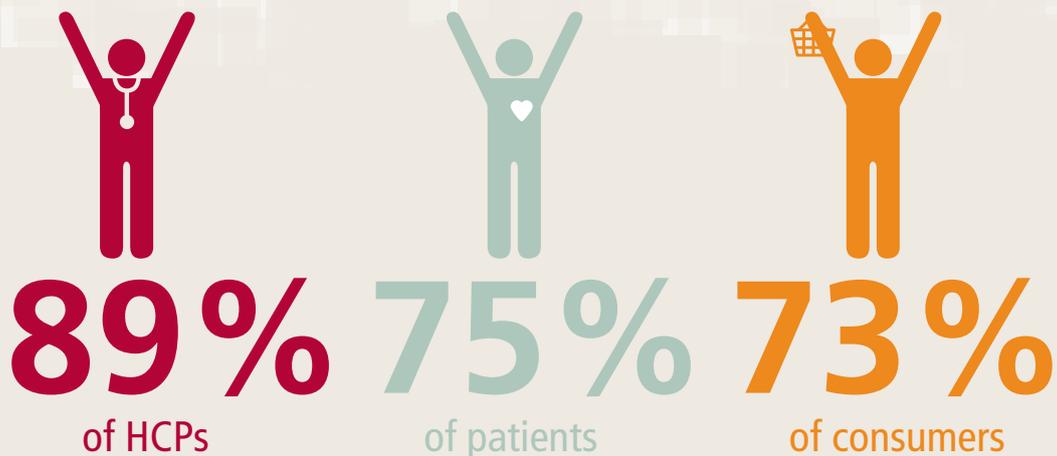




mHealth

Global study of perceptions of mobile solutions for healthcare in chronic disease

A white paper for patient societies
and advocacy groups



believe that mHealth solutions can convey
significant health benefits

Executive summary

Patients are living in a challenging healthcare environment. In developed regions, healthcare systems are being asked to do ever more on shrinking budgets, often leaving patients wondering if they are getting the right care from harried practitioners. In emerging economies, inequalities of access to care are still the norm.

As advocates for patients, these challenges pose many dilemmas. How can you help to ensure that patients take their medicines when at least half of patients are non-compliant? How can you help patients take more control of their health and reduce pressures on healthcare practitioners' time? How can you ensure that - whatever their educational, social, geographic or financial situation - equitable care is the rule, not the exception?

Mobile health (mHealth) solutions can help to address many of today's healthcare challenges, particularly in chronic (non-communicable) disease where demands on healthcare resources are considerable. Broadly defined, mhealth refers to the use of mobile communication and devices for providing healthcare services for patients, healthcare professionals and carers.

As demonstrated in this global end-user research, conducted among 2,000 healthcare practitioners (HCPs), patients and consumers, it is widely believed that mHealth solutions can help to address many challenges resulting from chronic disease: high healthcare costs, inequality of care, behavioural challenges, cost inefficiencies and low quality care. Specifically, this research revealed these top four beliefs about mHealth solutions:

- 1. mHealth solutions allow patients and consumers to achieve health goals and improve health outcomes via improved quality of care**
- 2. mHealth solutions provide health information and medical support in resource-constrained healthcare systems**
- 3. mHealth solutions must be affordable for patients and consumers, as well as simple, accessible and trusted**
- 4. Patients and consumers should be encouraged to talk to their HCPs about mHealth solutions**

It is widely believed that mHealth solutions could offer a win:win opportunity for patients to dramatically improve their health. We hope that you will use the results of this research to help drive your patient-centric programmes and campaigns. By doing this, you will encourage the increased, co-ordinated use of solutions that improve health outcomes for patients everywhere.

Introduction

In all countries, mobile health (mHealth) can have a significant impact on the health of the nation. Mobile health has the potential to change the way that healthcare is delivered in patients with chronic (non-communicable) disease - to increase efficiency and cost-efficiency of care, to give patients more knowledge and control of their condition, to change behaviours that are perpetuating chronic disease, and to help prevent a further increase in chronic disease that is spiralling out of control in many nations. However, to date, whilst some mHealth services have been introduced, this has not been achieved on a widespread and co-ordinated scale, and there remains limited awareness of the potential scale of its benefits.

Dr Stuart Bootle, UK, says, "As a person living with Type 1 diabetes, I need to use technology on a day-to-day basis to help me take control of my condition and reduce the risk of future complications. Self Monitoring of Blood Glucose (SMBG) and Continuous Glucose Monitoring (CGM) are valuable diagnostic tools that help me adjust my insulin doses to manage my blood glucose levels so I can reduce highs and prevent lows. However, I have limited 'face-to-face' time with the healthcare professionals involved in my care to discuss my blood glucose results and address any issues raised. There is a real need for mHealth solutions that can help me learn how to get the most out of the technology I am using and optimise my treatment."

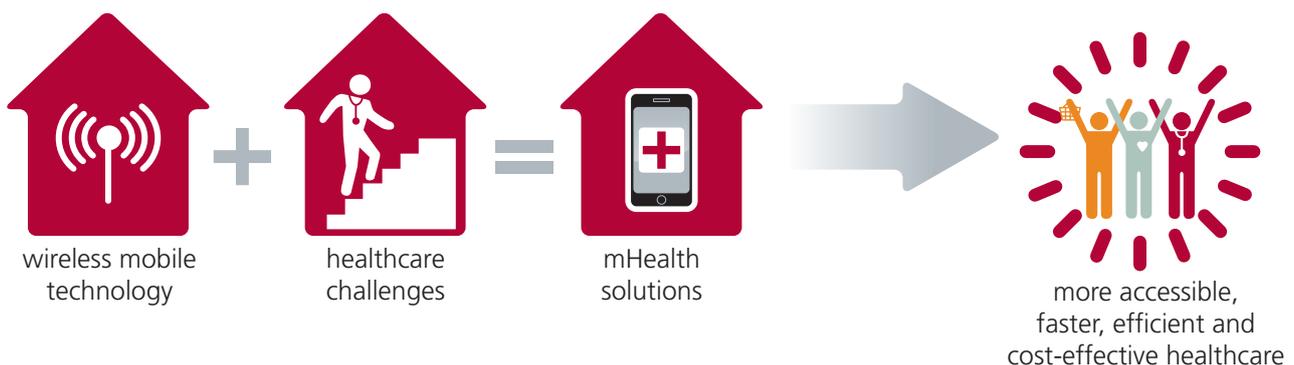
For patient societies and advocacy groups representing the interests of patients everywhere, there are, however, some challenges in encouraging the increased use of mHealth solutions. For example, patients need healthcare practitioners (HCPs) to recommend mHealth solutions to them, and they need affordable, customisable solutions that simply and reliably address their healthcare needs.

