Sizing the Business Potential of mHealth in the Global South:
A Practical Approach

By Vital Wave Consulting

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Introduction

Across the Global South, lower-income populations need quality education and health care to help meet basic human needs. As the number of mobile-service subscribers continues to skyrocket, the infrastructure and installed base for delivering services via the mobile phone continues to expand. Meanwhile, the dwindling number of new subscribers necessitates a shift of focus by the mobile communications industry to new sources of revenue. To justify the investments needed for the development and commercialization of mobile services such as mHealth (the delivery and monitoring of health data by mobile devices), it is necessary to gauge the market opportunity that exists for these services.

This report builds on a previous report, *mHealth in the Global South: Landscape Analysis,* prepared by Vital Wave Consulting to examine the current mHealth landscape and provide an overview of the scope and impact of mobile initiatives on health care across developing regions. The Landscape Analysis also analyzes critical success factors for making mHealth more widely available through sustainable implementations. mHealth programs require the participation of stakeholders from across international organizations, governments, NGOs, and private companies.

> **This report was originally prepared for the *Making the eHealth Connection* conference – a gathering of mobile health stakeholders in Bellagio, Italy from July 31 to August 8, 2008. It was revised for the Global mHealth Alliance to form a foundational base for the Alliance's thought leadership library.**

To stimulate cross-sector participation and partnership, it is necessary to size and locate the mHealth market opportunity so that these organizations can prioritize their investments, align mHealth investments with other business programs, and justify these expenditures to internal and external stakeholders.

Given the nascent character of the mHealth industry, competitive indicators needed to develop a market size from the bottom up are absent, and data on health expenditures from the top down lack detail for most developing countries. Therefore, determining a credible market size requires approaches that maximize the use of imperfect secondary data, including additional inputs from experts in the health field in the developing world. To move toward the development of a credible market sizing, this report identifies the available secondary data and provides three possible approaches for assessing the market size.

Part 1 – Market Sizing Overview examines the need for sizing the market opportunity for mHealth solutions in the Global South and the availability of reliable data to execute the sizing. Based on analysis of readily-available data on health care expenditures and health care indicators in three developing countries (Turkey, Vietnam, and South Africa), Vital Wave Consulting identifies the missing pieces needed to assess the potential health care expenditure that could be shifted to mHealth.

Part 2 – Definitions clarifies the main terms used in this paper. These definitions were originally proposed in Vital Wave Consulting's report, "mHealth in the Global South: Landscape Analysis," created for the UN Foundation.

Part 3 – Methodology Overview describes in detail the top-down and bottom-up approaches for sizing the mHealth markets and the three methodologies proposed as the most viable for this exercise. All proposed methodologies estimate the market opportunity for each of the mHealth application areas but rely on different sets of data.

> **Methodology 1:** Top-down from health budgets with needs-based segmentation

> **Methodology 2:** Top-down from health ICT or eHealth budgets

> **Methodology 3:** Bottom-up from health care program cost and volume potential data

In addition to detailed step-by-step explanations, each of the methodologies is evaluated for its advantages and disadvantages.

Part 4 – Methodology Comparison contrasts the three proposed methodologies and comments on the quality of their results.

The **Appendix** provides an overview of the data on health care expenditures and health care systems of the three countries researched in depth—Turkey, South Africa, and Vietnam—and evaluates its quality.

This report provides professionals from across sectors and industries with methodologies for sizing the market opportunity for mHealth solutions in the Global South. As these methodologies rely on primary and secondary research, this report was prepared after thorough research for available data and identifies gaps where subject-matter expert input is needed.

Part 1 - Market Sizing Overview

Market sizing is generally measured at two levels: *total market and addressable market.* Total market is the least granular measure of market opportunity and usually represents a large demographically or commercially identifiable group. In the mHealth context, the total market can be defined as governments and organizations around the world that are currently providing health-related services and programs. In some cases, the end user (patient or message recipient) would also pay for mHealth services, and might be considered part of the total market. The total market opportunity is thought of as the total amount of funds available from all customers for health care programs. Total market measures are normally a first step in market sizing, but they are rarely used by organizational decision-makers because the total market does not reflect the number of customers who are *likely* to buy. For this, one calculates an addressable market.

The addressable market is a subset of the total market. Put simply, it is the number of individual customers who are realistically *willing* and *able* to purchase a product or service. The "willing" part of the definition connotes that the solution is appropriate for fulfilling a customer's need, or set of needs. The "able" part indicates that the customer has the resources necessary to acquire and effectively use the solution. In other words, they have the requisite financial means to purchase the solution, minimum infrastructure to use the solution, and they can acquire the solution through reasonable means.

To measure the addressable market of mHealth, one has to understand the subset of willing and able customers. The "willing" will be based on the impact of mHealth programs and how that impact compares to other potential investments. This is difficult to measure, as mHealth is currently in its infancy and very limited data is available to measure its impact. Investors today make judgments about the value of mHealth based on their own experience. This is a valid and necessary approach for all new industries or technology applications, but it poses challenges to sizing the market on a global scale.

