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E-HEALTH IN THE COMMONWEALTH: PRIVATE SECTOR PERSPECTIVES

Prepared by the Commonwealth Business Council

EXECUTIVE SUMMARY

E-Health, or technology-enabled health care, in the popular conception is associated mainly with the use of computers in medicine. In modern applications, however, it has a much wider scope and potential. Applications include health information networks, electronic medical records, diagnostic systems, clinical decision support systems, and in the future may extend to automated diagnosis and treatment by computerised systems.

2. From the point of view of both the public and private sector, e-health offers the potential for significantly improved collection and availability of health information, leading to better diagnostics, reduced risk of inappropriate care and reduced healthcare costs. There are a wide range of advantages including: greater patient mobility, through electronic patient record systems and centralised access; improved early warning of diseases/outbreaks; better quality and promptness of treatment, avoiding duplication of treatments; and cost savings in provision of services. Private sector capability and expertise in research and development of IT and communications enabled systems can play a key role in delivering solutions that harness these advantages.

3. There are a number of challenges for the effective development and implementation of e-health systems. These include:

Coordination and Integration: there is a need for an integrated approach to the design, development and implementation of systems and projects. Technology systems are often developed by independent, uncoordinated bodies, resulting in different technical platforms and standards which inhibit interoperability.

Inclusion and Affordability: a key objective for all countries is ensuring healthcare access to the widest possible population at sustainable costs for public health.

Commercial Drivers: it is sometimes difficult to quantify the commercial benefits of an application which inhibits its development.

Connectivity: better connectivity is required to enable many systems, particularly those that rely on the internet.

Interoperability: for the private sector, the ability of systems to interact and exchange data effectively is a crucial issue that has stalled greater progress in many areas. Fragmented systems and a proliferation of different standards make interoperability difficult to achieve.

Security: given concerns about control, management and unauthorised access to systems and data which are relevant to all information technology programmes, considerable attention needs to be given to e-health security.

Privacy: security systems need to protect the confidentiality of sensitive data and this also needs to be carried out within the framework of ethical policies and national data protection legislation.

Delivery and Performance: the main challenge is how to achieve effective results, given the difficult history of delivery of large scale public technology/IT projects.

Small states: as in other areas of economic development, their size and vulnerability create particular challenges. There is a potential for effective development of centralised systems on a smaller scale, but countries often face an absence of economies of scale and resources to support costs.

4. The Commonwealth Business Council recommends the following approaches and solutions to delivering e-health in the Commonwealth:

1. **Private-Public Partnership:** Through private-public partnerships, governments can create the enabling framework and the private sector can deliver systems and solutions as well as investment.
2. **Co-ordinated Planning for Development and Delivery:** Planning and development should be carried out in consultation with the private sector, and collaborative working across all stakeholders will improve the likelihood of success.
3. **Long-term Sustainable Finance:** Research and development requirements, as well as the long period for return on investment, necessitate planning at least 5-7 years in advance to enable adoption and modernisation of systems.
4. **Development of a Common Infrastructure:** integrated systems will depend on a common platform around which e-health systems can be delivered, e.g. a national data spine.
5. **Harness New Technologies:** these include: internet based systems for access to information and solutions; mobile technologies for data collection, transmission and communications; telemedicine applications; smart card systems for electronic patient records.
6. **Improve Connectivity:** in order to harness the full benefit of technologies and data communication, connectivity needs to be improved, particularly for developing countries.

5 The Commonwealth Business Council stands ready to collaborate with partners in government and the private sector to help bring the most effective and affordable solutions.

INTRODUCTION

6. Technology-enabled healthcare, or e-health, is the wave of the future that is with us now. Rapid technological development in developed as well as developing countries offers a new avenue to better health, but for many countries the expected benefits have not yet been realised. New approaches, with the active involvement of the private sector in partnership with governments and other stakeholders, can help accelerate this process.

E-HEALTH: A WIDE SCOPE AND POTENTIAL

7. E-Health in the popular conception is associated mainly with the use of computers in medicine. In modern applications, however, it has a much wider scope and potential. The real power of e-health lies in information collection and exchange, in new tools for diagnostics and systems to support clinical decisions. In the future also lies a challenging debate on how far automated systems of diagnosis and treatment can and should replace human skills and interaction.

8. Health information networks have the potential to support collection and access to data, interactions and transactions between patients, healthcare professionals, healthcare providers, policy makers and legislators. Levels of functionality begin with public information access and with development can provide interactive services such as information search. At the next level, transactions including making online appointments and filling prescriptions online can be implemented. A wider vision is for connected health services aiming at seamless integration and delivery of new servicesⁱ.

