicals was having a unique digital health ID...

...**50 per cent of patients** said the greatest benefit was the ability to track their medical records. Patients said they were motivated to take up the service out of fear of being unconscious or ill without access to their medical records.

"The doctor explained to me that if I have the patch on me and I'm in an emergency where I may be unconscious, they would be able to find my medical records on the service. That impressed me and I decided to buy it."
Female patient

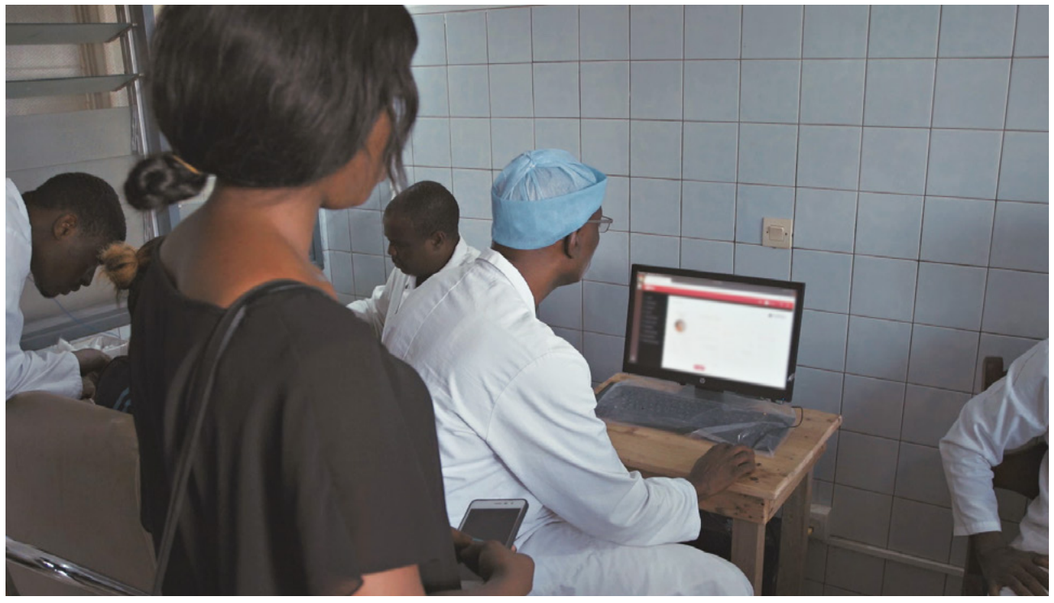
The QR patch, a form of digital ID, was a new concept for many users, but it was considered easy to use. Initial evidence suggests that users perceive Kea's QR patch to be affordable.



> "If purchasing the patch is for once and forever, I think the price is affordable and accessible to everyone."
> **Female patient**

Kea's mobile app-based service can also facilitate treatment for patients in remote locations. Doctors can access digital patient information quickly and get a second opinion from another doctor to assist with their diagnosis.

> **49 per cent of patients** said that a key attraction of Kea was that "My doctor will have easy and quick access to my medical history."



3.1.2 Barriers to receiving healthcare

The inconvenience of retrieving physical medical records or proof of ID was cited by patients as a barrier to receiving healthcare quickly.

> "What interested me was the fact that you can regularly track your medical records on the service. Maybe you're in town and you feel sick and haven't had time to go home to get your medical documents or card, but with Kea, doctors can easily find your medical history, they don't need to ask you any questions first before taking care of you."
> **Female patient**

3.1.3 The efficacy of Kea Medicals' digital health ID: initial evidence

Patients reported that they had a positive experience tracking and sharing their medical information with the Kea service, noting that their doctor or nurse could pull up medical records more quickly, and some reported positive changes in their treatment.

> "The patients who have not signed up to the Kea Medicals service, they end up having to do a lot of back and forth within the hospital, the patient will go to the cash desk to get change, then s/he will go to do something else there, but for patients who signed up for Kea, the process is going faster."
> **Pharmacy worker**

> "Compared to the other labs, we are ready; there are no results that will be picked up the next day; all results are returned to us the same day."
> **Lab worker**

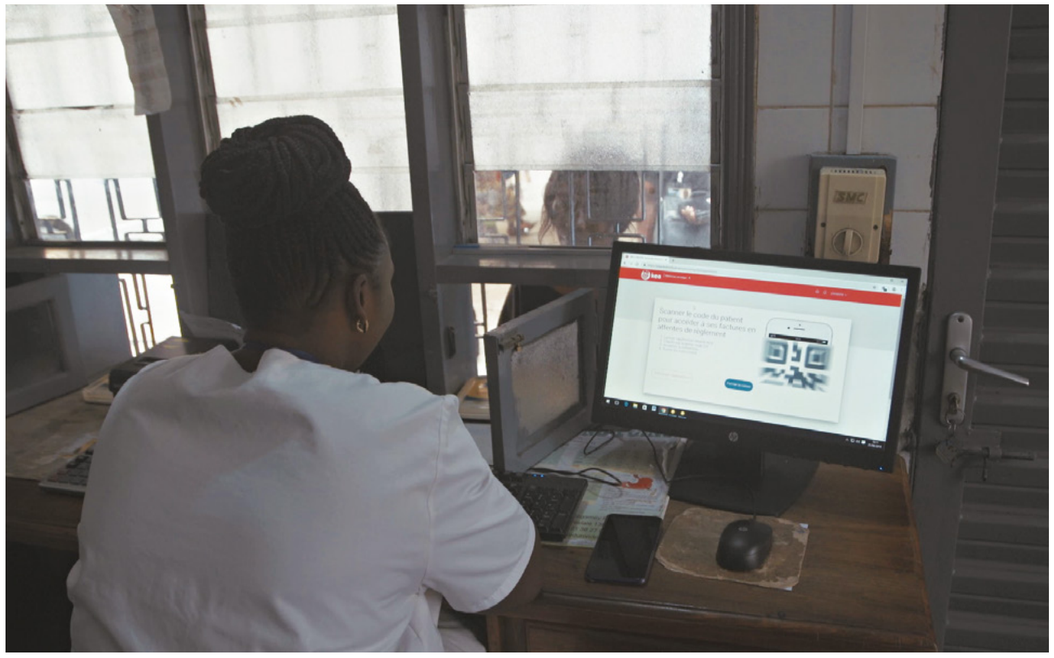
Hospitals traditionally spend a lot of time administering patient records and finances, and Kea's service is helping to address this.

