WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

Advancing mHealth Solutions

Proceedings of the mHealth Summit at the World Economic Forum

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Introduction

The World Economic Forum's inaugural mHealth Summit was held in San Diego, California, on 28 June and established a rich dialogue among leading stakeholders from government, civil society, academia, telecommunications and health industries.

With a focus on identifying key horizontal catalysts for global scale, the summit identified opportunities to leverage the ubiquity, cost effectiveness and personalization of the mobile platform. The collective expertise and influence of those participating in the event created an opportunity for aligning on key priorities in the development of the mHealth ecosystem.

A primary objective was to gain feedback on a guiding set of principles outlined by the World Economic Forum's Global Agenda Council on the Future of Mobile Communications. These principles were designed as a means to aid in shaping a balanced and healthy mHealth ecosystem (see sidebar).

Of these principles, empowering the individual was seen as the foundation upon which the others rest. As a highly personalized, global technology, mobile-based solutions can strengthen the control users have over their health and, as such, help transform the manner in which new solutions are created.

The importance of the end-user and the shift to person-centric models were areas of much in-depth discussion throughout the event.

Principles for Mobile Health Solutions

1.Empower individuals to keep themselves healthy (wellness) and manage their own health (e.g. chronic care) via real time feedback, while owning and controlling their own health data

2. Cost effectively improve and extend the reach of existing health services to support more people at all economic levels

3. Increase collecting and sharing of a base of evidence to demonstrate efficacy and return on investment

4. Integrate mobile health solutions into payment programs of governments, insurers, employers and other payers

5. Incentivize government funding of wellness programs due to long time horizons between investment and avoided cost.

6. Facilitate the connections between critical auxiliary infrastructure, such as supply chains and community information systems and the health sector proper.

7. Support of an open ecosystem characterized by its interoperability, competition, innovation and consumer choice.

Opening Plenary

This session addressed the question of how mobile communications – humanity's most pervasive platform with *5 billion* individuals – can be used for addressing some of the world's biggest healthcare challenges.

The panel started on a somewhat provocative note.

There is little empirical evidence that mHealth has a quantifiable impact.

While there is no shortage of observational and anecdotal support for the impact of mHealth in developing nations, the research is still highly fragmented and inconclusive. Early mHealth implementations were driven by technologists promoting IT innovations in search of problems they didn't understand – with little alignment on larger health priorities.

From a forward-looking perspective, the call to action from this panel was to increase the sharing of results from mHealth pilot studies. The need for a greater body of evidence is a critical next step.

The technology-centric approach driving many mHealth initiatives needs to change. While there are encouraging signs that change is underway (the sophistication of health information policy-makers is generally increasing) it is important to ensure that the alignment, interoperability and sharing of data is more tightly harmonized with larger health outcomes.

Panellists noted that government policy-makers need to continually invest in deepening their understanding of communications platforms, their capabilities and the economics of networked communications. With a deeper understanding of what is technically possible, needs can be expressed in a more integrated and holistic manner.

Technology providers were also encouraged to deepen their understanding of health priorities and to listen more effectively to the complex needs of end-users within the ecosystem. The ICT sector must also recognize the importance of fostering deeper partnerships with medical professionals to meet their specialized requirements.

In this light, it was suggested that some of the zealotry within the tech sector for "transforming industries" can be counterproductive. Approaching the health sector with a greater sense of openness (and humility) would go a long way. Doctors are often resistant to change and need factual evidence and incentives to change their behaviours and procedures.

The health industry, on the other hand, needs to recognize that it has failed miserably when it comes to leveraging the scale efficiencies of ICT. Individuals within the health sector need to more fully embrace ICT's potential for increased end-user benefits and significant cost savings.

One approach suggested was in making health and wellness related activities more akin to gaming experiences so individuals will be more engaged and the chances for success greater. Gaming applications and using "reward point" systems were discussed as a way to create sustained incentives for users and their social networks.

Panellists also noted that the health community needs to recognize that its concept of scale is quite different from that of the ICT industry. There is an imbalance in what people mean by the concept of scale. There are billions of mobile subscribers in developing countries but roughly 11 million hospital beds in these same countries.

The importance of localization was also addressed during this session. One panellist commented, "If you want to be a global player, don't. Be local." Deconstruct local ecosystems and go after each country one at a time.

