

Is Mobile the Cure for the Rising Costs of Healthcare?

Burgeoning healthcare costs are bankrupting America. Of the \$3.5 trillion budget outlay in 2010, close to 23 percent was spent by Medicare and Medicaid. These costs have risen by 9 percent a year over the past five years and are forecast to rise by 6 percent a year until 2015. The problem is not limited to the United States. As governments worldwide seek to contain or reduce health expenditures, many are turning to mobile technologies.

Healthcare costs are proving remarkably difficult to rein in, as more than one U.S. president can testify. In every other industry, technology has reduced costs, while in healthcare the opposite is the case—technol-

ogy is a major cause of the inexorable rise in healthcare spending.¹

One of the few technologies that could reverse this trend is “mobile health,” the use of mobile technologies to improve healthcare



Vertical View

delivery. Several sources predict a market in the United States on the order of \$4.5 billion within the next two to three years, and this has (perhaps rashly) been extrapolated to a global market in excess of \$30 billion. The predicted benefits of deploying the technology runs into the hundreds of billions of dollars. Even the usually restrained *Economist*, in a recent report on the future of healthcare in Europe, created an entire scenario around the use of mobile technologies.² However, while there are thousands of mobile-health applications and hundreds of pilot programs seeking to prove that mobile technologies can improve healthcare delivery—delivering both an immediate impact and longer-term advantage—few examples exist of wide-range use and little evidence shows that mobile technologies provide value in the real world.

Why has the adoption of mobile health been so slow, and how can the industry speed up the process? And if the technology does fulfill its potential, who will be the winners?

Mobile Could Change Everything

Healthcare, unlike many industries, is almost entirely delivered by means of physical interactions between patient and professional. This is manageable—particularly in developed countries—for episodic instances such as surgical operations, but for conditions that need regular monitoring, the inconvenience and expense of the necessary travel to receive treatment often means that treatment does not occur. For example, in the United States and the United Kingdom, only two-thirds of cardiac patients receive adequate rehabilitation.

¹ "Healthcare Out of Balance—how global forces will reshape the health of nations," A.T. Kearney, 2008

² "The future of healthcare in Europe," Economist Intelligence Unit, 2011

The real promise of mobile health is in convenience and cost savings. The technology allows patients and health professionals to interact without the need to be in the same place, and enables health professionals to access other health professionals, diagnostic tools and images and to prescribe drugs from any location.

Mobile health does not require expensive devices as smartphones have more power than the laptops of just a few years ago.

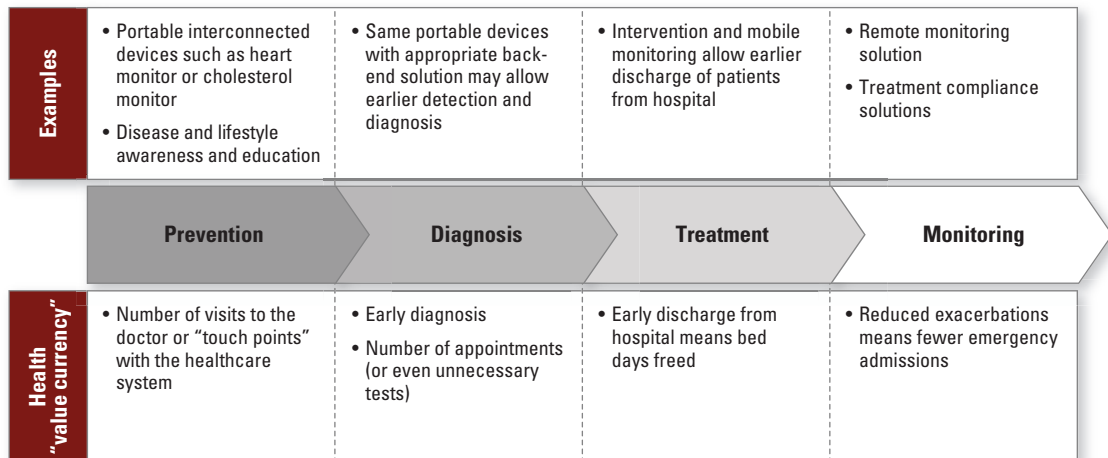
Patients can transact remotely with proxy systems through sensors such as heart monitors, smart pill dispensers, RFID (radio frequency identification) tags that sense when a pill has been swallowed, or "smart pills" that monitor vital signs. Or they can simply receive reminders to take medicines or attend appointments. Figure 1 illustrates the potential value of mobile health for heart patients.

