Emerging mHealth: paths for growth

7 June 2012
1. Executive summary
2. mHealth maturity scorecard
3. Key findings
4. Country breakdown of key data
5. Key global contacts
1. Executive Summary
Executive summary

Goal of the report

• Report assesses the market opportunities and challenges for mHealth from the perspective of patients, payers, and providers
• EIU report, commissioned by PwC, with analysis from PwC

Key findings

• Expectations are high for mHealth from patients, providers and payers
• Significant differences in adoption among emerging and developed nations
• Consumers are ready to adopt mobile health faster than the health industry is ready to adapt
• Solutions, not technology, are the key to success
About the research

Report surveys covered patients, physicians and payers

1. A patient survey with over 1,000 respondents— with a broad distribution of economic backgrounds, ages, levels of education and states of health

2. A physicians survey with 433 physicians — public and private sector, urban vs. rural, wide range of years in experience

3. A payer survey with 345 respondents — roughly evenly divided between public and private sector and 55% are C-suite or above

4. 20 in-depth interviews with key experts

The survey included 10 countries:

- Brazil
- China
- Denmark
- Germany
- India
- South Africa
- Spain
- Turkey
- UK
- US
2. mHealth readiness scorecard
**mHealth scorecard methodology**

- Provides an overview of the countries surveyed and the maturity of their mHealth market through four key pillars. Each pillar is further divided into eight dimensions to support the findings
- Survey questions are grouped into the eight dimensions
- Each country receives a score per pillar and dimension, and an overall score

**Overall Score - Maturity of the market**

**Four Pillars**

1. Awareness and openness for mHealth
2. Regulatory, reimbursement and business model
3. Technology
4. Impact

**Eight Dimensions**

1.1 Encouraging environment
1.2 Current use of mHealth
2.1 Reimbursement and business model
2.2 Encouraging regulatory and legal environment
3.1 Access and security
3.2 Interoperability
4.1 Institutional
4.2 Healthcare system

*Source: PwC analysis based on EIU research, 2012*
The scorecard is based on the survey of patients, physicians and patients and scores from 10 (mature) to 1 (immature)

1. **Scorecard framework**
   - Apply scorecard framework about the mHealth market based on eight dimensions

2. **Data analysis**
   - Collect and analyse data from
     - doctor/payer survey
     - patient survey
     - expert interviews

3. **Normalisation of data**
   - Normalise data on a scale of 1 to 10, with 10 being the most mature

4. **Dimension score calculation**
   - Calculate the scores for each of the eight dimensions

5. **Pillar and overall score calculation**
   - Calculate the score for the four pillars and the overall score
**Emerging markets lead the way in mHealth, followed by the US as the most mature market**

**Overall score**

<table>
<thead>
<tr>
<th>Country</th>
<th>Awareness and openness for mHealth</th>
<th>Regulatory environment, reimbursement and business model</th>
<th>Technology</th>
<th>Impact</th>
<th>Overall score</th>
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<tbody>
<tr>
<td>South Africa</td>
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</tbody>
</table>

Source: PwC analysis based on EIU research, 2012

10 most mature

1 immature
First pillar: Awareness and openness for mHealth

Detailed scores

<table>
<thead>
<tr>
<th>Country</th>
<th>Encouraging environment</th>
<th>Current use of mHealth</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>7.6</td>
<td>6.0</td>
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<td>China</td>
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- The emerging markets score high in doctors encouraging patients to use mHealth as well as patients using mHealth solutions.
- The most established mHealth market today, the US, scores very low in awareness and openness of mHealth. The same could be said of the UK. Reasons may be due to physicians who are already using mHealth are more aware of its possible drawbacks.

Source: PwC analysis based on EIU research, 2012
**Second pillar: Regulatory environment, reimbursement and business model**

**Detailed scores**

<table>
<thead>
<tr>
<th>Country</th>
<th>Reimbursement and business model</th>
<th>Encouraging regulatory and legal environment</th>
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<tbody>
<tr>
<td>South Africa</td>
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</table>

- Developed and emerging countries have no significant differences on reimbursement, and the regulatory and legal environment.
- According to survey respondents, too few proven business models and an unsupportive regulatory environment are key barriers to mHealth.
- China’s score is the lowest for both dimensions in this pillar, with 83% indicating there are too few proven business models (survey average is 64%).

*Source: PwC analysis based on EIU research, 2012*
Third pillar: Technology

Detailed scores

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- Access and security
- Interoperability

In technology, the developed markets e.g., US, Denmark or Germany are ahead
- The higher smartphone penetration, a much higher emphasis on interoperability with existing systems, as well as a more advanced access and security features lead to a perception of high readiness for mHealth from a technological point of view.

