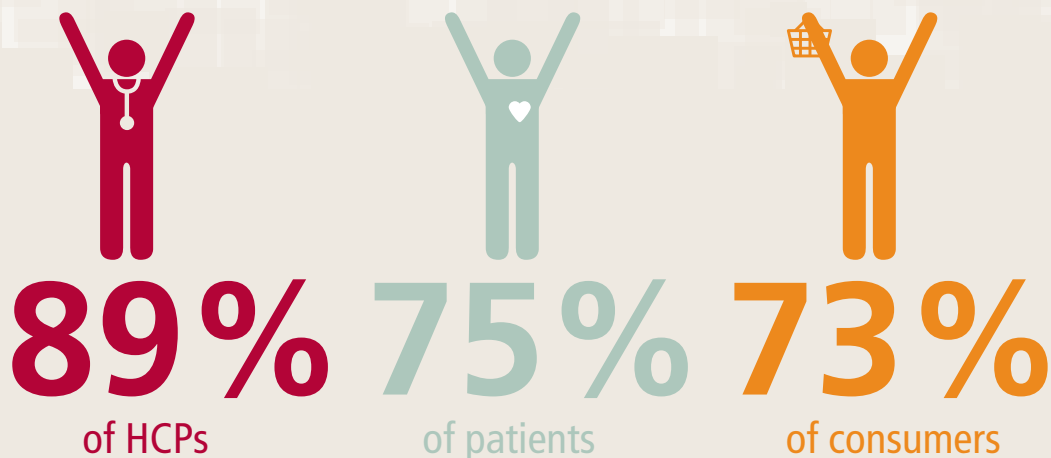




mHealth

# Global views on potential of mobile health solutions to address key healthcare challenges in chronic disease

A white paper for healthcare practitioners and the pharmaceutical industry



believe that mHealth solutions can convey  
*significant health benefits*

# Executive summary

For healthcare practitioners (HCPs) and the pharmaceutical industry, this is a challenging time. Healthcare systems have become overloaded, and the ability to operate effectively within current systems is becoming inadequate.

For example, for HCPs, how do you cope with the increasing demands on your time and the increasing numbers of patients presenting with chronic disease that need long-term monitoring and care? How do you keep up to date with medical advances so your patients receive the best care possible - whatever your location, whatever your resources, whatever their needs?

For representatives of the pharmaceutical industry, how do you maximise your return on investment? How do you enable patients to get the most out of your medicines? How do you best work with other stakeholders to ensure that your medicines are used as prescribed and so achieve the outcomes demonstrated in clinical trials?

Mobile health (mHealth) solutions can help to address all of these challenges. 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 funded by the GSMA and conducted among 2,000 end users (healthcare practitioners, patients and consumers), end users believe 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 offer a win:win opportunity for HCPs; they improve quality of care and reduce workload**
- 2. mHealth solutions can address the biggest challenge in chronic disease management - facilitating behavioural changes**
- 3. mHealth solutions improve cost efficiency in healthcare, but must be affordable**
- 4. HCPs should be encouraged to talk to their patients about mHealth solutions**

This new research clearly shows that mHealth solutions could offer a win:win opportunity for HCPs and the pharmaceutical industry to dramatically improve healthcare around the world. We hope that you can use this white paper to drive forward your use of, and investment in, mHealth solutions as a means of addressing many of today's biggest healthcare challenges and, ultimately, improving patient outcomes.

# Introduction

Mobile health (mHealth) has the potential to change the way that healthcare is delivered by healthcare practitioners (HCPs) to patients with chronic (non-communicable) disease - to increase efficiency and cost-efficiency of care, to give patients more informed control of their condition, to change behaviours that are perpetuating chronic disease and to help in chronic disease prevention. In all countries, mHealth can have a significant impact on the health of the nation.