Measuring the "able" part of an addressable market group is based on data that indicate how many customers have the means to purchase mHealth services. This is also challenging, as data for developing countries are often incomplete, unavailable, outdated, or too limited to capture the diversity and nuance of the country environment for a particular solution. Compounding that challenge is the fact that both eHealth and mHealth are in their infancy in many developing countries, and estimates of current expenditure on such solutions are not sufficient to extrapolate the market potential. In addition, there are limited data about health spending at the sub-account level to illustrate how countries allocate budgets across specific programs. If available, such data could be used as an indicator of mHealth market potential.

The exercise of market sizing is similarly complex, as there is no one-size-fits-all approach. Some market sizing approaches follow a "top down" methodology, cutting the market of a larger region or industry into smaller pieces. Other approaches follow a "bottom up" methodology, extrapolating a market size for the geography or industry based on country-level or competitive data points. However, all approaches rely on credible and current data.

To inform and develop a credible methodology for mHealth market sizing, Vital Wave Consulting conducted a thorough search of available data from across international organizations, country health ministries, press and journal articles, and company and project papers and documents. The data search covered three developing countries from different regions of the world (South Africa, Turkey, and Vietnam) and included documentation of mHealth projects implemented worldwide. The following is a summary of the available and unavailable data found in this investigation:

Available data [1]

- Total health expenditure (total and percent from private, public, and external sources)

- Health workforce (e.g., the number and geographic distribution of nurses, physicians, dentists, pharmacists, beds, hospitals, health care posts, and health care centers)

- Health service and care indicators (e.g., mortality, morbidity, disability-adjusted life years per disease, hospital admissions, HIV and TB prevalence)

- Drug expenditure (total and per drug type)

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[1] More information about the data found and the documented sources can be found in the Appendix.

- Information on the organization of the health care systems as well as trends and the latest developments in these particular countries

- Anecdotal, non-comprehensive information about potential savings and improved operational efficiency from implemented mHealth solutions, covering several solutions across selected countries

Limited or unavailable data

- Health budgets at the sub-account level by function or activity (e.g., ICT, preventive and primary health care service, health care education, and behavior change campaigns)

- Health budgets and health care indicators broken down by area (urban versus rural) or by area unit (province)

- Credible systematic study of the potential impact or cost savings from implemented mHealth solutions

Data about the health care systems and expenditure in the countries researched is abundant, but very high-level, inhibiting estimates of the portion of expenditures that could be shifted to mHealth. Publicly available sources of information (e.g., the World Health Organization and national ministries of health) and paid databases provide reliable information on those topics, but more in-depth knowledge from subject-matter experts at the country level is needed. For example, input from the latter would be critical when assessing the mHealth market opportunities for countries with great disparities in spending and availability of health care service in urban and rural areas. Such disparities determine different needs for mHealth solutions and are not always reflected in the readily available data.

Another important missing piece is a credible study of the impact of mHealth solutions. Information about the benefits can be found in some project reports and on the websites of mobile phone operators and companies developing such solutions, but this information does not substantiate impact beyond a single solution or small geography or target market, if at all. Additionally, the impact of a particular solution will not necessarily be the same in two different countries. For example, the SATELLIFE project estimates that owning a PDA device saves a medical officer in Uganda 9.37 hours per week on average.[i] The same project, if replicated in Turkey, could have a very different impact. Until comprehensive studies are done, one has to rely on subject-matter experts or field interviews to estimate the impact of different mHealth applications.

Below, Vital Wave Consulting proposes three methodologies for assessing the market opportunity for mHealth solutions in the Global South and its individual regions and countries. This report does not exhaust all possible methods for sizing the mHealth market, but instead provides an overview of the three methodologies that would give the most thorough picture of the mHealth investment opportunities.

Given the above-mentioned data limitations and challenges, all three proposed methodologies rely, to different extents, on primary research in addition to secondary research. Also, given the nascent character of the mHealth industry, the proposed methodologies concentrate on estimating the future or potential spending on mHealth.

Part 2 - Definitions

This section includes explanations of the important terms used in this paper:

- mHealth and its distinction from eHealth and telemedicine

- mHealth application segmentation

- Developing countries and the Global South

These definitions were originally proposed in Vital Wave Consulting's report, *mHealth in the Global South: Landscape Analysis*.

eHealth, mHealth, and Telemedicine: Definitions and Relationships

Many and diverse definitions of the terms eHealth, mHealth and telemedicine exist. However, there is general agreement that eHealth represents a superset of mHealth and telemedicine. eHealth is typically perceived as encompassing the use of any electronic technologies to provide health services. It is independent of patient/provider proximity or the use of specific technology.

For the purposes of this paper, Vital Wave Consulting, relying upon the input of industry experts and research, has utilized the following definitions:

- **eHealth**: the delivery of health-related services via information and communication technology.

- **mHealth**: a subset of eHealth referring to the delivery of health-related services via mobile communications technology.

- **Telemedicine**: a subset of eHealth referring to health-related services delivered remotely with clinical participation via electronic communications. Telemedicine also has overlap with mHealth when mobile communications technologies are employed in the delivery process. (Telemedicine is often associated with the term "tele-health," which may encompass a broader definition of remote health care that does not necessarily involve clinical services.)

