DISCUSSION PAPER
Harmonisation and Alignment of the eHealth Architecture
for Human Resources for Health Administration,
Development and Management

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### Abbreviations

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<th>Abbreviation</th>
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<tbody>
<tr>
<td>AHWP</td>
<td>Africa Health Workforce Program</td>
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<tr>
<td>CDC</td>
<td>US Centers for Disease Control and Prevention</td>
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<td>CIS</td>
<td>Clinical Information Systems</td>
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<tr>
<td>CPD</td>
<td>Continuing Professional Development</td>
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<tr>
<td>eHSCG</td>
<td>eHealth Standardization Coordination Group</td>
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<tr>
<td>ECOSOC</td>
<td>United Nations Economic and Social Council</td>
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<td>EA</td>
<td>Enterprise Architecture</td>
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<td>EHR</td>
<td>Electronic Health Record</td>
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<td>GICT</td>
<td>Global Information and Communication Technologies Department (WB)</td>
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<td>GOe</td>
<td>Global Observatory for eHealth</td>
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<td>GS</td>
<td>Global South</td>
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<td>HIRG</td>
<td>Human Resources for Health Information Reference Group</td>
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<tr>
<td>HIS</td>
<td>Health Information System</td>
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<td>HMN</td>
<td>Health Metrics Network</td>
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<td>HRH</td>
<td>Human Resources for Health</td>
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<td>HRIS</td>
<td>Human Resources Information System</td>
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<tr>
<td>ISCED</td>
<td>International Standard Classification of Education</td>
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<tr>
<td>ISCO</td>
<td>International Standard Classification of Occupations</td>
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<tr>
<td>ICT</td>
<td>Information Communication Technology</td>
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<td>ICT4D</td>
<td>Information Communication Technology for Development</td>
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<tr>
<td>IFC</td>
<td>International Finance Corporation</td>
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<tr>
<td>infoDev</td>
<td>Information for Development program (WB)</td>
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<tr>
<td>ITU</td>
<td>International Telecommunication Union</td>
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<td>MRS</td>
<td>Medical Record System</td>
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<td>SDOs</td>
<td>Standards Development Organizations</td>
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<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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<td>WB</td>
<td>World Bank</td>
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<td>WHO</td>
<td>World Health Organization</td>
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1 Background.

1) This paper has been commissioned by the Africa Health Workforce Program (AHWP) within the World Bank (WB) to support internal discussion and future action(s) on the ‘Harmonisation and Alignment of the eHealth Architecture for Human Resources for Health Administration, Development and Management’. One specific focus is the issue of interoperability. This is in relation to the rapid growth of information communications technology (ICT) in the Global South (GS) and expressed concerns on the increasing volume of vertical, stand-alone information systems as identified by a panel of African experts at the WB’s Human Resources for Health Results Symposium (HR²) in May 2009.

2) The work was undertaken in the period July – August 2009 (Terms of Reference are available as Annex 1). The paper builds on a mapping of the broader e-health activities and programmes of work by the World Health Organisation (WHO) and other leading stakeholders (see Annex 2) and key respondent interviews with individual experts in this field (see Annex 3).

3) Whilst the limitations of a short desk-review are noted, there are nonetheless emerging themes for consideration. Section 2 presents the broader context of eHealth and interoperability and how Human Resources for Health (HRH) relates to this¹. Section 3 identifies the perceived opportunities and challenges from key respondents’ commentaries, prior to a discussion in section 4.

2 eHealth and interoperability – the broader context

4) In May 2005 World Health Assembly Resolution 58.28 on eHealth was adopted by member states of the WHO (see Annex 4). The Resolution has facilitated an ongoing and evolving programme of work for the WHO to respond to ‘the potential impact that advances in information and communication technologies could have on health-care delivery, public health, research and health-related activities for the benefit of both low- and high-income countries’².

5) WHO has defined eHealth as ‘the cost-effective and secure use of information and communications technologies in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research’³. More recently, a conference series supported by the Rockefeller Foundation and WHO in July-August 2008, “Making the eHealth Connection: Global Partnerships, Local

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¹ Due to page length limitations the paper provides extensive references for readers who wish to explore in greater detail.
³ ibid
Solutions” promotes a shorter definition with a focus on outcomes: ‘the use of information and communications technology to improve health systems performance’.  

6) A review of eHealth activities by the WHO and other leading stakeholders (Annex 2) reveals a vast range of activities and alliances. Three areas are prominent:
   a) facility-based systems capturing patient and case-management data, in particular the development of electronic health records (EHR), clinical information systems (CIS) and medical record system (MRS);
   b) the use of diagnostic, consultative and treatment services exchanged from one site to another via electronic communications for patient-care (telemedicine); and
   c) the delivery of information to and between health professionals, i.e. to facilitate Continuing Professional Development (CPD) through distance learning.

7) New terms including: eDiagnosis; eCare, teleconsultation and; eLearning are common within these sub-areas. A glossary of eHealth terminology exists 5, but is yet to fully capture the emerging references as they apply to the health sector.

8) Collaboration and coordination between the respective stakeholders is evident.
   • The Bellagio meeting in 2008 resulted in a Call for Action6 (Annex 5) based on 5 key areas:
     • Policy- and Evidence-Based Agenda-Setting
     • Fostering Collaborative Networks and Global Partnerships
     • Knowledge and Capacity Building
     • Globally Reusable Metrics, Tools, and Templates
     • Supporting Country-Level Initiatives
   • Similarly, a June 2009 Regional Ministerial Meeting in Ghana7, hosted by the United Nations Economic and Social Council (ECOSOC) is indicative of ongoing attention and coordination efforts in Africa. Ten key recommendations resulted from this meeting: collaboration, partnerships and interoperability are strong themes (see Annex 6).
   • USAID is conducting an internal review, supported by an advisory panel of technical experts, on how to support eHealth activities at country level and coordinate investments and implementation8.
   • The WB is establishing an eHealth thematic group and reviewing how to mainstream eHealth into the African agenda9.

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6 Bellagio eHealth Call to Action, November 2008: [http://www.ehealth-connection.org/content/bellagio-ehealth-call-action](http://www.ehealth-connection.org/content/bellagio-ehealth-call-action)
9 Communication with Arlene Seed, WB.
9) WHO plays a leading role in global and regional collaboration. The Knowledge Management unit hosts the eHealth Standardization Coordination Group (eHSCG), established to promote stronger coordination among the key stakeholders\(^ {10} \) and the Global Observatory for eHealth (GOe) – which completed the first global survey on eHealth in 2005/6\(^ {11} \) (a second global survey is to be published shortly). In addition, WHO has further capacity within its Healthcare Informatics Group which looks at information standards and enterprise architecture and the Essential Health Technologies unit. The Geneva offices also host the Health Metrics Network (HMN) which has released a Framework and Standards for Country Health Information Systems\(^ {12} \) and is actively addressing coordination.

10) One of the key areas that the eHSCG and other coordination platforms\(^ {13} \) are reviewing is the issue of interoperability. This is broadly defined as ‘the ability of two or more systems or their components to exchange information and to use the information that has been exchanged’ \(^ {14} \). The two elements of interoperability are \textit{syntactic} and \textit{semantic} respectively. Within the health sector there is further deconstruction of the concept to include technical, structural, syntactic, semantic and service-oriented interoperability\(^ {15} \). The complexities of each element are beyond the scope of this short paper but demonstrate the wider field of study and implementation that is ongoing.