Hospital staff appreciate that medical records are digitised, recordkeeping is transparent and there are fewer errors.

"[The Kea service] will reduce a lot of time that we lose. At the end of the month, we must sit down and prepare statistics. With Kea, you no longer have to collect receipts… You just go to the database and it gives you the information you need."
Healthcare worker

Hospital staff preferred digital medical records and management systems, with early indications that Kea's service provides faster access to patient medical records and streamlines payment at patient checkout.

The integration of insurance also has potential to reduce the burden of paperwork. As hospitals become more digitised, most patients do not perceive any major barriers to continuing use of the Kea app.



KEY LEARNING 2

3.2 Sympathetic user design helps ensure no one is left behind

3.2.1 Factors driving use

GSMA research has found that when pitching new digital ID concepts to end users, it is helpful to explain how the digital ID is both use case-driven ("This is the problem it could solve") and process-driven ("This is how it would work").[13]

Instructions, outreach and training are key to overcoming barriers to use and understanding the patient journey. Evaluation results suggest that most patient users found it quite a smooth process to use the Kea app, and features such as the QR patch have been relatively easy for users to grasp.

84 per cent of patients said they had sufficient information when they first heard about Kea to make a decision about signing up.

91 per cent of Kea users found that the process of downloading the app was easy or somewhat easy, while **85 per cent** found filling in information on the app straightforward or somewhat straightforward.

"I had to download the application to my phone. And I'm the one who signed up on the platform myself. And I filled out the information."
Female patient

However, user journeys might look different when the service is scaled to more rural locations where digital literacy rates are lower. An intuitive and barrier-free sign-up process and navigation will be key to ensure potential users do not reject the service.

Most Kea users in the GSMA's evaluation were urban dwellers.

Interestingly, there was a divide between users' ability to navigate the app: **48 per cent of patients** found it easy to navigate on their phone while **31 per cent** found it somewhat difficult and **16 per cent** found it difficult.

13. GSMA Digital Identity (April 2020), GSMA Digital Identity Programme: Insights and Achievements (2016–2020): Exploring the role of mobile platforms, conducive policies and business models in strengthening digital identity ecosystems.

3.2.2 Initial reaction to Kea Medicals' QR patch design

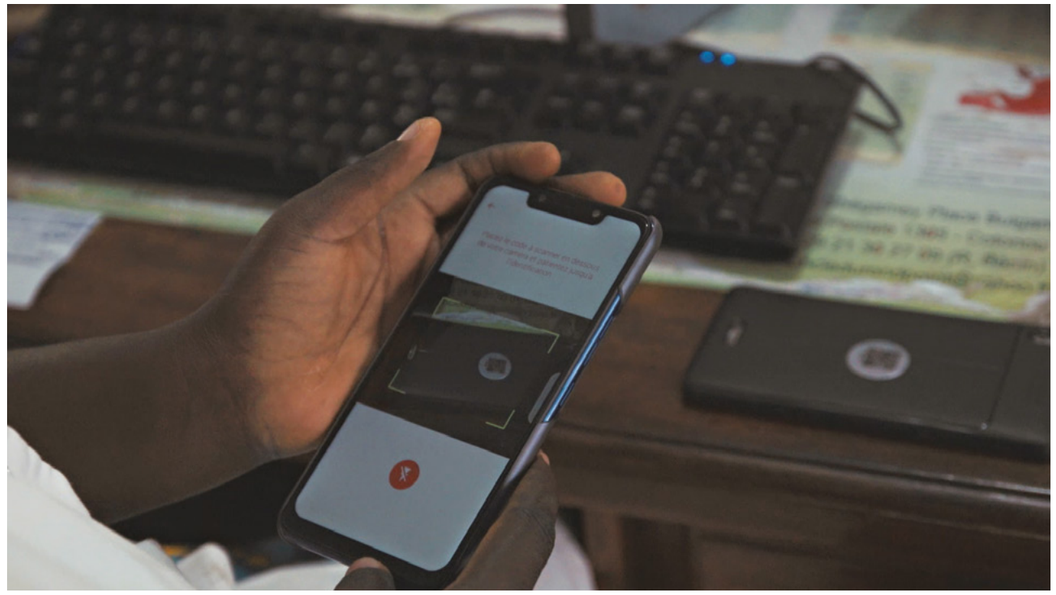
Kea's mobile app is supplemented with a separate QR patch, a form of digital ID that provides access to a user's health records when scanned with a mobile device.

Although the QR code is a new concept for many, it was considered easy to use and affordable. Most patients found the QR patch to be a suitable way to store medical information, for example, on the back of their phone, in their wallet, on their watch or in their paper medical records.

Only **24 per cent** of users were aware of QR codes before hearing about Kea.

However, once aware, **69 per cent** felt that QR codes were either "very easy" or "somewhat easy" to use.

98 per cent of patients agreed that the QR patch is useful, **61 per cent** perceive it as secure and **34 per cent** say it's easy to stick on one's wallet or phone.



3.2.3 The effectiveness of user training and outreach

Kea has relied extensively on social media outreach — an effective way to reach urban, highly educated and young patients — but less effective in rural areas, among people with lower education levels and among older people. Healthcare workers stressed that TV and radio were better channels to reach these customer segments. Half of Kea subscribers first heard about the service either through friends and relatives, or at a health facility from Kea staff, followed by social events and health facilities.

50 per cent of Kea subscribers first heard about the service through friends and relatives or at a health facility from Kea staff.

13 per cent heard about it via social events and **12 per cent** from medical staff at a health facility.

18 per cent heard about it through social media (Facebook and WhatsApp).