While a common global technology infrastructure is emerging, solutions built on "one size fits all" approaches are destined to fail. Payers, doctors and patients are uniquely different in each country. mHealth platforms need to be flexible, innovative and able to adapt to the local requirements of the ecosystem.

Economically, developing and developed countries have widely different needs. While developing countries are focused on access to basic care and information, developed countries suffer from the high burden of chronic disease management.

For developed economies, access is generally not the issue; the outcomes, particularly on chronic disease management, are the big challenge. The GSM Association noted that chronic disease management now represents 75% of healthcare costs worldwide.

While the potential for mobile communications to address this challenge and reduce expenditures is genuine, there is scepticism among the provider and payer communities on how ICT can actually lower the cost of chronic disease management. The technology industry must continue to illustrate its economic return in measurable ways.

Workshop Summary: Enabling Scale and Scope

This workshop focused on identifying some of the key factors for scale within mHealth. Participants were asked to select a particular domain within mHealth and answer three direct questions: What is working? What is not? What needs to change?

The following is a synthesis of each group's thoughts on their particular domain.

The Overall mHealth Ecosystem

There is no denying that the interest and demand for mHealth is growing. The types of applications, their scope and the range of people they are attracting are all positive indicators.

Yet, despite advancements in technology and growing demand, what is not working are the frustrations and inefficiencies from fragmentation. The systems integration that holds all of the disparate parts together is missing.

The big constraint that encompasses the entire ecosystem is risk. The downstream implications of regulatory uncertainty, uncertain consumer adoption, liability and a lack of technology standards compound to create a significant risk profile to mHealth.

Of these risk factors, the development of device standards is seen as a key first step needed to reduce some of the uncertainty so investment can flow, new devices can be created and new solutions discovered.

With the democratization that occurs with personalized communications, the medical culture – those that are delivering the care – may not necessarily be ready for this decentralized revolution.

It was noted that many doctors tend to think that, to make things work, *they* need to be in complete control. The world of empowered, connected patients is not good for them. In this sense, understanding the incentives of healthcare evangelists – practitioners who see the light and want to increase the empowerment of their patients – would be quite valuable to recruit at this juncture.

In terms of what is needed, the group suggested that metrics should be directed towards capturing how well

an ecosystem is (or is not) self-propagating and expanding with further advancements.

Within the scope of what could be measured, the following components were offered:

1. Viable business models – at the local level – that are demand-based and meet the unique needs and requirements of the individual
2. Government policies that enable innovation yet proportionately manage risk and protect the individual
3. User confidence, trust and health literacy; this will lead to engaged and empowered users

Emergency Medical Response Services

What is working: there are lots of devices and services available that are keeping people out of hospitals. Remote sensing devices are working. They are not seamless, but they are making progress.

From the perspective of what is not working globally, the challenges of fragmented health information is of key concern. There is either too much data or not enough. It is lost, unused or simply too hard to access. In the context of emergency medical response, these inefficiencies can cost lives.

Economic and cultural incentives are needed for the medical community to fully adopt wireless healthcare. Licensing medical professionals in multiple areas of heath delivery, including mobile technology, could engage a physician to use mobile technologies from the onset of his or her career.

Incentives such as reimbursement should also be further explored. While there is a platform for collecting wireless medical data, standards and ubiquitous mobile services are still lacking in both developed and developing countries.

The extended time it takes for a product to receive FDA approval is a major obstacle to the timely deployment of advanced solutions.

Data Collection and Disease Surveillance

While it can also apply to the entire mHealth ecosystem, the advancement of device functionality is viewed as a positive driver in the area of data collection and disease surveillance. Additionally, the engagement of payers in the design and deployment of solutions is a big step forward. Finally, the emergence of standards – albeit with limited progress – is gaining momentum and is viewed as a very positive sign for future growth.

Regarding things that are not working, the regulatory environment and the time it takes to clear certification processes are seen as a key challenge – particularly by hardware manufacturers.

A second challenge is the issue of incentives. Whether patients, payers, providers or manufacturers, people are just not clear on why mHealth matters or what is specifically in it for them in terms of the return or benefit. In some instances, there is sound research related to return on investment and cost-saving benefits, but it is not getting into the hands of those that could make an informed decision and act accordingly.

Treatment Compliance

Easy access to valuable information is important for compliance. Small-scale pilots have indicated evidence to support the benefits of compliance in overall disease management cases. Tools that can promote compliance, e.g. warn individuals that they are in the very early stages of diabetes, will continue to be successful.