11) While there is ongoing collaboration to agree best-practice principles and rules for standards and interoperability across eHealth applications, including health information systems (HIS), many questions remain about how to implement this. The global health ‘market’ is such that proprietary systems and the interests of developers and vendors are already entrenched and even open-source approaches require capital and recurrent investment to implement and evolve. However, good practices are emerging. Examples include:

- WHO’s Interoperability wiki - an online, cross referenced document that promotes best practice principles\(^ {16} \)
- The Joint Initiative on SDO Global Health Informatics Standardization\(^ {17} \) which includes the three major SDOs
  i) Health Level Seven (HL7)\(^ {18} \)

\(^ {10} \) \url{http://www.who.int/ehscg/en/}
\(^ {13} \) i.e. the Information Communications Technologies Standards Board (ICTSB) \url{http://www.ictsb.org/}
\(^ {16} \) \url{http://healthmetricsnetwork.info/interoperability/#Overview}
\(^ {17} \) \url{http://www.global-e-health-standards.org/}
\(^ {18} \) \url{www.hl7.org}
ii) CEN TC 251 - the Technical Committee on Health Informatics of the European Committee for Standardization (CEN)

iii) ISO TC 215 – the Technical Committee on Health Informatics of the International Standards Organization (ISO)

- The South African Medical Research Council hosts an OpenMRS Implementers Network and a free and open source software interoperability laboratory.\(^\text{19}\)
- The Open Architectures, Standards and Information System (OASIS) also hosted by the South African Medical Research Council\(^\text{20}\)
- Africa Health Infoway (AHI) is an ICT-based network of solutions for decision-making that is intended to reach district health facilities in 53 African countries over 5 years, delivering connectivity to global information, and capacity building through integrated systems to capture, use and exchange health information.\(^\text{21}\).

12) There are numerous examples of coordination and interoperability efforts across the European Union, including the EUi2010 subgroup on eHealth\(^\text{22}\), the CALLIOPE Thematic Network\(^\text{23}\) and the Telemedicine Alliance\(^\text{24}\). The latter includes the International Telecommunication Union, who, in collaboration with WHO will be hosting an eHealth Forum and Pavilion at the ITU TELECOM World 2009 conference in October 2009.\(^\text{25}\). These are not presented in detail, but WHO’s participation in many of these initiatives suggests that evidence and knowledge from these initiatives will be integrated into activities in the Global South (GS).

13) In parallel to the focus on standards and interoperability is consideration of how a HIS is planned, developed and managed, taking account of existing and future ICT capacity in a particular setting. Enterprise Architecture (EA), and its various methodologies, is fast becoming the preferred approach to conceptualize, design and deliver appropriate solutions for the public sector. The Global ICT Department at the WB recently outlined “how EA is a useful if not an essential tool for transforming governments”\(^\text{26}\). HMN has outlined the case for a Reference National HIS Enterprise Architecture\(^\text{27}\). The OASIS project (described above) is introducing enterprise eHealth architectural frameworks in Rwanda, Mozambique and

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\(^{19}\) [www.mrc.ac.za/ikmd/biomed.htm](http://www.mrc.ac.za/ikmd/biomed.htm)


\(^{21}\) [www.who.int/afrocalliope/en/] (described above)


\(^{23}\) [www.calliope-network.eu/](http://www.calliope-network.eu/)


\(^{27}\) [http://www.who.int/healthmetrics/documents/HMN_Architecture_for_National_HIS_20080620.pdf](http://www.who.int/healthmetrics/documents/HMN_Architecture_for_National_HIS_20080620.pdf)
Zimbabwe and findings from this work will feed into an ‘eHealth Framework Architecture for African Countries’

2.1 Human Resources for Health

14) The activity review for this paper suggests that the global attention on HRH, as a bottleneck to improving health services, has yet to permeate the eHealth discourses and activities. There is emerging consensus on strengthening human resource capacity, as a specialized skill-set, to support the implementation and scale-up of ICT but much less consideration on how ICT will support HRH systems and needs. There is a clear differentiation of ‘HR for ICT’ and ‘ICT for HRH’. A few examples of the latter ‘ICT for HRH’, including activities related to (health) Human Resource Information System/s (HRIS) are presented below.

15) The HMN approach and recommendations on Enterprise Architecture for HIS considers HRH as one of the essential ‘business domains’ which will form part of a national information system. Issues of HRIS interoperability are therefore being addressed as part of the broader eHealth, EA and HIS discussions. This includes ongoing work promoted by WHO for the adoption of the International Standard Classification of Occupations (ISCO) and International Standard Classification of Education (ISCED) as they apply to the health workforce. The March 2008 revision to the WHO Global Atlas of the health workforce reflects the improved classification and a joint WHO, World Bank and USAID publication ‘Handbook on Monitoring and Evaluation of HRH’ further promotes standards implementation. In those countries which are yet to complete the 2010 Round of Population and Housing Censuses, it is anticipated that health workforce analysis will be strengthened by the new ISCO-08 classifications.

16) A HRH Information Reference Group (HIRG) is being established by the Global Health Workforce Alliance (GHWA) and WHO to explore, amongst other areas, ‘ICT for HRH’. The WB has been invited to participate in the HIRG. WHO has also established health workforce Observatories in a number of regions and countries to improve knowledge and evidence on the health workforce. Common approaches to ‘counting’ and categorizing health workers have been introduced (as evident in data for the 2006 World Health Report). A Service Availability Mapping (SAM) tool that collects information on infrastructure, HR and services at district and sub-national level is a further WHO tool.

28 This is a proposed programme from HealthNet South Africa (operating as “Jembi”) to be co-funded by the International Development Research Centre and the Rockefeller Foundation.
34 The HIRG is scheduled to meet in December 2009.
35 www.who.int/healthinfo/systems/serviceavailabilitymapping/en/index.html
17) The USAID-funded ‘Capacity Project’ has a particular focus on HRIS and support to country activities. The project has developed a suite of open-source software applications (iHRIS\textsuperscript{36}) to support country needs and has recently published a HRIS Strengthening Implementation Toolkit to guide country practitioners and foster data-driven HR decision-making.\textsuperscript{37} The iHRIS suite includes a particular module to support professional bodies establish live registers of health professionals. This work will be continued into the new five-year ‘HRH and Quality Services’ project funded by USAID.

18) A ‘Workforce Surveillance’ research network\textsuperscript{38} is reviewing evidence and opportunities to address WHO’s recommended strategy to “strengthen strategic intelligence”\textsuperscript{39} at the country level. Within this network, the US Centers for Disease Control and Prevention (CDC), is currently conducting a systematic review of HRIS and anticipates publication in the final quarter of 2009. The review builds on their experience of developing interoperable HRIS with professional associations and Ministries of Health in Kenya and Zimbabwe. Identification of “best practices” is a key output of the review\textsuperscript{40}.

3 Opportunities and Challenges

19) From the key respondent interviews five themes emerge:
- Complexity – global and national;
- ‘Market’ dynamics;
- HR for ICT versus ICT for HRH;
- Weak HRH awareness/advocacy, and;
- Where to focus?

20) Complexity: The digital revolution continues to unfold at a rapid pace. The fields of ICT generally and ICT for Development (ICT4D) specifically are occupied by a multitude of stakeholders representing a vast array of expertise and interests – many of which operate in separate field of expertise and silos. The eHealth arena, as a particular sector within ICT4D, is not isolated from the global complexities, and whilst the definition (‘the use of ICT to improve health systems performance’) may be simple, the reality is not.

21) Collaboration networks for eHealth do exist and are partly facilitating greater awareness of frameworks, common standards and best practice, in particular the Bellagio Call to Action. However, the rhetoric of global agreement is continuously tested at country level where ICT solutions are implemented. There are broader dynamics which national authorities are engaged with on e-governance, infrastructure, capacity and resources which affect all economic sectors. ICT for health, let alone ICT for HRH, has to be considered with reference

\textsuperscript{36} http://www.capacityproject.org/hris/suite/
\textsuperscript{37} http://www.capacityproject.org/hris-toolkit/index.html
\textsuperscript{38} Including: CDC, UC Berkeley, KIT, Integrare, MoH China and MoH Thailand.
\textsuperscript{40} Personal communication with Pat Riley, National Centre for HIV/AIDS, CDC.
to these cross-sectoral dynamics to establish national frameworks, protocols and implementation pathways.