Most respondents who received information about the service from Kea staff felt it was "very clear", but it was less clear for those who received information from friends and relatives. Many patients who heard about the service through social media, websites, or friends and relatives felt they needed more detailed information on the service to fully understand the benefits, functionality and which hospitals they could visit.

71 per cent of respondents who received information about the service from Kea staff felt it was "very clear".

Among those who received information from friends and relatives, **42 per cent** found it to be "very clear," while **44 per cent** were only "somewhat clear" and **14 per cent** were "somewhat unclear".

"There are too many fake things in this country. I thought it was a fake thing. If it was a service that was regularly shown on television or if a lot of people talked about it, it would be better. That way, a lot of people will believe the service."
Male patient

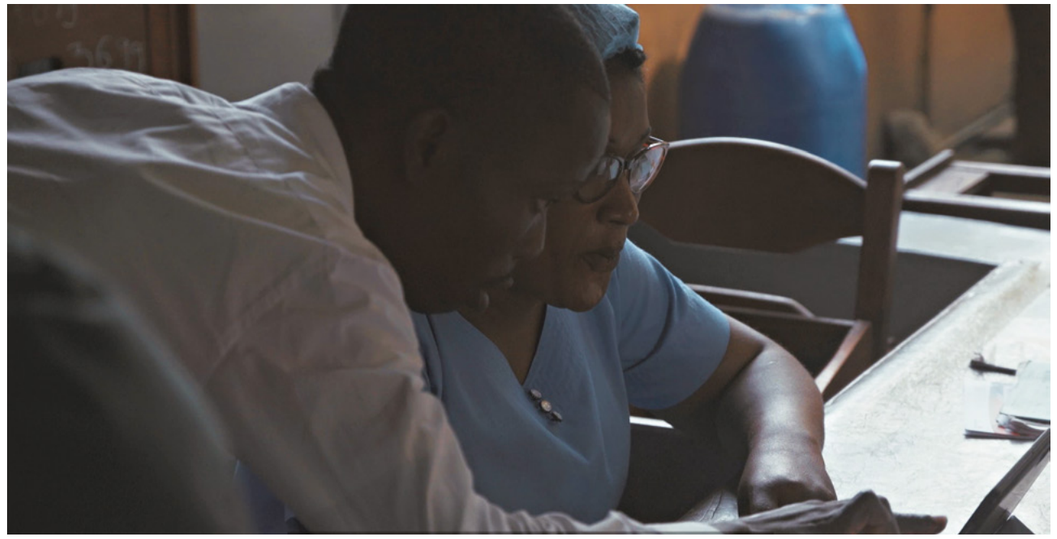
Healthcare workers considered Kea's agents the most useful source of information about the service. However, for many, the director of their hospital was the primary source of information, so initial impressions depended on what the director had conveyed to them. Based on information communicated from a hospital director, healthcare workers believed that Kea would enable better quality services. It would help them manage many patients through a seamless flow of information between services and hospitals that would, in turn, reduce procedure times.

Healthcare workers recognised the benefit of the new service and appreciated in-person support and training. However, there was concern about the required time commitment, limited digital literacy and perceptions that the app would be monitoring their work. They also appreciated how the innovation could serve their interest in improving administration and quality of care.

Hospital staff appreciated the training sessions held by Kea staff in hospitals, which provided greater clarity about the service, including the patient journey and its utility to the hospital. There was some resistance from certain staff members who were not interested initially, and others who thought it would be difficult to implement. However, during the training, staff realised that the solution was quite easy to use and found practical sessions helpful for understanding how it worked.

"At the start, we thought it would be difficult to use. But for someone who has limited experience using such systems, I found it very easy to use after practicing."
Healthcare worker

"People are not used to the IT tool, but bit by bit…and by demonstrating, they say 'ah this tool works like that'."
Kea Medicals staff



Through the on-boarding process, hospital staff have come to realise how innovative the Kea Medicals service is for Benin's health system. The technology was compared with similar services used in Europe, instilling pride that a Benin-based company had developed the solution.

"Digital health identity is a kind of modernization and it is already happening in several countries and why not here? That's the way I explain it to the patients. You have to innovate."
Healthcare worker

Kea is exploring other ways to expand its service by developing patient-owned health records, improving privacy, making the solution interoperable to expand to other countries and enhancing user design for those with low or no literacy skills.

KEY LEARNING 3

3.3 Multi-stakeholder partnerships open access to mobile-enabled services and unlock the benefits of a scaled-up service

Multi-stakeholder partnerships are essential to leverage the expertise, reach and resources of collaborating organsations, such as government ministries, MNOs, banks, NGOs, solution providers and start-ups.[14,15] Benefits of multi-stakeholder partnerships include:

- the ability to scale solutions more quickly;
- easily access customers, particularly the most underserved;
- providing ready investment and effective multi-media marketing; and
- creating appropriate, commercially sustainable and socially impactful business models (e.g. subsidisation models, B2C, B2B, B2B2C or B2G).

Kea Medicals' mobile solution relies on successful multi-stakeholder partnerships to unlock scale and additional value for its users.[16] Kea is in different phases of setting up partnerships with Benin's ministries of health and digital economy; one of Africa's largest MNOs, MTN; one of Africa's major financial groups, NSIA; and developmental, philanthropic and health organisations, including Sanofi, Tony Elumelu Foundation, Aliko Dangote Foundation and Sèmè City.

The evaluation team consulted some of these key stakeholders and confirmed the important role partnerships will play in Kea scaling its solution and generating mutual benefits.

Partnerships can help remove some of the key barriers to a mobile-led implementation, such as internet penetration, patient literacy, capacity of participating hospitals, data security, availability of requisite hardware, hospitals' ability to pay, hospital training, staff turnover, outreach and appropriate multi-media marketing.[17]

Kea Medicals has collaborated with MTN in Benin to integrate its mobile money API to offer patients a simpler and more efficient way to pay for services via mobile money. This partnership benefits MTN (by increasing its mobile money customer base), Kea and hospitals (by receiving free/subsidised telecoms equipment and connectivity) and end users (by having better access to quality, low-cost healthcare).