Figure 1 presents the terms described above in the context of the corresponding health care application segments. The segments shown at the top of the table reflect the growing sophistication of application and technological requirements as they move from education and public awareness, at the left, to diagnosis and consultation on the far right. It is mobile technology's unique characteristics of portability and access that provide completely new solutions to health care needs across a broader range of health care applications.

Figure 1: Positioning eHealth, mHealth and Telemedicine

mHealth Application Segmentation

By surveying a broad range of mHealth programs, initiatives, and applications, Vital Wave Consulting created an application segmentation model based on targeted health care goals. Figure 2 lists these segments, with corresponding descriptions and examples of specific mHealth programs in the Global South. Reading the list from top to bottom, the application segments have increasing technology requirements and complexity of implementation. These application characteristics have an inverse relationship with their potential for scale. Therefore, education and awareness mHealth programs have the simplest technology requirements and implementation methods with the highest potential for scale. Analysis, diagnosis and consultation applications via mobile technology are more complex and difficult to scale.

Application	Description	Potential Benefits & Savings Examples
Education & Awareness	Primarily one-way communication programs to mobile subscribers via SMS/text messaging in support of public health, behavior change campaigns.	• Improved awareness • Enhanced quality of care through education • Saved time and travel cost from distant learning • Decreased cost per impression
Data, Health Record Access	Applications designed to use mobile phones, PDAs, or laptops to enter and access patient data. Some projects may also be used by patients to access their own records.	• Improved data accuracy • Saved office supplies • Reduced time for collecting and transcribing data by medical personnel • Increased productivity within health system • Enhanced quality of care
Monitoring/ Medication Compliance	One-way or two-way communication to patient to monitor health conditions, maintain care giver appointments, or ensure strict medication regimen adherence. Some applications may also include inpatient and outpatient monitoring sensors for monitoring of multiple conditions (such as diabetes, vital signs, or cardiac.)	• Improved medication adherence and reduced DALYs, medication cost, general health care cost • Improved service because of better monitoring • Saved travel time (both doctors and patients) • Reduced expense for hospital stays • Saved time for doctors through access to automated medical history • Saved resources from fewer missed appointments
Disease/ Emergency Tracking	Applications using mobile devices to send and receive data of disease incidence, outbreaks, geographic spread of public health emergencies, often in association with GPS systems and backend applications for visualization.	• Enhanced disease surveillance and control
Health/ Administrative Systems	Applications developed for "back office" or central health care IT systems allowing for access by and integration with mHealth application. Such applications often tie in to regional, national, or global systems.	• Reduced IT/MIS cost • Reduced cost from better IT integration, reduced compatibility problems, ease of upgrades
Analysis, Diagnosis, and Consultation	Applications developed to provide support for diagnostic and treatment activities of remote care givers through internet access to medical information data bases or to medical staff.	• Increased productivity within health system • Enhanced quality of care

Figure 2: mHealth Applications, Descriptions, and Potential Benefits and Savings

Recognizing the distinctions between these segments and understanding the characteristics of relating technologies is a critical part of being able to build applications that promise sustainability and scale. For some health care applications, mobile technology provides a means to address specific tasks better and faster. However, current mobile technology is not ideal for some mHealth applications that require greater bandwidth or lower costs. Mobile technology's appropriateness to any given application depends on a balance of technical performance, cost, and efficacy – conditions that will continue to evolve.

Developing Countries and the Global South

Throughout this paper, the terms "developing countries" and "Global South" are used interchangeably. Vital Wave Consulting follows established World Bank economic benchmarks to define "developing countries" or "Global South" as countries that have a gross national income (GNI) of $10,725 or less per capita. In the private sector, the term "emerging markets" is frequently used interchangeably with "developing countries."

Within developing countries, Vital Wave Consulting distinguishes between three subgroups according to population size and economic status. More information about these terms and categories may be found in the "Insights" section of the Vital Wave Consulting website.

Part 3 - Methodologies Overview

Based on available information and extensive research on health care markets in developing countries performed by Vital Wave Consulting, both top-down and bottom-up approaches are feasible for estimating the market size for mHealth solutions. Three possible methodologies are described in detail below.

The two top-down approach methodologies (Methodology 1 and Methodology 2) start from the total health care or Health ICT/eHealth expenditures per country and estimate the portion of this expenditure that can be shifted to mHealth solutions. The bottom-up approach (Methodology 3) starts with the different mHealth application areas identified in Figure 2 and estimates the potential savings from their implementation. All proposed methodologies estimate the market opportunity for each mHealth application. The addressable market size, in this case, is the sum of the market sizes per application. Choosing the most appropriate methodology depends on preferences for specific approaches, geographic areas of interest, time, and budget.

Methodology 1 – Top-down from Health Budgets with Needs-based Segmentation

Methodology 1 estimates the market opportunity for mHealth solutions as a portion of total health expenditure for each application area. The total market size is equal to the size of all markets per application combined.

$$\text{Market Opportunity (by application)} = \text{Total Health Expenditure} \times \text{\% of Health Expenditures for Application Area} \times \text{\% of Health Application Spending that can be converted to mHealth}$$

Step 1: *Determine Total Health Expenditure*

Collect information about total health expenditure in each country, accessible via public sources of information, such as the World Health Organization.