Jonathan Anscombe, Partner, Health Practice, A.T. Kearney Limited, London, comments, "Patient groups have a big role to play in driving uptake of mobile health solutions through helping patients to understand how these technologies can help them to manage their conditions. This is especially important for hard to reach groups where issues such as literacy or cultural difference limit engagement with the healthcare system."

In this white paper, we report on results from a large multi-country end-user survey of the views and perceptions of HCPs, patients with chronic disease (diabetes and cardiovascular disease) and general wellness consumers (adults with a high level of interest in health and wellness who do not suffer from a chronic health issue) commissioned by the GSMA (which represents the interests of mobile operators worldwide) [see back page]. The findings make fascinating reading for patient societies and advocacy groups and this research, together with other recent research into mHealth solutions,¹⁻⁵ emphasises the opportunities that mHealth can offer to patients and consumers. It outlines some of the revealed challenges for mHealth and how they might be addressed. It also shares some learnings from major stakeholders in mHealth solutions and chronic disease around the world.

All stakeholders involved in healthcare have different interests and priorities. By working together, all stakeholders should be able to see mHealth for what it is – an opportunity to dramatically improve healthcare – wherever we are, whatever our role, whatever our current healthcare system. Read, digest and ask yourself – how can mHealth solutions benefit patients, populations and society as a whole and what do you need to do to help this happen?

"Diabetes is undoubtedly one of the most challenging health problems in the 21st century."⁶



The prevention and management of chronic disease is a global health priority.

Spotlight on chronic disease, particularly diabetes

The focus of the GSMA end-user research was on chronic disease, with diabetes used as an example throughout this white paper.

Chronic disease, such as diabetes, is currently the leading cause of mortality in the world and accounts for 63% of all deaths worldwide.⁷ The prevention and management of chronic disease is a global health priority as highlighted by the World Health Organization's (WHO's) "Action Plan on Prevention and Control of Non-Communicable Diseases 2008-2013".⁸

Sophie Peresson, Regional Director, IDF Europe, notes, "Over the past decade, we have seen a significant rise in the prevalence and incidence of diabetes and pre-diabetes. In every country, we have seen demands for healthcare practitioners' time soar in line with the increased diagnoses, increased need for out-patient appointments, and increased hospitalisations from complications. This is placing enormous pressures on already overburdened healthcare systems globally. We need urgent action on prevention and access to high quality care, but we know that the actions will not reverse the situation - that they will at best control the progression and hopefully minimise the burden of chronic disease in Europe."

Currently 366 million people (8.3% of adults) worldwide have diabetes⁶ and, if current trends continue, by 2030 around one in ten adults will have diabetes.⁶ The WHO predicts that diabetes will become the seventh leading cause of death.⁹ Currently, the Middle East and North Africa, China and India have the highest prevalence of diabetes, followed by the US, Indonesia, Brazil and Russia.¹⁰ Six out of the world's top ten countries for highest prevalence (%) of diabetes are in the Middle East and North Africa region – Kuwait, Lebanon, Qatar, Saudi Arabia, Bahrain and the United Arab Emirates.¹¹ Rapid economic development coupled with ageing populations have resulted in a dramatic increase in the prevalence of diabetes.¹¹

Unless addressed, the mortality and disease burden from chronic disease will continue to increase. WHO projects that, globally, deaths from chronic disease will increase by 17% over the next ten years. The greatest increase will be seen in the African region (27%) and the Eastern Mediterranean region (25%). The highest absolute number of deaths will occur in the Western Pacific and South-East Asia regions.⁸

Diabetes poses a considerable economic burden on healthcare systems worldwide, with 11% of the global healthcare expenditure spent on the disease.¹² Most countries (80%) spend between 5-18% of their national health expenditures on treatment and management of the condition.^{12,13} Higher income countries spend more on diabetes, and these account for 90% of the global expenditure, with the US spending more than half of the total. Low- and middle-income countries spend less than 10% of the global expenditure. India - which accounts for one of the highest prevalence rates - spends less than 1% of the total global expenditure on the disease. In the UK, the cost of diabetes to the NHS is over £1.5m an hour or 10% of the NHS budget for England and Wales. This equates to over £25,000 being spent on diabetes every minute. In total, an estimated £14 billion is spent each year on treating diabetes and its complications, with the cost of treating complications representing the much higher cost.¹⁴ Overall, the global expenditure on diabetes is predicted to rise by up to 34%, reaching a total of around US \$595 billion by 2030.^{12,13}

"This is definitely what we all want to see - helping patients improve their quality of life and their overall health."