Kea has partnered with Nouvelle Société Interafricaine d'Assurance (NSIA). This mutually beneficial partnership provides Kea with access to a large network of hospitals and pharmacies, while it helps NSIA reduce fraud in the healthcare system, reduce costs and gain competitive advantage.

GSMA research found that Kea's and NSIA's visions are aligned, with a focus on enabling easy access to digital healthcare across the country regardless of a patient's mobility or where they live.

Both partners benefit from the ability to detect fraud early or even prevent fraud, in contrast to when fraud might have been detected retroactively.

Kea is an example of a start-up whose mobile tech solution, combined with government reach and policy, can extend to the largest possible population. Kea was initially involved with the government to scale its original pilot, and when the Ministry of Health conducts competitive procurement to digitise Benin's health system, Kea plans to compete.

14. GSMA Intelligence (September 2019), 2019 Mobile Industry Impact Report: Sustainable Development Goals. Executive Summary.
15. GSMA #BetterFuture, "Partnering for a Better Future".
16. https://www.keamedicals.com/
17. GSMA evaluation research in Benin

KEY LEARNING 4

3.4 MNOs are critical enablers

Although solutions such as Kea's are still nascent, early evidence suggests that digital heath IDs are creating new opportunities for MNOs to develop cross-sector partnerships; deliver social impact and generate new revenue through subscription and service fees (from patients, doctors and health centres); and introduce customers to new and life-changing value-added services, such as mobile money and remote healthcare.[18]

Kea has formed a partnership with one of Africa's largest MNOs, MTN, to integrate mobile money and a wallet (via an API) for users to pay for health services and insurance. For MTN, this partnership has the potential to expand its customer base and increase revenue.

Mobile money also benefits users by providing greater access to health services and a more secure method of payment than sending cash through an intermediary. Benefits extend to being able to access the Kea app even when users have no data left and accessing it via USSD in areas with low connectivity.[19]

GSMA research found that Kea and MTN Mobile Money users could **pay digitally** for health-related services **without ever having to withdraw cash.**

18. GSMA Digital Identity (April 2020), GSMA Digital Identity Programme: Insights and Achievements (2016–2020): Exploring the role of mobile platforms, conducive policies and business models in strengthening digital identity ecosystems.
19. GSMA evaluation research in Benin

The research revealed other benefits of integrating MTN's Mobile Money with Kea's solution:

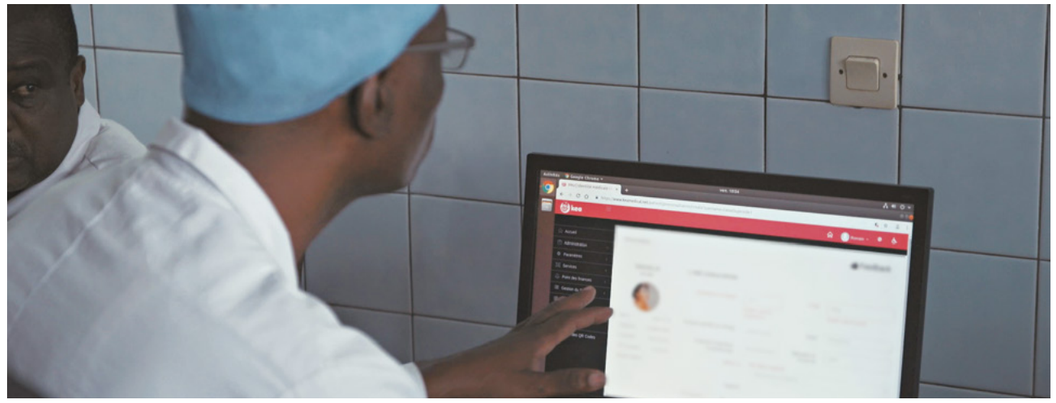
If a family member is unable to pay for their doctor consultation, another family member can pay the bill via their mobile phone. Cash and physical distance are no longer barriers.

Or, that person can **send money via their mobile phone to a pharmacy and their family member can collect their medication.**

Mobile money integration helps to ensure that funds are received by the correct person for the correct purpose and is not taken by another family member or friend, which can be a risk with cash.

In return for integrating their mobile money solution, MNOs can offer free or subsidised connectivity and telecommunications equipment in participating hospitals, which helps Kea to scale its solution.

Such equipment would facilitate on-boarding of hospitals to the service because funding for this equipment is currently a barrier for many hospitals.



MNOs are well placed to partner with start-ups and scale up digital health IDs and solutions. The mobile network infrastructure of MNOs allows them to not only reach a broad customer base, but the majority of a country's population, including the underserved. Marketing health solutions to this customer base or integrating the service can help drive uptake. Establishing a multi-stakeholder partnership with the government could also unlock the opportunity to "add on" government health subsidy payments to users' mobile wallets.

GSMA research has found that official ID has practical, aspirational and emotional value, and MNOs can drive consumer demand for, and improve access to, official proof of identity.[20] MNOs can improve digital identity verification, and since relationships and trust are vital to customers, they can also develop stronger customer relationships and act as trusted partners that open access to other relevant mobile services.

20. GSMA Digital Identity (2 August 2019), "GSMA end-user research: Our top 5 lessons about digital identity", *Mobile for Development Blog*.