Source: PwC analysis based on EIU research, 2012
Fourth pillar: Impact

Detailed scores

- The emerging markets and the US score high in this pillar
- The impact on institutions is measured by the expected impact on medical care, on the relationships with patients and on internal operations. For example, 92% of physicians in India expected a noticeable effect of mHealth in 3 years. In Denmark, only 80% believe this is the case
- The impact on healthcare can be illustrated by the following figure: 52% of physicians in India believe the widespread adoption of mHealth is inevitable, vs. 34% in Denmark

Source: PwC analysis based on EIU research, 2012
3. Top ten findings of the survey
Finding #1 – mHealth could enable a disruptive move from doctor-directed care towards a more personalised, consumer-oriented model

46% of surveyed patients expect more convenient access to providers as well as the possibility to reduce their own healthcare costs

Drivers for patients:
- Reduce own healthcare costs (40%)
- Access to a greater choice of applications (30%)
- Access better quality healthcare (20%)
- Manage a particular medical condition (10%)
- Manage aspects of my life from my mobile phone (0%)
- Greater control over own health
- Encouragement from my healthcare provider
- Encouragement from my healthcare payer
- Ability to obtain information
- Convenient access to provider

Source: PwC analysis based on EIU research, 2012
Finding #2 – Patients with health issues are most likely to use mHealth products and services

Patients with chronic diseases like diabetes are better informed about mHealth, more likely to be using mHealth services and more likely to pay for them.

82% of patients with poorly managed conditions engage in some sort of mHealth (vs. 64% survey average)

mHealth adoption for patients with chronic diseases vs. survey average

- Familiarity with term mHealth
  - Survey average: 49%
  - Patients with poorly managed conditions: 62%
  - Healthcare spending >30% of income: 74%

- Engage in mHealth
  - Survey average: 64%
  - Patients with poorly managed conditions: 82%
  - Healthcare spending >30% of income: 79%

- Currently use 1 or more apps
  - Survey average: 47%
  - Patients with poorly managed conditions: 72%
  - Healthcare spending >30% of income: 68%

Source: PwC analysis based on EIU research, 2012
Finding #3 – Patients are highly price sensitive, mainly because they think healthcare payers should bear the costs

20% of patients in emerging countries would pay more than $5 annually for an mHealth service, vs. 10% in developed countries

Patients in emerging markets are willing to pay more than those in developed ones – likely reflecting the higher proportion of all healthcare costs they have to pay themselves.

Source: PwC analysis based on EIU research, 2012
Finding #4 – Payers and – to a lower extent physicians – see the potential for improving quality of care and reduced costs...

Payers seem more optimistic about the potential for mHealth in promoting better health through greater patient involvement in care and reduced healthcare costs.

40% of payers encourage patients to monitor their condition through mHealth (vs. 25% of physicians)

Drivers for physicians and Payers

- Lower overall cost of care for patients
- Easier access to care
- Reduction in administrative time for medical personnel
- Reach previously unreachable patients
- Encouragement by regulators
- Improved quality of care
- Ubiquity of smartphones
- More efficient internal processes
- Opportunity to provide new services
- Patient expectations/demand
- Expectation of medical personnel

Source: PwC analysis based on EIU research, 2012
Finding #4 – ... but physicians are concerned that mHealth will make patients too independent

Patients are aware of this reluctance among physicians. 60% of active users of mHealth say that patients and technology companies are more interested in mHealth than physicians.

44% of physicians are worried that mHealth will make patients too independent.

Barriers for physicians and payers

- Existing reimbursement structure
- Lack of compatibility
- Lack of evidence
- Lack of necessary technology
- Regulatory and legal barriers
- Lack of interest by key users
- Privacy and security issues
- Culture of medical professionals
- Lack of information on mHealth
- Other areas needing investment

Source: PwC analysis based on EIU research, 2012
Finding #5 – Payers are more likely to cover mHealth services than physicians are to provide them

70% of payers plan to pay for mobile access to EMR in the next three years, but only 55% of physicians plan to offer this service.

Physicians frequently cite existing payment structures as a barrier to their greater deployment of mHealth yet reimbursement seems to be less an issue among payers than expected.

Services doctors plan to offer and payers plan to pay for in the next three years:

- Text-based consultations: 47% (doctors), 65% (payers)
- Telephone consultations: 71% (doctors), 67% (payers)
- Administrative comm.: 83% (doctors)
- Drug adherence: 68% (doctors), 68% (payers)
- Remote Patient Monitoring: 73% (doctors), 69% (payers)
- General health data: 61% (doctors), 66% (payers)
- Access EMR remotely: 55% (doctors), 70% (payers)

Source: PwC analysis based on EIU research, 2012
Finding #6 – Emerging markets will lead the way in mHealth

mHealth is less disruptive to healthcare in emerging markets because for a majority, it is not a substitution to care but rather the only access

High patient expectations in emerging countries: mHealth will change how...