22) **Market’ dynamics**: ICT solutions which aim to improve health systems performance are part of a global eHealth ‘market’. Multiple actors/stakeholders participate, including the private-for-profit sector, international standards organizations, philanthropic bodies and aid-funded organizations. The market is entrepreneurial and continuously evolving. The role of the telecommunications industry cannot be underestimated, especially with the increasing role and potential of mobile technologies and *m-health* as a component of ICT.

23) Simply imagining the market as a divide between vendors with proprietary applications and subsidized entities offering open-source solutions over-simplifies the complexities and dynamics. It is naive to imagine that competition does not exist across and within the categories of stakeholders or that they act in isolation from the financial resources available to them. Significant increases in research and development in high-income countries and health funding to the Global South are part of the market stimulation and consequent supply/demand dynamics. To some extent, focused funding (for case-management systems, disease programs/surveillance and/or private service provision) has supported stand-alone solutions which pay less attention to interoperability with other health and government systems.

24) Influencing this market, like any other, will require multiple strategies at various points of engagement to stimulate collaboration, coordination and effective partnerships.

25) **HR for ICT versus ICT for HRH**: There is a separation between a) building human resources capacity to support ICT or Information Systems (HR for ICT/IS) and b) the development of ICT or Information Systems for Human Resources for Health (ICT/IS for HRH). Irrespective of the divide, both should be on the agenda for the HRH community.

26) The former is a challenge for most all public sector ICT4D initiatives and includes a critical lack of capacity in the health sector in most of the Global South. This undermines national ownership and leadership of eHealth activities and future sustainability.

27) The latter is more attuned to how ICT can improve health systems performance. However, this is further contested by some stakeholders, arguing that information systems to support HRH administration or management are essentially different to eHealth and should not be confused with this agenda even if they exhibit increasingly common use of digital platforms and technologies. Payroll and personnel management systems which record data on the health workforce are examples which fit this distinction.

28) **Weak HRH awareness/advocacy**: The global HRH community is a late entrant to ICT4D and eHealth. It is behind the pace in articulating its vision, demands and aspirations and stimulating the market. Outside of the specific work on health workforce data management systems there is low or no recognition of how ICT solutions can provide added value to workforce surveillance, scenario-planning, policy discourses, management etc, etc.
29) The technology that exists is capable of performing almost limitless functions and permutations connected with the management of a health workforce. However, there is weak advocacy to communicate needs, stipulate minimum interoperability standards and promote a core set of priority interventions which are proven to improve efficiency and performance. Silos, resistance and division between health, HRH and ICT professionals, in international organizations and within national health systems restrict HRH advocacy from maturing.

30) Where to focus?: Given the scenarios above, there are varying considerations on defining the points of engagement where the WB’s perceived and comparative strengths could add value. This is further complicated by agencies associated with the WB and existing engagement in pan-African health systems development which result in interventions which may or may not mainstream eHealth and interoperability. For example: the International Finance Corporation (IFC) and infoDev (housed by the Global ICT Department) who are actively engaged in promoting the private health sector and ICT4D across Africa, and; ongoing commitments to Harmonization for Health in Africa or the International Health Partnership+ supporting broader health systems strengthening with a focus on monitoring and evaluation frameworks.

31) There is some consensus on the need for the WB to use its privileged position with host governments to promote high-level e-governance frameworks which will facilitate ICT improvements within the health sector generally. Focusing down to the specific level of ICT for HRH in Africa raises questions and concerns on the internal capacity of the WB and the AHWP in particular to lead, influence and engage. The WB is perceived to have been a peripheral participant in evolving discourses and may have insufficient technical resources.

32) The above themes resonate with the broader challenges for the adoption and use of eHealth as documented in a recent survey by the Rockefeller Foundation:

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Survey question: “Please rank the top three challenges facing the widespread adoption and use of eHealth in the Global South”

<table>
<thead>
<tr>
<th>Challenge</th>
<th>First</th>
<th>Second</th>
<th>Third</th>
<th>Number of times cited</th>
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<tr>
<td>HR/Capacity</td>
<td>18</td>
<td>20</td>
<td>52</td>
<td>68</td>
</tr>
<tr>
<td>Awareness</td>
<td>11</td>
<td>12</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>Fragmentation</td>
<td>14</td>
<td>13</td>
<td>24</td>
<td>42</td>
</tr>
<tr>
<td>Funding</td>
<td>15</td>
<td>15</td>
<td>11</td>
<td>41</td>
</tr>
<tr>
<td>Poor Infrastructure</td>
<td>16</td>
<td>11</td>
<td>12</td>
<td>39</td>
</tr>
<tr>
<td>Policy (prohibit/lack of)</td>
<td>15</td>
<td>15</td>
<td>12</td>
<td>23</td>
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<tr>
<td>Mentality</td>
<td>11</td>
<td>7</td>
<td>5</td>
<td>68</td>
</tr>
<tr>
<td>Lack of sustainable models</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>68</td>
</tr>
<tr>
<td>Lack of standards</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>68</td>
</tr>
<tr>
<td>Connectivity</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>68</td>
</tr>
<tr>
<td>Appropriate product</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>68</td>
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</tbody>
</table>

“Lack of human capital to maintain/support, particularly in developing countries”
“Resistance to change because of shortage of health professionals, eHealth adds work on the ground.”
“Non-health sector constraints – legal, physical infrastructure, education, etc.”
“Different levels of priorities (pure healthcare delivery versus developing information systems).”
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4 Discussion

33) Concerns raised at the HR\(^2\) Symposium in Ethiopia indicated an increasing volume of ICT solutions supporting health and HRH activities at the country level, with too few incentives to promote interoperability between solutions and potentially more incentives to deliver immediate functionality. This is the problem statement key respondents were asked to respond to which in turn would assist the conceptualization of opportunities and challenges for the AHWP and other WB departments.

34) Moving forward, three layers of engagement are considered where the AHWP/WB could utilize comparative advantage: HRH, HIS and ICT4D. A summary is presented in the table below.

Table 1: Themes and recommendations.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Recommendation</th>
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| HRH   | • HRH 1: Map interventions (including WB-funded programs) and prepare evidence on what is working, what can be scaled-up, and the costs and benefits.  
       | • HRH2: Utilize the WB’s comparative advantage to lead knowledge management activities that assess the cost-effectiveness and/or sustainability of existing interventions to address the current paucity of data.  
       | • HRH 3: Adopt and promote minimum interoperability standards for ICT for HRH across a) all WB agencies and implementing contractors and b) with host governments and wider cooperation partners.  
       | • HRH 4: Stimulate new thinking within the market, engaging non-state partners. |
| HIS   | • HIS 1: Ensure common approaches on ICT for HRH are adopted in all WB HSS engagement.  
       | • HIS 2: Maximize potential of HIRG, sharing WB knowledge products and HSS outlook to promote the productivity. |
| ICT4D | • ICT4D 1: Build on the WB’s intersectoral capacities to promote broader e-governance and e-health frameworks at country level. This should include collaboration with the GICT to integrate their existing activities in IT architecture and interoperability standards within the health sector.  
       | • ICT4D 2: Capitalize on WB’s intersectoral capacities to engage with the ITU and national telecommunications organizations to explore eHealth uptake and implementation.  
       | • ICT4D 3: Work with IFC and other WB agencies to review opportunities for enhanced public-private partnerships in support of ICT for HRH and HR for ICT. |

35) **HRH.** Existing initiatives and coordination networks present an opportunity for more active AHWP/WB engagement, particularly on knowledge management. The baseline of the strengths and weaknesses, impact, costs and sustainability of existing ICT for HRH initiatives and their interoperability is absent. Commissioning agents (host government and funding agencies) therefore have few references to support decision-making and the ‘market’ has
little to respond to. CDC’s Systematic Review may enable new discourse on this, but there is further scope to review and assess active initiatives which are not necessarily in the published literature. This includes programs funded by the WB, IFC and infoDev.

HRH 1: Map interventions (including WB-funded programs) and prepare evidence on what is working, what can be scaled-up, and the costs and benefits.

HRH2: Utilize the WB’s comparative advantage to lead knowledge management activities that assess the cost-effectiveness and/or sustainability of existing interventions to address the current paucity of data.