In terms of cost savings, mobile has the potential to be far less expensive than existing telehealth solutions—at least when deployed on a large scale. Modern smartphones have more power than the laptops of only a few years ago, so there is no need for expensive dedicated devices. Communications technologies such as Bluetooth allow the construction of complex networks of devices. Global networks of 3G and 4G technologies offer sufficient inexpensive bandwidth for most applications.

FIGURE 1

Illustrative

The value of mobile health for heart patients



Source: A.T. Kearney analysis

Is There a Killer App?

Mobile has a powerful role to play virtually everywhere, from the established healthcare systems of the West to the rudimentary set-ups of Sub-Saharan Africa. The applications are different, however. For established healthcare systems, the biggest opportunities are in managing chronic conditions such as diabetes, heart disease, respiratory disease and dementia. Many of these diseases share common risk factors—smoking, poor diet, lack of exercise—and patients often suffer more than one condition. Technologies that can address these risk factors and deal with multiple co-morbidities are likely to be most in demand.

In the developing world, where health infrastructures are weak and infectious diseases are still major killers, the problem, particularly in rural communities, is lack of access to basic healthcare. Here, mobile connectivity is the only realistic mechanism for citizens to obtain many services. Indeed, the power of mobile technology to bring new services to citizens in poorer countries is well illustrated by mobile

banking in Kenya, where the use of bank accounts has increased dramatically with the availability of mobile phones. Technology that provides access to primary healthcare and offers advice for important health issues, such as HIV education and reminders for tuberculosis therapies, can have a major impact in the poorest countries.

As wealth increases, so the epidemiology shifts from infectious diseases to diseases of affluence. Today, many rapidly modernizing countries face the problems of established Western markets but lack the health infrastructures to deal with them. For example, the countries of the Gulf Cooperation Council (GCC) are suffering a dramatic rise in chronic disease, but their health systems have not yet matured.³ By 2030, when China has broadly the same age distribution as most Western European countries, how will it deal with the upcoming wave of elderly and frail? Mobile technologies offer new models of care that avoid many of the pitfalls of established systems.

³ The GCC countries include Saudi Arabia, Qatar, United Arab Emirates, Oman, Bahrain and Kuwait.

Vertical View

Given the wide range of health conditions that need to be addressed, it is unlikely that a single killer application for mobile health will emerge—at least, in the near future. Today, multiple proprietary solutions exist, but ultimately a few platforms will establish their positions. Technology providers should see mobile health as a series of “layered” solutions, where core technologies are linked to a range of applications focused on different customer objectives, with a specific value proposition tailored to a particular customer segment and funding model (see figure 2). While technology solutions might serve a global and general purpose, applications will have to address specific health needs, and the local nature of health systems means that distribution must take place through local partners.