KEY LEARNING 5

3.5 Conducive political environments can accelerate the benefits of digitisation for the underserved

3.5.1 Overcoming access barriers to healthcare

By 2025, the Government of Benin aims to have an efficient healthcare system accessible to all segments of society. One notable feature of the government's action plan is building internal capacity in human resources and e-health through information technology. It is in this area that Kea Medicals may find the space to develop and demonstrate its full potential.[21,22,23,24]

Commitment from the government and healthcare sector will not in itself be sufficient to strengthen the country's health and hospital system, which continues to be affected by shortages in human and technical resources, and patients are not always satisfied with the level of care they receive, particularly in public health facilities.[25]

Kea users expressed some of the limitations of Benin's healthcare system:

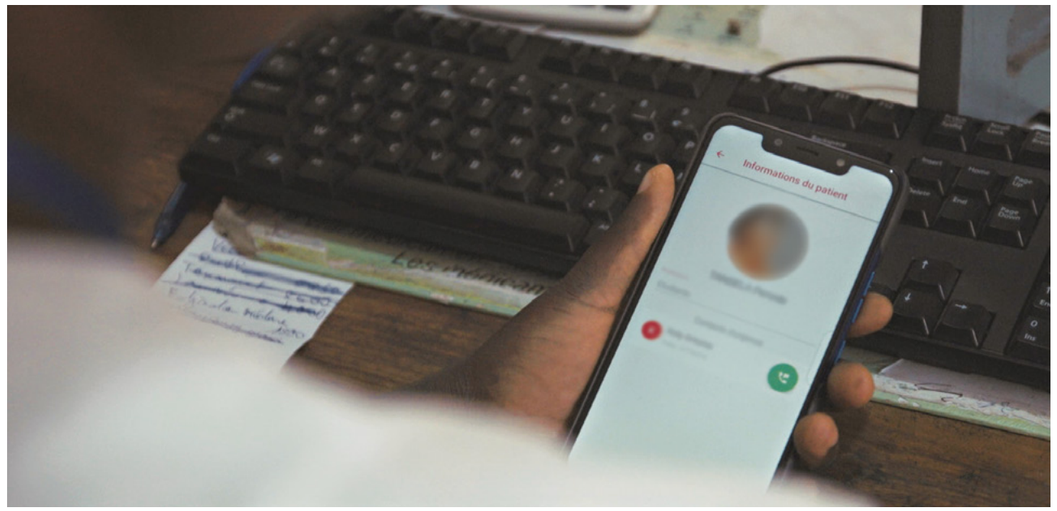
88 per cent of users did not have any kind of access to their medical records prior to hearing about Kea. Of the **12 per cent** that had access, **69 per cent** were paper records. Before using Kea, only **four per cent** had access to their medical records on a computer device.

Kea has been able to overcome these barriers to provide swift access to healthcare and more efficient and higher quality service.

Overall, patients seem to have no doubt about the importance of having ready access to medical records. **83 per cent** stated it was "very important" and **16 per cent** stated it was "somewhat important".

"It is the ability to regularly monitor your medical file [that attracts a person to Kea]. Maybe you are in town and you feel unwell and you did not have time to go home to get your paper records, but with Kea, the doctor can easily find your medical history."
Male patient

21. Republique du Bénin Ministère de la Santé (2009), Plan National de Développement Sanitaire.
22. The World Bank (1 September 2016), Results-Based Financing: A Promising Approach for Benin's Health Sector.
23. The World Bank (1 July 2019), Benin: World Bank Provides $100 Million to Promote Digital Solutions in Rural Communities.
24. Olu, O. et al. (15 November 2019). How Can Digital Health Technologies Contribute to Sustainable Attainment of Universal Health Coverage in Africa? A Perspective. Frontiers in Public Health.
25. Ibid.



The Government of Benin appears resolute in improving the health and socio-economic conditions of its citizens and has been working with The World Bank to strengthen the country's healthcare system and improve its access to funding.[26] Kea is addressing this problem by reaching the most underserved with mobile money and integrating insurance in its solution.

3.5.2 Perceptions of data security and privacy

The digitisation of healthcare can raise concerns about data privacy and government surveillance, which were voiced by some users and hospital directors in the study. Some healthcare workers, for example, expressed concern that the Kea app may be an attempt to monitor and control their activities.

Appropriate government policy and legislation would help to allay these concerns. Innovators will also need to consider building appropriate privacy and security features into their solutions and provide appropriate training and messaging to ensure all users feel secure and are happy using the solution.

Some respondents expressed general concern that digital data is never totally secure and that it could be misused. One person noted that it could be a particular risk if someone has a health condition that is stigmatised, such as HIV/AIDS.

Kea has taken steps to address these security and data protection concerns by allowing each user to control their personal digital health records. This has been met with a positive response. Training on how to share information, and raising awareness of security issues, are both important in promoting user uptake.