61% of surveyed patients in emerging markets are aware of term “mobile health” (vs. 37% in developed markets)

Source: PwC analysis based on EIU research, 2012
Finding #6 – Emerging markets will lead the way in mHealth

More mHealth services are covered by payers in emerging markets than in developed countries

43% of payers in emerging markets pay or plan to pay for telephone consultations (vs. 29% in developed markets)

Services payers have already begun to pay for

<table>
<thead>
<tr>
<th>Service</th>
<th>Developed markets</th>
<th>Emerging markets</th>
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<tbody>
<tr>
<td>Telephone consultations</td>
<td>29%</td>
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<tr>
<td>Video consultations</td>
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<td>24%</td>
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<tr>
<td>Text based consultations</td>
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<tr>
<td>Administrative comm.</td>
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<td>Remote Patient Monitoring</td>
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<td>33%</td>
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<td>35%</td>
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<tr>
<td>Access EMR remotely</td>
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<td>39%</td>
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Source: PwC analysis based on EIU research, 2012
Finding #7 – A tale of two countries – India and the UK

For India, mHealth address pressing healthcare needs; for the UK, it is an added luxury

0.6 physicians per 1,000 inhabitants are practicing in India (vs. 2.2 per 1,000 in the UK)

Drivers for patients

Source: PwC analysis based on EIU research, 2012
Finding #7 – A tale of two countries – India and the UK

Lower cost for patients is the leading driver of mHealth in India, whereas the reduction of administrative time is a leading concern of physicians in the UK with the NHS system.

Drivers for physicians and payers

88% of India respondents do engage in mHealth activity (vs. just 52% of UK respondents)

Source: PwC analysis based on EIU research, 2012
Finding #8 – Focus on solutions, not technology

To create real value and identify business models, companies must focus on solutions that address the needs of stakeholders (payer, provider, patients) directly.

64% of physicians and payers say mHealth has exciting possibilities but too few proven business models.

Exciting possibilities, but too few business models

- 64% Agree
- 30% Neither agree or disagree
- 6% Disagree

Source: PwC analysis based on EIU research, 2012
Finding #8 – Focus on solutions, not technology

48% of surveyed patients who have used an mHealth app discontinued it after the first six months

Immense high dropout rates illustrates the need for engaging, integrated, interoperable, and intelligent apps

Example for PwC Six Success principles: WellDoc Diabetes manager

Integrated
- Integrated into existing healthcare plans, personal lifestyles, and clinical process
- Utilizes multiple technologies

Interoperability
- Incorporated into Allscripts electronic health record system
- Enables data from app to be accessed by physicians through EHR

Intelligent
- App provides real time alerts and intelligent guidance for users based on data inputted
- Doctors receive clear, actionable data that they can use as a basis for recommendations

Socialized
- Improves treatment and medication while providing personal coaching, direct physician support, and caregiver linkage

Outcome Oriented
- Demonstrated clinical success in trials
- Demonstrated economic success in the reduction of health care costs

Engaging
- Patients can configure settings, messaging, tonality, and interaction modes

Source: PwC analysis based on EIU research, 2012
Finding #9 – Technology still presents challenges for mHealth adopters

Lack of interoperability, standards and integration into existing IT-systems impedes uptake of the fragmented mHealth market

47% of surveyed physicians say that mHealth applications they use will not work with their organisation’s IT

mHealth services used by physicians/ payers integrated into...

- IT systems of my organisation: 53%
- IT systems of local hospitals and clinics: 37%
- IT system of the national healthcare system: 27%
- IT systems accessible by colleagues in other organisations: 23%
- Health data systems that patients can access directly: 15%

Source: PwC analysis based on EIU research, 2012
Finding #10 – Regulators could encourage advances in mHealth, but the survey shows otherwise

Surveyed physicians and payers see little encouragement for mHealth by regulators, due to regulatory and legal barriers

45% of physicians and payers think mHealth advances are held up by regulation

mHealth advances are being held up by regulation created for older technologies that does not translate well to newer ones

Source: PwC analysis based on EIU research, 2012
4. Country breakdown
Overview of key data

1. Expectation of physicians and healthcare payers about the widespread adoption of mHealth

2. Services physicians would like to offer and payers plan to reimburse for in the next 3 years

3. Top 3 drivers and barriers for patients and physicians (including average of the peer group)
Brazil - Potential and services

Widespread adoption of mHealth services in my country is inevitable in the near future

Services physicians would like to offer and payers plan to reimburse for in the next 3 years

Source: PwC analysis based on EIU research, 2012
Brazil - Top 3 drivers and barriers for patients and physicians

Patients

<table>
<thead>
<tr>
<th>Drivers</th>
<th>Brazil</th>
<th>Emerging countries (excl. Brazil)</th>
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</thead>
<tbody>
<tr>
<td>Reduce own healthcare costs</td>
<td>22%</td>
<td>52%</td>
</tr>
<tr>
<td>Convenient access to provider</td>
<td>29%</td>
<td>54%</td>
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<tr>
<td>Access better quality healthcare</td>
<td>22%</td>
<td>52%</td>
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<td>Cost</td>
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<td>48%</td>
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<td>Lack of relevant applications</td>
<td>39%</td>
<td>36%</td>
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<tr>
<td>Lack of knowledge about services</td>
<td>44%</td>
<td>49%</td>
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Physicians