9. Electronic Medical Records, medical records in digital format, include patient information originated in digital format, as well as scanned/digitized information. The conversion of paper based or hard copy format information (e.g. x-rays, photographs) to digital format presents a major challenge.

10. Telemedicine is a fast developing area of clinical medicine enabled by the internet, telephone or other networks with applications to medical consultation, and remote examinations or procedures. Isolated communities and rural areas distant from urban medical centres can benefit significantly. For example, the world's most remote inhabited island, Tristan de Cunha which lies some 1600 miles west of Cape Town, South Africa, can now access telemedical care following implementation of pro bono services by IBM and Beacon Equity Partners. The island's only physician is now able to electronically capture and share medical data and information, including X-Rays and EKGs as well as video camera examinations with mainland consultants. Satellite communications will facilitate real-time diagnostic advice and suggested treatments.

11. Information and communication technology has revolutionised other sectors such as telecommunications and financial services. However, the uptake in healthcare has been slower and far more limited. In the United States, for example, as of 2006 the health care industry spent only 2 per cent of gross revenues on health information technologyⁱⁱ, whereas the norm in other information intensive industries is 10 per cent or more. It is therefore important to consider the barriers to enhanced implementation as well as approaches to help enable further adoption and development.

WHY E-HEALTH? PRIVATE SECTOR VIEWS

12. From the point of view of both the public and private sector, e-health offers the potential for significantly improved collection and availability of health information, leading to better diagnostics, reduced risk of inappropriate care and reduced healthcare costs. In short, new approaches through the application of technology can provide improved public health.

13. There are a wide range of advantages including:

- Greater patient mobility, through electronic medical records and centralised access
- Improved early warning of diseases/outbreaks
- Better quality and promptness of treatment, avoiding duplication of treatments
- Cost savings in provision of services

14. Private sector capability and expertise in research and development of IT and communications-enabled systems can play a key role in delivering systems and solutions that harness these advantages.

CHALLENGES FOR DEVELOPMENT AND IMPLEMENTATION OF E-HEALTH SYSTEMS

15. **Coordination and Integration:** there is a need for an integrated approach to the design, development and implementation of systems and projects. Technology systems are often developed by independent, uncoordinated bodies, resulting in different technical platforms and standards which inhibit interoperability. In government projects, the Ministry of Health, as responsible for healthcare policy and implementation, may lead the planning and development process, but needs to work with other Ministries, for example, IT, Communications, Rural Development.

16. **Inclusion and Affordability:** a key objective for all countries is ensuring healthcare access to the widest possible population at sustainable costs for public health. Rising costs of healthcare have affected both developed and developing countries, however the burden is heavier in lower income nations. The World Bank estimates that between \$25 billion and \$70 billion per annum is required to meet the Millennium Development Goals for health. Healthcare spending (2004) accounts for 16 per cent of GDP in the United States, 9 per cent on average in OECD countries and less in most developing countries. Scrutiny of health care costs, and the potential for efficiency and savings, as well as approaches to long-term investment are key considerations.

17. **Commercial Drivers:** it is sometimes difficult to quantify the commercial benefits of an application which inhibits its development. For example, as Dr Sumanth Raman of Tata Consultancy Services points out, electronic medical records (EMR) help hospitals and doctors treat patients better and help reduce medical errors, however, “their global acceptance levels remain abysmally low because no one has yet figured out how the EMR helps the Healthcare Provider Organizations. Worse, some of these systems can actually end up causing losses to the provider by cutting down the inpatient stay, reducing the number of tests done, rationalizing the medication etc.”ⁱⁱⁱ Policy frameworks and financial models need to consider what are the incentives for development and who should take the lead in financing and developing new systems?

18. **Connectivity:** better connectivity is required to enable many systems, particularly those that rely on the internet. For example, for the new national Network in the United Kingdom, over 22,000 broadband connections have been installed, which gives an indication of the scale required to service a population of 61 million in a country with comparative high levels of connectivity. Connectivity and internet access is still at the early stages in many developing countries, and the digital divide between urban and rural areas is more pronounced. Computers may be in place, but they are of limited use without networks and connectivity.

19. **Interoperability:** For the private sector, the ability of systems to interact and exchange data effectively is a crucial issue that has stalled greater progress in many areas. Fragmented systems and a proliferation of different standards make interoperability difficult to achieve. Microsoft cites estimates in the United States that fully standardized interoperability between healthcare providers and other organizations (e.g. specialists, laboratories and insurance funds) could save up to \$US75 billion per annum, or 5 per cent of the \$US health spending of \$1.7 trillion in 2003^{iv}. Policy makers face decisions on application of standards in an environment which is difficult to forecast over the next decade. Open standards that are currently available offer an accessible pathway to interoperable solutions, and consultation between governments and the private sector can help chart the most effective approaches.