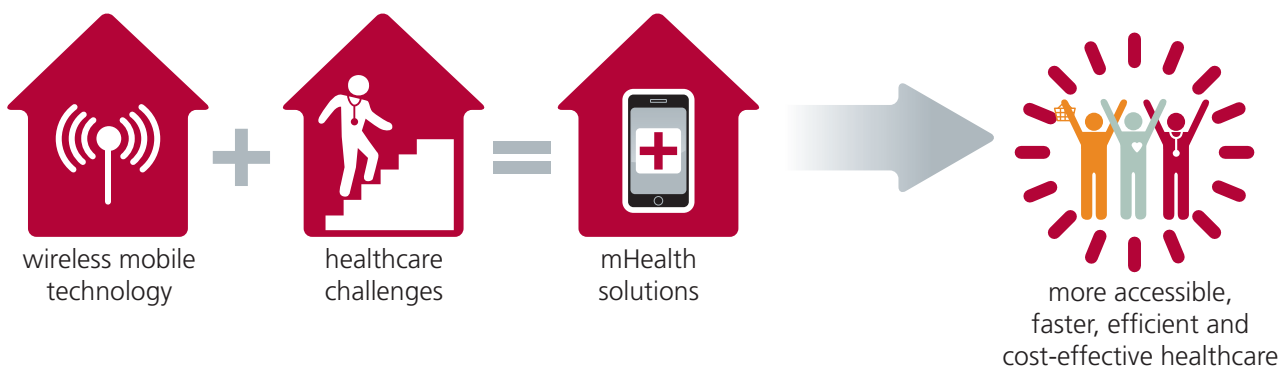
*Dr Stuart Bootle, UK, says, "As a person living with Type 1 diabetes, I need to use technology on a day-to-day basis to help me take control of my condition and reduce the risk of future complications. Working as a doctor, I have limited 'face-to-face' time with patients. There is a real need for mHealth solutions to help healthcare professionals connect with their patients outside of the traditional consultation, to support; sustained change in lifestyle behaviours, more informed decision-making and optimal use of appropriate therapeutic interventions. By enabling healthcare professionals and patients to work together in this way, mHealth has the potential to enable improvement in health outcomes without increasing the use of limited healthcare professional resources."*

*Jonathan Anscombe, Partner, Health Practice, A.T. Kearney Limited, London, comments, "An increasing number of mobile based health solutions are becoming available, and early implementations are starting to show that mHealth can provide cost effective remote management of patients. What we need now is for some solutions to be deployed at scale to demonstrate how transformative such solutions can be both in terms of patient care and system efficiency."*

However, for HCPs and people working in the pharmaceutical industry, there are challenges. For example, many HCPs still need to be convinced of the true benefits of mHealth solutions so they will recommend them to their patients: they need to be persuaded that mHealth will not add complexity to their work and will reduce workload pressures. Industry representatives need to be convinced that it is worth their while investing in the development of mHealth solutions, and that there will be a social and business gain from increased adoption into everyday practice.

In this white paper, we discuss some of the results from a large multi-country end-user survey of healthcare practitioners, 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 stimulating reading for HCPs and the pharmaceutical industry and this research, together with other recent research into mHealth solutions,<sup>1-5</sup> emphasises the numerous opportunities that mHealth can offer to all stakeholders in health. It outlines some of the revealed challenges and suggests how they can be addressed. It also shares some learnings from major stakeholders in mHealth solutions and chronic disease around the world.

This white paper is designed to prompt you to ask the following questions - how can mHealth solutions benefit you, your patients, your business, your population and your healthcare economy, and what actions do you need to take?



### Recommended reading: IDF Europe Policy Puzzle

In the 3rd Edition of the IDF Europe Policy Puzzle, FEND and IDF Europe have joined forces with EURADIA and PCDE in recognising the burden of diabetes in the whole of Europe. These organisations share a conviction that providing sustained and comparative documentary evidence on the epidemic levels and disparity of diabetes care across the European region will persuade governments and health providers that action to deal with this condition is urgent. They have published this latest audit at a time when, despite considerable political awareness of the health risks of diabetes and the knowledge that the disease is largely preventable, Europe is faced with epidemic growth of the disease. This comprehensive audit of diabetes policies across the European region serves as an update to the previous editions and introduces new countries from outside the EU.

Diabetes represents a serious global health problem.<sup>6</sup>

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

Research Respondent,  
Diabetes Specialist

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

### 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.<sup>7</sup> 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".<sup>8</sup>

*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 over-burdened 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 - 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 diabetes<sup>6</sup> and, if current trends continue, by 2030 around one in ten adults will have diabetes.<sup>6</sup> The WHO predicts that diabetes will become the seventh leading cause of death.<sup>9</sup> Currently, the Middle East and North Africa, China and India have the highest prevalence of diabetes, followed by the US, Indonesia, Brazil and Russia.<sup>10</sup> 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.<sup>11</sup> Rapid economic development coupled with ageing populations have resulted in a dramatic increase in the prevalence of diabetes.<sup>11</sup>