36) The AHWP/WB has played an active part in global HRH awareness and advocacy and has an opportunity to leverage this experience within ICT for HRH to promote minimum standards and approaches for interoperability. Ensuring active adoption and promotion of the agreed taxonomy and standards, i.e. ICSO-08, across all WB agencies and implementing contractors and influencing host governments and cooperation partners through other stakeholder forums will create new dynamics in the market.

HRH 3: Adopt and promote minimum interoperability standards for ICT for HRH across a) all WB agencies and implementing contractors and b) with host governments and wider cooperation partners.

37) Thus far the HRH community has failed to articulate an ICT for HRH vision and the market is responding to individual briefs with minimal concerns on semantic interoperability with broader HRH needs. The AHWP/WB could draw upon its wider technical resources to conduct a market-appraisal of the evolving opportunities (in HR for ICT and ICT for HRH) to stimulate new thinking and future actions\(^{41}\). Given the many concerns on public sector capacity, public-private partnerships must be considered.

HRH 4: Stimulate new thinking within the market, engaging non-state partners.

38) HIS. The WB’s engagement in wider health systems strengthening initiatives offer existing platforms to focus attention on how ICT can support HIS strengthening which focuses on the domain needs of HRH. The IHP+ Common Evaluation Framework and the utilization of the Country Health Systems Surveillance (CHESS) approach is ongoing\(^{42}\). These are supportive of the strategic goals at country and global levels to monitor performance and evaluate progress towards the health MDGs\(^ {43} \text{,}^{44} \). Similarly, the HMN work program on Enterprise Architecture is ongoing.

\(^{41}\) Advances in ICT offer huge potential in supporting HRH administration, management and development as components for health systems strengthening and subsequent performance gains. These are not yet mapped amongst HRH stakeholders and the private sector may be unaware of demand.

\(^{42}\) \url{http://www.internationalhealthpartnership.net/en/working_groups/monitoring_and_evaluation}

**HIS 1:** Ensure common approaches on ICT for HRH are adopted in all WB HSS engagement.

39) These programs offer scope to create greater eHealth linkages across the WB and partners and arrest the silo approach that appears to be affecting interoperability. The recently formed HRH Information Reference Group (HIRG) may provide the coordination platform to stimulate these discussions. New evidence generated by the AHWP/WB on the impact of existing programming can be disseminated and acted upon by this group.

**HIS 2:** Maximize potential of HIRG, sharing WB knowledge products and HSS outlook to promote the productivity.

40) **ICT4D.** The WB stresses intersectorality as “potentially one of the Bank’s most important strengths for contributing to HNP results at country level, both in other sectoral policies that influence HNP results and in its role in health system strengthening”\(^\text{45}\). Many commentators agree that this is a distinct area of advantage for the WB, and this higher-level engagement, supporting ICT as a development paradigm, offers scope for a range of interventions based on its authority and credibility.

41) This includes working with national partners to mainstream eHealth issues across government ministries, formulate broader development work on e-governance, identify the specific infrastructure (national, ‘the last mile’ and facilities) and capacity requirements and investigate resources and sustainability. Instilling lessons across government on the essential foundations and building blocks to develop and sustain integrated information systems for the health sector will be essential\(^\text{46}\).

42) Work on e-governance, led by the Global Information and Communication Technologies Department (GICT) of the Bank offers an existing platform for specific actions related to eHealth and HRH.

**ICT4D 1:** Build on the WB’s intersectoral capacities to promote broader e-governance and e-health frameworks at country level. This should include collaboration with the GICT to integrate their existing activities in IT architecture and interoperability standards within the health sector.

43) Specific focus on the role of the telecommunications sector, globally (ITU) and nationally, including mobile network operators, to broker agreements which positively impact on

\(^\text{44}\) [http://www.internationalhealthpartnership.net//CMS_files/documents/ten_strategic_goals_at_global_and_country_level_EN.pdf](http://www.internationalhealthpartnership.net//CMS_files/documents/ten_strategic_goals_at_global_and_country_level_EN.pdf)


\(^\text{46}\) A recent report commissioned by the Gates Foundation on HIS in Africa, Asia and Latin America may provide lessons once available in the public domain.
market dynamics and enable the adoption and scale-up of eHealth solutions would provide considerable value. This may entail work to promote cross-carrier reverse billing; free bandwidth for eHealth solutions, and; corporate social responsibility investments.

**ICT4D 2:** Capitalize on WB’s intersectoral capacities to engage with the ITU and national telecommunications organizations to explore eHealth uptake and implementation.

44) Further work with the private sector, building on the evidence, awareness and advocacy generated from the mapping of existing HRH initiatives and the productivity of the HIRG could also change market comprehension and entrepreneurial activity in the Global South. Developed markets will continue to invest heavily in ICT and eHealth but there are still many demands and opportunities in emerging markets which have yet to be addressed.

**ICT4D 3:** Work with IFC and other WB agencies to review opportunities for enhanced public-private partnerships in support of ICT for HRH and HR for ICT.

45) **Other considerations:** The capacity of the AHWP to influence the agenda and carry forward some of the above discussion points will also require due consideration. Active participation in the coordination networks and forums will improve understanding of the complexities and technical issues within this market. However, it may be that additional expertise is required to complement existing personnel within the AHWP in order to enhance capacity and respond to the concerns of the African panelists in Ethiopia.

END
Annex 1: Terms of Reference

Consultant – Harmonisation and alignment of the e-health architecture for Human Resources for Health management and development

Date: 27 May 09

Background:
1. There is an increasing need to raise the discourse on the Harmonisation and Alignment of the e-Health Architecture for Human Resources for Health Management and Development.

2. Similar to the increase of health financing for vertical, disease-focused initiatives there has been a recent expansion of e-health systems, platforms and solutions on the back of the technology revolution and vertical funding. Many of these vertical initiatives may perform to their initial technical specification but their inter-operability, standardised nomenclature and sustainability is less evident.

3. The World Health Organisation (WHO) and other stakeholders are actively looking at the broader e-health agenda. However, few initiatives have thus far considered the particular issues in respect to HRH management and development systems. These include health management information systems, human resource information systems, professional registers, online distance learning, telemedicine etc, etc.

4. To assist in generating further discussion and actions to improve the inter-operability of e-health solutions (and the anticipated growth of m-health solutions) the World Bank wishes to commission an initial concept paper outlining relevant issues and options moving forward

Purpose:
5. To prepare a concept paper on the harmonisation and alignment of the e-health architecture for Human Resources for Health management and development

Scope of Work
6. The consultant(s) will:
   a. Review broader e-health activities and programmes of work by WHO and other leading stakeholders and the current progress to promote standards, nomenclature, definitions and inter-operability
   b. Review e-health and ICT activities related to HRH management and development
   c. Identify key stakeholders, including intra-governmental, UN, philanthropic foundations and private sector organisations actively promoting inter-operability
   d. Consult with relevant stakeholders and individual experts on the perceived opportunities and challenges
   e. Develop and expand on the opportunities and challenges for the future harmonisation and alignment of e-health solutions, platforms and systems
   f. Develop and expand on the possible short-term actions to address opportunities and challenges.

Timeframe:
7. The assignment is expected to start in June 2009 and be completed by the 25th September 2009.