26. Ibid.

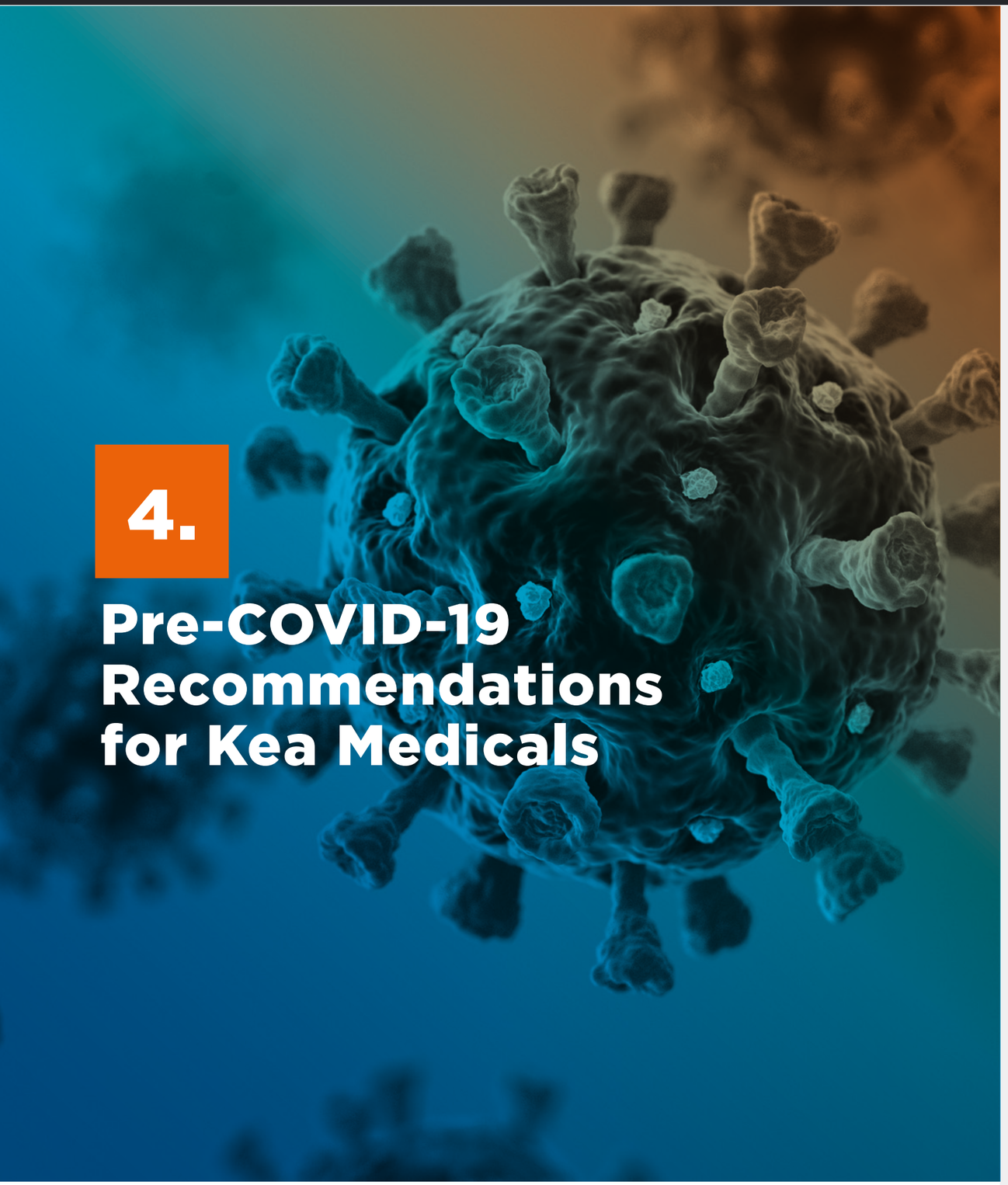
80 per cent of respondents had no concerns and did not see barriers to tracking medical records through Kea. **61 per cent** perceived the app as secure and **55 per cent** are somewhat confident in their ability to control who can see their medical records.

Among hospital staff, there was concern that the technology solution may be used to monitor and control their work, while some hospital directors were concerned about general data privacy and potential government surveillance, and were apprehensive about medical data being stored outside Benin.

> "Unfortunately, the data is not stored in Benin, it will be stored in a data centre [abroad]. It's still weird that our data is being sent [abroad]; why not have a storage structure on site..."
> **Healthcare worker**

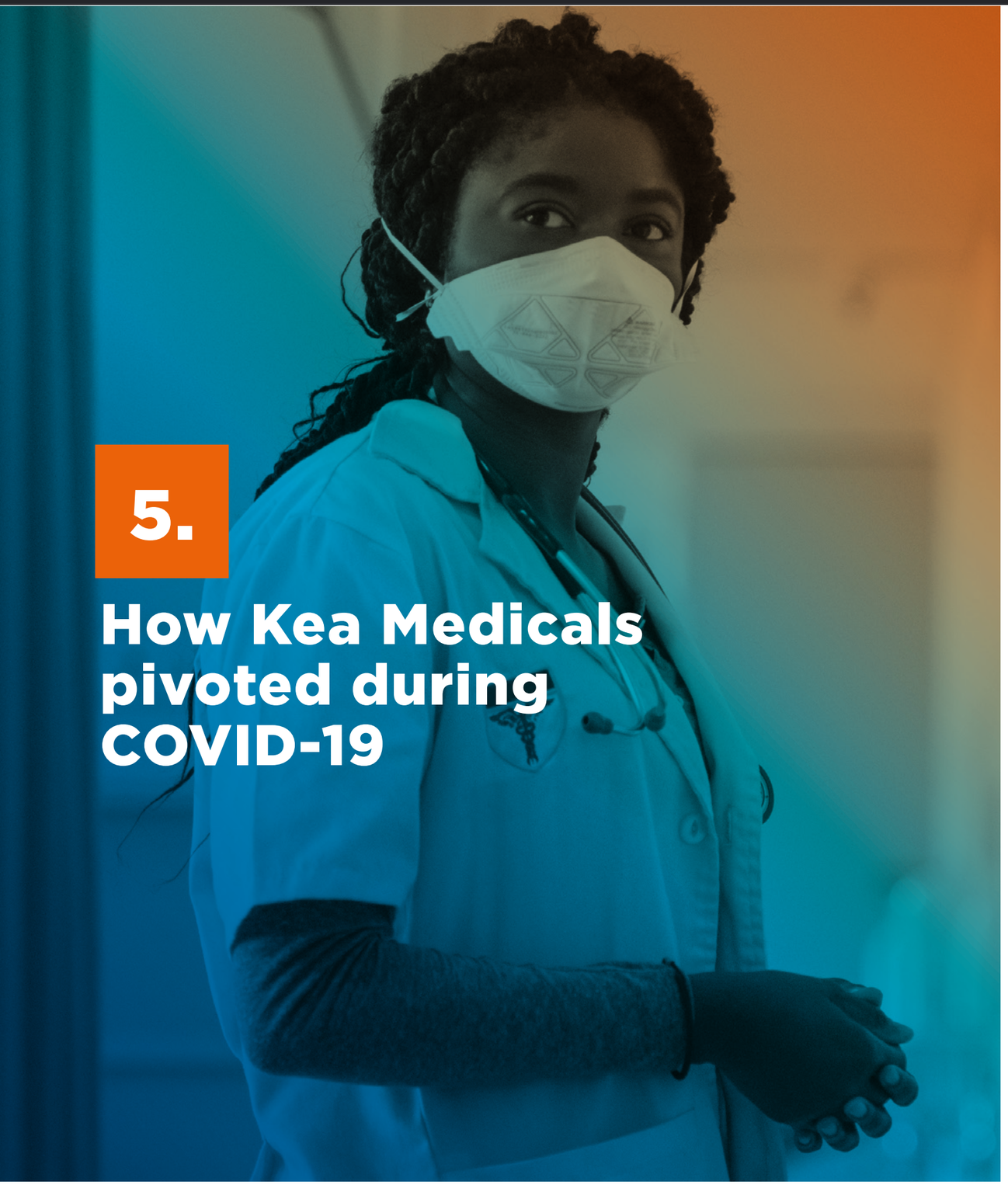
Start-ups offering digital health ID solutions and governments can complement each other in multi-stakeholder partnerships. For example, governments may be able to "piggyback" on a technology solution and help it reach scale by offering health, social services and disbursements to the underserved. Greater collaboration between MNOs, NGOs or investors could strengthen the coordination, funding and longevity of such solutions.