Why Mobile Technologies Have Been Slow to Take Off

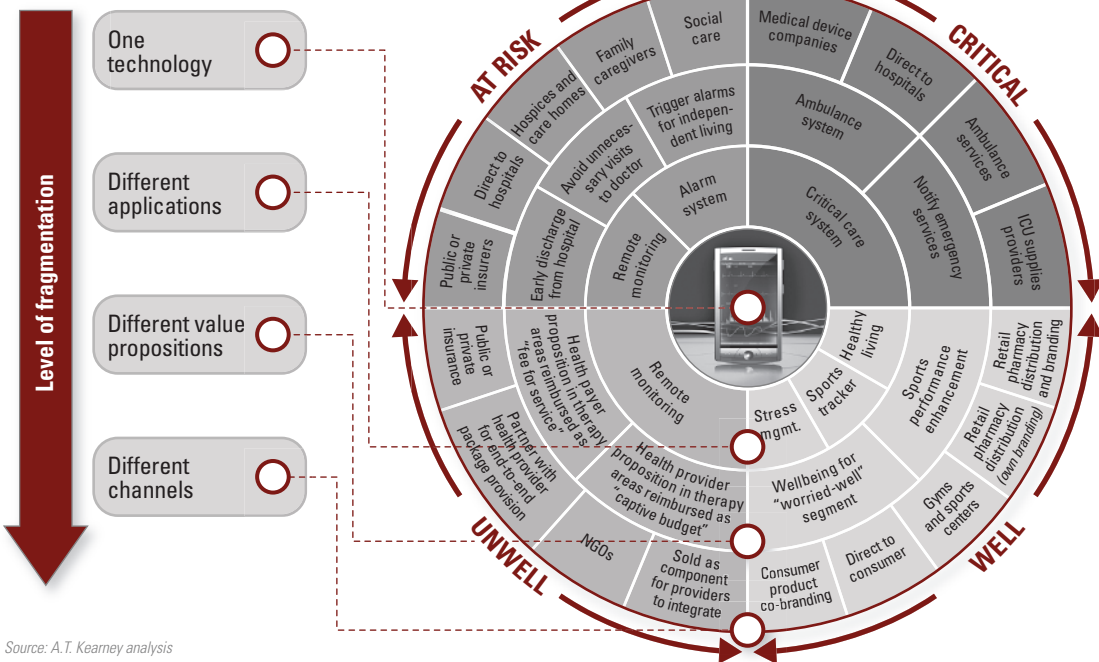
While there is no shortage of problems for mobile health to address, there are plenty of possible solutions. For example, among the biggest issues facing wealthy nations is the rise in diabetes cases and the difficulty in managing the disease. At the time of writing this article, there are 149 iPhone and 120 Android diabetes apps that can potentially be remotely connected to 10 different blood glucose meters, 15 blood pressure meters and 30 remote heart monitors. None of these is in widespread use by health systems. And between the technology solutions and the health problems they seek to address, there are significant barriers to overcome. The following discusses the major hurdles.

FIGURE 2

Illustrative

A road map to increase scale of mobile-health solutions

Heart monitor example



Source: A.T. Kearney analysis

Finding buyers. The vast majority of money spent on healthcare occurs in the developed world—the United States alone accounts for 45 percent of global health spending. Of this, most is routed through health insurers or state payers. So while companies see a great future in mobile health as a consumer proposition, in established health systems, people who become ill expect the health system to pick up the tab.

Finding out who in the health system benefits and who pays for mobile-health solutions is complicated; the answer depends on the precise manner in which the solution creates value, how financial risks are distributed among payers and health providers, and what the health system is prepared to reimburse. In the simplest systems, the reimbursement method is “fee for service,” where health providers are paid retrospectively for the work they do (see figure 3). At the opposite extreme, health payers can shift virtually all the risk for treatment on to the health provider