Research Respondent, Diabetes Specialist

Regional overview of diabetes:¹⁰

- **Africa: 78% of people with diabetes are undiagnosed**
- **Europe: the highest prevalence of type 1 diabetes in children**
- **Middle East and North Africa: 6 of the top 10 countries by diabetes prevalence**
- **North America and Caribbean: 1 adult in 10 has diabetes**
- **South and Central America: 12.3% of all deaths were due to diabetes**
- **South-East Asia: almost one-fifth of the world's people with diabetes live in just seven countries**
- **Western Pacific: 132 million adults have diabetes, the largest number of any region**

About the research

This end-user research – commissioned by the GSMA (which represents the interests of mobile operators worldwide) and undertaken by Ipsos MORI between March and June 2012 – was conducted to understand how mHealth is viewed by HCPs, people with chronic disease and general wellness consumers. People from these three groups were questioned in four countries so that a broad range of views were obtained from a more established country (US) and three countries in which the healthcare system is still developing (Brazil, China and India). Respondents mainly lived in city locations and were clearly told what mHealth solutions are, with examples given.

The participants interviewed in both phases were drawn from market research access panels (respondents who have opted in to undertake research). For Phase I, Ipsos MORI used its own panels in Brazil, China and India, and a third party panel in the US. For Phase II, it used third party online panels across all four countries. Respondents were sent a link to the screener and study.

In terms of entry criteria, respondents were excluded from Phase I if they stated they had no awareness of mHealth and were not confident discussing it. These exclusion criteria did not apply to Phase II, although Ipsos MORI limited those respondents not aware of/not confident in discussing mHealth to <15% of the total sample in any one market. Respondents were excluded if they had taken part in any mHealth market research in the previous three months (both phases). As well as ensuring a mix of ages for the patients/consumers, Ipsos MORI also ensured a good balance of males/females.

The first phase of the research involved detailed interviews from each audience in each country on their views and current use of mHealth (qualitative phase). Some of the quotes received are shown in this white paper. The second phase of the research used online surveys to further explore topics discussed in the first phase of the research (quantitative phase). Results were calculated in all four countries overall, and in each of the four countries individually to look for any inter-country differences.

The online surveys included 50 people from each HCP group (cardiologists, diabetes specialists, primary care practitioners and community health workers or nurses) and 100 from each patient/consumer group (chronic patients with cardiovascular conditions, chronic patients with diabetes, and general wellness consumers).

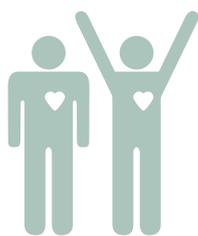
Key to icons used throughout this white paper



HCP



Diabetes HCP



Patient



Diabetes patient



General wellness consumer

Key message 1. mHealth solutions allow patients and consumers to achieve health goals and improve health outcomes via improved quality of care

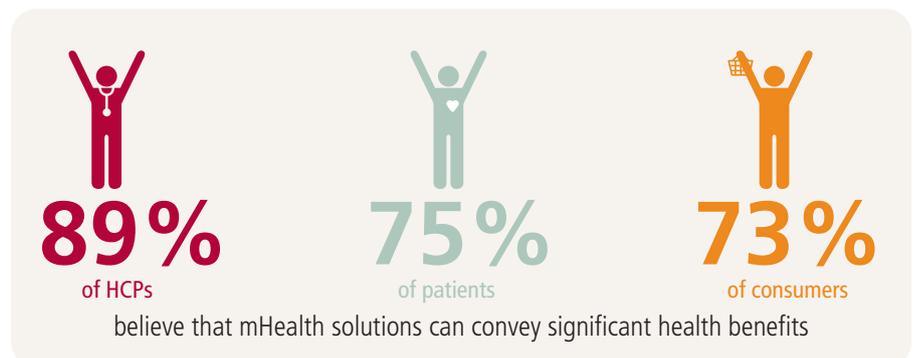
mHealth solutions can improve the quality of care, and allow patients and consumers to reach their health goals

Improving quality of care and enabling more patients to achieve their health goals are key targets in chronic disease management.

Keith J. Petrie, Professor of Health Psychology, University of Auckland, New Zealand, comments, "With so many more people being diagnosed with chronic disease, and many more in the pre-disease state, we need to urgently find ways to improve patient care within restricted resources. Currently, we have many patients who do not understand their condition, and so cannot care well for themselves. We have many patients who struggle to achieve their disease goals, whether for blood glucose, cholesterol, blood pressure or peak flow. My clinical experience has shown that mobile health solutions can offer an important way of reaching out and influencing patients. We all need to look at ways to apply this technology urgently to improve health outcomes globally. The benefits that it can bring to our quality of care are enormous. We see improved lifestyle, diet and compliance, improved patient and consumer education, reduced workload and reduced costs. Remotely, we can make a huge difference to individual patient care and, subsequently, to patient outcomes."

Jonathan Anscombe, A.T. Kearney, adds, "Perhaps one of the most exciting aspects of mobile health is the potential to help patients to engage with management of their own health. Only about half of all patients with chronic disease fully comply with their treatment. The convenience, immediacy and familiarity of mobile devices has the opportunity to get far greater engagement so really improve health outcomes"

In our end-user research, almost half of patients stated that they struggle to achieve health goals, one quarter feel they lack a full understanding of their condition and almost one third have difficulty keeping appointments. However, the majority of end users surveyed believe that mHealth solutions can convey significant health benefits and improve the quality of care.



Three quarters of patients believe that mHealth can help them achieve their disease goals.

60% of consumers believe that mHealth would allow them to manage their health more independently.

Furthermore, many other aspects of patient quality of care might improve with mHealth solutions according to this research; for example, almost two thirds of patients believe mHealth improves information for diagnosis and treatment, two thirds believe that it allows real-time monitoring of disease progression, over half believe mHealth can help them to better understand their condition, three quarters believe that mHealth can help them achieve their disease goals, almost three quarters believe that mHealth can help them keep appointments and over half believe that mHealth can help them gain a fuller understanding of their condition.