Output:
8. A concept note not exceeding 10 pages A4 + Annexes responding to the above scope of work
### Annex 2: Mapping of stakeholders

<table>
<thead>
<tr>
<th>ORGANIZATION</th>
<th>PROGRAMMES OF WORK</th>
<th>RELEVANT PROGRAMMES/PROJECTS</th>
<th>ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO eHealth Standardization Coordination Group (eHSCG)</td>
<td>Standards List Support standards List Frequently asked questions Case studies and use studies Presentations (2005 only)</td>
<td>Standards List Support standards List</td>
<td><a href="http://www.who.int/ehscg/en/">www.who.int/ehscg/en/</a></td>
</tr>
<tr>
<td>WHO Global Observatory for eHealth</td>
<td>Carried out 1st global survey on eHealth. That and subsequent publications</td>
<td>eHealth Intelligence Reports</td>
<td><a href="http://www.who.int/goe/">www.who.int/goe/</a></td>
</tr>
<tr>
<td>ORGANIZATION</td>
<td>PROGRAMMES OF WORK</td>
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</tbody>
</table>
| Health Metrics Network                        | Global partnership to strengthen HIS                                               | HMN Framework & Standards for Country HIS  
HMN assessment Tool  
HMN Guidance on Strategic Planning of HIS strengthening                                        | www.who.int/healthmetrics          |
| WHO Africa Health Infoway                    | Creating infrastructure and connectivity for districts  
To standardize and facilitate ICT infrastructure implementation (in collaboration with ITU & HMN) | EHR System access  
CRIS  
HISP/DHIS  
DSS INDEPTH                                                                                      | www.who.int/africahealthinfoway/en/|
| WHO ePortuguese Network                       | HRH development in Portuguese-speaking Member States                               | VHL in Portuguese  
Blue Trunk Libraries  
HINARI collaboration                                                                                   | www.who.int/eportuguese/en/        |
| WHO Essential Health Technologies             | eHealth for Health Care Delivery  
Focus on primary health care                                                               | Activities conducted in collaboration with Regional Offices                                                                                  | www.who.int/eht/eHealthHCD regions/en/index.html |
| WHO Health Statistics & Health Information Systems | Service Availability Mapping (SAM)                                                  | Collects info on infrastructure, HR and services at district & sub-national level                                                          | www.who.int/healthinfo/systems/serviceavailabilitymapping/en/index.html |

World Bank: ‘Harmonisation and Alignment of the eHealth Architecture for Human Resources for Health Administration, Development and Management’
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<thead>
<tr>
<th>ORGANIZATION</th>
<th>PROGRAMMES OF WORK</th>
<th>RELEVANT PROGRAMMES/PROJECTS</th>
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</table>
| WHO Global Health Mapping & GIS | To respond to information needs of infectious disease and public health programmes. | HealthMapper  
Global Health Atlas  
Remote field data collection tools | www.who.int/health_mapping/tools/en/ |
| WHO Global Infobase | Data warehouse that collects stores and displays information on chronic diseases and their risk factors for all WHO Member States. | | http://apps.who.int/infobase/report.aspx |
| WHO Knowledge Management and Health | To bridge the “know-do” gap in global health | KSH  
KM4PH  
Blue Trunk Library Project  
HINARI  
Global Health Library | www.who.int/kms/en/ |
| Global Health Workforce Alliance | HRH Exchange CoP | Online discussions for health professionals moderated by GHWA | www.who.int/workforcealliance/knowledge/e_solutions/COP/en/index.html |
| United Nations and Vodafone Foundation Technology Partnership | Partner: datadyne.org  
Partner: WHO  
Partner: Rockefeller | To help build and implement a digital health data surveillance system operating on mobile devices. Development and deployment of EpiSurvyeor, DataDyne.org’s free, open source software for mobile devices. Support to a mobile health (mHealth) data program that uses wireless technology mHealth for Development program | www.unfoundation.org/  
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<th>ORGANIZATION</th>
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<tr>
<td>Foundation</td>
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| EU i2010 subgroup on eHealth | RIDE (a roadmap for interoperability of eHealth system) 
SHARE (Supporting and structuring HealthGrid Activities & Research in Europe) 
Semantic Health (Semantic Interoperability Research and Deployment) 
Q-REC (European Quality Labeling and Certification of Electronic Health Record Systems) 
Information and Communication Technologies Policy Support Programme (ICT PSP) | 7th Framework Programme for Research has specific focus on eHealth 
European Patients Smart Open Services Project (epSOS) 
eten projects 
Commission recommendation on cross-border interoperability of HER systems | [http://ec.europa/information society/activities/health/index_en.htm](http://ec.europa/information society/activities/health/index_en.htm) |
<p>| The CALLIOPE Thematic Network | Supporting the implementation of interoperable eHealth solutions across Europe | Elaboration of a proposal for a common “Interoperability Road Map”, review and advancement of EU interoperability recommendations and facilitation of pre-standardization | <a href="http://www.calliope-network.eu/">www.calliope-network.eu/</a> |</p>
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<tr>
<td><strong>ICT Standards Board</strong></td>
<td>eHealth and Standardization (among others)</td>
<td>processes via liaison with SDOs.</td>
<td><a href="http://www.ictsb.org/index.htm">www.ictsb.org/index.htm</a></td>
</tr>
<tr>
<td><strong>Health Level Seven (HL7) ANSI accredited SDO</strong></td>
<td>Develops specifications e.g. a messaging standard that enables disparate healthcare applications to exchange key sets of clinical and admin data</td>
<td>HER HIPAA Reference information model (RIM) Templates. Vocabulary &amp; XML</td>
<td><a href="http://www.hl7.org">www.hl7.org</a></td>
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<td>ORGANIZATION</td>
<td>PROGRAMMES OF WORK</td>
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<tr>
<td>South African Medical Research Council</td>
<td>Biomedical Informatics Research Division.</td>
<td>OASIS</td>
<td><a href="http://www.mrc.ac.za/ikmd/biomed.htm">www.mrc.ac.za/ikmd/biomed.htm</a></td>
</tr>
<tr>
<td></td>
<td>Division Mgr: Dr Chris Seebregts</td>
<td>OpenMRS Implementers Network</td>
<td><a href="http://www.slideshare.net/hamishfraser/seebregts-omrs-oasis-boston-May09">www.slideshare.net/hamishfraser/seebregts-omrs-oasis-boston-May09</a></td>
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<tr>
<td>Regenstrief Institute</td>
<td>Regenstrief Institute Medical Informatics.</td>
<td>Medical Informatics Standards e.g. LOINC &amp; RELMA</td>
<td><a href="http://www.regenstriefinstitute.org">www.regenstriefinstitute.org</a></td>
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<tr>
<td></td>
<td>OpenMRS in HIV/AIDS clinics in Tanzania and Uganda.</td>
<td>Public use tools &amp; open source software</td>
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<td></td>
<td>Indiana University Kenya Program</td>
<td>Medical informatics fellowship</td>
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<td></td>
<td></td>
<td>Integrated Advanced Information Management Systems (IAIMS) grant program</td>
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<td></td>
<td></td>
<td>Developed OpenMRS.org</td>
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<tr>
<td>Fogarty International Center</td>
<td>Forum for International Health</td>
<td>Informatics Training for Global Health (ITGH)</td>
<td><a href="http://www.fic.nih.gov">www.fic.nih.gov</a></td>
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<tr>
<td>US National Institutes of Health</td>
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<tr>
<td>SPIDER: Swedish Program for ICT in Developing</td>
<td>Promotion of and support to relevant Information and Communication Technology for Development (ICT4D)</td>
<td><a href="http://www.spidercenter.org/project/inform-tanzania-health">www.spidercenter.org/project/inform-tanzania-health</a></td>
<td><a href="http://www.spidercenter.org">www.spidercenter.org</a></td>
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<td><a href="http://www.spidercenter.org/project/expan">www.spidercenter.org/project/expan</a></td>
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<tr>
<td>Regions</td>
<td>efforts at partner institutions and organizations in developing countries and establishment of networks of collaboration.</td>
<td>d-inform-africa-and-asia&lt;br&gt;ICT4MPOWER: ICT for Medical Community Empowerment</td>
<td></td>
</tr>
<tr>
<td>International Medical Informatics Association</td>
<td>Organizes tri-annual &quot;World Congress on Medical and Health Informatics&lt;br&gt;Regional members incl EFMI, APAMI, Helina, IMIA LAC</td>
<td>Health Informatics for Development (WG 09)&lt;br&gt;Health Information Systems (WG 10)&lt;br&gt;Open Source Health Informatics&lt;br&gt;Primary Health Care Informatics (WG 05)&lt;br&gt;Security in Health Information Systems (WG 04)&lt;br&gt;Standards in Health Care Informatics (WG 16)&lt;br&gt;Telematics in Health Care (WG 18)</td>
<td><a href="http://www.imia.org">www.imia.org</a></td>
</tr>
<tr>
<td>American Medical Informatics Association</td>
<td>Global health and Bioinformatics Workforce Capacity Initiative</td>
<td>Background papers and case studies</td>
<td><a href="http://www.amia.org">www.amia.org</a></td>
</tr>
<tr>
<td>The Earth Institute, Columbia University</td>
<td>Millennium Villages Project: a) health via REACH project&lt;br&gt;b) communications Partner: Ericsson</td>
<td>Millennium Global Village-Net. <a href="http://www.sibim.net/helina/helina2009/Sesson1">www.sibim.net/helina/helina2009/Sesson1</a></td>
<td><a href="http://www.millenniumvillages.org">www.millenniumvillages.org</a></td>
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<td>One Village Foundation</td>
<td>Open Digital Village (ODiV)</td>
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<td><a href="http://www.sibim.net/helina/helina2009/Session1">www.sibim.net/helina/helina2009/Session1</a></td>
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<td>AllAfrica Global Media</td>
<td>AllAfrica Foundation&lt;br&gt;HealthAfrica.org&lt;br&gt;HealthLiberia.org</td>
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<td><a href="http://allafrica.com">http://allafrica.com</a></td>
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<tr>
<td>ITOCA (Information Training and Outreach Centre for Africa)</td>
<td>To enhance ICT skills</td>
<td>Support to TEEAL, AGORA HINARI, OARE.</td>
<td><a href="http://www.itoca.org/">www.itoca.org/</a></td>
</tr>
<tr>
<td>Division of Global Health Equity Brigham &amp; Women’s Hospital, Boston, MA.</td>
<td>Global Health Delivery Project</td>
<td>GHDonline</td>
<td><a href="http://www.brighamandwomens.org/socialmedicine/ghd.aspx">www.brighamandwomens.org/socialmedicine/ghd.aspx</a> <a href="http://globalhealthdelivery.org/blog/">http://globalhealthdelivery.org/blog/</a></td>
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<td>Global Knowledge</td>
<td>Multi-stakeholder</td>
<td>Global Partnership program includes;</td>
<td><a href="http://www.globalknowledgepartnership.org">www.globalknowledgepartnership.org</a></td>
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<td>Partnership</td>
<td>development network in knowledge &amp; ICT</td>
<td>telecentre.org. Regional Partnership Program includes; K4D &amp; ICT4D. Global Knowledge Conference Series</td>
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<td><strong>GLOBAL INITIATIVES</strong></td>
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<td>G8 Dot Force</td>
<td>Digital Opportunities Task Force – reviewed the digital divide between north and south</td>
<td>Genoa Plan of Action to support ICT4D and the MDGs</td>
<td><a href="http://www.g7.utoronto.ca/summit/2001genoa/dotforce1.html">www.g7.utoronto.ca/summit/2001genoa/dotforce1.html</a></td>
</tr>
<tr>
<td>Global Alliance for ICT &amp; Development (G@ID)</td>
<td>Global Alliance for Information and Communication Technologies and Development (GAID), an initiative approved by the United Nations Secretary-General in 2006</td>
<td>ICT for Country Health Information</td>
<td><a href="http://www.un-gaid.org">www.un-gaid.org</a></td>
</tr>
<tr>
<td>World Bank InfoDev ICT4D</td>
<td><em>infoDev</em> is a global development financing program among international development agencies.</td>
<td>Coordinated and served by an expert Secretariat housed in the Global ICT Department (GICT) of the World Bank</td>
<td><a href="http://www.infodev.org">www.infodev.org</a></td>
</tr>
<tr>
<td>ECOSOC</td>
<td>ECOSOC was established under the UN Charter as the principal organ to coordinate economic, social, and related work of the 14 UN specialized agencies, functional</td>
<td>Information and Communication Technologies. A thematic group within the ECOSOC Commission on Science and Technology for Development.</td>
<td><a href="http://www.un.org/ecosoc/">http://www.un.org/ecosoc/</a> <a href="http://stdev.unctad.org/themes/ict/docs.html">http://stdev.unctad.org/themes/ict/docs.html</a></td>
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<tr>
<td>Clinton Global initiative</td>
<td>commissions and five regional commissions</td>
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<tr>
<td>CGI</td>
<td>CGI facilitates cross-sector partnerships</td>
<td>Global Health Business as a Partner in Strengthening Public Health Systems in Developing Countries</td>
<td><a href="http://www.clintonglobalinitiative.org">www.clintonglobalinitiative.org</a></td>
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<tr>
<td>IHP+</td>
<td>Launched in 2007 with a common aim to accelerate the achievement of the health-related MDGs in line with the Paris Declaration</td>
<td>Common Framework on M&amp;E Country Health Systems Surveillance (CHeSS)</td>
<td><a href="http://www.internationalhealthpartnership.net/en/working_groups/monitoring_and_evaluation">www.internationalhealthpartnership.net/en/working_groups/monitoring_and_evaluation</a></td>
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</tbody>
</table>
Annex 3: Key Respondents