20. **Security:** Given concerns about control, management and unauthorised access to systems and data which are relevant to all information technology programmes, considerable attention needs to be given to e-health security. Five classes of threat have been identified by the British National Research Council (1997): insiders who make innocent mistakes and cause accidental disclosures of confidential information; insiders who abuse their access privileges; insiders who knowingly gain access to information through spite or for profit; an unauthorised physical intruder gains access to information; and vengeful employees and outsiders. Robust security systems need to be able to counter these threats. Key features and controls include^v: anonymisation; audit trails; physical security; user authentication; client and server authentication; security breach detection; encrypted data movement; data integrity; availability; and access control.

21. **Privacy:** security systems need to protect the confidentiality of sensitive data and this also needs to be carried out within the framework of ethical policies and national data protection legislation. Key policy questions to address include: the proper role of notice and consent; the right of patients to access their own health records in electronic formats; identification and authentication; secondary uses; and enforcement mechanisms.^{vi}

22. **Delivery and Performance:** the main challenge is how to achieve effective results, given the difficult history of delivery of large scale public technology/IT projects. Co-ordinated planning, effective consultation and design at the planning stage and risk identification are important ways to address delivery which have not always been properly utilised in previous projects.

23. **Small states:** as in other areas of economic development, their size and vulnerability create particular challenges. There is a potential for effective development of centralised systems on a smaller scale, but countries often face an absence of economies of scale and resources to support costs.

APPROACHES AND SOLUTIONS TO DELIVERING E-HEALTH IN THE COMMONWEALTH

24. The Commonwealth Business Council recommends the following approaches and solutions to delivering e-health in the Commonwealth:

1. **Private-Public Partnership:** Through private-public partnerships, governments can create the enabling framework and the private sector can deliver systems and solutions as well as investment. At the global level, the importance of this approach has been recognised by governments, including at the World Health Assembly^{vii} based on the need “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”. Such partnerships need to be developed to address public needs, with provisions to ensure inclusive access, affordability and effective alignment of both public and private sector goals.

25. Most global health partnerships have thus far been more directed towards disease-specific initiatives, therefore drawing on this experience may not be directly instructive. In addressing the need for essential health technologies, the World Health Organisation’s eHCD Programme aims to strengthen the synergies from partnerships by:

- developing the capacity and mechanisms for partnership and coordination of efforts of other interested parties for e-health projects in Member States;
- ensuring that partnerships with other agencies, organizations and institutions are in place. Partnerships at international level will be established between WHO, the ITU and the European Commission. Partnerships at national level will bring together various government ministries and the public sector, the private sector, WHO regional and country offices as well as WHO collaborating centres;

- ensuring that effective mechanisms for resource mobilization and funding are in place to support capacity building at country level.
- ensuring that policies and procedures are in place to help countries develop strategies and plans for integrated e-health services.

26. At national level, partnerships for e-health are starting to evolve, such as in Australia, Canada, India, New Zealand, the United Kingdom, and Singapore^{viii}. Recent examples of private-public partnership in other sectors, such as in India for the development of the biotechnology sector^{ix}, demonstrate that the public-private environment can greatly influence more rapid development. Human resource development, public research and infrastructure development are key aspects. Incentives to invest in research are strongly linked to intellectual property protection. Government can take the lead with investment in large-scale programmes where there is a need, but commercial incentives are lacking.

2. **Co-ordinated Planning for Development and Delivery:** Planning and development should be carried out in consultation with the private sector, and collaborative working across all stakeholders will improve the likelihood of success. As New Zealand's Minister of Health, Hon David Cunliffe has stated, "In health IT, perhaps more than in any other area of IT, collaborative working across the multiple stakeholders is imperative. The Ministry of Health actively encourages collaboration between private sector health IT providers, and is a founder member, and major funder, of the New Zealand Health IT Cluster. The Cluster is an alliance of organisations interested in health IT, from software developers and infrastructure companies to health care providers and academic institutions – all of which have agreed to work collaboratively."^x
3. **Long-term Sustainable Finance:** Research and development requirements, as well as the long period for return on investment, necessitate planning at least 5-7 years in advance to enable adoption and modernisation of systems. Identification of cost savings can in turn provide an impetus to investment. In Canada, Canada Health Infoway projects for electronic medical records are projected to achieve savings of \$6 to \$7 billion CAD per annum, create 37,000 new jobs by 2010 and add \$2 billion CAD in employment income.^{xi}
4. **Development of a Common Infrastructure:** integrated systems will depend on a common platform around which e-health systems can be delivered, e.g. a national data spine. Potential benefits of a common infrastructure, identified by Microsoft^{xii} include: accelerated time-to-use for new services; common consistent building blocks such as user identity management; authentication and authorisation across services, and improved user experience. It is important to establish consistent specifications which facilitate development and interoperability. The Indian Government, for example, has been developing an Information Technology Infrastructure for Health (ITI^h)^{xiii} with private sector inputs from Apollo Health Street Limited (AHSL), a subsidiary of Apollo Hospitals Enterprise Limited, and leading Indian IT companies including WIPRO.
5. **Harness New Technologies:** these include: internet based systems for access to information and solutions; mobile technologies for data collection, transmission and communications; telemedicine applications; smart card systems for electronic patient records. There are now many examples of successful applications which can be shared amongst countries including: physician office systems; electronic health records; imaging equipment, picture archiving and communication; drug information systems; alternative healthcare delivery systems; administration and financial solutions.