Privacy issues also can force users to get involved, as they will want to ensure that their private information is kept secure.

Health Information Systems and Point of Care

With the support of the Millennium Development Goals and the UN, the increasing public awareness of global health challenges is good news. Participants commented on progress being made in sharing data, applications and best practices in how mobile technology could help to achieve global health goals.

From a technology perspective, the group counselled others not to be too harsh on the lack of standards. Given that mHealth is a new technology, it is only natural that point solutions emerge first. The notion of adopting best practices should be used in place of calling for formal standards. Standards take too long to adopt and implement.

What is not working, from this group's perspective, are the number of governments who neither understand nor appreciate the potential of mHealth. Too many do not get it.

Many countries, including developed countries, seem indifferent to deploying an integrated mHealth system. Many governments do not fully understand the cost benefits, end-user benefits or broad social outcomes of implementing such systems.

What needs to change, within the developed economies, is the emergence of a new class of leaders who have multiple interests and the incentives to promote a win-win-win framework.

In the developing world, there needs to be greater alignment between donors and mobile network operators to accelerate the adoption of mHealth services. It was widely agreed that the broad adoption of mHealth will most likely occur first in developing economies. The absence of over-regulation in the developing world creates a huge opportunity for accelerated change.

Health Promotion and Disease Prevention

Information about disease prevention and better health promotion must reach all levels of the economic pyramid.

Today, information about disease prevention continues to be segmented by geography, age and different knowledge levels.

Having private employers participate in the effort to educate employees with regards to prevention programmes will not only increase productivity but also support the industry's ongoing effort to promote disease management tools and preventative education.

Incentives should be put into place to encourage companies to participate in such programmes. This should include populations based in rural and poor areas.

Panel Session: Who Pays? Who Saves?

This session addressed the opportunity to leverage the economics of mHealth to accelerate innovation and scale.

Panellists noted the contrasting timelines between the tech and healthcare sectors and agreed that the traditional path for monetizing medical technology needs to change. Taking roughly 15-17 years to reach scale (with years of analysis on safety, efficacy, comparative effectiveness and agency approvals), this pace of innovation is not sustainable.

The economics of the tech sector are based on scale, interoperability and continuous innovation, while the economics of healthcare are built largely on the delivery of diverse and complex services on a case-by-case basis.

The question for the panel was how the economics of these two worlds can coalesce. How can the massive scale and rapid innovation shaping the technology

sector combine with the unique, personalized and complex requirements of healthcare? Is there a way to connect people to the healthcare industry more easily and cost effectively, but in a manner that is safe, reliable and effective?

The panel's general outlook on striking this balance was positive but cautious. The need for connecting people at greater scale with lower costs and greater flexibility is widely acknowledged, but the need for a deeper appreciation for the details required to achieve this goal was the panel's clear message.

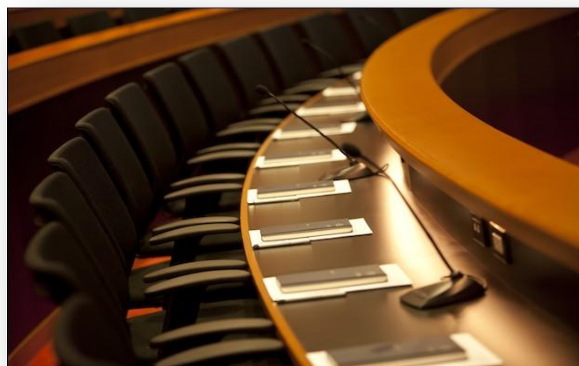
From the perspective of Mobile Network Operators, greater integration with back-end systems is needed to create a scalable platform capable of supporting multiple devices. Gaining a deeper understanding of the complexity of integrating billions of personal devices into legacy health systems (and making this information more widely accessible) was seen as a key priority.

However, this will not be easy. A core challenge identified was that the health sector is generally characterized by leveraging information asymmetries and technology silos. New personal communications services that democratize access to information are highly disruptive. What may be good for end-users may not be good for physicians. Their ability to delay the introduction of new, disruptive services should not be underestimated.

However, from the perspective of the cardiologist on the panel, the long-term value of supporting this posture was dismissed. Having patients wirelessly transmit information to their doctors is seen as being enormously valuable. Simply put, patients live longer when their devices wirelessly connect with doctors.