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.<sup>8</sup>

Diabetes poses a considerable economic burden on healthcare systems worldwide, with 11% of the global healthcare expenditure spent on the disease.<sup>12</sup> Most countries (80%) spend between 5-18% of their national health expenditures on treatment and management of the condition.<sup>12,13</sup> 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.<sup>14</sup> Overall, the global expenditure on diabetes is predicted to rise by up to 34%, reaching a total of around US \$595 billion by 2030.<sup>12,13</sup>

### Regional overview of diabetes:<sup>10</sup>

- **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 and undertaken by Ipsos MORI between March-June 2012 - was performed to understand how mHealth solutions are perceived by HCPs, patients with chronic disease and general wellness consumers. These end-user groups included a broad range of ages and social levels (patients/consumers) and professional experience (HCPs) primarily from urban locations. Participants were provided with a definition of mHealth and shown examples of potential solutions. The research was conducted in two phases in four countries; one country in which the healthcare system is more established (US) and three countries in which the healthcare system is still developing (Brazil, China and India).

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 research phase was an in-depth qualitative phase to explore the perception and usage of mHealth. In this, one to two focus groups with a broad mix of participants (three to six in each) were held in each of the four countries. Some of the quotes received are shown in this white paper.

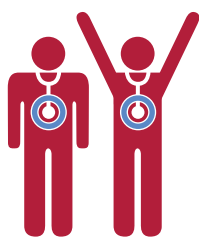
The second research phase was a quantitative phase in which online surveys provided validation of themes uncovered during the first phase - for the four countries as a whole, and for each country individually to look for inter-country differences.

The survey included 2,000 respondents in total, with 50 end users 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) in each country.

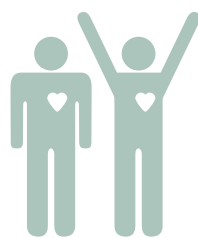
### Key to icons used throughout this white paper



HCP



Diabetes HCP



Patient

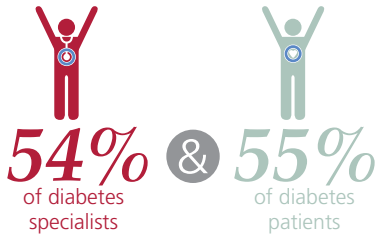


Diabetes patient

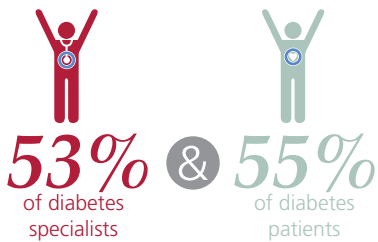


General wellness consumer

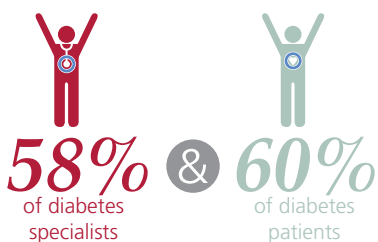
# Key message 1. mHealth solutions offer a win:win opportunity for HCPs; they improve quality of care and reduce workload



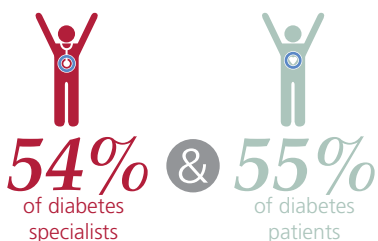
believe that mHealth solutions can lead to better quality of care and improved health



believe that mHealth solutions will make it easier to manage health information



believe that mHealth solutions can allow real-time monitoring of disease progress



believe that mHealth solutions can allow patients to better understand their condition

## Widespread belief that mHealth solutions can improve care

This research showed that almost 50% of HCPs believe that patients lack full understanding of their condition, and 42% of patients are struggling to achieve their disease goals and are looking for help. mHealth offers a portal to address this need. Real-time data capture and analysis, increased access to information, increased patient ownership and understanding of their condition, support with diet/lifestyle changes, improved compliance with medications – these perceived benefits of mHealth solutions all go towards improving the overall quality and efficiency of patient care. These findings suggest that HCPs need to view mHealth solutions as a ‘partner’ in effective and efficient healthcare rather than an additional demand on their time.