Step 2: *Establish Geographic Segments Based on Health Need*

Segment the developing countries according to their needs for the six mHealth application areas using available secondary data (e.g., disability-adjusted life years, health expenditures per capita, land area, rural and urban populations, and number of doctors and hospitals). Determine country segments with similar need levels (low, medium and high) for each application. For instance, countries with high instances of infectious diseases and stressed health system infrastructure (e.g., nations in sub-Saharan Africa) may have greater needs for education and awareness and monitoring/medication compliance applications than countries with a lower incidence of infectious diseases and more advanced health systems (e.g., nations in Eastern Europe).

The required data can be obtained from public sources of information, such as WHO, the United Nations, and the World Bank. More specific information can be found in paid databases such as Business Monitor International. Available data will be validated through and augmented by expert opinion. A sample needs-based segmentation is shown in Figure 3.

mHealth Application Area	Segment 1	Segment 2	Segment 3
Education & Awareness	◆◆◆	◆◆	◆
Data Entry, Health Records Access	◆	◆◆	◆◆◆
Monitoring/ Medication Compliance	◆◆◆	◆◆	◆◆
Disease/ Emergency tracking	◆◆◆	◆◆	◆
Health/ Administrative System	◆	◆	◆◆◆
Analysis, Diagnosis, and Consultation	◆	◆	◆◆

◆◆◆ High Need   ◆◆ Medium Need   ◆ Low Need

Figure 3: Needs-based Segmentation (sample output). Table for illustrative purposes only.

Step 3: *Determine Total Health Expenditure per Determine Total Health Expenditure per Application Area (as Percentage of Total Health Expenditure)*

Using inputs from subject-matter experts across the six mHealth application areas combined with any anecdotal data found for representative countries within the segment to validate the experts' opinions, the portion of total health spending allocated to each application area for each segment can be estimated. This process is demonstrated in Figure 4.

Step 4: *Convert Total Health Expenditure per Application Area to mHealth-specific Expenditures*

Using inputs from subject-matter experts across the applications, one can determine the portion of total health spending by application that could be transferred to mHealth in the different geographic segments. This step incorporates a country's need and the potential impact of a particular solution, as well as the cost trade-off between the mHealth application and traditional services. For instance, mHealth education and awareness campaigns in sub-Saharan Africa could command a higher percent of the overall budget if they directly replace radio, print, and television campaigns. The penetration of mobile services across the population and coverage of different geographic areas would also figure into this calculation, taking into consideration the increased impact a program could have with expanded mobile coverage. A sample calculation of the potential impact in an application area for varying segments (such as countries or regions) is shown in Figure 5.

Figure 5: Portion of Health Application Area Spending that is Convertible to mHealth Table for illustrative purposes only.

mHealth Application Area	Segment 1	Segment 2	Segment 3
Education & Awareness	25%	10%	5%
Data Entry, Health Records Access	10%	15%	18%
Monitoring/ Medication Compliance	13%	7%	7%
Disease/ Emergency tracking	13%	7%	5%
Health/ Administrative System	5%	5%	8%
Analysis, Diagnosis, and Consultation	3%	3%	5%

High Need   Medium Need   Low Need

Step 5: *Calculate the Market Opportunity*

Given the outcomes from the previous steps, one can calculate the market opportunity for mHealth solutions for each of the application areas per country and application. The total market size for mHealth in a given country will be the sum of these application-specific markets.

Advantages of Methodology 1	Disadvantages of Methodology 1
• Incorporates an evaluation of needs into the analysis	• Spending data are directional because they are based on expert opinion
• Captures market opportunities beyond current/potential IT expenditure	• Requires primary research resources (subject matter experts) that are knowledgeable of health expenditures by application area and mHealth potential

Advantages and Disadvantages of Methodology 1

Methodology 2 – Top-down from Health ICT or eHealth Budgets

Similar to Methodology 1, Methodology 2 estimates the market opportunity per application as a portion of existing technology expenditures.

$$\text{Market Opportunity (by application)} = \text{Total Health ICT/eHealth Expenditure} \times \text{\% of Health Application Spending that can be converted to mHealth}$$

Step 1: *Total Health ICT or eHealth Expenditure*

Collect all available data for health ICT and eHealth expenditures for approximately 40 to 50 countries. Such data is available through published reports (such as those by Frost and Sullivan), press reports, government papers or speeches, and studies by academics and the international development community. Total spending for ICT in health care worldwide is estimated at 3-4% of total health care spending. However, for the Global South, this percentage will be lower.

Step 2: *Establish Geographic Segments Based on Health Care Infrastructure*

It is possible to segment countries based on health system infrastructure and coverage profiles. However, comprehensive research is needed for this segmentation because countries vary greatly, not only in the level of development of their health system infrastructure, but also in their budget sources. For instance, some countries allocate higher portions of the government budget and gross domestic product to health than others, and some countries rely much more heavily on private entities for health care provision. In addition, countries have varying levels of wireless infrastructure and mobile capacity for mHealth services. Countries with limited wireless infrastructure and large populations (such as Ethiopia and Myanmar) could present a long-term market opportunity but require additional reforms before widespread mHealth services can be offered.