The evaluation concluded with a workshop to discuss findings, brainstorm solutions and identify actionable recommendations. The recommendations for Kea included below may also benefit other stakeholders involved in implementing a digital health service.



4. Pre-COVID-19 Recommendations for Kea Medicals

Phase	Key recommendations
Outreach	**1. CONSIDER AN ECOSYSTEM-BASED APPROACH TO OUTREACH AND ON-BOARDING.** This means on-boarding a hospital and the patients at that hospital before on-boarding additional hospitals. This is a more efficient use of resources and makes it possible to fully operationalise the service. It also produces faster results, propels iterations and makes it easier to secure buy-in for the service. **2. BE MORE STRATEGIC IN TARGETING USERS AND CHOICE OF COMMUNICATION CHANNELS TO ATTRACT A STRONG USER BASE.** For instance, targeting women users could be a catalyst for other household members to enrol. Audio-video communication in local languages and increasing TV and radio outreach will facilitate uptake among a wider demographic. **3. CONSIDER ADAPTING MARKETING TO RESPOND TO PATIENTS' PRIMARY CONCERNS.** Patient respondents expressed concern that they could fall ill and be in a hospital without access to their medical records.
Sign-up and on-boarding	**4. CONDUCT RESEARCH AND PRODUCT TESTING WITH DIVERSE POPULATIONS.** People in rural areas or with lower levels of education will likely face additional challenges with sign-up and on-boarding. User research in these contexts would help to identify these challenges before rollout. **5. FACILITATE PAYMENTS FOR HOSPITAL EQUIPMENT.** Acquiring equipment is a key barrier to hospital on-boarding. There is potential for partnerships with stakeholders who can sell equipment to hospitals and offer convenient payment terms. **6. ASSIST HOSPITALS IN ASSESSING THEIR RETURN ON INVESTMENT (ROI).** Hospitals are more likely to invest in the Kea solution if they can foresee financial gains or other benefits for their facility. In its outreach to hospitals, Kea could develop an ROI model that estimates the potential future financial benefits and includes elements such as the efficiencies realised from digitisation. This could help attract more patients and minimise litigation. **7. PROVIDE ONLINE OR VIDEO-BASED TRAINING MODULES FOR ALL HEALTHCARE STAFF.** This will allow staff to participate as time allows and refresh their training as needed. To mitigate the challenges of internet connectivity, modules should be downloadable and, ideally, provided on a memory stick for hospitals to download directly to their devices.
Ongoing service use	**8. IMPLEMENT A STRONG M&E SYSTEM, WITH RELEVANT SOCIO-ECONOMIC, BUSINESS AND MOBILE KPIS TO INFORM DECISION MAKING AND SECURE BUY-IN.** As Kea scales up its service throughout Benin, it needs to integrate a robust M&E plan to monitor progress against its theory of change.



5. How Kea Medicals pivoted during COVID-19

5.1 Joining multi-stakeholder partnerships to deliver benefits quickly

Since COVID-19 social distancing and quarantine restrictions were imposed, there has been a major focus on providing social cash transfers to beneficiaries who may have less income and access to basic necessities, and enabling safe and better access to health. Throughout the world, multi-stakeholder partnerships between health services, governments, MNOs, mobile money providers (MMPs), NGOs and other private sector actors have prompted swift changes that leverage mobile technology and networks, and remove or lower legal barriers to accessing social and health benefits.[27,28,29]

5.2 Shifting the user journey online and to mobile

The COVID-19 pandemic has imposed restrictions on movement, enforced social distancing measures and had a negative impact on economic well-being and health around the world. In this context, Kea's digital health ID provides access to remote healthcare and consultations and the ability to pay remotely with mobile money. This ensures users can comply with travel and social distancing restrictions while still meeting their medical needs.

Kea has pivoted to focus on remote functionality, shifting the user journey online and to mobile. Since COVID-19 reached Benin, Kea has achieved the following:[30]

- To access Kea's solution, **ID can be verified remotely** from a user's name and mobile number.
- **Doctor consultations can be accessed remotely** (e.g. at home) via a user's mobile phone.
- **COVID-19 testing can be accessed remotely** via a user's mobile phone.
- Users can **sign up remotely and/or log in** to Kea's mobile app-based solution on their mobile phone without the need to visit a hospital or health centre in person.
- **More hospitals have been connected** to the Kea solution.
- Increased focus on **product development and urban/rural marketing** for remote patient access.
- Increased focus on **engaging healthcare workers** through partnerships to adopt new ways of working and to scale more easily in other countries.
- Developed functionality to ensure users and healthcare workers can **access Kea's solution when there is no internet** signal.
- **Developing partnerships to scale up** solutions and drive down healthcare costs with MNOs, government ministries and insurance providers in Benin, Côte d'Ivoire, Gabon and Mali.
- **Developing USSD and call centre solutions for users without smartphones.**

27. GSMA (June 2020), Digital Health: A health system strengthening tool for developing countries.
28. Casswell, J. (27 April 2020), "The role of mobile technology for humanitarian assistance in a COVID-19 world", *Mobile for Development Blog*.
29. Chadha, S., Kipkemboi, K. and Muthiora B. (16 July 2020), "Tracking mobile money regulatory responses to COVID-19", *Mobile for Development Blog*.
30. GSMA interviews with Kea Medicals staff, July 2020

5.3 Addressing COVID-19 restrictions with remote functionality

Figure 3

Healthcare experience for users during COVID-19, before and after using Kea Medicals' solution

Note: this diagram captures some of the key lessons learned from respondents and Kea Medicals staff in the GSMA's evaluation of Kea Medicals before and during the COVID-19 pandemic.