*Horst Merkle, Director Information Management Systems, Diabetes Care, Roche Diagnostics Corp. comments, “Even with the proliferation of mobile devices like smart phones and tablets into the medical space I have seen many healthcare professionals in the chronic disease field feeling hesitant embracing mHealth technologies. Most HCPs believe in the potential benefits of mHealth, e.g., improved therapy adherence due to improved patient/HCP communication; provision of patient education while reducing unnecessary, inefficient doctor’s visits. We, the industry, can help overcome these barriers to broad adoption by providing easy to use and interoperable solutions that seamlessly fit into the HCPs’ workflow and increase efficiency in the daily routine. Under today’s cost pressures HCPs need reassurance that their investment into new technologies provides a positive return short and long term. At Roche we are investing significantly in identification and development of mHealth solutions that meet the needs of both patients and HCPs and we see indicators of improved standards of care and better collaboration between HCPs and patients.”*

Results from a recent Vodafone mHealth report concur with the GSMA research findings, showing that HCPs believe in the numerous benefits of mHealth solutions to improve quality of patient care. It also showed additional quality benefits for patients, such as allowing them to monitor their condition outside of the hospital environment, live a less disrupted life and respond rapidly to changing healthcare needs.<sup>1</sup>

*mHealth solutions should be urgently explored to help improve quality of care and outcomes in chronic disease. Through telecare and telemedicine, expanded access to healthcare services for all - regardless of location, gender, level of education or financial resources - is a real possibility.*

## mHealth solutions improve efficiency of care and so reduce workload, resource and time pressures for HCPs

This end-user research found that workload pressures are considerable for 40% of HCPs, who state that they are currently overworked and lack time needed to effectively care for patients (over 50% in China). Almost half the HCPs surveyed would use mHealth solutions if they were shown to reduce the time required to manage their patients' condition. By increasing efficiency of care (e.g., increasing health information, increasing patients' independence in managing their condition, improving compliance and lifestyle, improving quality of care, reducing the need for out-patient consultations), mHealth solutions reduce workload and time/resource pressures that are widespread in the clinical setting.

Previous research reinforces these GSMA 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 and enabling more of a focus on complex cases.<sup>15</sup> Furthermore, according to recent PricewaterhouseCoopers LLC (PwC) research in over 1,000 patients, 433 physicians and 345 payers across ten 'developed' and 'emerging' countries, 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 'emerging' countries such as India, mHealth is often the only access to healthcare.<sup>2</sup>

*"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."*

*HCPs need to manage their workload more efficiently and effectively, and patients want more time with their HCP and more information about their health. mHealth solutions can meet all of these needs. HCPs should be reassured that that mHealth will not add complexity to their current practice, but will instead streamline workload and improve quality of care.*

"Another thing is the doctor's time. We see a patient every minute so time is of importance..."

Research Respondent, HCP, India

### Case study: example of mHealth solution reducing 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 that automatically uploads the data to the eHealth Connecting Platform over any available 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 use in the Italian market and a pilot has been launched in Brazil.

# Key message 2. mHealth solutions can address the biggest challenge in chronic disease management - facilitating behavioural changes

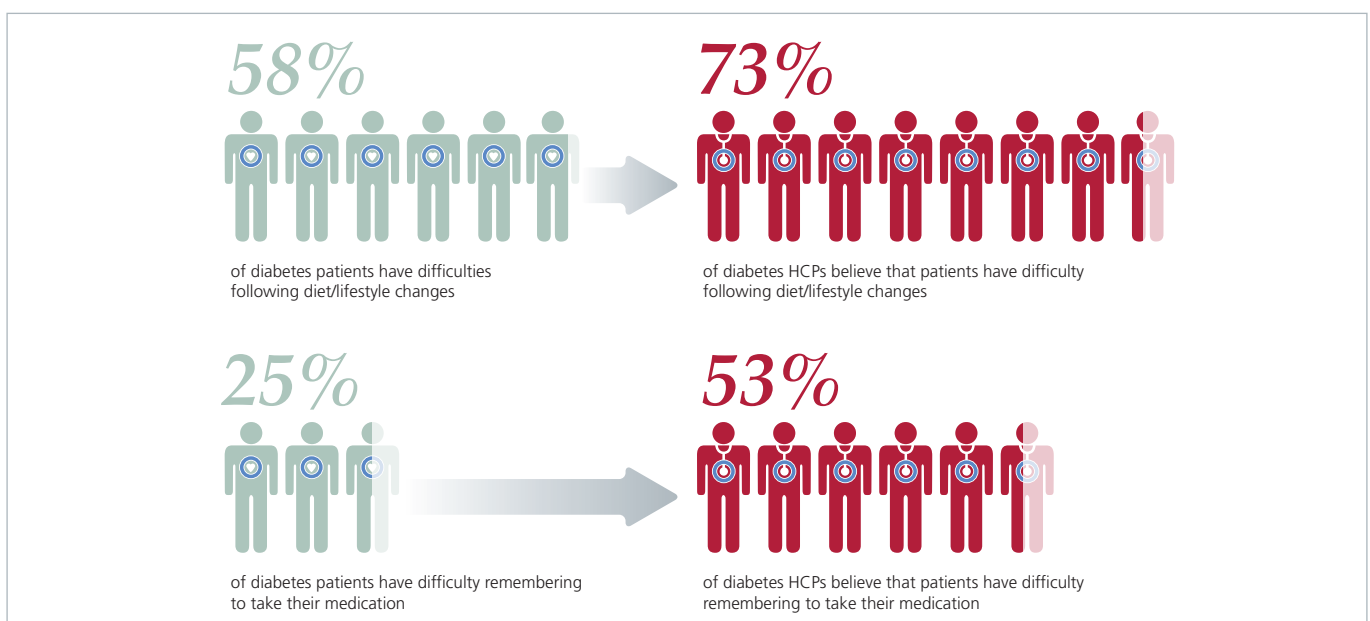
## Behavioural change - the biggest challenge in chronic disease management