Step 3: *Convert Health ICT or eHealth Expenditure to mHealth-specific Expenditure*

Using inputs from subject-matter experts across the six mHealth application areas and any available anecdotal evidence, identify the portion of total health ICT and eHealth spending that can be converted to mHealth spending across application areas and segments. Countries that are investing in ICT for health and have strong mobile coverage could be better candidates to convert budget allocations to mHealth in the short term.

Step 4: *Calculate Market Opportunity*

One can calculate the market opportunity per application area and per country for those where reliable data are available. The final step is to extrapolate this process to other countries using the same coefficients for countries in the same geographic segment.

Advantages of Methodology 1	Disadvantages of Methodology 1
• Incorporates an evaluation of needs into the analysis	• Spending data are directional because they are based on expert opinion
• Captures market opportunities beyond current/potential IT expenditure	• Requires primary research resources (subject matter experts) that are knowledgeable of health expenditures by application area and mHealth potential

Advantages and Disadvantages of Methodology 2

Methodology 3: Bottom-up from Cost and Volume Data

Methodology 3 follows a bottom-up approach to calculate the market opportunity per application area as the product of average spending per person and the volume potential of an application.

$$\text{Market Opportunity (by application)} = \text{Average spending per person for mHealth-related applications} \times \text{Volume potential per application}$$

Step 1: Establish Geographic Segments Based on Health Need

As in Methodology 1, a needs-based segmentation is required. One can segment the developing countries according to their needs for the six mHealth application areas using available secondary data (such as disability-adjusted life years, health expenditures per capita, land area, rural and urban populations, and the number of doctors and hospitals). Then, determine country segments with similar need patterns (low, medium and high) for each application.

Further, one can select 10 to14 representative countries across the segments for deeper investigation. Later, the factors calculated for these countries can be applied to all countries in the particular segment. Illustrative output of the need-based segmentation is shown in Figure 3, above.

Step 2: Identify Potential Cost Savings from mHealth Applications per Area

Using inputs from subject-matter experts across the six mHealth application areas and any applicable anecdotal data from secondary sources, one can expand, refine and ensure the accuracy and comprehensiveness of the list of potential benefits and savings outlined in Figure 2.

Step 3: *Conduct Country Research*

Using secondary data from 10 to 14 countries selected from across the segments, as well as expert opinion, one can devise an average cost per unit for each of the application areas (Figure 6) in each geographic segment. Additionally, one can create coefficients to adjust those average costs for different segments containing countries with varying income levels and health infrastructure.

For instance, South Africa and Lesotho could be in the same geographic segment according to their health needs, but costs for conducting epidemiological surveys in South Africa, with its larger rural-land area, may be more expensive per fieldworker than in Lesotho because of the need for additional travel.

Figure 6: mHealth Per-capita Unit Cost and Volume Potential by Segment Table for illustrative purposes only. Final variables to be adjusted based on

	mHealth Per-capita Unit Cost Base			Multiplied By	Volume Potential Base		
	Segment 1	Segment 2	Segment 3		Segment 1	Segment 2	Segment 3
Education & Awareness	Cost per impression; Costs per individual behavior change	Cost per impression; Costs per individual behavior change	Cost per impression; Costs per individual behavior change		Number of impressions (per 100)	Number of impressions (per 100)	Cost per impression; Costs per individual behavior change
Data Entry, Health Records Access	Costs per record access	Costs per record access	Costs per record access		Volume of record access transactions (per 100)	Volume of record access transactions (per 100)	Number of impressions (per 100)
Monitoring/ Medication Compliance	Cost per patient	Cost per patient	Cost per patient	**X**	Number of patients to be monitored (per 100)	Number of patients to be monitored (per 100)	Volume of record access transactions (per 100)
Disease/ Emergency tracking	Cost per survey	Cost per survey	Cost per survey		Number of surveys (per 100)	Number of surveys (per 100)	Number of patients to be monitored (per 100)
Health/ Administrative System	Cost per 100 population	Cost per 100 population	Cost per 100 population		Population served (per 100)	Population served (per 100)	Number of surveys (per 100)
Analysis, Diagnosis, & Consultation	Cost per interaction	Cost per interaction	Cost per interaction		Number of interactions (per 100)	Number of interactions (per 100)	Population served (per 100)

High Need	Medium Need	Low Need

precise data availability.

Next, one can identify the volume potential by application and by segment (such as the number of field surveyors needed per population of 1,000, the number of recipients of behavior change campaigns per population of 1,000, and the number of impressions needed to invoke behavior change in each person). The steps above will demand both secondary research and expert opinion.

Step 4: *Calculate the Market Potential*

With the findings generated from steps described above, one can calculate the sum of the market opportunity per application area. The benefit of this approach is that it is more comprehensive across all mHealth savings areas beyond technology. However, it also requires very knowledgeable primary sources and presents the most challenging data requirements of the three approaches.

$$\text{Market Opportunity (by application)} = \text{Average spending per person for mHealth-related applications} \times \text{Volume potential per application}$$

Advantages and Disadvantages of Methodology 3

Part 4 - Methodology Comparison

Each of the three methodologies presented in this paper provides a realistic and credible approach for estimating the market opportunity for mHealth solutions in the Global South. All of them include primary research and input from subject-matter experts in the data-gathering phase. For effective execution and results that accurately gauge the market opportunity, a team of researchers and analysts working with a team of experts over several months will be needed.