<table>
<thead>
<tr>
<th>Drivers</th>
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<tbody>
<tr>
<td>Easier access to care</td>
<td>25%</td>
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<td>Patient expectations/demand</td>
<td>32%</td>
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<td>Reach previously unreachable patients</td>
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<table>
<thead>
<tr>
<th>Barriers</th>
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<tbody>
<tr>
<td>Lack of compatibility</td>
<td>24%</td>
<td>29%</td>
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<tr>
<td>Privacy and security issues</td>
<td>35%</td>
<td>37%</td>
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<tr>
<td>Culture of medical professionals</td>
<td>37%</td>
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Source: PwC analysis based on EIU research, 2012
China - Potential and services

Widespread adoption of mHealth services in my country is inevitable in the near future

Services physicians would like to offer and payers plan to reimburse for in the next 3 years

Doctors plan to offer | Payers plan to reimburse
---|---
Text-based consultations | 69% | 100%
Telephone consultations | 89% | 97%
Video consultations | 67% | 90%
Administrative comm. | 91% | 100%
Drug adherence | 85% | 97%
Remote Patient Monitoring | 89% | 97%
General health data | 77% | 97%
Access EMR remotely | 81% | 94%

Source: PwC analysis based on EIU research, 2012
### China - Top 3 drivers and barriers for patients and physicians

**Patients**

**Drivers**
- Convenient access to provider: 45% (China), 49% (Emerging countries)
- Reduce own healthcare costs: 36% (China), 58% (Emerging countries)
- Ability to obtain information: 31% (China), 30% (Emerging countries)

**Barriers**
- Cost: 35% (China), 53% (Emerging countries)
- Lack of relevant applications: 31% (China), 40% (Emerging countries)
- Lack of knowledge about services: 28% (China), 45% (Emerging countries)

**Physicians**

**Drivers**
- More efficient internal processes: 26% (China), 44% (Emerging countries)
- Improved quality of care: 27% (China), 38% (Emerging countries)
- Reduction in administrative time for medical personnel: 27% (China), 33% (Emerging countries)

**Barriers**
- Existing reimbursement structure: 25% (China), 49% (Emerging countries)
- Lack of necessary technology: 38% (China), 34% (Emerging countries)
- Privacy and security issues: 38% (China), 34% (Emerging countries)

*Source: PwC analysis based on EIU research, 2012*
Denmark - Potential and services

Widespread adoption of mHealth services in my country is inevitable in the near future

Services physicians would like to offer and payers plan to reimburse for in the next 3 years

---

Source: PwC analysis based on EIU research, 2012
Denmark - Top 3 drivers and barriers for patients and physicians

**Patients**

**Drivers**
- Ability to obtain information: 33% (Denmark), 47% (Developed countries)
- Access better quality healthcare: 27% (Denmark), 30% (Developed countries)
- Reduce own healthcare costs: 25% (Denmark), 30% (Developed countries)

**Barriers**
- Cost: 48% (Denmark), 47% (Developed countries)
- Lack of knowledge about services: 39% (Denmark), 47% (Developed countries)
- Lack of relevant applications: 36% (Denmark), 30% (Developed countries)

**Physicians**

**Drivers**
- Reach previously unreachable patients: 21% (Denmark), 42% (Developed countries)
- Easier access to care: 33% (Denmark), 33% (Developed countries)
- Improved quality of care: 31% (Denmark), 44% (Developed countries)

**Barriers**
- Regulatory and legal barriers: 23% (Denmark), 44% (Developed countries)
- Lack of information on mHealth: 27% (Denmark), 42% (Developed countries)
- Culture of medical professionals: 22% (Denmark), 36% (Developed countries)

Source: PwC analysis based on EIU research, 2012
Widespread adoption of mHealth services in my country is inevitable in the near future

Source: PwC analysis based on EIU research, 2012

<table>
<thead>
<tr>
<th>Service</th>
<th>% Doctors Plan to Offer</th>
<th>% Payers Plan to Reimburse</th>
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</thead>
<tbody>
<tr>
<td>Text-based consultations</td>
<td>31%</td>
<td>70%</td>
</tr>
<tr>
<td>Telephone consultations</td>
<td>77%</td>
<td>67%</td>
</tr>
<tr>
<td>Video consultations</td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>Administrative comm.</td>
<td>71%</td>
<td>63%</td>
</tr>
<tr>
<td>Drug adherence</td>
<td>61%</td>
<td>70%</td>
</tr>
<tr>
<td>Remote Patient Monitoring</td>
<td>61%</td>
<td>70%</td>
</tr>
<tr>
<td>General health data</td>
<td>39%</td>
<td>55%</td>
</tr>
<tr>
<td>Access EMR remotely</td>
<td>80%</td>
<td>27%</td>
</tr>
</tbody>
</table>

Source: PwC analysis based on EIU research, 2012
Germany - Top 3 drivers and barriers for patients and physicians

**Patients**

**Drivers**
- Reduce own healthcare costs: 41% (Germany), 27% (Developed countries)
- Greater control over own health: 39% (Germany), 30% (Developed countries)
- Access better quality healthcare: 31% (Germany), 27% (Developed countries)

**Barriers**
- Lack of knowledge about services: 46% (Germany), 39% (Developed countries)
- Cost: 50% (Germany), 40% (Developed countries)
- Privacy or security concerns: 38% (Germany), 25% (Developed countries)