But, the economics for monetizing this value are difficult. Panellists described how the traditional business models of incumbent device manufacturers are built on incrementally adding new capabilities and then charging for them. The incentives for monetizing the sharing of device-generated *information* are not yet present. The expenses, liabilities and uncertain returns for data storage and data management are currently too great for the incumbents.

In contrast, the gaming sector – which does not share the same risks nor protect the same revenue base – is actively pursuing the health device market. Gaming, entertainment and social communities are viewed as powerful forces for change and a fundamentally



important way to motivate and engage individuals in pro-health behaviours.

In this light, panellists described the growing momentum from the patient community to “just do it”. Patients are not going to wait for the well-established healthcare community to change. It was asserted that patients feel empowered when they have the tools and knowledge to see what works and what does not.

Websites like “Patients Like Me”, where individuals share their own data with other patients, are seen as a response to a stalled system where clinical trials take an enormous amount of time.

Businesses – with very large patient populations – are also growing tired of paying for the massive economic inefficiencies in healthcare delivery. Businesses can address many of the escalating costs by themselves. They do not need to wait for governments to fix the problems of legacy healthcare delivery systems. Implementing employer-sponsored remote health systems, for example, can both reduce costs and improve employee productivity.

From the perspective of less-developed economies, the absence of legacy delivery systems, lower regulatory hurdles and tremendous public health concerns have created conditions where new collaborative models are taking root. The adoption of mobile-based health services is beginning to flourish and most likely will start a reverse technology transfer from developing to developed countries.

One example cited relates to counterfeit drugs. Counterfeit medicine is a massive inefficiency that adds additional costs. In Africa, the impact is particularly profound. Counterfeit medicines are 40-45% of the market in Nigeria and Ghana.

By creating a model that addresses this issue by distributing the risks, embracing the wisdom of crowds and shortening cycle times, a win-win-win business model was created between end-users, telcos and the pharmaceutical industry.

The solution discussed on this panel involves having individuals send an SMS with an ID number printed on a box of medicine. The SMS technology on a typical mobile phone has come in handy to authenticate the validity of the drug by the end-user.

Each authentically manufactured drug bears a unique serial number. While the drug moves through the supply chain, anyone can verify its authenticity by sending a SMS message to the mobile network, which responds in less than a minute.

In terms of a measurable return on investment, this solution helps companies recapture revenue lost to counterfeit drugs, understand how a drug moves through its supply chain and provides direct access to the consumer – providing demographic information for marketing purposes.

In terms of the evolution of this application, the location of counterfeit drugs is also being included in the value proposition. By using cell tower information on where the originating SMS messages were sent, the application provides real-time data on where various medications are located in the supply chain. When incidents with counterfeit drugs occur, resources can be more efficiently directed to isolate the problem, reduce risks and prevent their reoccurrence.

On a proactive basis, the use of this mobile-based feedback loop has great potential to be leveraged as a tool for treatment compliance. It is becoming much easier to gain visibility on whether a given patient population is actually taking their prescribed medications.

In conclusion, all members of the panel recognized the need for continued dialogue and the development of innovative business models. There was also a sentiment that everyone needs to continually demonstrate their long-term commitment to a healthy ecosystem. There is an abundance of opportunities for all.

Luncheon Keynote: The Emergence of a New Ecosystem for Healthcare Delivery, Global Public Health and National Security

Dr. George Poste, Chief Scientist and Regents' Professor and Del E. Webb Chair in Health Innovation, Arizona State University, USA, provided the keynote on the disruptive nature of mHealth and the opportunity for it to redesign global healthcare systems. Key trends noted in this keynote include:

- Healthcare is in a fundamental transition from a reactive, MD-centric model to one that is proactive, person-centric and focused on keeping people healthy
- Resources and information need to be optimized and designed as an integrated system; in its current state of fragmentation, there are vast unmet needs, unsustainable costs, massive inefficiencies, infinite demand, finite resources and escalating global threats and instabilities
- Technology is necessary but not sufficient to meet the challenges; what is also needed is the emergence of new decentralized organizational structures, alliances and business models; these approaches need to create market-relevant solutions that reduce complexity at a lower cost

From the perspective of shifting to person-centric care, the disruptive nature of this transition should not be underestimated nor the length of time it may take. The need to engage, incentivize and educate multiple constituencies (consumers, physicians, patients, providers, payers, governments) with entrenched behaviours and resistance to change will require a high degree of commitment from multiple stakeholders.