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Organisation</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Najeeb Mohamed Al Shorbaji</td>
<td>Director, Knowledge Management, WHO</td>
<td><a href="mailto:shorbajin@who.int">shorbajin@who.int</a></td>
</tr>
<tr>
<td>Piers Bocock</td>
<td>Director, Knowledge Exchange, Management Sciences for Health</td>
<td><a href="mailto:pbocock@msh.org">pbocock@msh.org</a></td>
</tr>
<tr>
<td>Yunkap Kwankam</td>
<td>Director, Global eHealth Consultants (GeHCs)</td>
<td><a href="mailto:ykwankam@gehcs.com">ykwankam@gehcs.com</a></td>
</tr>
<tr>
<td>Ron Poropatick</td>
<td>US Africa Command</td>
<td><a href="mailto:Ron.Poropatick@amedd.army.mil">Ron.Poropatick@amedd.army.mil</a></td>
</tr>
<tr>
<td>Mario dal Poz</td>
<td>Human Resources for Health, WHO</td>
<td><a href="mailto:dalpozm@who.int">dalpozm@who.int</a></td>
</tr>
<tr>
<td>Arleen Seed</td>
<td>Sr. eGovernment Specialist , World Bank</td>
<td><a href="mailto:aseed@worldbank.org">aseed@worldbank.org</a></td>
</tr>
<tr>
<td>Dykki Settle</td>
<td>Director IT IntraHealth</td>
<td><a href="mailto:dsettle@intrahealth.org">dsettle@intrahealth.org</a></td>
</tr>
<tr>
<td>Mitul Shah</td>
<td>UN Foundation</td>
<td><a href="mailto:mshah@unfoundation.org">mshah@unfoundation.org</a></td>
</tr>
<tr>
<td>Regina Ungerer</td>
<td>Project Manager ePORTUGUÊSe, WHO</td>
<td><a href="mailto:ungererr@who.int">ungererr@who.int</a></td>
</tr>
<tr>
<td>William Warshauer</td>
<td>Executive Vice President Voxiva</td>
<td><a href="mailto:willw@voxiva.com">willw@voxiva.com</a></td>
</tr>
</tbody>
</table>

Key Respondents were identified either by the World Bank or via the mapping exercise.