**Physicians**

**Drivers**
- Reduction in administrative time for medical personnel: 42% (Germany), 32% (Developed countries)
- Improved quality of care: 43% (Germany), 33% (Developed countries)
- Patient expectations/demand: 31% (Germany), 24% (Developed countries)

**Barriers**
- Privacy and security issues: 47% (Germany), 36% (Developed countries)
- Existing reimbursement structure: 40% (Germany), 28% (Developed countries)
- Lack of necessary technology: 30% (Germany), 31% (Developed countries)

*Source: PwC analysis based on EIU research, 2012*
**India - Potential and services**

Widespread adoption of mHealth services in my country is inevitable in the near future

Services physicians would like to offer and payers plan to reimburse for in the next 3 years

Source: PwC analysis based on EIU research, 2012
India - Top 3 drivers and barriers for patients and physicians

Patients

<table>
<thead>
<tr>
<th>Drivers</th>
<th>India</th>
<th>Emerging countries (excl. India)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce own healthcare costs</td>
<td>58%</td>
<td>52%</td>
</tr>
<tr>
<td>Convenient access to provider</td>
<td>55%</td>
<td>47%</td>
</tr>
<tr>
<td>Ability to obtain information</td>
<td>40%</td>
<td>28%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Cost</th>
<th>Lack of relevant applications</th>
<th>My provider is unwilling to work with mHealth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>48%</td>
<td>47%</td>
<td>36%</td>
</tr>
</tbody>
</table>

Physicians

<table>
<thead>
<tr>
<th>Drivers</th>
<th>Lower overall cost of care for patients</th>
<th>Reach previously unreachable patients</th>
<th>Reduction in administrative time for medical personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>42%</td>
<td>40%</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29%</td>
<td>26%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23%</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Lack of interest by key users</th>
<th>Culture of medical professionals</th>
<th>Lack of information on mHealth</th>
</tr>
</thead>
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<tr>
<td></td>
<td>37.50%</td>
<td>33.30%</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19%</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19%</td>
<td>27%</td>
</tr>
</tbody>
</table>

Source: PwC analysis based on EIU research, 2012
South Africa - Potential and services

Widespread adoption of mHealth services in my country is inevitable in the near future

Services physicians would like to offer and payers plan to reimburse for in the next 3 years

Source: PwC analysis based on EIU research, 2012
South Africa - Top 3 drivers and barriers for patients and physicians

Patients

Drivers

- Reduce own healthcare costs: 46% South Africa, 82% Emerging countries
- Convienient access to provider: 47% South Africa, 55% Emerging countries
- Greater control over own health: 42% South Africa, 30% Emerging countries

Barriers

- Lack of knowledge about services: 34% South Africa, 71% Emerging countries
- Cost: 33% South Africa, 53% Emerging countries
- Privacy or security concerns: 27% South Africa, 39% Emerging countries

Physicians

Drivers

- Lower overall cost of care for patients: 24% South Africa, 38% Emerging countries
- Easier access to care: 31% South Africa, 33% Emerging countries
- Reach previously unreachable patients: 31% South Africa, 33% Emerging countries

Barriers

- Privacy and security issues: 36% South Africa, 45% Emerging countries
- Culture of medical professionals: 29% South Africa, 41% Emerging countries
- Lack of information on mHealth: 31% South Africa, 28% Emerging countries

Source: PwC analysis based on EIU research, 2012
Spain - Potential and services

Widespread adoption of mHealth services in my country is inevitable in the near future

Source: PwC analysis based on EIU research, 2012

Services physicians would like to offer and payers plan to reimburse for in the next 3 years

![Chart showing percentages of services offered and reimbursed](chart.png)

- Doctors plan to offer
- Payers plan to reimburse

Source: PwC analysis based on EIU research, 2012
Spain - Top 3 drivers and barriers for patients and physicians

Patients

<table>
<thead>
<tr>
<th>Drivers</th>
<th>Spain</th>
<th>Developed countries (excl. Spain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convenient access to provider</td>
<td>25%</td>
<td>47%</td>
</tr>
<tr>
<td>Access better quality healthcare</td>
<td>33%</td>
<td>38%</td>
</tr>
<tr>
<td>Greater control over own health</td>
<td>31%</td>
<td>44%</td>
</tr>
</tbody>
</table>

Physicians

<table>
<thead>
<tr>
<th>Drivers</th>
<th>Spain</th>
<th>Developed countries (excl. Spain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved quality of care</td>
<td>29%</td>
<td>58%</td>
</tr>
<tr>
<td>Easier access to care</td>
<td>26%</td>
<td>37%</td>
</tr>
<tr>
<td>More efficient internal processes</td>
<td>38%</td>
<td>49%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Spain</th>
<th>Developed countries (excl. Spain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>32%</td>
<td>45%</td>
</tr>
<tr>
<td>Lack of relevant applications</td>
<td>32%</td>
<td>32%</td>
</tr>
<tr>
<td>Lack of knowledge about services</td>
<td>32%</td>
<td>42%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Spain</th>
<th>Developed countries (excl. Spain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture of medical professionals</td>
<td>22%</td>
<td>36%</td>
</tr>
<tr>
<td>Lack of information on mHealth</td>
<td>29%</td>
<td>33%</td>
</tr>
<tr>
<td>Privacy and security issues</td>
<td>33%</td>
<td>39%</td>
</tr>
</tbody>
</table>

