

mHealth in WASH: the future of global development?

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BACKGROUND

People around the world are searching for innovative means to solve the water, sanitation, and hygiene (WASH) issues that affect billions of people worldwide. Women and girls travel for hours each day to collect their daily water supply preventing them from attending school. Over 2.5 billion people do not have access to adequate sanitation and resulting in the widespread practice of open defecation. Basic handwashing practices, proven to be the most cost effective method against the spread of water-borne diseases such as diarrheal disease, are not upheld in many communities due to cultural norms and barriers to health education. Public health professionals, technical experts, and organizations worldwide are working tirelessly to meet the Millennium Development Goals (MDGs) by 2015 in hopes of improving health outcomes related to WASH.

It is estimated that by 2013, more Africans will have access to a mobile phone than they will to an improved water source.

The number of mobile phone subscriptions is expected to increase at a rate of 7.2% annually in developing countries compared to 2.8% in developed countries.ⁱ By the beginning of 2014 there will be more mobile phone subscriptions than people in the world.ⁱⁱ In fact, the number of mobile phone subscriptions has been rising dramatically over the past decade and the

number of mobile phones has surpassed the number of toilets.

Mobile phones offer an avenue to reach the most at-risk populations and change health outcomes.

Although some public health professionals may view this situation as an outrageous limitation in the efforts to solve the WASH crisis, it should be accepted as an *enormous opportunity*. The widespread use of mobile technologies, even in rural and developing areas, provides public health professionals with an opportunity to reach the most at-risk populations in a timely manner. In communities where the social value of toilets remains low, water is often inaccessible, and handwashing is not practiced, the use of mobile technology can help reduce barriers to WASH and increase positive health outcomes, such reducing the incidence of diarrheal disease.

WHAT IS MHEALTH?

mHealth can be defined as: “the use of mobile technology to improve health outcomes, healthcare services, and health research.”ⁱⁱⁱ

This can be done using different kinds of mobile technology, whether it is mobile phones, iPads, smartphones, or GPS units. From the public health lens, improving health outcomes is the most relevant and the most important outcome related to mHealth.

MHEALTH

the future of WASH?



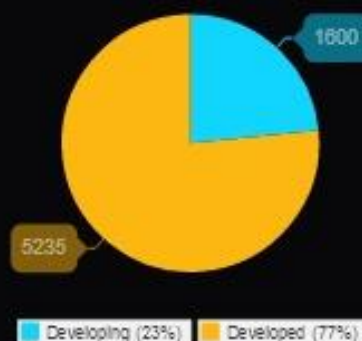
mHealth:

The use of mobile technology to improve health outcomes.

WASH:

Water, Sanitation & Hygiene

Number of mobile phone subscriptions (in millions) by region



Number of People with Access to Phones v. Toilets



Applications of mHealth

Education & Behavior Change Communication



Example:
Reminder SMS to wash hands after using toilet

Data Collection & Reporting



Example:
Collecting data about location of water pumps

Supply Chain Management



Example:
Keep shops stocked with chlorine tablets

Financial Transactions & Incentives



Example:
Pay for water services through mobile device

Some of the inherent benefits of mHealth:

- * The spread of mobile phones has greatly reduced the time and cost of communication between multiple, often remote areas.
- * Mobile phones are increasingly being used as cost-effective tools for collecting data and disseminating information.
- * In the past decade, water and sanitation practitioners have begun deploying mobile phones as tools to improve water, sanitation, and hygiene (WASH) services.

Some of the challenges of mHealth:

- * Reliable access to phones and a consistent means to charge the mobile devices are a barrier in some of the most remote areas.
- * Low literacy rates may provide to be a barrier in that educational material cannot be disseminated through writing on a mobile phone.
- * Cost of services (i.e. SMS service) may be too costly for the target population
- * A lack of local and national government cooperation may hinder mHealth progress in certain communities or nations.

HOW CAN MHEALTH BE USED IN THE FIELD?

mHealth can be applied to many different health issues in a multitude of ways. Research^{vi} has identified twelve mHealth and ICT applications that have been commonly used in

the field. Several of these common uses of mHealth can be applied directly to WASH.

Common applications of mHealth:

1. Client education and behavior change communication (BCC)
2. Sensors and point of care diagnostics
3. Registries and vital events tracking
4. Data collection and reporting
5. Electronic health records
6. Electronic decision support
7. Provider-to-provider communication
8. Provider workplanning and scheduling
9. Provider training and education
10. Human resources management
11. Supply chain management
12. Financial transactions and incentives

The following case studies will serve to provide examples of mHealth in the WASH sector and to identify key areas that need improvement. mHealth is used in the WASH sector in four specific applications: Client education and behavior change communication (BCC); data collection and reporting; supply chain management; and financial transactions and incentives.

Client Education and Behavior Change Communication

Case Study: Text to Change^{viiviii}

The handwashing campaign in Uganda took place on Global Handwashing Day in 2011. There was a major community event and community health workers encouraged villagers to send an SMS to “Text to Change” signifying their pledge to wash their hands at critical times, such as after using the bathroom.