From a technology perspective, one of the greatest challenges lies in managing megadata, device heterogeneity and the secure, reliable and confidential delivery of real-time data services.

The combination of massive datasets (approaching zetabytes within 10 years) combined with complex, diverse, always-on end-user data will create unique opportunities and risks.

The challenges will centre on the policy frameworks for data mining (and clarity on the question of who owns health data); how data is structured so it is context-aware; and how it is aggregated, stored securely, integrated across multiple devices and kept private. Plus, with trillions of sensors set to come online within the next decade, spectrum scarcity will also loom as a challenge.

The growing importance of *integrated* health services was also noted. As things shift from an increasingly fragmented healthcare-centric universe to one oriented on point-of-care monitoring, patient self-management and remote care, the importance of an integrated home health environment will increase.

It will be important that homes are equipped with a robust, secure and reliable communications infrastructure so individuals have integrated remote care. Data streams from multiple specialists will need to merge so the complete picture of the individual is available.

The shift to person-centric health will also empower patient communities and the use of social networking. Empowered individuals who speak to one another, share insights and collaborate will be an extremely valuable feedback mechanism. One uncertainty is the increasingly blurry line as to what constitutes providing medical advice in an online environment. This uncertainty is even greater when communications crosses international borders.

A final point of the keynote addressed the question of who pays and the need for new billing codes. "If it doesn't get billed it won't get done," was one quote offered during the keynote. Given the growing influence of Centers for Medicare & Medicade Services (CMS) within the United States, its role as the arbiter of healthcare decisions for nearly half of all Americans was noted.

Another concern relates to the increase in the volume of health monitoring data flows. The rewards and incentives for doctors, nurses and health watchers need to be in place to ensure they are diligently monitoring and responding to all of the new devices that will enter the market.

Ultimately, it comes down to trust. People want reassurance. They want to be assured they are being monitored correctly and that personnel will respond quickly. There are needs for the integrity, security and confidentiality of the data.

End-User Scenario Workshop: Blind Spots of Tomorrow

The second workshop took the insights gained throughout the day and applied them to developing future scenarios.

With the end-user as a starting point, participants were asked to join one of six teams and to imagine that a global challenge has emerged in 2020 that no one saw coming.

The aim of the workshop was to use these scenarios to identify potential blind spots that are collectively being overlooked today.

Scenario 1: Health System Manager

This scenario painted a future where patient monitoring devices are given away for free – in exchange for end-user personal data. Problems arose when the device was hacked, exposing millions of poor, rural individuals and compromising the data flows generated by their devices.

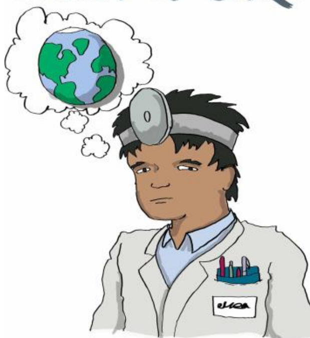
The incident created a global crisis where the trust of individuals was shattered, the scope of regulations inadequate and the ability to return to a known state impossible.

Members of this team focused on the need for an articulated set of global policies on the use of *all* personal data – not just health data. With that framework in place, the appropriate technological, policy and individual rights mechanisms could be developed.

Additionally, the panel suggested that the following can start to be addressed today:

- Establish local and global clarity regarding data collection and patient rights
- Establish a way for individuals to have access to their personal data so they can be engaged and in control of their personal health data and its management
- There needs to be a robustness in the system that can reach back to all users and quickly identify problems through anomaly detection
- Establish a model that has the ability to iterate and fix itself as security vulnerabilities and technologies evolve

Scenario 2: Point of Care



This scenario was based on a doctor who lives in a small country that invests heavily in its health networking infrastructure and an integrated data management platform. This country also places extremely tight controls on how the health infrastructure is used and with whom one can collaborate. It is technology and process focused, not rooted in delivering improved health outcomes.

Despite having the best technology in the world, the doctor in this scenario was frustrated by the top-down nature of the system and ready to leave his country in search of greater freedom.

The major blind spot identified was a lack of innovation and the inability to adapt over time. Pursuing national health over personal wellness was viewed as a mistake. Building only what a country needs and not learning from the rest of the world on how to meet the needs of individuals will create long-term challenges.