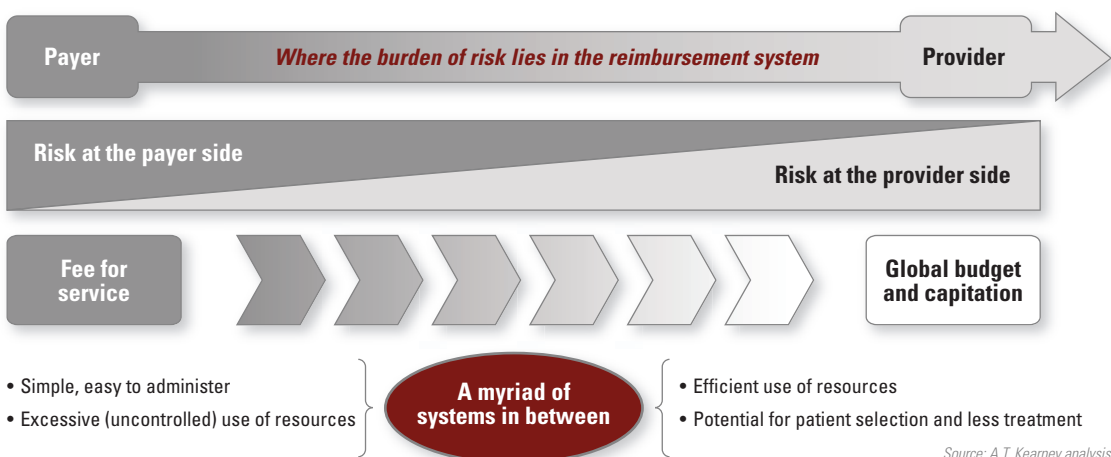
by using a prospective payment such as capitated payments or global budgets. Fee for service tends to encourage over-treatment, and capitation the opposite, so many intermediate and hybrid mechanisms are used in practice.

Thus, if a mobile-health solution is designed to allow early discharge from the hospital, this will be of interest to payers that have agreed to pay for each night separately. However, if the agreement is for an all-in price for the entire course of treatment with the hospital, the hospital, not the payer, will benefit from the mobile solution. In some areas, such as social services, consumers and caregivers (those asked to contribute to costs) may also be buyers. A good example is social alarms for the elderly. Most alarms are provided by social or housing services, with funding routes varying from the public purse in Germany and Denmark, to public financing with user co-payments across the rest of Europe and Japan, to private payment in the United States.⁴

FIGURE 3

Illustrative

Transferring risk through the reimbursement system



⁴ “ICT and Ageing: European Study on Users, Markets and Technologies,” European Commission, January 2010

Vertical View

The situation in developing countries is rather different. Here the state will typically provide only basic healthcare; much more of the market is self-pay. In such markets, mobile health may well be more of a consumer proposition.

Unless a mobile-health solution provider understands both the benefits and the intricacies of the local reimbursement system, they are likely to try to sell to the wrong people or frame the benefits in the wrong way.

Getting paid. Once the right buyer has been found, the next challenge is to get the system or the consumer to recognize the technology as something worth purchasing. To get a health system to pay for a mobile-health solution, it must deliver healthcare better than existing solutions. It can do this by delivering a given health outcome less expensively, in which case, as discussed above, it is critical to understand who will realize the financial gain. Alternatively, the mobile-health application can provide additional health outcomes at similar or incremental cost, in which case it will need

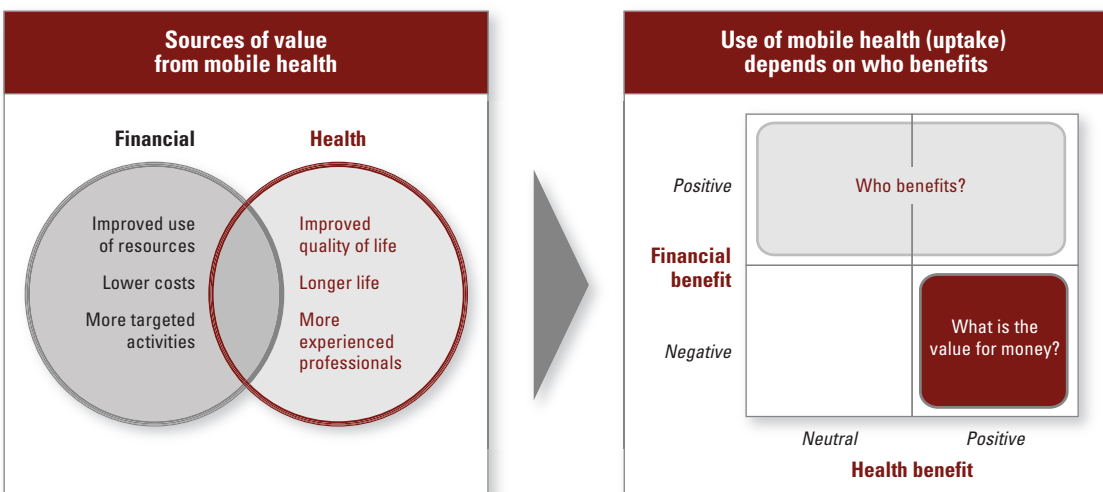
to demonstrate it is “good value” in economic terms (*see figure 4*).