Consumers surveyed also see the potential health benefits of mHealth solutions, for example, to reach their health goals and improve health outcomes, with around half of consumers believing that mHealth can improve the quality of care, around 60% believing that mHealth would make it easier to manage health information, and the same proportion believing that it would allow them to manage their health more independently.

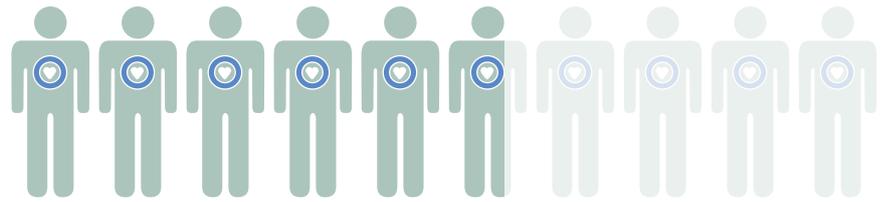
“There are many advantages to applying mobile technology in health and wellness. Text messaging is widely available, low cost and requires minimal technological expertise. We are seeing texting programs that motivate behavior change, increase adherence and patient engagement. However, to make it more robust, connectivity to devices enhances the outcomes and experience. To make this easy to use for both patients and providers, these tools and apps must have ‘plug-and-play’ connectivity for wide-scale adoption,” says Chuck Parker, Executive Director, Continua Health Alliance. “Remote monitoring programs are also giving individuals the information they need to take control of their care and better manage their own health. Personal health devices can collect accurate, individual patient vital signs, including blood pressure, weight, heart rate and blood glucose levels, as well as quality of life data such as sleep patterns and daily activity. Individuals can then access their own data, presented in a user-friendly format, with easy-to-understand information and educational support messaging to help keep the individual on the right track. These data can also be easily shared with the patient’s healthcare provider and care team. As devices and technology services become easier to use with ‘plug-and-play’ connectivity, we will see even faster adoption of personal connected health.”

The fact that around half of patients and consumers surveyed believe that mHealth solutions can improve their quality of care means this is a tool that needs to be explored and far more widely introduced at a time of ever-increasing demands on healthcare systems.

The challenge of compliance and behaviour in chronic disease

Linked to healthy goals and outcomes is health-related behaviour. Health-related behaviour is highly complex and includes diet/lifestyle changes and compliance with medication schedules. Whilst psychologists have made many attempts to explore what drives behavioural changes in chronic disease and how to influence this, e.g., by changing patients’ beliefs and perceptions about their illness and medication,¹⁵⁻²² drivers differ and our long-term record of changing diet, lifestyle and exercise habits and improving compliance remains extremely poor.¹⁷

In this end-user research, difficulties in following diet/lifestyle changes was the number one challenge for 50-60% of patients with chronic disease in three of the four countries surveyed, and for almost 60% of the diabetes patients surveyed. Around one third of consumers also stated that maintaining a healthy lifestyle and exercising regularly were significant challenges to them.



58% of diabetes patients have difficulties following diet/lifestyle changes

Poor compliance is everyone's concern

Poor compliance should be everyone's concern, since it leads to considerably increased healthcare costs, inefficiencies of care, high wastage and poorer outcomes.

Adherence to treatment schedules in patients with chronic disease is around 50% in developing countries.²³ Of patients prescribed a medication for a chronic condition, after only 10 days, 45% reported intentional non-adherence (i.e., due to incorrect beliefs and perceptions of their condition and the prescribed treatment) and 55% reported unintentional non-adherence.^{24,25} Furthermore, data show that, in medication-naïve patients, more patients stop treatment after 30 days if they have never taken medication before compared with those who have taken previous medication, especially in those with diabetes, asthma and glaucoma, showing that new patients need additional support to help them stay on their medicine.²⁶ In diabetes, poor adherence rates have been quoted to be over 75%.²⁷ One study showed that two thirds of patients with type 2 diabetes fail to take their medication as prescribed, with significant linear trends for poorer adherence with each increase in the daily number of tablets taken ($p=0.001$) and increase in additional medication ($p=0.0001$).²⁸ In patients taking two drugs, compliance rates were as low as 13%.²⁸ The WHO states that almost 50% of patients do not adhere to insulin regimens in some population groups,²³ and that 67% of patients with type 2 diabetes report not performing self-monitoring of blood glucose as frequently as recommended.²³

Poor adherence results in less than optimal management and control of the illness and is the primary reason for sub-optimal clinical benefit.^{15,23} In diabetes, non-adherence to therapy can lead to poor glycaemic control, increased complications and increased mortality, as well as increased healthcare costs.^{23,29}

Professor Petrie notes, "We need to find ways to encourage sustained medicine-taking so that patients achieve the true benefits from proven medicines. But how to change patients' poor diet, lifestyle and compliance behaviours in the short and long term has been the golden question."

Dr Petra Wilson, Senior Director, Connected Health (Europe), Internet Business Solutions Group, Cisco Systems Belgium BVBA/SPRL, comments, "Behavioural change is hard - it requires a great deal of commitment from the patient and support from the HCP as well as the patient's wider circle of support."

mHealth can drive behavioural changes, including compliance

This latest end-user research shows that around half of patients believe that mHealth solutions will allow them to address this enormous challenge of driving behavioural changes (including diet/lifestyle changes, improving compliance with medications and taking greater ownership of their health).



And it is not only patients' behaviour that can change with mHealth solutions; over 60% of consumers also believe in the power of mHealth solutions to change their behaviour. This could have a massive impact on disease prevention, with which many countries are currently struggling.