Each methodology, however, differs in its approach toward the existing and readily available data, as illustrated in Figure 7.
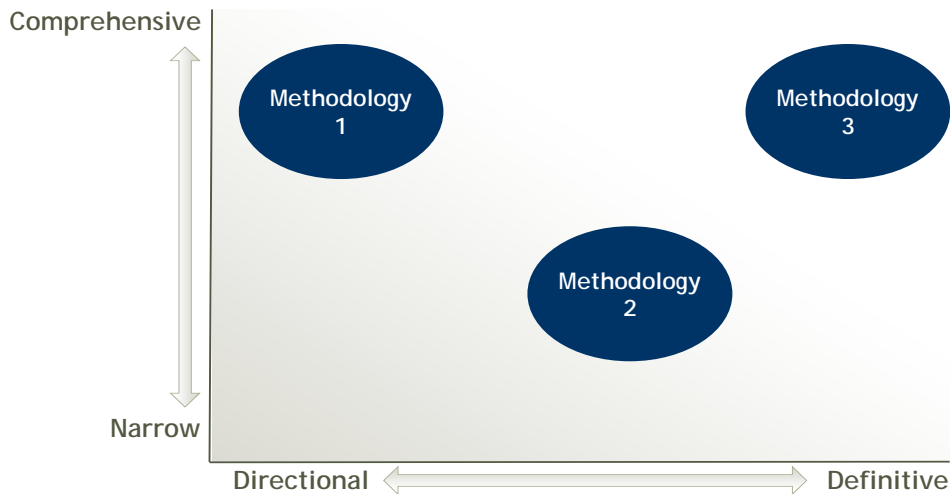

Figure 7: Methodologies Comparison

Methodology 3 with its bottom-up approach provides the best combination of comprehensive and definitive results. This methodology is, however, the most time- and labor-consuming of the three. In general, bottom-up approaches are time and resource intensive and therefore challenging to implement globally. But in a manageable set of countries, it is a compelling approach.

Methodology 1 is more directional than definitive in its results when compared to Methodology 3. It relies on subject-expert opinions rather than on data from global field surveys, and is less time- and cost-intensive to implement.

Methodology 2 is the least time-and labor-consuming among all three approaches. The results will be more directional than with the other methodologies. This approach estimates the portion of Health ICT and eHealth budgets that could be shifted toward mHealth solutions and omits the other areas where mHealth will have impact (e.g., augmenting or replacing traditional media in awareness and behavior change campaigns). This approach is best used in cases with limited budgets and the need for a global estimate of the market size.

All three proposed methodologies analyze either current expenditures or those that could be available to mHealth solutions through shifting budget line items (justified by cost savings resulting from mHealth services). Two other important aspects of implementing mHealth solutions are the improved efficiency and improved service that are more difficult to measure or to express in monetary terms. Undoubtedly, measuring the outcomes should be part of the market sizing as well, but credible information for this is not yet available. It is also important to note that a measurement of the results of mHealth solutions will draw additional investments in this field.

Appendix: Available Data and Sources

The information below summarizes available data, illustrating the level of detail and providing guidelines for further research. It is not a comprehensive overview of the respective health care markets.

World Health Organization Statistical Information System

The most important source of high-level statistical data on health care per country is the database of the World Health Organization, the WHO Statistical Information System (WHOSIS). WHOSIS contains historical values for many indicators, allowing the identification of trends and forecasting. The database contains data for 164 indicators in the following six categories:

- Demographic and socioeconomic statistics

- Health service coverage

- Health systems resources

- Inequities in health care and health outcome

- Mortality and burden of disease

- Risk factors

For developing countries, however, and for the countries surveyed by Vital Wave Consulting in particular, data for many of the 164 WHOSIS indicators are not available. The most relevant and available data cover the following indicators:

- Total health care expenditure in absolute value, as a percentage of GDP, per capita, in real dollars, international dollars, and national currency units.

- Breakdown of the total health care expenditure into:

  - Private spending – such as out-of-pocket payment, prepaid and risk-pooling plans, and NGOs

  - Public spending – such as Ministry of Health, social security funds, and other government spending

  - External sources – such as international donor programs.

- Health workforce and resources (nurses, midwives, physicians, dentists, pharmacists, hospitals, hospital beds) – in absolute value and per a population of 1,000.

Some of the WHOSIS indicators that would be helpful in the market assessment and for which data for the researched countries are not available are:

- Expenditure on inpatient curative care

- Expenditure on prevention and public health services

- Expenditure on hospitals

- Expenditure on human health resources

Although the WHOSIS database is probably the best source for high-level health care data per country, some national governments provided much more detailed and up-to-date data on health care in their country.