Source: PwC analysis based on EIU research, 2012
Turkey - Potential and services

Widespread adoption of mHealth services in my country is inevitable in the near future

Services physicians would like to offer and payers plan to reimburse for in the next 3 years

- Text-based consultations: 61%, 62%
- Telephone consultations: 63%, 59%
- Video consultations: 61%, 55%
- Administrative comm.: 76%, 64%
- Drug adherence: 61%, 45%
- Remote Patient Monitoring: 87%
- General health data: 63%, 50%
- Access EMR remotely: 76%, 65%

Doctors plan to offer | Payers plan to reimburse

Source: PwC analysis based on EIU research, 2012
Turkey - Top 3 drivers and barriers for patients and physicians

Patients

Drivers
- Convenient access to provider: Turkey 47%, Emerging countries (excl. Turkey) 53%
- Reduce own healthcare costs: Turkey 40%, Emerging countries (excl. Turkey) 57%
- Greater control over own health: Turkey 40%, Emerging countries (excl. Turkey) 31%

Barriers
- Cost: Turkey 50%, Emerging countries (excl. Turkey) 49%
- Lack of relevant applications: Turkey 40%, Emerging countries (excl. Turkey) 38%
- Lack of knowledge about services: Turkey 36%, Emerging countries (excl. Turkey) 43%

Physician

Drivers
- Reach previously unreachable patients: Turkey 31%, Emerging countries (excl. Turkey) 34%
- More efficient internal processes: Turkey 29%, Emerging countries (excl. Turkey) 31%
- Patient expectations/demand: Turkey 26%, Emerging countries (excl. Turkey) 26%

Barriers
- Lack of necessary technology: Turkey 32%, Emerging countries (excl. Turkey) 44.7%
- Regulatory and legal barriers: Turkey 18%, Emerging countries (excl. Turkey) 28.90%
- Other areas needing investment: Turkey 17%, Emerging countries (excl. Turkey) 26.30%

Source: PwC analysis based on EIU research, 2012
United Kingdom - Potential and services

Widespread adoption of mHealth services in my country is inevitable in the near future

Services physicians would like to offer and payers plan to reimburse for in the next 3 years

Source: PwC analysis based on EIU research, 2012
United Kingdom - Top 3 drivers and barriers for patients and physicians

Patients

Drivers

- Convenient access to provider: 49% (UK), 44% (Developed countries)
- Greater control over own health: 29% (UK), 43% (Developed countries)
- Ability to obtain information: 27% (UK), 26% (Developed countries)

Barriers

- Cost: 50% (UK), 48% (Developed countries)
- Lack of knowledge about services: 44% (UK), 40% (Developed countries)
- Lack of relevant applications: 28% (UK), 32% (Developed countries)

Physicians

Drivers

- Improved quality of care: 40% (UK), 42% (Developed countries)
- Patient expectations/demand: 23% (UK), 36% (Developed countries)
- Reduction in administrative time for medical personnel: 36% (UK), 34% (Developed countries)

Barriers

- Lack of interest by key users: 18% (UK), 33% (Developed countries)
- Privacy and security issues: 33% (UK), 39% (Developed countries)
- Lack of necessary technology: 29% (UK), 33% (Developed countries)

Source: PwC analysis based on EIU research, 2012
United States - Potential and services

Widespread adoption of mHealth services in my country is inevitable in the near future

Services physicians would like to offer and payers plan to reimburse for in the next 3 years

Source: PwC analysis based on EIU research, 2012
United States - Top 3 drivers and barriers for patients and physicians

**Patients**

**Drivers**
- Reduce own healthcare costs: 28% (US), 53% (Developed countries)
- Convenient access to provider: 25% (US), 43% (Developed countries)
- Ability to obtain information: 28% (US), 50% (Developed countries)

**Barriers**
- Cost: 13% (US), 28% (Developed countries)
- Lack of knowledge about services: 13% (US), 26% (Developed countries)
- Own not a mobile device: 13% (US), 35% (Developed countries)

**Physicians**

**Drivers**
- Improved quality of care: 44% (US), 41% (Developed countries)
- Reduction in administrative time for medical personnel: 33% (US), 42% (Developed countries)
- Easier access to care: 33% (US), 33% (Developed countries)

**Barriers**
- Existing reimbursement structure: 26% (US), 26% (Developed countries)
- Privacy and security issues: 37% (US), 37% (Developed countries)
- Lack of evidence: 20% (US), 31% (Developed countries)

Source: PwC analysis based on EIU research, 2012
5. Global contacts
Global contacts

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pierre-alain.sur@us.pwc.com
Appendix
# mHealth scorecard – Detailed scores per dimension