Key Facts:

- ✓ 12,000 pledges were collected through SMS and Community health workers.
- ✓ Respondents received a reply in their local language educating them about the importance of washing hands with soap to prevent diarrheal diseases and pneumonia.
- ✓ During the event, community members were taught the correct methods of hand washing through demonstrations by the health workers, community leaders and officials from Ministry of Health in Uganda.”

Challenges:

- There was often more than one person using a cell phone to respond. Therefore, of the 12,000 pledges, there were only about 500 unique numbers of which only 200 respondents completed a follow-up call.
- First results showed that 98% of the respondents washed hands the last time they visited the toilet. The study did not detail how long after the campaign the follow-up was performed. Self-reporting may present a bias, and if the follow-up was performed immediately following the campaign, this is not a good measure of the sustainability of the behavior change.
- *Recommendations:*

- supplementing mHealth with other programs to reinforce behavior change

Data Collection and Reporting

Case Study: NextDrop^{ixx}

This mHealth platform reaches about 5,000 people in India who use it for two main applications:

1. receiving SMS notifications of when water will be turned on
2. reporting problems with water supply and sanitation and track the solution



NextDrop has received much praise from customers due to the platform’s time-saving aspect. Many users have reflected that they are able to be more productive with their time because they are not waiting for the water taps to turn on. Instead, they receive a text message alerting them that their water will be turned on in an hour. This allows women, in particular, to travel outside the home and complete daily tasks.

**“Now I am free to go
anywhere I like!”**
NextDrop customer, female

One criticism from customers is that sometimes the text messages are not received in a timely manner. Although the messages are sent on time the majority of the time, there are some

instances when a text message will come an hour or two after the water has been turned on. This can prevent a household from being able to collect water that day.

Additionally, NextDrop is useful to those who have piped water. That means that NextDrop does not apply to the rural populations without piped water. Although there are many people in urban areas without access to clean water and sanitation, rural areas often have the most need.

Supply Chain Management

Case Study: Movercado^{xi}

Movercado is a platform launched by PSI/Mozambique that delivers health products to at-risk populations by utilizing small businesses. Movercado aims to support small businesses by **supplying them with health products**, such as water purification chlorine tablets, bed nets, and condoms free of charge. PSI uses a mobile network to send SMS messages to a target population. The SMS contains health information and a code for a health product that can be redeemed at a local shop. Shop owners validate the customer's code before giving them the health product. The health product may include a bednet, chlorine solution, or Oral Rehydration Solution (ORS).

Shop owners submit the code to a mobile number in order to be reimbursed for the price of the product. This process is completed through mobile money transfers. This monitoring aspect allows automatic tracking of shop inventories so products can be resupplied in a timely manner.

Movercado has several limitations despite its insightful approach. First, there are low mobile

phone subscriptions in some areas of Mozambique, so some of the at-risk populations may not have access to the mobile codes, but still desire the health product. Second, there is a potential for low literacy rates and thus the inability to the health messaging. Thirdly, sustainability is an issue because when PSI/Mozambique depletes its financial resources on the health products, the target population will no longer be able to get the products.

Movercado may be well suited to work in tandem with other educational health programs to reach all at-risk populations, including those who may not have access to a phone or those who are illiterate.

Financial Transactions and Incentives

Case Study: M-Pesa^{xiixiii}

M-Pesa is the largest mobile money platform in the world, getting its start in Kenya and expanding to Tanzania, Afghanistan, South Africa, and India. It is used to deposit, transfer, or use money or airtime stored in an account on the cell phone. In 2012, 17 million M-Pesa accounts had been registered in Kenya.

After restructuring the original platform, M-Pesa has seen much success in Kenya and some of its other pilot countries. Despite the success, there are a few challenges that limit the potential to reach the most at-risk populations. First, M-Pesa only allows users with a **national ID card** or passport to deposit, withdraw, and transfer money easily with a mobile device. People living in rural areas that may not have a national ID card would not benefit from M-Pesa due to the user restrictions. Additionally, critics claim the platform is undermining local banks.

GAPS ADDRESSED:

One of the major limitations that mHealth may present in the WASH sector is the inability to reach all at-risk populations because of the sheer fact that not everyone has access to a cell phone. Although these numbers are growing, mHealth should not serve as the only means in which to reach these populations. WASH must be approached differently from other sectors because it is not necessarily focused on point of care or keeping electronic health records, but in preventing adverse health effects due to poor WASH. This prevention spans infrastructure, market logistics, data collection, and behavior change. Learning from open source data may be one way to use mobile health more effectively in the WASH sector. Akvo is a company that is founded on solving the WASH crisis through using open source data that is available for all to see and learn from. Being able to learn from others successes and shortcomings is crucial in any field, but it is even more so in a field that is new and developing quickly. As mobile health sees financial growth and the expansion of pilots to programs, these lessons learned will be instrumental in informing future mHealth programs.

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