Health-related behaviour is highly complex. 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,<sup>16-23</sup> drivers differ in different patients, and the long-term record of changing diet, lifestyle and exercise habits and improving medicine compliance remains extremely poor.<sup>18</sup>

*Keith J. Petrie, Professor of Health Psychology, University of Auckland, New Zealand, comments, "The patient taking the drug is where the rubber meets the road. We need to find new effective techniques to encourage sustained medicine-taking in order to improve health outcomes. Influencing patients to adhere to medications remains an important goal in most healthcare interactions."*

*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."*

In this end-user research, three quarters of HCPs surveyed believed that the number one challenge for their patients was difficulty following diet/lifestyle changes. This was true in three of the four countries surveyed (the exception being India where their number one perception of patients was non-adherence to keeping appointments, possibly due to geographical challenges, and perceived lack of understanding of their condition). In the US, three of the top five challenges perceived by HCPs related to patient behaviours, including failure to follow diet and/or lifestyle changes and medication compliance. This may be because patients generally do not believe they have problems with non-compliance to medications and appointments. In the diabetes end users questioned, both HCPs and patients acknowledged the considerable behavioural challenges of this chronic disease.





### Poor compliance is everyone's concern

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

Adherence in patients with chronic disease is around 50% in developing countries.<sup>24</sup> 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.<sup>25,26</sup> Furthermore, data show that, in medication-naïve patients, discontinuation rates after 30 days are higher than in medication-experienced patients, especially in those with diabetes, asthma and glaucoma.<sup>27</sup>

In diabetes, poor adherence rates have been quoted to be more than 75%.<sup>28</sup> 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 ( $p=0.0001$ ).<sup>29</sup> In patients taking two drugs, compliance rates were as low as 13%.<sup>29</sup> The WHO states that almost 50% of patients do not adhere to insulin regimens in some population groups,<sup>24</sup> and that 67% of patients with type 2 diabetes report not performing self-monitoring of blood glucose as frequently as recommended.<sup>24</sup>

Non-compliance is directly associated with poor treatment outcomes in patients with diabetes, epilepsy, AIDS (acquired immunodeficiency syndrome), asthma, tuberculosis, hypertension, and organ transplants.<sup>16,24</sup> In diabetes, non-adherence to therapy can lead to poor glycaemic control, increased complications and increased mortality, as well as increased healthcare costs.<sup>16,24,30</sup> In one study, the least compliant diabetes patients were more than twice as likely to be hospitalised compared to those who were most compliant, and their total health-care costs were nearly double. The study noted that people who use their diabetes medications as directed were less likely to develop the short-term and long-term health complications that require expensive care. The combined drug and medical costs for the most-compliant diabetes patients average \$4,570 per patient per year, which is almost 50% below the \$8,867 cost for the least compliant patients.<sup>31</sup> Furthermore, the direct costs of complications attributable to poor control of diabetes are three to four times higher than those of good control.<sup>24</sup> Clearly, if health systems could be more effective in promoting adherence to self-management of diabetes, the human, social and economic benefits would be substantial.<sup>24</sup>

... least compliant diabetes patients  
... more than twice as likely to be  
hospitalised compared to those who  
were most compliant.