Semi-structured interviews were conducted by telephone and lasted between 45 minutes to 2 hours.
Annex 4. World Health Assembly resolution on eHealth (WHA58.28, May 2005)


The Fifty-eighth World Health Assembly,

Having considered the report on eHealth;

Noting the potential impact that advances in information and communication technologies could have on health-care delivery, public health, research and health-related activities for the benefit of both low- and high-income countries;

Aware that advances in information and communication technologies have raised expectations for health;

Respecting human rights, ethical issues and the principles of equity, and considering differences in culture, education, language, geographical location, physical and mental ability, age, and sex;

Recognizing that a WHO eHealth strategy would serve as a basis for WHO’s activities on eHealth;

Recalling resolution WHA51.9 on cross-border advertising, promotion, and sale of medical products through the Internet;

Stressing that eHealth is the cost-effective and secure use of information and communications technologies in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research,

1. URGES Member States:

(1) to consider drawing up a long-term strategic plan for developing and implementing eHealth services in the various areas of the health sector, including health administration, which would include an appropriate legal framework and infrastructure and encourage public and private partnerships;

(2) to develop the infrastructure for information and communication technologies for health as deemed appropriate to promote equitable, affordable, and universal access to their benefits, and to continue to work with information and telecommunication agencies and other partners in order to reduce costs and make eHealth successful;

(3) to build on closer collaboration with the private and non-profit sectors in information and communication technologies, so as to further public services for health and make use of the eHealth services of WHO and other health organizations, and to seek their support in the area of eHealth;

(4) to endeavour to reach communities, including vulnerable groups, with eHealth services appropriate to their needs;

(5) to mobilize multisectoral collaboration for determining evidence-based eHealth standards and norms, to evaluate eHealth activities, and to share the knowledge of cost-effective models, thus ensuring quality, safety and ethical standards and respect for the principles of confidentiality of information, privacy, equity and equality;

(6) to establish national centres and networks of excellence for eHealth best practice, policy coordination,
and technical support for health-care delivery, service improvement, information to citizens, capacity building, and surveillance;

(7) to consider establishing and implementing national electronic public-health information systems and to improve, by means of information, the capacity for surveillance of, and rapid response to, disease and public-health emergencies;

2. REQUESTS the Director-General:

(1) to promote international, multisectoral collaboration with a view to improving compatibility of administrative and technical solutions and ethical guidelines in the area of eHealth;

(2) to expand the use of electronic information through the submission of regular reports, to document and analyse developments and trends, to inform policy and practice in countries, and to report regularly on use of eHealth worldwide;

(3) to facilitate the development of model eHealth solutions which, with appropriate modification, could be established in national centres and networks of excellence for eHealth;

(4) to provide technical support to Member States in relation to eHealth products and services by disseminating widely experiences and best practices, in particular on telemedicine technology, devising assessment methodologies, promoting research and development, and furthering standards through diffusion of guidelines;

(5) to facilitate the integration of eHealth in health systems and services, including in the deployment of telemedicine infrastructure in countries where medical coverage is inadequate, in the training of health-care professionals, and in capacity building, in order to improve access to, and quality and safety of, care;

(6) to continue the expansion to Member States of mechanisms such as the Health Academy, which promote health awareness and healthy lifestyles through eLearning;

(7) to provide support to Member States to promote the development, application and management of national standards of health information; and to collect and collate available information on standards with a view to establishing national standardized health information systems in order to facilitate easy and effective exchange of information among Member States;

(8) to support in the area of eHealth regional and interregional initiatives or those among groups of countries that speak a common language;

(9) to submit to the Executive Board, at its 117th session, a list of proposed specific activities upon which the Secretariat will focus, which should be entirely aimed at tools and services that Member States can incorporate into their own national solutions or adapt as necessary, and an outline of the budgetary implications of proposed activities.

WHA Resolution 58.28 on eHealth, May 2005.

As representatives of governments, multilateral agencies, development partners, provider organizations, academic, research, and public health institutions, standards development organizations, health care workers, entrepreneurs, information and communication technology experts from the public and private sectors, we assembled at the “Making the eHealth Connection: Global Partnerships, Local Solutions” conference have collaboratively derived a set of critical actions. We recognize that world citizens now face globalization, dynamic demographic changes, rapid urbanization, a rising burden of chronic and infectious diseases, and failing or limited health systems. To achieve substantial progress on improving health quality, access, affordability, and efficiency, nations must share and work toward a global eHealth vision.

== We solemnly commit...==

In order to accelerate progress toward implementing eHealth technologies for improving health around the world, and especially in low-resource settings, we solemnly commit to work together and encourage our organizations and others to support these efforts that promote the global realization of eHealth’s benefits through:

=== Policy- and Evidence-Based Agenda-Setting: ===

- **Agenda-Setting and Policy Processes** - Engage in a timely, consensus-based global agenda-setting and policy process for eHealth;
- **Donor Alignment** - Align donors to reduce global health fragmentation, harmonize reporting requirements, and consolidate reporting structures;
- **Interoperability** - Encourage governments to adopt a culture of eHealth interoperability based on open standards;
- **Health System Strengthening** - Strengthen health systems capacity to access and use health information and evidence to improve decision-making;
- **Research Development and Impact Evaluation** - Develop national and global research programs to identify information needs, recognize barriers to access, and translate and use information to evaluate the impact of information and knowledge-sharing interventions on health outcomes;
- **Global eHealth Compact and Resolution** - Increase intergovernmental endorsement of and consensus on eHealth issues through a Global eHealth Compact and a ministerial resolution on eHealth and interoperability;
- **Policymaker Engagement** - Engage policymakers and boost the understanding of collective action on consensus-based eHealth policy through support for the formation of national eHealth Councils, creation of eHealth policy frameworks, toolkits, and a proper workforce, and the appointment of local, regional, and national eHealth ambassadors;

=== Fostering Collaborative Networks and Global Partnerships: ===

- **Online Collaboration Spaces** - Create an online common space that enables producers, intermediaries, and users to develop and share eHealth content, methods, and technologies, with priority given to settings with weak production of and access to information and knowledge;
- **Collaborative Action Platforms and Networks** - Support the development and launch of collaborative action platforms and a network of networks in eHealth, tentatively named the Worldwide eHealth Collaborative Action Network (WE-CAN);
- **Portals and Idea Clearinghouses** - Create Internet portals and idea clearinghouses for knowledge and information-sharing on eHealth among public and private-sector stakeholders, including health care workers, researchers, educators, providers, policymakers, entrepreneurs, and donors;
• **eHealth Entrepreneur Networks** - Develop an eHealth promotion and entrepreneur network for training, partner/donor matching, and the incubation and acceleration of optimal and transferrable projects;

• **SDO Agreements** - Facilitate agreements with global Standards Development Organizations (SDOs) to harmonize and provide their health IT standards for free to low-income countries;

• **Advancing mHealth** - Launch a new mHealth Alliance to focus attention and increase multi-stakeholder dialogue on the critical issue of mobile health (mHealth) and the Millennium Development Goals through incubation of key mHealth demonstration projects, including, but not limited to, the areas of hospital care, HIV/AIDS treatment and wellness, community health worker support, and epidemiological outbreak alerting and response coordination;

### Knowledge and Capacity Building: ===

• **Cultivate Centers of Excellence** - Identify and support existing and new health informatics and eHealth Centers of Excellence, and facilitate their development as central resources for disseminating health informatics knowledge and skills through the support of educated health informaticians and eHealth experts;

• **Increase Collaboration and Networking** - Establish relationships among health informatics and eHealth training and research centers and develop a mechanism for South-South and North-South collaboration and networking to share resources and create a global community of competent professional practitioners and scholars;

• **Educate About eHealth Capacity Expansion** - Educate governmental and national leaders about the importance of expanding eHealth capacity toward national goals for health and economic development in order to cultivate and sustain support within the highest levels of government;

• **Better Health Information and Knowledge Management** - Expand human resource capabilities to incorporate skills necessary for health information and knowledge management and sharing to meet the needs of different users, applying appropriate standards, methods, and technologies;

• **Sustained, Skilled eHealth Workforce** - Ensure growth and development of local health informatics and telehealth expertise through support of grassroots, local, and regional communities of practice, faculty development, institutional support, educational material development, distribution, and virtual access linked to colleagues across the world in a meaningful scholarly and practice community;

• **eHealth Implementation and Adoption Education** - Develop educational components that focus on implementation and adoption strategies and skills required for both success and sustainability;

• **Training Systems Linkages** - Encourage and foster stronger linkages between pre-service and in-service training systems for the development of eHealth capacity;