Other blind spots included:

- Not looking to the global community to learn, share and collaborate on best practices
- Focusing only on national needs and not those of the global community
- Focusing only on the activity of the physician, not delivering health outcomes
- Not focusing on the power of innovation along a continuum of care; under-utilizing lighthouse pilots
- Limiting the ability of a country to grow and adapt as its needs change

Scenario 3: The Caregiver

This scenario envisioned a world where personal care givers are overwhelmed with too many people to support and too many technology options. It is a world with an abundance of technological choices but not enough support to understand how to apply them in a holistic manner.

Actions that could be started in 2010 to offset this scenario include:

- Developing a “Smart Alert System” that monitors patients via a cloud-based platform and notifies the caregiver when the patient is not taking his or her medications and an intervention is required

- Creating face-to-face "On Demand Personal Services"; a core aspect of tomorrow's challenge will be that many are physical, not virtual
- Scaling current commercial services by using social networking tools to form a cooperative network for situations that are non-acute
- Building a new business where digital services, life sciences and personal support are all combined into one value proposition
- Establishing higher levels of assurance on the delivery, confidentiality, integrity, availability and performance of these remote monitoring data platforms

Scenario 4: Ageing Individual

This scenario involved an elderly woman dealing with multiple health issues living in an overcrowded, crime-ridden Latin American megacity. While she uses her mobile phone relatively frequently, she has little interest or understanding of using technology as a tool.

A key opportunity that can be leveraged today centres on creating a systemic approach for increasing the digital and health literacy of individuals.

Other opportunities to pursue in 2010 include:

- Better promotion of health literacy
- Finding enablers that are easy and attractive to learn
- Identifying personal incentives to use technology
- Leveraging local touch points within the local healthcare system to create a context for why technology can help
- Creating migration strategies that can guide people from where they are today to where they need to go

Scenario 5: Super Agents

This scenario was premised on the assumption that the functional capabilities and skills of mobile network agents (who sell airtime in emerging markets) would scale and extend. There was a question of whether the existing distribution system of emerging market wireless providers could transition into a community health resource.

The short answer is no. Airtime and mobile money agents – although highly qualified as a community resource – would not be suitable to transition into the delivery of selling other health-related services.

In that light, the distribution of mHealth services in 2020 would need to have the following characteristics: standardization, limited liability, interoperability and with a centralized way to certify the quality of health-related service providers.

Additional characteristics of the 2020 mHealth distribution system would need to include:

- Doctors and pharmacists engaged in commercial activity beyond selling pharmaceuticals and specific wellness and prevention services
- Working within a "fee-for-service" market context that is deployed in a country with few regulatory barriers and limited legal liabilities

Scenario 6: The "Wild Card"

The last group developed their own scenarios for 2020 and identified five "doomsday" situations. Overall, participants agreed that managing health-related data will be a key determinant in shaping the 2020 ecosystem. It was also strongly suggested that the pivot to personalized healthcare should begin immediately.

While none of these doomsday scenarios are desirable, all were positioned as somewhat probable.

- *Ageing bubble*: life expectancy extends to 110 and retirement stays at 65; we have 45 years of consuming healthcare services
- *Indifference*: we do nothing to solve the problems of 2010 and are wondering about the same issues in 2020
- *No evidence*: Social media dictate the way people receive healthcare; we lose evidence-based medicine and rely on the suggestions of our friends and what the media tell us
- *De-personalization*: healthcare is no longer personalized; we become numbers and the focus

is on cutting costs; different services and computers take over healthcare

- *Mass technology failure*: we are unable to access our electronic records and new technologies like Glo Caps no longer work

Closing Plenary

The final session wrapped up of the day and identified the key trends. Recognizing the broad nature of the day, the following themes seemed to reoccur.

Scale

The technology and medical sectors differ widely in their notion of scale. The healthcare industry needs to run faster and catch up to the opportunity of leveraging 5 billion devices.

This will require a shift in the nature of innovation and a focus on simple, low-tech solutions that can be deployed globally. One panellist noted that we will never get to scale if we focus on sophisticated solutions that serve hundreds of thousands of individuals.

Sustainable solutions need to be designed that serve billions. The pivot to serving billions in a sustainable fashion will take time.