### mHealth solutions can change patient behaviour, including compliance

This latest end-user research shows that the majority of HCPs, patients and consumers believe that mHealth solutions will allow them to change behaviour.



The PwC research confirmed the higher emphasis being placed on compliance. Compliance aids were high on the list of mHealth solutions that HCPs would like to offer patients within the next three years, and that payers are prepared to pay for.<sup>2</sup> For example, in China, 85% of HCPs plan to offer a drug adherence mHealth-based service and 97% of payers plan to reimburse this in the next three years; in India, the figures are 71% and 83% respectively; in Brazil, 66% and 80%; and in the US, 58% and 69%.<sup>2</sup>

*Dr Wilson comments, "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."*

Various examples exist of mHealth solutions altering 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.<sup>20</sup>

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 the data collation, patients will lose interest in gathering the data. Conversely, where there is personalised feedback to the patient, 80% remain committed.<sup>32</sup>

According to PwC research, 48% of surveyed patients who have used an mHealth app discontinued it after the first six months due to the perceived lack of engaging, integrated, interoperable and intelligent apps.<sup>2</sup> So, intelligent solutions must be introduced with in-built feedback mechanisms [see case study]. However, additionally, HCPs must drive on-going engagement from patients by interacting with them at regular intervals.

"I think it would be good to have something that would warn you about the time to take your medicine. I can never take my medicine at the same time."

Research Respondent,  
Cardiology Patient

### Case study: SMS improves compliance in type 2 diabetes

In 104 type 2 diabetes patients with suboptimal adherence to oral anti-diabetics, 56 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 ( $p=0.007$ ).<sup>33</sup>

*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 healthcare providers to develop similar ways of supporting their patients."*

## mHealth solutions improve glycaemic control

The real importance of mHealth solutions in diabetes is that numerous studies have now confirmed that they can improve glycaemic control, 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 mean decreases in glycated haemoglobin was 1.9% in the mobile intervention group and 0.7% in the usual care group, a difference of 1.2% ( $p < 0.001$ ) over 12 months.<sup>34</sup>
- 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 improvement in glycaemic control, particularly in Hispanics who had the highest baseline A1C levels, suggesting that telemedicine has the potential to help reduce disparities in diabetes management.<sup>35</sup>
- A recent meta-analysis among 1,657 participants showed that mobile phone interventions for diabetes self-management reduced A1C levels by a mean of 0.5% [6mmol/mol] over a median of 6 months.<sup>36</sup>
- In another recent study in patients from the Care Co-ordination Home Telehealth (CCHT) programme, 69% of the CCHT group ( $n=36$ ) versus 36% of the non-CCHT group ( $n=67$ ) achieved the A1C goal of  $<7\%$  over 6 months ( $p=0.0011$ ).<sup>37</sup>

*Seeing evidence that mHealth solutions can address the challenge of changing patient and consumer behaviour, as well as inequalities in care and access to healthcare, should encourage the pharmaceutical industry and HCPs to work together to develop effective mHealth solutions to meet complex behavioural needs.*

... telemedicine has the potential to help reduce disparities in diabetes management.

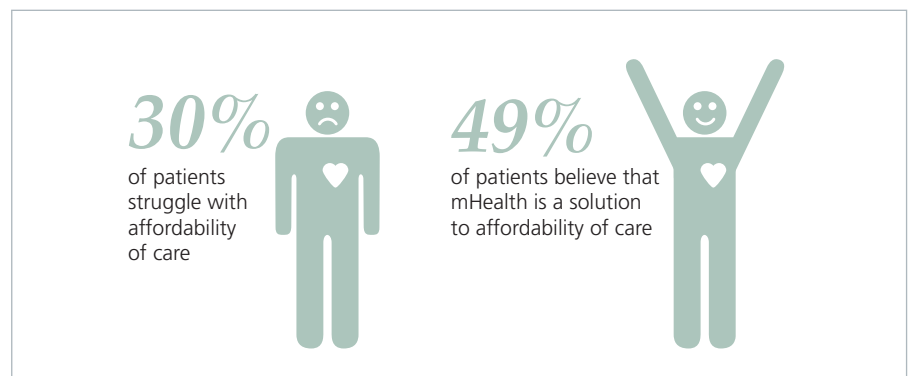
**mHealth solutions can change behaviour, including improved compliance**

## Key message 3. mHealth solutions improve cost efficiency in healthcare, but must be affordable

### mHealth can lead to cost efficiencies

mHealth solutions will not be accepted if they add to the current costs of healthcare.