<table>
<thead>
<tr>
<th>Area</th>
<th>South Africa</th>
<th>India</th>
<th>Brazil</th>
<th>US</th>
<th>Germany</th>
<th>Spain</th>
<th>China</th>
<th>Denmark</th>
<th>Turkey</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Score</td>
<td>6.0</td>
<td>5.7</td>
<td>5.6</td>
<td>5.2</td>
<td>5.1</td>
<td>5.1</td>
<td>5.0</td>
<td>4.8</td>
<td>4.7</td>
<td>4.7</td>
</tr>
<tr>
<td>Awareness and openness</td>
<td>5.5</td>
<td>7.0</td>
<td>6.2</td>
<td>3.5</td>
<td>4.4</td>
<td>5.1</td>
<td>7.0</td>
<td>3.1</td>
<td>4.9</td>
<td>2.4</td>
</tr>
<tr>
<td>Encouraging environment</td>
<td>6.6</td>
<td>7.1</td>
<td>7.0</td>
<td>2.8</td>
<td>4.7</td>
<td>6.1</td>
<td>5.8</td>
<td>3.9</td>
<td>4.8</td>
<td>3.0</td>
</tr>
<tr>
<td>Current use</td>
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<td>6.9</td>
<td>5.3</td>
<td>4.2</td>
<td>4.1</td>
<td>4.1</td>
<td>8.3</td>
<td>2.4</td>
<td>5.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Regulatory environment, reimbursement and business model</td>
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<td>5.8</td>
<td>6.7</td>
<td>4.6</td>
<td>5.9</td>
<td>6.8</td>
<td>3.3</td>
<td>6.0</td>
<td>5.5</td>
<td>6.6</td>
</tr>
<tr>
<td>Reimbursement and business model</td>
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<td>6.8</td>
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<td>5.3</td>
<td>6.0</td>
<td>3.9</td>
<td>6.4</td>
<td>5.4</td>
<td>5.4</td>
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<tr>
<td>Encouraging regulatory environment</td>
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<td>4.9</td>
<td>6.0</td>
<td>5.0</td>
<td>6.5</td>
<td>7.6</td>
<td>2.8</td>
<td>5.6</td>
<td>5.5</td>
<td>7.7</td>
</tr>
<tr>
<td>Technology</td>
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<td>4.3</td>
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<td>6.0</td>
<td>4.6</td>
<td>3.7</td>
<td>7.3</td>
<td>4.6</td>
<td>5.7</td>
</tr>
<tr>
<td>Access and security</td>
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<td>5.2</td>
<td>5.0</td>
<td>4.3</td>
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</tr>
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<td>Interoperability</td>
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<td>2.2</td>
<td>8.5</td>
<td>6.9</td>
<td>5.0</td>
<td>4.5</td>
<td>8.1</td>
<td>4.7</td>
<td>5.5</td>
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<tr>
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<td>6.6</td>
<td>6.0</td>
<td>5.3</td>
<td>4.2</td>
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<td>5.9</td>
<td>4.0</td>
<td>3.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Impact on institution</td>
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<td>6.7</td>
<td>6.7</td>
<td>4.3</td>
<td>4.7</td>
<td>3.7</td>
<td>6.4</td>
<td>4.0</td>
<td>3.8</td>
<td>3.9</td>
</tr>
<tr>
<td>Impact on Healthcare system</td>
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<td>5.3</td>
<td>6.3</td>
<td>3.6</td>
<td>2.2</td>
<td>5.4</td>
<td>3.9</td>
<td>3.9</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Source: PwC analysis based on EIU research, 2012
# Questions per dimension

## 1 Awareness and openness

### 1.1 Encouraging environment

- Doctors encouraging patients to adopt a range of mHealth applications and services
- Patients expecting that mHealth applications/services will improve the quality of healthcare they receive in the next 3 years.
- Patients expecting that mHealth applications/services will make healthcare substantially more convenient in the next 3 years
- Percentage of patients familiar with the terms “mobile health” or “mHealth”
- Percentage of patients who would be interested in using mHealth applications/services
- Patients who are willing to pay more than $5 annually for a service - median from a set of services

### 1.2 Current use

- Patients using mHealth services to manage their personal healthcare
- Doctors using mHealth services in managing their personal healthcare
- Doctors who use mobile internet at work to provide healthcare
- Doctors who have begun to offer services via mobile devices

## 2 Regulatory environment, reimbursement and business model

### 2.1 Reimbursement and business model

- Doctors who say that existing payment structures for health services discourage them from taking advantage of potential efficiencies in mHealth
- Doctors who say that today’s mHealth market has exciting possibilities but too few proven business models
- Patients willing to pay annually for an application/service more than $5
- Patients expecting that mHealth applications/services will substantially reduce their overall healthcare costs in the next 3 years

### 2.2 Regulatory and legal environment

- Doctors believing mHealth advances are being held up by regulation created for older technologies that does not translate well to newer ones
- Payers who say that the regulatory and legal framework are leading barriers to greater adoption of mHealth applications or services
- Providers who say that the regulatory and legal framework are leading barriers to greater adoption of mHealth applications or services