Complexity

There needs to be a deeper appreciation that mHealth is emerging as complex, dynamic and distributed system. Its value and innovation will be largely created at the edge and flow inward.

There was broad recognition that top-down, centralized systems, structures and processes are transitioning to personalized, decentralized and adaptive networks, but the timeline for this evolution is unclear.

Taxonomy

A somewhat provocative comment from the panel was that the umbrella term “mHealth” is too broad and perhaps no longer useful. The analogy was that defining mHealth is akin to the three blind men who describe different parts of an elephant – everyone and no one is right.

In this light, there needs to be an agreed upon taxonomy for mHealth so richer and more coherent conversations can be held. The differences between health, public health and healthcare also need to be better defined.

Within this need to segment and parse the mHealth domain, participants called for greater focus on the top priorities. The community needs to identify the low-hanging fruit and galvanize support to act on them.

Identifying simple, straightforward things that can be placed in everyone’s phone was one idea. While the specifics were not explicitly agreed on (maternal health was one of the front runners), there was a call to promote a few lighthouse case studies quickly.

Awareness

Among all of the ecosystem members, there needs be a greater emphasis on communications and generating awareness on the impact and value of mHealth. The provider, government and industry communities need more “pull” with greater focus on enabling new business models and demonstrating the returns. Participants suggested that no single business model would apply universally.

The focus of innovation cannot just be at the edge of the discussion. There must be sustained commitment to working on the hard stuff. Ignoring the core

challenges and taking the path of least regulatory resistance will come at a cost.

User Centricity

Perhaps the strongest theme heard throughout the day was the need to pivot to solutions and systems design which are truly end user-centric. Understanding what this change would entail, the risks, uncertainties and opportunities was highlighted a key learning opportunity going forward. Along with a taxonomy of mHealth, a taxonomy of what being —user-centric means may also be beneficial for the community.

In conclusion, the panelists agreed that the work of Forum needs to continue. Along with dialogue which is focused and tied with concrete action plans, there needs to be a prioritized list of areas to address. In that light, the Forum will continue to raise the key mHealth issues at its future summits, will partner with key organizations for focused knowledge exchange and will highlight key innovations and lighthouse case studies.

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WORLD ECONOMIC FORUM
COMMITTED TO IMPROVING THE STATE OF THE WORLD

Appendix

A Global Cooperation for the Advancement of Mobile Health and Wellness

A Proposal by the World Economic Forum Global Agenda Council on the Future of Mobile Communications

Council Chairman's Message

With nearly 5 billion mobile phones in use, there is an unprecedented opportunity to leverage humanity's most pervasive global platform to enable the transformation of industries and the improvement of lives globally.

The Global Agenda Council on the Future of Mobile Communications envisions a world in the next five years in which everyone is connected with sufficient access to an Internet-based, open ecosystem of information, devices and applications through incentives for technological, social and business innovation.

The Council calls for strengthened global coordination among stakeholders to provide for investment, interoperability, innovation and social inclusion by leveraging the pervasiveness of mobile networks and devices as an enabling global platform to transform multiple industries and social infrastructure.

The health sector is a top priority. The Council aims for the health sector to become better interconnected and more personal by increasing productivity, reducing costs, facilitating connections and improving wellness.

Mobility solutions empower users to take control of their health. We see a tremendous opportunity for mobile solutions to not just impact, but also truly transform health and wellness over the next five years. Healthcare today can be viewed much like the banking industry of 20 years ago.

At its core, it is based on face-to-face interactions that are not widely scalable. Because of rising costs and demand from ageing populations, the healthcare industry is facing a critical crossroad. Much like the mobile phone industry, the health sector needs to become consumer-focused and value-driven to sufficiently scale and meet demand.

The Council believes mobile solutions are key for health to become personal, real-time and closed loop in order to reduce costs, increase wellness, improve productivity of healthcare providers and affect social benefits globally, while deepening connections between different levels of the clinical and extra-clinical experience.

We invite you and other mobile health institutions, clinics and centres of experience to read and respond to our following goals and to participate in our proposed knowledge sharing and cooperative framework to help advance mobile health and wellness solutions globally.