Pivoting in response to COVID-19 to focus on remote access to doctor consultations and COVID-19 testing has demonstrated the relevance and agility of mobile technology and digital identity, and the ability of small-scale innovators to reach underserved communities.

During the GSMA's evaluation, which concluded in March 2020

Kea Medicals had **24,000+ users** in Benin

Kea Medicals pivoted during the COVID-19 crisis by scaling up its mobile remote access doctor consultations

... and as of July 2020

Kea Medicals has **100,000+ users**

... and facilitates **25,000+** online consultations per month.

6. Conclusion

The Kea Medicals solution has been operating for a little over a year, with the GSMA's evaluation concluding in March 2020. Based on the evaluation, the GSMA has concluded that if users and stakeholders adopt Kea Medicals' service and use it consistently, there will be cascading effects that will have a positive impact across the ecosystem and society. Kea's solution is still a nascent technology and it is too early to measure the broader impact of the solution. However, the GSMA's evaluation and research has revealed the solution is having a positive impact at a small scale, especially during COVID-19, and has identified some areas to address to scale it up even more.

On the demand side, most patients in the GSMA's evaluation indicated they had sufficient information to sign up, download, navigate and use the Kea app and QR patch easily. They found the service affordable and did not perceive any barriers to continued use. However, some patients had difficulty with self-sign up and navigation, and perceived the limited availability of clinics using Kea and internet connectivity as potential barriers, with one feeling that digitisation was less personal. Some did not understand or know where to buy the QR patch.

A small number of patients indicated they have had a positive experience tracking and controlling their medical records with Kea, and pointed to this feature as the most appealing benefit of the service. These patients observed that medical staff retrieved their medical records more quickly than in the past, and some reported changes in their treatment. Recent evidence (since the COVID-19 pandemic began) suggests the user journey has shifted online, with Kea patients receiving advice based on their medical records via online doctor consultations. As of July 2020, over 25,000 consultations were being delivered via Kea per month. Patients also saw value in insurance being integrated in the solution and its potential to reduce paperwork.

On the supply side, hospitals and healthcare staff had positive perceptions of Kea and its potential future benefits. They appreciated in-person support from Kea, which has provided significant assistance from installation through to training. Staff said that training has been well received, although there were concerns about the required time commitment, digital literacy and availability of staff and perceptions that Kea may be a monitoring mechanism. Staff also stressed that Kea should rely more heavily on TV and radio than internet and social media for outreach in rural areas and among those who are older and with lower educational levels.

Hospital staff reported there were early indications that Kea's service was improving their administrative and financial management, and patients also reported that Kea has helped their healthcare provider access their medical information more quickly. Some hospital staff indicated they were more informed, could find patients' medical records more easily and prescriptions were being processed for patients more quickly. Staff generally anticipated a positive financial benefit to their hospital through a better patient experience, higher quality of care and less litigation.

For hospitals, the main barrier to the Kea solution becoming operational is the cost of computers and associated fees. However, hospitals report that it is too soon to form an opinion of the value of the service relative to the price. Some hospitals found the cost acceptable while one found it high. Plans are underway for MTN to support hospitals with these expenses. Hospitals and patients also expressed support for integrating insurance in the solution to lower barriers to healthcare.

7. Appendices

7.1 Evaluation approach

The primary purpose of the GSMA's evaluation was to give the Kea team insights into improving the design and implementation of its solution. There were two main objectives:

- To understand the user journey for the various user profiles (patients, health workers, doctors, pharmacists and lab workers), detect pain points and identify unmet expectations; and
- To evaluate how effective the service was in reducing inefficiencies in health service provision, with a focus on the early impacts of the service.

7.2 Methodology

The GSMA's formative evaluation addressed the evaluation questions using a mixed methods approach, drawing on primary quantitative and qualitative data, as well as secondary data from the Kea Medicals team. Data was collected between December 2019 and January 2020.

The evaluation team selected five hospitals using the Kea Medicals service to participate in the evaluation. One hospital was not available for interview, so the final sample was four. The length of exposure to the Kea Medicals service varied from one to eight months at the time of the evaluation. In each sampled hospital, the team aimed to interview the hospital director, doctors, nurses, other healthcare workers, lab technicians, pharmacy managers and cashiers. Interview topics covered respondent experiences at each step of the user journey.

For patient perspectives of Kea Medicals, the evaluation team completed 216 successful patient interviews via a 20-minute Computer Assisted Telephone Interview (CATI). Questionnaire topics covered patient experiences in outreach, sign up and use of the service.

In addition to the quantitative patient survey, the evaluation team completed 12 qualitative patient interviews, gleaning further insights into patient outreach, sign up and use of the service via in-depth interviews.

The team also conducted in-depth interviews with Kea staff and key informant interviews (KIIs) with MTN and an insurance firm to understand the motivation and expectations of the partnership with Kea Medicals. At the beginning of the evaluation, the team spoke briefly with a representative of the Ministry of Health to discuss Kea's service and its usefulness to the healthcare sector in Benin. Some findings from that interview are shared in this report.

7.3 Limitations

Selection bias: The respondent selection process for CATI interviews was non-random and involved self-selection. Therefore, the evaluation team does not expect the views of the sample of respondents to represent the views of the entire target user base. Further, the degree of representativeness of the sample is unknown since there is no available data for which to compare the sample to the entire user base.

Measuring outcomes and impact: The Kea service had been operational for a little under a year at the time of this evaluation. Much of that time involved outreach and on-boarding activities with a small number of patient use cases. It is therefore premature to observe changes in medium- or long-term outcomes, such as improved quality of care or hospital management. Therefore, the evaluation captures only the perceptions of different users of the changes they have noted since using the system.

Translations from French to English: All quotes have been translated from French to English and are not verbatim. Some liberties have been taken to convey the essence of the quotes recorded in French.

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