Deciding if a technology is a good value varies by country. The United Kingdom and Germany perform a robust value-for-money assessment process. France and Italy use price negotiations, while New Zealand engages in risk-sharing agreements. In the United States, the approach varies by health plan. In developing countries, such evaluations are usually informal.

Receiving reimbursement directly from health payers is a complicated and time-consuming exercise, but has the advantage of encouraging widespread uptake. Mobile-health solutions, however, do not necessarily have to be accepted by health payers to succeed in a reimbursed environment. Providers will purchase technologies if they see that they make commercial sense. Reimbursement systems that are flexible and transfer high levels of risk to health providers are therefore generally beneficial to mobile health as they make it easier to sell the concept and technology to providers.

FIGURE 4

Types of value created by a mobile health application



Source: A.T. Kearney analysis

Proving value. One of the most significant impediments to the uptake and use of mobile-health technologies is the dearth of evidence that it improves health outcomes or reduces costs. While at any one time thousands of pilots may be underway, the overall results are far from conclusive. A.T. Kearney recently performed a comprehensive review of the evidence relating to the topic of mobile health. We found that most published articles generally

similar conclusions.⁷ This is not to say that technologies do not add value, only that no one has proved it.

Based on the evidence, we believe that most trials have tried to prove the wrong thing: either that a specific solution works technically, or that a specific clinical intervention—such as a compliance program with a mobile element—has advantages over doing nothing at all (the comparator). What these trials cannot prove is that mobile-enabled health solutions are better than non-mobile.

The compelling proposition of mobile is its ability to provide health solutions on a larger scale more easily and cheaply, and to allow disadvantaged people access to healthcare more cost effectively. A new type of trial is required that can demonstrate that clinical interventions known to be effective through other channels are significantly improved through the use of mobile. Only when this is proven on a large scale will health systems be convinced that mobile is a technology worth investing in.

Integrating with (or decommissioning) current services. Many suppliers of mobile solutions claim impressive benefits from the use of their technologies. Yet while it is all very well to say a remote monitor can allow early discharge from hospital, doing so requires an infrastructure of call centers, emergency response teams and clinical governance, and a wholesale redesign of the clinical, managerial and risk-management processes within a hospital. If money is to be saved, existing services must be decommissioned to reduce overall asset use, and clinical staff members must be persuaded

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only looked at technical endpoints, a few more included an assessment of clinical outcomes, and even fewer articles looked at efficiency measures such as cost, attendance or utilization.⁵ Once all of the articles were assessed for robustness, only a small number of them came to any real conclusions on whether or not mobile improved efficiency; and many of these were inconclusive. Only nine systematic reviews had been completed, and four of these were inconclusive.⁶ Evidence to show that mobile adds value is therefore tenuous. Other researchers and the European Commission have drawn

⁵ The search used PubMed medical subject search headings with custom search queries of more than 800 journals.

⁶ Systematic review refers to a meta-analysis of published data aiming to draw generalized conclusions.