Health Expenditure and Health Care Service Indicators in South Africa

South Africa, for example, has a well-documented health care system and database with comprehensive statistical information on country and province levels. The National Department of Health (www.doh.gov.za) issues a "Department of Health Annual Report" giving details on legislative changes, departmental revenue and expenditure, strategic health programs, and progress made toward achieving established goals. The role of the National Department of Health is mainly strategic and its participation in South Africa's health care expenditure is less than 1 percent.

More detailed data about health care than that found through WHOSIS and the National Department of Health are available on the Provincial Departments of Health websites (http://www.doh.gov.za/links/index.html). These departments are responsible for the allocation of more than 95 percent of government health spending. Each of the departments issues an annual report with details on its financial spending, human resources, and the following programs:

Program 1: Health Administration

Program 2: District Health Services

Program 3: Emergency Medical Services

Program 4: Provincial Hospital Services

Program 5: Health Sciences and Training

Program 6: Health Care Support

Program 7: Health Facilities Management

Besides purely quantitative information on a great number of health indicators, these reports include the qualitative information needed for a better understanding of the local health care system and an assessment of the potential benefits of mHealth solutions – an overview of the current situation, discussions of problems (such as disparities in different regions within a province) and projections for the future. The level of detail surpasses the details in a public company's annual report.

While the National and Provincial Departments of Health's documentation contain data mainly about public health expenditure and government programs, the Health System Trust (www.hst.org.za) and Statistics South Africa (www.statssa.gov.za) provide information on South Africa's health care as a whole. Health System Trust's annual report "South African Health Review 2007" (http://www.hst.org.za/publications/711) focuses on broad areas with respect to the role of the private health sector. These areas include oversight, pooling of resources, purchasing of health care, delivery of health care services and health-related indicators. Critical issues covered in the 2007 review include:

- Assessment of the role of the government in the overall transformation process of the health sector.

- Policy and legislative review on the provision and funding of private health care.

- Review and analysis of health care financing and expenditure as well as recent trends in spending in the public and private health sectors.

- Overview of health information systems and the role played by intermediaries in facilitating the flow of patient information.

- Analysis of the health status of the South African workforce and health care provision in the workplace.

- Analysis and developments in the market and regulatory environment impacting medicine pricing and access to medicines.

- Review of the impact of public-private partnerships on access to health care and health outcomes.

- Analysis of the private hospital industry with specific focus on structure, ownership, and market share per geographical region and the nature of relationships between private hospitals and providers.

- Analysis of the private sectors response for HIV/AIDS, sexually transmitted infections, and tuberculosis.

In brief, the report summarizes the most relevant data from the sources described above, and compares the health care systems across provinces on both the public and private level. See References for source data.

Health Expenditure and Health Care Service Indicators in Vietnam

While detailed data on health care expenditure, allocation, and indicators for South Africa are abundant, readily available and easily accessible through government agencies' or public institutions' websites, this is not the case for many other developing countries, such as Vietnam. For Vietnam, WHOSIS proves to be the best source for quantitative data, even though it gives data that are too high-level to be directly useful for determining how monies are spent.

The English version of the Vietnamese Ministry of Health's website (www.moh.gov.vn) contains little qualitative or quantitative information, while the Health Policy and Strategy Institute (www.hspi.org.vn) refers to documents prepared by the United Nations and WHO. The Vietnamese version of the Ministry of Health's website contains some quantitative data, but in much less detail than the data available in the WHO Statistical Information System.

Up-to-date quantitative data on health care indicators are available on the website of the General Statistics Office of Vietnam (www.gso.gov.vn). However, the indicators covered largely overlap with those in the WHOSIS and give little new information. Additionally, most of the data exclude the rapidly growing private sector and are summarized at the country level.

Two additional facts make finding in-depth information in Vietnam difficult:

- Vietnam's 64 provinces have significant budget and investment autonomy.

- Private out-of-pocket spending represents as much as 80 percent of total spending on health care in Vietnam.

In brief, a systematic study on the health care expenditure in Vietnam at a level of detail that would add to the market assessment efforts is not available. Most of the external data sources (such as the United Nations, United Nations Population Fund, WHO, World Bank, International Monetary Fund, and the Asia-Pacific Action Alliance on Human Resources for Health) use the quantitative data already available. These sources, however, contain qualitative descriptions of the organization of the health care system in Vietnam, which provides useful background. See References for source data.

Health Expenditure and Health Care Service Indicators in Turkey

While South Africa and Vietnam represent the extremes of readily available and easily accessible health data, Turkey provides a satisfactory, if not thorough, quantity of data. Information about the Turkish health care system is not as structured as corresponding information for South Africa, but it is still abundant and contains useful details.

Relevant and informative documentation about the health care system in Turkey is available on the Ministry of Health website (www.saglik.gov.tr). The "Turkey Health Transformation Program" document describes the latest developments, ongoing projects and future government plans to address topics such as health care organizations, current and future expenditures, hospitals and hospital services, human resources availability and training and geographical disparities. Turkey's profile on the WHO website (www.euro.who.int/document/e79838.pdf) adds to these topics, but data in the document are outdated.

Turkey's profile on the OECD website (www.oecd.org/turkey) provides basic health care indicators for Turkey in comparison to other members. OECD also breaks down details of health care expenditures (http://www.oecd.org/dataoecd/7/49/33696739.pdf) by main function, financing agent and health care provider.