Whilst there are costs associated with mHealth solutions, and this research showed that many HCPs are concerned about these costs, almost half of HCPs and patients surveyed believe that mHealth solutions will reduce the overall cost of care. There are numerous ways in which cost-efficiency could manifest as discussed earlier, for example, by reducing the need for costly out-patient consultations, improving the management of information, allowing patients to take more control of their condition, and improving compliance (see page 5).



*Jonathan Anscombe, A.T.Kearney says, "Mobile technologies can dramatically reduce the cost of healthcare, by making HCP/patient interactions more effective, by improving the ability to spot problems before they occur, and by enabling patients to take a greater role in their own care. But these technologies will only be adopted if they save the system money. Indeed, it is the fact that mobile technologies can be deployed at low cost that makes them so attractive."*

### Diabetes cost burden around the globe<sup>38-43</sup>

#### North America

**48%**

of global diabetes-related healthcare spending.

USA alone accounts for most of the US \$223 billion spent in the region in 2011

#### South and Central America

US \$20.8 billion in 2011.

Accounts for

**4.5%**

of the global total

Will increase to US \$32.9 billion by 2030

Region spends

**13%**

of total health care expenditures on diabetes in adults

#### Europe

US \$131 billion in 2011.

Almost

**one-third**

of global healthcare expenditures on diabetes.

#### South East Asia

US \$4.5 billion in 2011

**<1%**

of the global total

Most of the estimated spending is expected to occur in **India**

#### Africa

US \$2.8 billion in 2011

- expected to rise by

**61%**

#### Middle East

**2.3%**

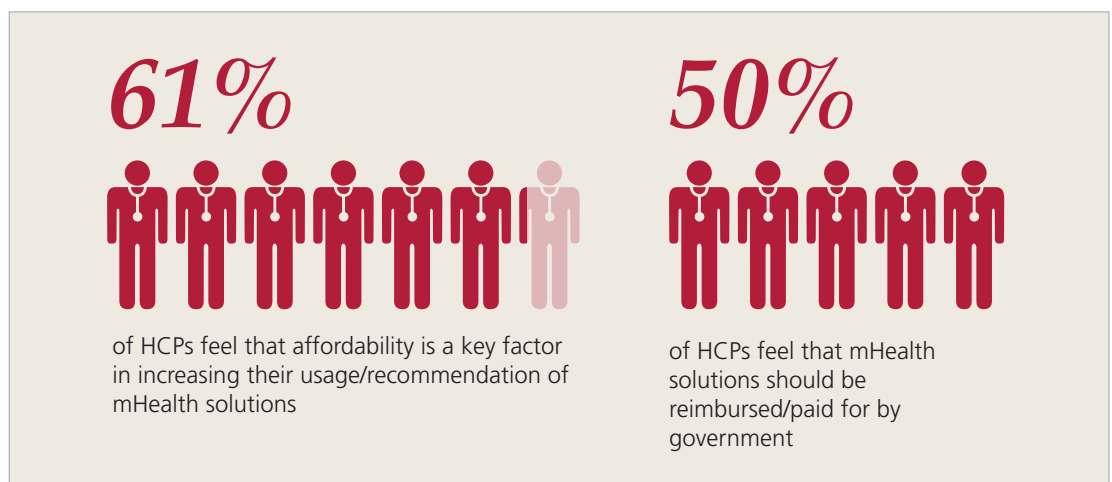
of the total global figure.

US \$10.9 billion in 2011

## Regulators need to make mHealth solutions affordable

However, mHealth solutions can only result in such cost efficiency benefits if they are affordable for HCPs, patients, consumers and payers. The GSMA research emphasises that affordability is a key factor to the success of mHealth solutions. Indeed, affordability of mHealth solutions was the most cited factor that would lead to increased usage for HCPs in all countries surveyed except India (which stated interest/request from patients as their number one factor) (see next section). The recent Vodafone mHealth report further confirmed that unless private and public organisations fund the move towards mHealth solutions, barriers to their increased use will remain.<sup>32</sup>

*Jonathan Anscombe notes, "Local health environments are very complex, and vary by therapy area and application. For example, for rheumatoid arthritis in the UK, there are over 20 influencers on treatment decisions. For this reason, mHealth cannot be successful without the buy-in of all relevant stakeholders. Which stakeholder benefits the most from an mHealth solution will depend on how it creates value. However, everyone needs to work together for that value to be realised at any link of the healthcare chain."*



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

Research Respondent,  
Wellness Consumer, US

Interestingly, whilst affordability is a crucial consideration when developing mHealth solutions, patients are willing to pay towards them. In our research, 70% of patients and 78% of consumers across all countries surveyed would consider paying towards the cost of an mHealth solution if it was shown to improve the management of their health. This is encouraging for healthcare providers, since it confirms the value that is conferred on high quality mHealth solutions for improving health and well-being.