⁷ European Commission: Strategic Intelligence Monitor on Personal Health Systems, 2010; European Commission: ICT and Ageing 2010

Vertical View

to change their practices. Both of these are notoriously difficult to do.

Technology providers generally do not have the capabilities to integrate services, and healthcare providers often struggle to do it alone. And of the relatively few healthcare companies that might consider forming partnerships with technology companies, most are based in the United States. The challenges in costs, credibility and risks often stifle progress.

Managing risks and regulations. Among the most significant concerns of technology providers are the risks inherent in providing healthcare-oriented services. Generally, risks increase with the severity of the condition suffered by the patient, the consequences of failure of the solution, and the “value-add” of the services pro-

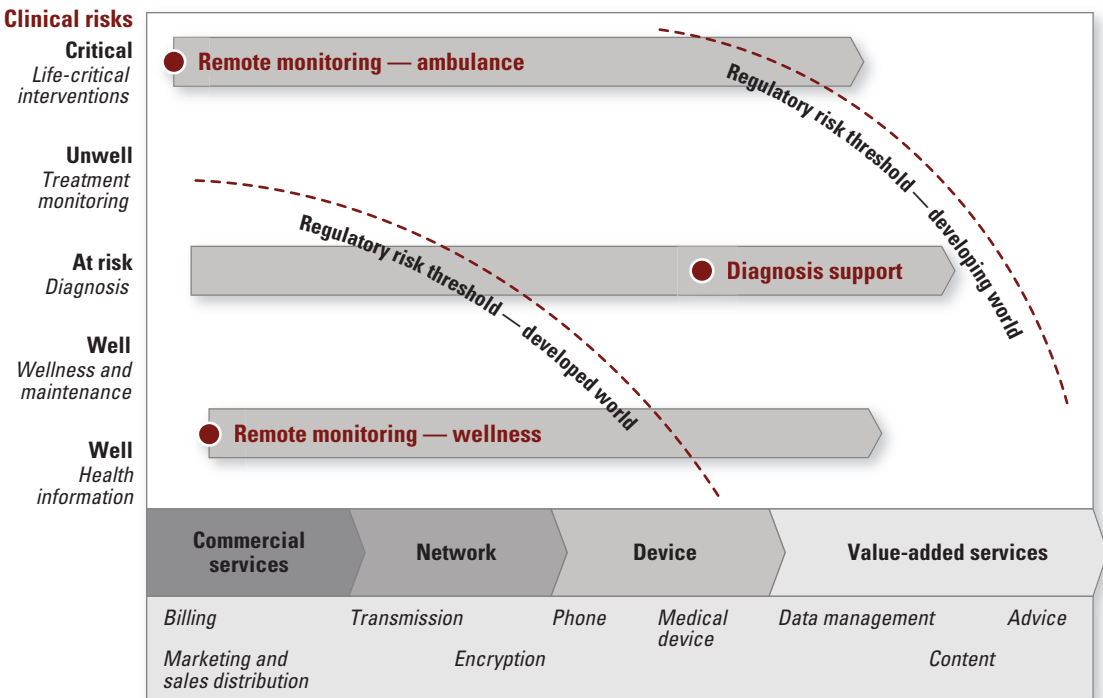
vided (see figure 5). The threshold beyond which the level of risk becomes onerous varies with the nature of the regulatory environment and, not surprisingly, is often reached faster in established healthcare markets.

Clinical risk management is a complicated area. Of the many regulations that might be relevant, most are not designed for mobile health, although recent moves by the U.S. Food and Drug Administration (FDA) are at least starting to clarify the position. Anything classified as a medical device is subject to regulatory approval, and as services move into data management, specific rules on how and where clinical data is stored may apply. A single mobile-health solution might be used for multiple purposes with different regulatory implications.

FIGURE 5

Illustrative

Clinical risks along the mobile health value chain



Source: A.T. Kearney analysis

Mobile health value chain

With proper advice and appropriate partnerships these issues can be managed.