There are many examples of where mHealth solutions have been successful in altering patients' behaviour. For example, a targeted text message programme was shown to increase adherence to the use of an asthma preventer inhaler and was felt to be useful in other conditions where adherence is a major issue.¹⁹

Dr Wilson says, "mHealth allows HCPs and others to provide individualised support – giving patients the information, encouragement and guidance where, when and how they want it. Using mHealth solutions, such as location sensitive messaging or social network based information and coupling that with real time medical data, the patient's medical support network is brought into their everyday life, making it easier to make better health and lifestyle decisions. mHealth could be a key part of the human network response to chronic disease to support personalised behavioural change."

However, there are challenges in keeping patients engaged in maintaining compliance in the longer term, a point emphasised in a recent debate on mHealth organised by Vodafone. For example, if the mHealth solution requires a patient to maintain a diary and there is no apparent response to data collection, patients will lose interest in gathering the data. Conversely, where there is personalised feedback to the patient, 80% remain committed.³⁰

Case study: SMS improves compliance in type 2 diabetes

104 type 2 diabetes patients with low adherence to oral anti-diabetics were randomised to receive SMS reminders if they forgot their medication and 48 received no reminders. Over the six-month study period, patients receiving SMS reminders took significantly more doses within pre-defined time windows than patients receiving no reminders: 50% vs. 39% within a 1 hour window ($p=0.003$) and 81% vs. 70% within a 4 hour window ($p=0.007$). Real time monitoring of patients' medication use with SMS reminders improves compliance in type 2 diabetes.³¹

Marcia Vervloet, Researcher, NIVEL Netherlands institute for health services, who was lead researcher in this study, comments, "As we found in our research, SMS reminders were a driver of improved adherence in people with type 2 diabetes, especially the regularity with which patients adhered to their prescribed treatment improved. The SMS reminders were appreciated by patients. This simple mHealth intervention can support patients' self-management. I urge other patient groups to work with HCPs, the pharmaceutical industry and mHealth providers to develop similar ways of supporting their patients."

mHealth solutions improve glycaemic control in diabetes

But what is most exciting for patients is that mHealth solutions alter disease outcomes. Numerous studies have now confirmed that mHealth solutions can improve glycaemic control in type 2 diabetes, this being the single biggest factor that significantly impacts on outcomes:

- In 163 patients with type 2 diabetes randomised to either a mobile intervention (mobile application coaching and patient/provider web portals) or usual care, the mobile intervention group decreased glycated haemoglobin by 1.9% vs. 0.7% in the usual care group over 12 months (1.2% difference; $p < 0.001$).³²
- The Informatics for Diabetes Education and Telemedicine (IDEATel) project randomised 1,655 ethnically diverse under-served older adults with diabetes to a telemedicine intervention (home video visits with a diabetes educator and glucose levels uploaded every 4-6 weeks) or usual care. The telemedicine intervention was associated with improved glycaemic control.³³
- A recent meta-analysis of 1,657 participants showed that mobile phone interventions for diabetes self-management reduced A1C values by a mean of 0.5% [6mmol/mol; 95% confidence interval, 0.3-0.7% (4-8mmol/mol)] over a median of 6 months follow-up.³⁴
- In another recent study in the Care Co-ordination Home Telehealth (CCHT) programme over 6 months, 69% of the CCHT group (n=36) achieved the A1C goal of less than 7% after 6 months vs. 36% of the non-CCHT group (n=67) ($p = 0.0011$).³⁵

Inability to change behaviour, including compliance, is known to be a considerable challenge in chronic disease, resulting in enormous cost inefficiencies in healthcare. Knowing that mHealth solutions could address this, as well as inequalities and access to healthcare, should encourage patient societies and advocacy groups to work together with healthcare providers to develop and roll-out effective mHealth solutions to meet patients' complex behavioural needs.

"I have an app that tracks exercise, calories, but it's a community, so friends are members also. They'll get updates saying you haven't logged in or exercised, so you're accountable."

Research Respondent,
General Wellness Consumer, US

"It will tell us what to do and not to do and maintain a record of all the activities and reports and sugar monitoring ..."