*It is essential that designers of mHealth solutions, regulators, the pharmaceutical industry and all stakeholders work closely together to provide low cost, affordable mHealth solutions.*

**mHealth solutions must be affordable**

# Key message 4. HCPs should be encouraged to talk to their patients about mHealth solutions

## Patients will adopt mHealth solutions if HCPs prescribe/recommend them

What other main barriers are there to the increased use of mHealth solutions and how can they be addressed?

The GSMA research shows 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 HCP recommendation.

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



41%

Lack of sufficient knowledge of options/insufficient information/mHealth solutions will be too expensive



52%



40%



43%

My doctor does not use/recommend mHealth solutions

Yet patients and consumers are open to the opportunities that mHealth solutions can bring.



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

Research Respondent,  
Diabetes Patient, Brazil

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.

*Dr Partha Kar, NHS Diabetes Innovation Lead, Clinical Director, Portsmouth Hospitals Trust says, "As physicians, how can we expect our patients to use something new regularly if we do not encourage them to. It is up to us as the gatekeeper of our patients' health to know what mHealth solutions are available, and work with industry to develop solutions that are still needed. It is up to us to take control of the possibilities that this technology can bring to us and our patients and drive its increased use."*

*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."*

### HCP acceptance before recommendation

However, in order for HCPs to recommend mHealth solutions, they must first recognise their benefits and accept them as an established part of future healthcare.

According to the recent PwC mHealth survey, currently payers are more willing to pay for mHealth solutions than HCPs are to recommend them, and patients are more interested in using mHealth solutions than HCPs are to recommend them.<sup>2</sup>

*Mohammad Chowdhury, Pricewaterhouse Coopers LLC, notes, "Our survey found that payers are more willing to pay for mHealth solutions than HCPs are to recommend them. This was a surprise, but illustrates the perceived value of this intervention in addressing healthcare challenges. If HCPs embrace this opportunity by accepting payers' money to implement widespread but customised use of mHealth solutions, then everyone will benefit."*

With HCPs being the gatekeepers of health, they must be convinced of the benefits of mHealth solutions before they will broaden their discussions with patients. Government and regulatory encouragement can be 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 of care, improved outcomes and reduced healthcare costs.

*Patients trust that their HCP is the expert in their health and, as such, advocacy for mHealth solutions must be built amongst HCPs. HCPs should include conversations about the value of specific mHealth solutions within their consultations, and the pharmaceutical industry should work closely with HCPs and patients to drive this.*

### 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 and acceptance in 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).

# What next for mHealth?

## **The future for mHealth is positive and exciting**

As we have shown in this white paper, healthcare providers believe that mHealth solutions offer the opportunity to improve the quality of patient care, improve efficiency of work and increase cost efficiencies. For the pharmaceutical industry, mHealth solutions offer the opportunity of improved adherence to medicines, thereby allowing their true value to be seen, as well as opportunities to work more closely with HCPs and patients, to explore new ways of working together to improve health. Other benefits include supporting clinical trials to obtain real-world data and helping to advance research and development. The possibilities and opportunities that mHealth can offer in all countries are enormous across public and private healthcare providers.

*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."*

mHealth is in a unique position to transform healthcare. What is needed now is for all stakeholders to come together at a national, local and individual level to address any existing barriers; for practical, relevant, simple, customisable solutions to be designed to meet the needs of all stakeholders.

The potential of mHealth is considerable and supports a fundamental change in the way that HCPs and patients/consumers interface with healthcare. mHealth is rightly moving up the healthcare agenda in many countries worldwide. The time is upon us to focus on driving the benefits that mHealth solutions can bring locally, regionally, nationally and, ultimately, globally to your profession, your patients and your business.



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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.

For more information, please visit the GSMA corporate website at [www.gsma.com](http://www.gsma.com) or Mobile World Live, the online portal for the mobile communications industry, at [www.mobileworldlive.com](http://www.mobileworldlive.com).