Mobile Health Enters the Mainstream

Is mobile health just another fad, or will it become a major part of healthcare delivery? The Internet revolutionized business and created significant value for those able to create the right business models. The same will likely be true of mobile-health technologies.

*For a health system to pay for a mobile-health solution, **it must deliver healthcare better than existing solutions.***

The clinical evidence suggests where and when mobile health is likely to enter the mainstream. Half of all articles on the topic have been published in the past two years, and the volume is increasing exponentially. While the evidence is limited, interest is accelerating. The vast majority of applications—about 90 percent—are for patients as opposed to healthcare professionals. Patient monitoring, education and diagnosis make up two-thirds of all mobile applications, with heart disease, diabetes and wellness being the main target populations.

Two areas stand out as the most likely to experience early growth: wellness and chronic disease. *Wellness* is relatively easy to get into and far less troublesome than clinically intense

applications. While this is likely to have the largest number of applications and users, it is not yet clear how much consumers will be willing to pay. This channel will probably not generate the most mobile-health revenues.

Chronic disease is likely to be a mobile health front-runner, specifically applications that reduce the amount and use of resources. The United States will likely lead this market as it has the biggest immediate problem, the most advanced disease management supply base, and a fragmented system that makes it easier to gain a foothold.

Who Will Be the Winners?

Players across the health ecosystem are showing more interest in mobile health. Most major mobile phone operators have at least some mobile-health initiatives underway, and A.T. Kearney has worked extensively with the GSMA

researching issues faced by the telecommunications industry, the findings of which can be found in the joint paper *Mobile Health, Who Pays?*⁸ Pharmaceutical companies, medical-technology providers, mobile-handset providers, packaging companies, software providers, health insurers, healthcare providers, non-governmental organizations, charities and component manufacturers are developing products or experimenting with mobile-health technologies. At the time of writing this article, pharmaceutical companies alone offer more than 50 mobile-health applications.

Yet it is still not clear which, if any, of these technologies will succeed in the marketplace. In our view, technology will *not* be the stumbling

⁸ Mobile Health, Who Pays? is available at www.atkearney.com. The GSMA represents the interests of the worldwide mobile communications industry.

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block for most companies. Rather, the ability to develop compelling value propositions will be the biggest obstacle. The winners in mobile health will be companies that put it all together first—overcome barriers within the health system, provide solutions that patients and consumers want to use and healthcare systems benefit from, and develop robust commercial models that generate revenue.

For acutely ill patients, medical technology and medical service companies are perhaps the best positioned to win due to their understanding of patient pathways and ability to sell to health professionals. For the less ill, consumer health-products companies—either in food or pharmaceuticals—are the most likely to prosper as they have the capabilities to develop more consumer-oriented propositions that the population at large will use.

Pharmaceutical companies should be big players, but must stop looking at mobile health as digital marketing and instead integrate technology into the product; this could become a battleground with medical technology and packaging companies.


Technical platforms are likely to be a fight between telecom operators, phone manufacturers and medical technology providers, with probably only a handful of winners.

All parties hoping to play a role in mobile health will have to build momentum and estab-

lish a path to long-term growth. The process begins with answers to the following questions:

- What is the real market opportunity? Which applications add significant value and align with our market objectives and capabilities?
- Which value propositions will prove most successful? Which stakeholders must be engaged at what point in the development cycle, and what proof points will be required?
- Who is the customer, what will be the route to market, and what is the best commercial model?
- Which partners will be required for both delivery of the service and an effective route to market?

Delivering on the Promise

Mobile health can and will be an important tool to control the costs of healthcare by helping to address some of the most intractable health issues. There are signs that the technology may finally be ready to enter the mainstream, but uptake will not be widespread until the evidence improves. As companies jockey for position, the winners will be those that calculate how to increase uptake among health professionals and consumers and build a commercial model that delivers on one big promise—that mobile could be the cure for the rising costs of healthcare. 

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