### Globally Reusable Metrics, Tools, and Templates: ===

• **eHealth Assessment, Evaluation, and Metrics** - Develop strong eHealth assessment and evaluation tools, including robust metrics for evaluation of eHealth interventions to determine level of interoperability, health workforce informatics capacity, and impact of interventions on quality, access, and affordability of the health system;

• **eHealth Blueprint Development** - Work together to develop a blueprint for initiative activities and programs in resource-poor countries, and rapidly create eHealth initiatives to unite and add value to current “siloeed” single-disease programs;

• **eHealth Enterprise Architecture and Strategy Development** - Evolve an open, freely available generic enterprise architecture and strategy for interoperable, scalable, and robust eHealth systems, based on successful on-the-ground implementations and open standards;

• **Increase Standards Consensus** – Strongly encourage the use of open standards to support interoperability of systems, and develop and share open source reference implementations and toolkits that support both open and proprietary solutions;
World Bank: ‘Harmonisation and Alignment of the eHealth Architecture for Human Resources for Health Administration, Development and Management’

== Supporting Country-Level Initiatives: ==

- **Advocate for Needed Country-Level Changes** - Advocate for the development of country-level eHealth strategies, architectures, and implementation of systems according to these schemas;
- **Funded and Evaluated Pilot Projects** - Create fundable pilot or demonstration projects with adequate evaluative and reference implementation components, with a commitment to evaluate and implement successful efforts;
- **Interoperable eHealth Reference Implementations** - Support national-scale implementations of interoperable eHealth systems, including necessary support and maintenance, within selected low- and middle-income countries, and carefully evaluate impact and publish the results;
- **Comprehensive, User-Centered eHealth Systems** - Support, design, and fund eHealth systems that are person-centered, need-driven, promote health and disease prevention, and are interoperable, standards-based, collaborative, sustainable, scalable, reusable, and owned by in-country organizations;

We the undersigned commit to achieving these aims through consensus-based actions, proactive agenda-setting that carries these messages to appropriate global health and eHealth forums, creating innovative public-private partnerships, and through implementation of strategies and policies that provide appropriate financial and technical resources to support the Bellagio eHealth Call to Action.

== We call upon ==

We call upon governments, multilateral agencies, development partners, provider organizations, academic, research, and public health institutions, health care workers, entrepreneurs, technology experts from the public and private sectors, and members of civil society to join this Call to Action. Together we must accelerate achievement of better health for all in the 21st century. We can accomplish this through interoperable, person-centered, evidence-based, and sustainable eHealth systems. Ultimately, these efforts will contribute to more equitable health care and improve the well-being of all the world’s citizens.

[http://www.ehealth-connection.org/content/bellagio-ehealth-call-action](http://www.ehealth-connection.org/content/bellagio-ehealth-call-action)
Annex 6 - Report of the ECOSOC Annual Ministerial Review: Regional Preparatory Meeting on eHealth: Use of Information and Communication Technology in Health

10 key recommendations, reflecting the core issues raised by the panelists and delegates are presented here:

1. Countries should develop national policies, national strategic plans, legal and ethical frameworks, standards and norms for eHealth and mHealth with specific reference to national, regional and continental health and development agenda. Development of legal, legislative and regulatory frameworks for personal health data protection, confidentiality, ownership and access for research purposes should be part of the legal framework;

2. Countries should adopt continental and regional codes of ethics and quality control mechanisms and tools for health information on the Internet;

3. Countries should be encouraged to contribute to standard development and to ensure that eHealth systems implemented in their countries meet international interoperability standards. Interoperability of eHealth systems is key and should be based on open standard principle and collaborative community practice;

4. Countries should identify health system and health services challenges they face that might be amenable to solution using eHealth systems. Need-based approaches should be used in planning and implementation of eHealth systems;

5. Countries should ensure proper investment in building the necessary national health information infrastructure which includes connectivity, computing and human resources in healthcare and medial institutions;

6. Countries should seek partnerships and forge collaboration with the United Nations agencies, donor community, the private sector and other national stakeholders to plan, implement, sustain and evaluate eHealth systems and services;

7. Countries should aim at integrating eHealth training and capacity building as part of the formal public health education. Creating a critical mass of eHealth experts, increased awareness of eHealth issues among the public and decision makers should be a priority;

8. Countries should establish, with support from the international community, platforms for collaboration, knowledge sharing and learning, exchange of experience and joint projects in support of eHealth at the regional and international level;

9. Countries should build capacity for eHealth project management, contracting, needs assessment and evaluation in partnership with the international community;

10. UN agencies, donor community, the private sector and the other eHealth partnerships should create a repository of eHealth projects, they should implement projects driven by country needs and responding to local health problems, they should comply with the ethical and legal frameworks and invest in building of eHealth local capacity.
Annex 7: Recent and upcoming events

The attendees included WHO teams such as the Health Metrics Network and representatives from the University of Oslo, the Centers for Disease Control and several leading initiatives for information system development. These groups came together to discuss how to build a comprehensive health information system from the ground up.

2. Africa regional meeting on "Human Resources Information Systems: taking stock, sharing lessons and setting the agenda for the future" Arusha, Tanzania, 20-24 April 2009
This meeting brought together participants from ten countries to share experiences and lessons learnt about national human resources information systems (HRIS) and strengthening approaches, and the degree to which routine administrative data on human resources for health are used to support policy and management decisions. Participants explored opportunities to harmonize HRIS with other health, management and broader social and economic information systems. The meeting also provided a forum for regional networking for HRIS strengthening, notably in the context of Health Workforce Observatories and other cooperative mechanisms for promoting evidence-informed decision making. The event was organized by the Capacity Project, in collaboration with the East, Central and Southern African (ECSA) Health Community and the World Health Organization.

3. Measuring health workforce inequalities: methods and applications - Special topic meeting. 57th Session of the International Statistical Institute (ISI) 16-22 August 2009, Durban, South Africa
The goal of the Special Topic Meeting at the ISI 2009 Session is to promote statistical discourse on measuring health workforce inequalities and the implications for policy and planning. Submissions should focus on methodological developments and applications for measuring health workforce inequalities, with special attention to monitoring trends (over time and/or areas) and evaluating their impacts on health systems performance and population health outcomes.

The health workforce is broadly defined to include all those who promote and preserve health as well as those who diagnose and treat disease. Also included are health management and support workers – those who help make the health system function but who do not provide health services directly. Inequalities in the health labour market may refer to, for example, workforce imbalances by occupation, geographical typology, place of work or gender.

4. eHealth 2009: 2nd International Conference on electronic healthcare. Patients or Users - who are we developing services for? 23rd-25th September 2009 - Istanbul, Turkey
http://www.electronic-health.org/
CONFERENCE AIMS Building on a very successful eHealth 2008 conference, the aim of eHealth 2009 is to bring together experts from academia, industry and global healthcare institutions to stimulate cutting-edge research discussions and share experience with real-world healthcare service providers and policy makers as well as provide numerous business opportunities. Despite substantial budgets spent on eHealth in recent years, existing healthcare services do not sufficiently address the issue of patient privacy, trust, or quality-assurance, nor the potential in e-learning and web mining for delivering 21st-century healthcare systems for European citizens.

5. International Symposium on Health Workforce Neuchâtel, Switzerland, 14-16 October 2009
An international symposium focusing on the theme, "The performance of a national health workforce: How to assess it? How to strengthen it?" will be organized in October 2009 in Neuchatel, Switzerland. The meeting will provide decision-makers and researchers interested in human resources of the health system an occasion to exchange their views and assess the state-of-the-art in the matter. The symposium is being hosted by the Swiss Health Observatory, under the aegis of the World Health Organization and in collaboration with the Swiss Federal Office of Public Health, the Center for Health Workforce Studies/State University of New York and the Centre de Sociologie et de Démographie Médicin.

6. ITU TELECOM World 2009 conference, October 2009. The International Telecommunication Union, in collaboration with WHO will be hosting an eHealth Forum and Pavilion