Source: PwC analysis based on EIU research, 2012
**Questions per dimension (cont.)**

### 3 Technology

#### 3.1 Access and security
- Doctors with access to mobile internet at work
- Percentage of doctors considering their internet access at work very secure
- Mobile penetration rate (Source: ITU)

#### 3.2 Interoperability
- Patients frustrated by incompatibilities of mHealth solutions
- Organisations that are reluctant to invest heavily in mHealth until the technology becomes more standardised, or interoperable

### 4 Impact

#### 4.1 Institutional
- Doctors expecting a noticeable effect on their medical care from mHealth - Currently
- Doctors expecting a noticeable effect on their medical care from mHealth - In three years
- Doctors expecting a positive impact on relationships with patients
- Doctors expecting a positive impact on internal operations

#### 4.2 Healthcare
- Patients who are expecting little effect on healthcare through mHealth
- Patients who are expecting mHealth services will improve a great deal in the next three years
- Patients who are considering mHealth as a more effective way to adopt healthier lifestyle
- Doctors expecting inevitable widespread adoption of mHealth applications and services is in the near future (6)
## Detailed results of drivers and barriers for patients

### Drivers

<table>
<thead>
<tr>
<th>Drivers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce own healthcare costs</td>
<td>444</td>
</tr>
<tr>
<td>Convenient access to provider</td>
<td>477</td>
</tr>
<tr>
<td>Ability to obtain information</td>
<td>289</td>
</tr>
<tr>
<td>Encouragement from my healthcare provider</td>
<td>153</td>
</tr>
<tr>
<td>Encouragement from healthcare payer</td>
<td>123</td>
</tr>
<tr>
<td>Greater control over my own health</td>
<td>329</td>
</tr>
<tr>
<td>Manage aspects of my life from my mobile phone</td>
<td>104</td>
</tr>
<tr>
<td>Manage a particular medical condition</td>
<td>149</td>
</tr>
<tr>
<td>Access to better quality healthcare</td>
<td>261</td>
</tr>
<tr>
<td>Access to a greater choice of applications</td>
<td>97</td>
</tr>
<tr>
<td>Other</td>
<td>32</td>
</tr>
<tr>
<td>Total</td>
<td>1027</td>
</tr>
</tbody>
</table>

### Barriers

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>498</td>
</tr>
<tr>
<td>Lack of relevant applications</td>
<td>357</td>
</tr>
<tr>
<td>My providers are unwilling to work with mHealth</td>
<td>190</td>
</tr>
<tr>
<td>Privacy or security concerns</td>
<td>295</td>
</tr>
<tr>
<td>Lack of knowledge about services</td>
<td>419</td>
</tr>
<tr>
<td>Inconvenience and time involved in setting up mHealth</td>
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</tr>
<tr>
<td>Already satisfied with current possibilities</td>
<td>124</td>
</tr>
<tr>
<td>Incompatible mHealth applications/services therefore takes more time to set up mHealth</td>
<td>92</td>
</tr>
<tr>
<td>Difficulties understanding the content of services</td>
<td>104</td>
</tr>
<tr>
<td>Don’t own a mobile device</td>
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<tr>
<td>Other</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>1027</td>
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</table>

Source: PwC analysis based on EIU research, 2012
## Detailed results of drivers and barriers for physicians

### Drivers

<table>
<thead>
<tr>
<th>Drivers</th>
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</thead>
<tbody>
<tr>
<td>Lower overall cost of care for patients</td>
<td>109</td>
</tr>
<tr>
<td>Easier access to care</td>
<td>140</td>
</tr>
<tr>
<td>Reach previously unreachable patients</td>
<td>122</td>
</tr>
<tr>
<td>Improved quality of care</td>
<td>154</td>
</tr>
<tr>
<td>More efficient internal processes</td>
<td>126</td>
</tr>
<tr>
<td>Patient expectations/demand</td>
<td>112</td>
</tr>
<tr>
<td>Expectation of medical personnel</td>
<td>57</td>
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<tr>
<td>Opportunity to provide new services</td>
<td>75</td>
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<tr>
<td>Ubiquity of smartphones</td>
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<tr>
<td>Encouragement by regulators</td>
<td>60</td>
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<tr>
<td>Reduction in administrative time for medical personnel</td>
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<tr>
<td>Other, please specify</td>
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<tr>
<td><strong>Total</strong></td>
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### Barriers

<table>
<thead>
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<tr>
<td>Other areas needing investment</td>
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<tr>
<td>Existing reimbursement structure</td>
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<tr>
<td>Lack of compatibility</td>
<td>111</td>
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<td>Lack of evidence</td>
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<tr>
<td>Lack of necessary technology</td>
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<td>Regulatory and legal barriers</td>
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<tr>
<td>Lack of interest by key users</td>
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<tr>
<td>Privacy and security issues</td>
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<tr>
<td>Culture of medical professionals</td>
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<td>Lack of information on mHealth</td>
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<td>Other, please specify</td>
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<tr>
<td><strong>Total</strong></td>
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</table>

**Source:** PwC analysis based on EIU research, 2012