Research Respondent, Diabetes Patient

Key message 2. mHealth solutions drive better quality of care in chronic disease

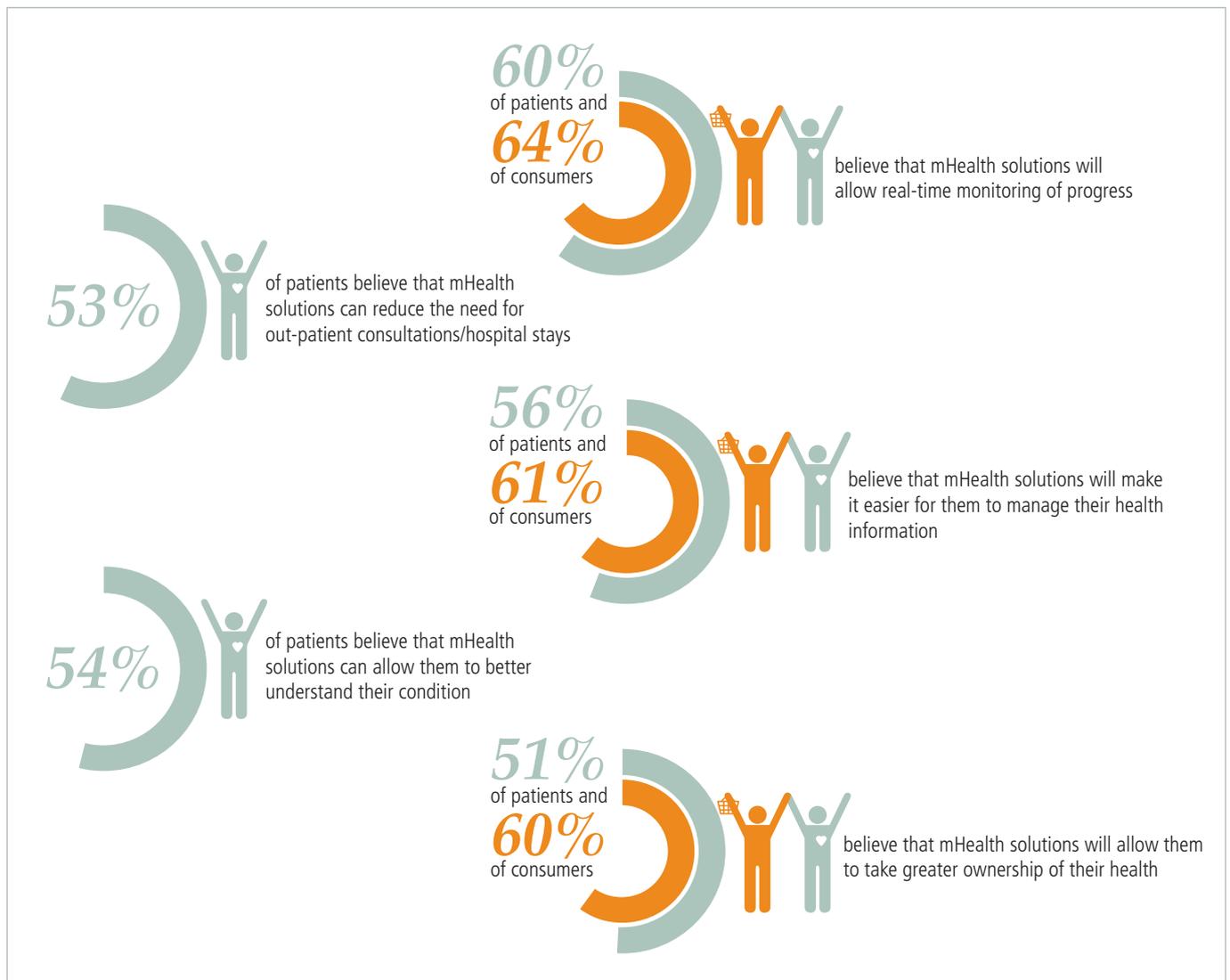
Patients and consumers want more health information but HCPs lack time

The GSMA research showed that patients and consumers want more information about their condition/health, are struggling to achieve their health goals and so are looking for help (42%) and complain of long waiting lists to see a HCP (34%). However, 39% of HCPs stated that they are overworked and lack time needed to effectively care for patients.

Of the countries surveyed, there is a particularly urgent need for mHealth solutions that reduce face-time with HCPs in Brazil, where 55% of consumers believe there are long waiting lists to see a HCP vs. 29% in China, 30% in India and 22% in the US. Also in China, nearly half of patients lack a full understanding of their condition vs. almost 20% in other countries surveyed, and half of HCPs feel overworked vs. around a third in other countries surveyed.

mHealth solutions can provide this support

mHealth offers an ideal solution that patients and consumers, as well as HCPs, believe will address these resource needs. Almost half of HCPs surveyed would use mHealth solutions if they were shown to reduce the time required to manage their patients' conditions. The GSMA research also found that, by increasing quality of care (see Key Message 1), mHealth solutions reduce workload and time/resource pressures.



Case study: mHealth solution reduces workload

The MyDoctor@Home remote diagnostics service allows patients suffering from chronic disease to measure key clinical parameters from home, e.g., glucose monitoring. The results are transmitted from the connected medical device to a gateway which automatically uploads the data to the eHealth Connecting Platform via fixed line or mobile network. **The system reduces the number of patients in hospital for chronic conditions, increases health data quality, makes available health data in real time and reduces costs for the healthcare provider. In addition, doctors have more free time to consult with critical patients.** This is already in commercial status in the Italian market and a pilot has been launched in Brazil.

Previous research reinforces these findings, showing that mHealth solutions enable HCPs to diagnose, treat and monitor more patients than traditional face-to-face routes, thereby freeing up time and resources to treat more patients.³⁶ Furthermore, according to recent PwC research, mHealth could enable a move from doctor-directed care towards a more personalised, patient-oriented model. Indeed, patients believe that mHealth offers them convenient access to providers and, in countries with developing healthcare systems such as India, mHealth is often the only access to healthcare.²

Horst Merkle, Director Information Management Systems, Diabetes Care, Roche Diagnostics Corp. comments, "Roche looks back to more than 35 years of experience in leading the way towards optimal diabetes self-management. We have demonstrated that our solutions improve the life of people with diabetes by enhancing therapy satisfaction, lower HbA1c and hypoglycaemia. I personally believe that mHealth technologies have the potential to deliver the aforementioned outcomes faster and more cost effectively than traditional, proprietary medical devices."

The UK's Department of Health recently completed the Whole Systems Demonstrator (WSD) programme, the world's largest randomised control trial of telehealth services, which revealed significant reductions in costs, services required and negative outcomes. Its headline findings, published 5th December 2011, revealed:⁵

- **45% reduction in mortality rates**
- **20% reduction in emergency admissions**
- **15% reduction in A&E visits**
- **14% reduction in elective admissions**
- **14% reduction in bed days**

HCPs need to manage their workload more efficiently and effectively, and patients and consumers want more time with their HCP and more information about their health. mHealth solutions can meet all of these needs. Reputable and reliable mHealth solutions can complement the role of the HCP, and provide support and advice to patients and consumers.

mHealth solutions supplement the provision of high-quality health information to patients and consumers

Key message 3. mHealth solutions must be affordable for patients and consumers, as well as simple, accessible and trusted

mHealth can lead to cost efficiencies but must be affordable

It is widely acknowledged that spiralling healthcare costs are expected to further increase with the increasing age of populations and the increasing number of patients with chronic disease. Mobile health solutions will not be accepted if they add to the current costs of healthcare and are inaccessible to patients and consumers.