Our Goals for Mobile Health Solutions

The Council has identified seven key goals that, if accomplished, will significantly advance mobile health and wellness solutions:

1. Empower individuals to keep themselves healthy (wellness) and manage their own health (e.g. chronic care) via real time feedback, while owning and controlling their own health data

2. Cost-effectively improve and extend the reach of existing health services to support more people at all economic levels

3. Increase collecting and sharing of a base of evidence to demonstrate efficacy and return on investment

4. Integrate mobile health solutions into payment programmes of governments, insurers, employers and other payers

5. Incentivize government funding of wellness programmes due to long time horizons between investment and avoided cost.

6. Facilitate the connections between critical auxiliary infrastructure, such as supply chains and community information systems and the health sector proper.

7. Support of an open ecosystem characterized by its interoperability, competition, innovation and consumer choice

Our Proposal

The intent is to create a global framework to address the growing needs of effective mobile health solutions over the next three to five years. We believe it is critical to work closely with mobile health-related

clinics and centres of experience to gain consensus on the key goals for mobile health solutions, share knowledge and coordinate activities.

Common Goals: The seven goals we have identified are just a starting point. These goals cannot be ours alone if the health and mobile industries collectively are to achieve them. To begin an initial dialogue, we ask for you to either acknowledge that these goals are top collective priorities or voice your opinion otherwise. Our aim is to reach a consensus and make these shared common goals.

Initiatives and Gaps: We also ask for you to summarize your key initiatives that support and advance these goals. Additionally, we would ask you to identify any unmet needs associated with these initiatives where additional collaboration could create significant value.

Research and Knowledge: We believe the research and knowledge from the various mHealth domains is fragmented at this time. Therefore, we propose a framework to improve global knowledge flows and coordinate some level of effort across these institutions on initiatives and issues reflecting the common goals.

Framework: To achieve the common goals, the Council adopts a model that focuses on building on existing initiatives across the globe and promotes synergy among organizations that have common interests in effective mobile health solutions.

The Council has identified a framework for its mobile health efforts that includes the following components of activities:

- Identify key mobile health initiatives as proposed during the Summit on the Global Agenda in Dubai in November 2009
- Select global organizations that are engaged in mobile health solution projects that align with the Council's goal and objectives
- Invite these organizations to share their project plans where they may address initiatives identified by the Council
- Request these organizations to identify gaps in coordination and collective needs that, when eliminated, could help accelerate their efforts
- Identify and seek to better understand of which auxiliary services and "surrounding infrastructures" can most impact the acceleration and adoption of mobile health innovations and seek to engage with the appropriate institutional agents
- Create a global advisory board or similar structure comprised of the World Economic Forum, health and telecommunications industry partners and international associations and organizations
- Create an educational programme for policy-makers to accelerate the embodiment of public policies in support of mobile health initiatives

Role of the World Economic Forum

As the sponsoring institution, the World Economic Forum will serve in its capacity as a convening organization to provide a neutral platform for dialogue and knowledge exchange. Additionally, with the support of the community, it will serve to synthesize the collective insights and objectives of the community and share them with other relevant activities and actors associated with the Forum.

Regarding the operational and administrative elements of the community, the Forum would be in support of a model based on agreed upon shared responsibilities throughout the community.

Global Board

In parallel, we propose creating a global advisory board or similar structure to help steer this global collaboration. The primary roles of this global board are to act as advisers to the participant community and to help embody the initiatives in the policies.

We propose that the board meet on a quarterly basis to discuss governing topics including but not limited to:

- Best practices
- Policy recommendations
- Communication strategies
- Role models
- Case studies
- Test beds
- Regulatory environment
- Funding, size and scope
- Suggested projects

Web-based Information Sharing Tool

We believe a community-based website and information repository (where relevant data is shared in an open and extensible format) will help foster collaborative information sharing on these goals,

initiatives and success factors among the key mobile health participants.

We expect to further develop the proposed adviser board structure and information-sharing tool design over the coming months and welcome your feedback on these items during this process.

Fully aware of the existence of redundancies across the mobile health data ecosystem, the proposed tool shall focus on driving exchange rather than on replicating existing nodes of information sharing within the mobile health and mobile innovation space.

Summary

Through the successful implementation of mobile healthcare initiatives as outlined by this proposal, the Council aims to coordinate open partnerships of organizations that collect, create and share data on the efficacy of mobile solutions.

We believe this cooperation can significantly advance and accelerate mobile health solutions, allowing them to gain traction and reach scale much earlier than on their own. This framework will act as anchoring proof that wireless communications indeed bring social benefits not only for the healthcare industry but for other industries as well.