6. Improve Connectivity: in order to harness the full benefit of technologies and data communication, connectivity needs to be improved, particularly for developing countries. There are a number of international and national initiatives in this regard. For example, Reliance Communications, one of the largest communications companies in India, has begun an initiative to build a submarine cable linking South Africa to East Africa that could help slash Internet costs and accelerate delivery of long overdue connectivity. There are four projects in the works to link 22 eastern, central and southern African countries to the world's network of submarine cables and twenty first century communications.

27. To help realise the vision for connected e-health as a tool for sustainable development, the CBC stands ready to collaborate with partners in government and the private sector to help bring the most effective and affordable solutions.

ⁱ "Knowledge Driven Health", Microsoft Corporation 2006

ⁱⁱ Wikipedia, citing Raymond, B. and C. Dold. "Clinical Information Systems: Achieving the Vision. Prepared for the Meeting "The Benefits of Clinical Information Systems" Sponsored by the Kaiser Permanent Institute for Health Policy, 2001.

ⁱⁱⁱ Dr Sumanth Raman, "Healthcare IT Trends", *E-Health in the Commonwealth – Building Healthcare Systems in the Digital Age – Private Sector Perspectives*, Commonwealth Business Council, 2008

^{iv} Jan Walker, Eric Pan, Douglas Johnston, Julia Adler-Milstein, David Bates and Blackford Middleton, "The Value of Health Care Information Exchange and Interoperability: There is a business case to be made for spending money on a fully standardized nationwide system", *Health Affairs: Web Exclusive*, 19 January 2005 (<http://content.healthaffairs.org/cgi/reprint/hlthaff.w5.10v1>).

^v See Mark Slaymaker, Eugenia Politou, David Power and Andrew Simpson, "E-Health Security Issues: the e-DiaMoND Perspective", University of Oxford, 2004
<http://www.allhands.org.uk/2004/proceedings/papers/53.pdf>

^{vi} See Centre for Democracy and Technology, Health Privacy Project, www.healthprivacy.org

^{vii} World Health Assembly, May 2005 Resolution 58.28

^{viii} Singapore's Infocomm Development Authority (IDA) initiated a program in 2006 to encourage Health Information Technology adoption among primary care clinics. Intelligent Nation 2015 (iN2015) is Singapore's ten-year master plan for realizing the potential of infocomm over the next decade. Led by the Infocomm Development Authority of Singapore (iDA), iN2015 is a multi-agency effort that is the result of private-, public-, and people-sector co-creation. For more information, see <http://www.in2015.sg>.

^{ix} Viren Konde, "Biotechnology in India: Public Private Partnerships", *Journal of Commercial Biotechnology* (2008) 14, 43-55;

<http://www.palgrave-journals.com/jcb/journal/v14/n1/full/3050079a.html>

^x Hon David Cunliffe, "The Challenges and Progress of the Health Information Strategy for New Zealand", *E-Health in the Commonwealth – Building Healthcare Systems in the Digital Age – Private Sector Perspectives*, Commonwealth Business Council 2008

^{xi} Richard Alvarez, "E-Health in Canada: Transforming Healthcare and Fostering Innovation", *E-Health in the Commonwealth – Building Healthcare Systems in the Digital Age – Private Sector Perspectives*, Commonwealth Business Council, 2008

^{xii} "Knowledge Driven Health", Microsoft Corporation 2006 p. 6

^{xiii} Framework for Information Technology Infrastructure for Health in India, Department of Information Technology, Ministry of Communication and Information Technology, 2003
<http://www.mit.gov.in/telemedicine/index.pdf>

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