Whilst around one third of patients surveyed in the GSMA research said that they struggle with affordability of care, with Brazil and China driving this perception (45% and 41% respectively), and around 80% of patients and consumers feeling that mHealth solutions are likely to be inaccessible due to their high cost, almost half of the end users surveyed believe that mHealth solutions will reduce the overall cost of care. This includes reducing the need for out-patient consultations and improving compliance.

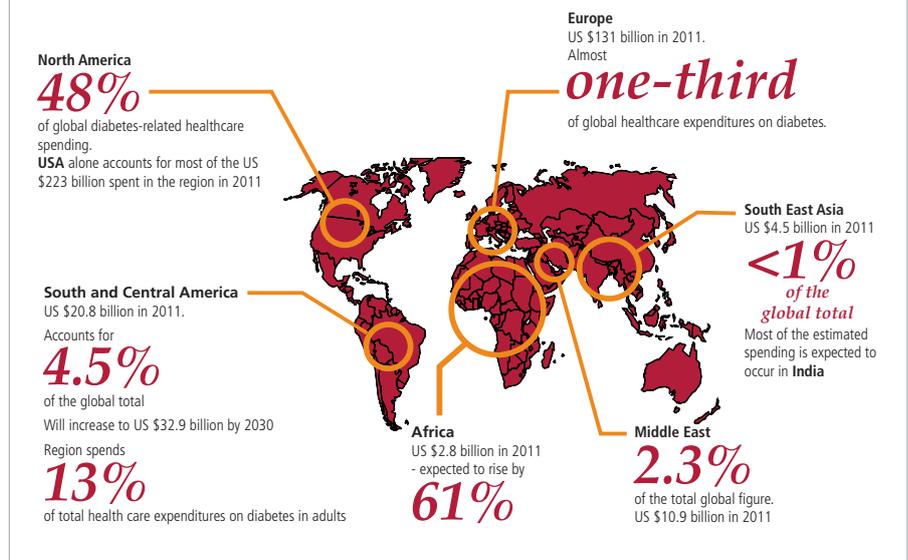
There are costs associated with mHealth solutions; however, there are numerous ways in which cost efficiencies could manifest as discussed earlier, for example, by reducing the need for costly out-patient consultations, by improving the management of health information, by improving compliance, etc. (see page 9). However, mHealth solutions can only result in such cost efficiency benefits if they are affordable from the outset. Around three quarters of patients and consumers were concerned that mHealth solutions would not be covered by their insurance company and around half of patients and consumers felt that mHealth solutions should be reimbursed / paid for by government. Overall, affordability was a key factor in determining whether patients and consumers would adopt mHealth solutions for most end users in all countries surveyed.

Although affordability is a key consideration for the future usage of mHealth, this research shows that around three quarters of patients and consumers are prepared to pay for mHealth solutions provided they demonstrate benefits or make the management of their condition or overall health more efficient.

Almost half of the end users surveyed believe that mHealth solutions will reduce the overall cost of care.



Diabetes cost burden around the globe²¹⁻²⁶



Jonathan Anscombe comments, "As illustrated in the A.T. Kearney report for the GSMA entitled 'Mobile health; who pays', paying for mHealth solutions is an incredibly complex area, depending on the structure of local healthcare systems, what the value system offers and local systems for reimbursement. Mobile health has enormous potential to lower the cost of health interactions all along the patient pathway, especially for chronic conditions. Mobile health applications that are able to address conditions such as diabetes, respiratory, and cardiac disease, and the risk factors that cause them, are likely to be most popular. However, it is clear that the large number of pilot projects need to be turned into co-ordinated, cohesive mHealth programmes so that everyone can reap the true benefits of this technology."

mHealth solutions should not be associated with considerable up-front costs and should be reimbursable so that they are not prohibitively expensive. Patient societies should work together to ensure that this occurs.

mHealth solutions must be simple to use and simplify health management

In the GSMA research, HCPs noted that a main barrier to their increased usage of mHealth solutions is a concern that they may not benefit all patients (young and old, all educational levels, all social classes, all types of illness, all literacy levels) (54%). In fact, uncertainty over whether mHealth is suitable for all patients is by far the biggest barrier to increased usage in Brazil and India where 60% and 43% of HCPs respectively see this as an issue.

In addition, to be useful and accepted, patients and consumers need mHealth solutions that are simple and easy to use, and HCPs need mHealth solutions that fit seamlessly into their practice and reduce, rather than increase, their workload (see Key Message 2).

Another factor for patients and consumers is security of information. Around half of patients and consumers stated that they need their data to be securely stored by a trusted company in order to feel comfortable using mHealth solutions, and patient societies and advocacy groups can work with other stakeholders to achieve this.

Jonathan Anscombe says, "The importance of robust information governance should not be underestimated. The consequences of breaches in security or misuse of data can not only undermine the credibility of the solution, but also open operators to significant sanctions. Information governance and security needs to be central to the design of any mHealth solution."

"I probably could not afford the added cost of mobile healthcare on top of regular healthcare"

Research Respondent,
General Wellness Consumer, US

"It should be covered by healthcare insurance [...] since the service can be used for prevention."

Research Respondent,
General Wellness Consumer, China



"The [mHealth] service should be easy to use, especially for old people... Many old people cannot even read."

Research Respondent,
Cardiologist, China

HCPs say that the accessibility of any mHealth solution lies in the simplicity of the offering rather than the mode of delivery. Patient societies and advocacy groups are advised to work closely with developers of mHealth solutions to ensure that simple solutions are provided that can be customised to meet all patients' needs in all countries, regardless of literacy or social levels.

mHealth solutions must be affordable, simple and secure

Key message 4. Patients and consumers should be encouraged to talk to their HCPs about mHealth solutions

Patients will adopt mHealth solutions if HCPs prescribe/recommend them

This research showed that, for patients to adopt them, mHealth solutions must be recommended by HCPs. Currently, almost 90% of patients are not using mHealth solutions because their HCP does not recommend them. In fact, in all countries surveyed except China, the number one barrier stated by patients to their increased use of mHealth solutions was lack of recommendation by their HCP (see below). Yet patients are open to the opportunities that mHealth solutions can bring them in terms of improved health, improved quality of care and reduced visits to medical centres and hospitals. Three quarters of patients surveyed would use mHealth solutions if they were prescribed by their HCP and two thirds would use them if they were recommended by their HCP.