Some of the quantitative data in this document is outdated, but it still gives a solid starting point for further exploration of health care expenditures in Turkey.

In brief, the public sources of information provide good documentation for one to get acquainted with the health care system and expenditure on a country level. However, quantitative data and profiles of the 81 provinces, or at least the regions with great disparities in health care spending and services, will require input from a subject-matter expert. See References for source data.

Paid Databases for Healthcare Data

Paid databases (e.g., ISI Emerging Markets and Business Monitor International) mainly use health care expenditure data and country profiles from WHO, the respective health ministry websites and statistics offices and extrapolate them. However, further breakdown of health care expenditures at a sub-account level is usually missing.

An important data point about disability-adjusted life years per disease can be found in the Business Monitor International databases. As described in Methodology 1 above, this information is useful in segmentation of the countries in the Global South.

Data on the Impact from mHealth Solutions

A credible study of the impact of mHealth solutions is not available, and impact is a key indicator in determining the market that is "willing" to purchase. Information about the benefits can be found in some project papers and on some websites of mobile phone operators and companies developing such solutions, but this information is anecdotal rather than comprehensive. Subject-matter experts can help augment the anecdotal data to a level that is quantifiable and credible for the market-sizing model. However, this would not be a rigorous impact study, but an estimation based on expert opinion

References

South Africa health expenditure and health care service indicators:

Country Profile – South Africa. (2007). WHO Report 2007 Global Tuberculosis Control. World Health Organization. Retrieved on 15 May 2008 from http://www.who.int

Evaluation of the On Cue Compliance Service Pilot Testing the use of SMS reminders in the treatment of Tuberculosis in Cape Town, South Africa. (March 2005). bridges.org. Retrieved on 14 May 2008 from http://www.bridges.org/files/active/0/Cmplnc_EvlRpt_FIN_29Mar05.pdf

South African Health Review, 2007. (2007). Durban: Health Systems Trust. Retrieved on 18 May 2008 from: http://www.hst.org.za/publications/711

Vietnam health expenditure and health care service indicators:

Adams SJ. Vietnam's Health Care System: A Macroeconomic Perspective, International Monetary Fund. 2005. Retrieved on 19 May 2008 from: http://imf.org/external/country/VNM/rr/sp/012105.pdf

Huong P, Hue V. Vietnam HIT Case Study. Center for Health and Aging – Health Information Technology and Policy Lab, The National Bureau of Asian Research. 2007. Retrieved on May 18, 2008 from: http://pacifichealthsummit.org/downloads/HITCaseStudies/Economy/VietnamHIT.pdf

Nguyen T, Lofgren C, Nguyen T, Janlert U, Lindholm L. Household out-of-pocket payments for illness: Evidence from Vietnam. BMC Public Health. 2006; vol. 6: p.283. Retrieved on May 12, 2008 from http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1660562

WHO Country Cooperation Strategy, Vietnam, 2003 – 2006. World Health Organization, Vienam Country Office. World Health Organization; 2007. Retrieved on June 1, 2008 from www.un.org.vn/who/docs/whoccs.pdf

Turkey health expenditure and health care service indicators:

Akdag R. The Progress So Far -Turkey Health Transformation Program, November 2002 -June 2007. Republic of Turkey, Ministry of Health. 2007. Retrieved on May 10, 2008 from http://www.saglik.gov.tr/EN/dosyagoster.aspx?DIL=2&BELGEANAH=466&DOSYAISIM=TurkeyHea lthTransformationProgram.doc

Charting the Way Forward: Health Care Reform in Turkey. Turkish Industrialists' and Businessmen's Association (TUSAID). 2005.

e-Transformation in Health. Republic of Turkey, Ministry of Health, Department of Information Processing. 2007. Retrieved on May 13, 2008 from http://www.saglik.gov.tr/EN/Tempdosyalar/533__e-transformationinhealth_07.pdf

Health Care and Health Care Equipments. Turkish – US Business Council, 2007. Retrieved on May 12, 2008 from: http://www.turkey-now.org/db/Docs/A-%20Healthcare%20May%202006.pdf

Mandil, S. Turkey eHealth Strategy -Towards the start of Implementation. Republic of Turkey, Ministry of Health. 2007. Retrieved on 10 May 2008 from: http://www.saglik.gov.tr/EN/Tempdosyalar/247__Turkey_Towards_start_of_Implementation_ eng.pdf

Ninth Development Plan (2007-2013). 2008 Annual Program. Republic of Turkey, Undersecretariat of State Planning Organization. 2008.

Savas BS, KarahanÖ, and Saka RÖ. Health Care Systems in Transition – Turkey. World Health Organization. 2002. Retrieved on 15 May 2008 from http://www.euro.who.int/document/e79838.pdf

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[i] Evaluation of the SATELLIFE PDA Project, 2002: Testing the use of handheld computers for health care in Ghana, Uganda, and Kenya. (28 February 2003).Retrieved on June 4th, 2008 from http://www.bridges.org/files/active/1/Evltn%20rpt_SATELLIFE%20PDA%20Project_FINAL_28%20Feb%20200 3.pdf