"A doctor's recommendation motivates you [to use mHealth solutions], [a] friend's recommendation does not."

Research Respondent,
Diabetes Patient, Brazil

Dr Bootle notes, "As a person living with Type 1 diabetes, I have about four consultations per year with my healthcare professionals to review my condition and make appropriate changes to my treatment. Working as a doctor, I have limited 'face-to-face' time in consultation with patients. Understanding the needs of people with diabetes and tailoring treatment to meet their needs is central to providing good healthcare. There is a real opportunity for mHealth solutions to help us optimise consultations between people with diabetes and their healthcare professionals."

Number one barrier stated by patients to their increased use of mHealth solutions



Three quarters of patients surveyed would use mHealth solutions if they were prescribed by their HCP and two thirds would use them if they were recommended by their HCP

HCPs and patients should discuss the benefits of specific mHealth solutions

Chain of Trust project showing value of telehealth in the EU

The Chain of Trust project (<http://www.chainoftrust.eu/>), being led by the European Patients' Forum, aims to better understand views on, and adoption of, telehealth from the perspective of HCPs and patients across the EU, and build confidence in and acceptance of its use. The project began in January 2011 and is due to end in December 2012, with preliminary findings expected in October 2012. The Chain of Trust project is co-funded by the Public Health Programme of the European Union managed by the Executive Agency for Health and Consumers (EAHC).

HCP acceptance before recommendation

According to the recent PwC mHealth survey, patients are currently more interested in using mHealth solutions than HCPs are in recommending them.² Since HCPs are the gatekeepers of health, they need to be further convinced of the benefits of mHealth solutions before they will broaden their discussions with patients.

Dr Wilson comments, "mHealth is by definition a two way process, which allows the HCP to support patients in their real lives. To be successful, mHealth needs three key ingredients: a safe and stable communication and collaboration platform, interoperable solutions which work together seamlessly, and a financial base within the healthcare system where patients and providers can be reimbursed for using mHealth solutions. Industry can drive the first two, through standards and guidelines and robust solutions; but we all need to pull together to change the political landscape to bring mHealth into the heart of everyday healthcare practice."

However, in order for HCPs to recommend mHealth solutions to their patients, they must first recognise their benefits and accept them as an established part of the future of healthcare. Yet history shows that HCPs are often slow to adopt new technologies and changes, and this may be one reason for the slower than expected uptake of mHealth solutions in many areas, despite the strong belief in their benefits (see front cover). Patient societies and advocacy groups can make an important first step towards mass HCP confidence and acceptance, for example, by encouraging the introduction of selected, regulated mHealth solutions that drive increased efficiency and quality of care.

Dr Partha Kar, NHS Diabetes Innovation Lead, Clinical Director, Portsmouth Hospitals Trust, says, "Patient advocacy groups should take control of the possibilities that this technology can bring to patients to drive its increased use."

Patients believe in mHealth solutions and trust that their HCP is the expert in their health. As such, patient societies and advocacy groups should work to encourage HCPs to adopt more mHealth solutions. Patients should be encouraged to actively ask their HCPs what mHealth solutions are available for their condition and how these solutions might help them; consumers should also be able to access advice and recommendations on mHealth solutions from HCPs.

What next for mHealth?

From reading this white paper, those with a keen interest in patient welfare will readily appreciate that the future of mHealth is a positive and exciting one for patients in all countries. End users believe that mHealth solutions can meet the challenges of improving healthcare efficiency and driving long-term behavioural changes in chronic disease.

Alex Sinclair, GSMA, notes, "At a time when healthcare costs are consuming an ever increasing portion of GDP each year, mobile health services offer innovative alternative solutions for delivering better quality at lower cost, and improving the quality of life for patients worldwide, particularly those suffering from long-term chronic conditions. The collaboration between mobile network operators and the healthcare sector is the key to the future of affordable healthcare for all."

What is needed now is for all stakeholders to come together at a national, local and individual level; for solutions to be designed to meet the needs of all involved stakeholders - from patient to carer, from doctor to nurse, from regulator to payer, from the pharmaceutical industry to mobile operators. mHealth solutions must make patients', consumers' and HCPs' lives easier; they must be simple, customisable and flexible to fit all patient and consumer needs; they must work within existing systems; they must simplify workload; they must be affordable, reimbursed by regulators and recommended by HCPs.

Jonathan Ancombe concludes, "Mobile Health technologies can be transformative to healthcare delivery. However, they should not be seen as an interesting 'add on' to business as usual. Health systems will need to redesign care pathways, HCP roles and the way that patients are involved in their care to truly realise the benefits of these technologies."

Whilst challenges exist, the potential of mHealth is considerable and supports a fundamental change in the way that patients/consumers and HCPs interface with healthcare. mHealth is rightly moving up the healthcare agenda in many countries worldwide. How are you addressing the benefits that mHealth solutions can bring locally, regionally, nationally and ultimately globally?

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About the GSMA

The GSMA represents the interests of mobile operators worldwide. Spanning more than 220 countries, the GSMA unites nearly 800 of the world's mobile operators with more than 230 companies in the broader mobile ecosystem, including handset makers, software companies, equipment providers and Internet companies, as well as organisations in industry sectors such as financial services, healthcare, media, transport and utilities. The GSMA also produces industry-leading events such as the Mobile World Congress and Mobile Asia Expo.

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