For information
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Legislative Council Panel on Health Services

Development of a Territory-Wide Electronic Health Record Sharing System

Supplementary Information

Purpose

The Food and Health Bureau (FHB) briefed the Legislative Council Panel on Health Services on the proposal to develop a territory-wide patient-oriented electronic health record (eHR) sharing system (vide LC Paper No. CB(2)1006/08-09(03)) and provided a written response on 12 May to the questions raised by the Panel(vide LC Paper No. CB(2)1724/08-09(01)). This paper aims to provide supplementary information for the Panel's reference.

Background of Development of Electronic Health Record Sharing System

2. In the discussion paper "Building a Healthy Tomorrow" on the future service delivery model for our healthcare system issued in 2005, FHB proposed for the first time to establish a territory-wide patient record system, which aims to enable better access to patients' records with the patients' consent by doctors in both the public and private sectors so as to facilitate the future service model which emphasizes primary care and better use of the healthcare resources, and enable transfer of patients between different levels of care and between the public and private sectors.

3. To test the feasibility and acceptability of eHR sharing, FHB has launched the "Electronic Patient Record Sharing" (ePR) pilot project since April 2006 in collaboration with the Hospital Authority (HA) to allow participating private doctors and healthcare providers and other related institutions to view their patients' medical records kept at HA, subject to the patients' consent.

4. In view of the positive responses from the private sector to the pilot project, FHB established in July 2007 the Steering Committee on eHR Sharing (the Steering Committee) comprising healthcare professionals, groups and organisations from both the public and private sectors. The Steering Committee makes recommendations to the Government on the development of an eHR sharing system connecting different levels of care and the public and private healthcare systems. The idea is that participation of private healthcare

providers and individuals in eHR sharing would be on voluntary basis.

5. Further to the discussion paper "Building a Healthy Tomorrow", FHB published the Healthcare Reform Consultation Document entitled "Your Health, Your Life" in March 2008 and conducted the first stage public consultation on healthcare reform. One of the service reform proposals is to develop eHR sharing as an infrastructure for healthcare reform, so as to provide an information sharing platform for enhancing primary care and promoting public-private partnership (PPP) in healthcare.

6. As the Administration pointed out in the Report on First Stage Public Consultation on the Healthcare Reform, the proposal to develop eHR sharing received broad support from the public. Almost all respondents expressed support for the proposal, noting its benefits to patients brought about by enhancing efficiency and quality of care through avoiding duplicate investigation and facilitating collaboration among different healthcare professionals. The majority was of the view that that the eHR system would help implement patient-oriented healthcare services, and was essential for the promotion of comprehensive and holistic primary care, particularly the strengthening of connection and communication between family doctors and other healthcare providers. The eHR sharing system could also facilitate interface among primary care services, hospitals and specialist services and connect the public and private healthcare sectors so that patients could move between different levels of healthcare and between the public and private healthcare sectors without worrying about the transfer of their medical records.

7. Based on the results of the first stage public consultation on healthcare reform, the Administration has pledged to make use of the increased healthcare funding in the next few years to implement various service reforms that have received broad public support, including enhancing primary care, promoting PPP in healthcare and developing eHR sharing system. Among them, the implementation of the eHR sharing system has the greatest urgency as it is the infrastructure platform for the other two reform proposals.

8. Based on the recommendations of the Steering Committee and its Working Groups on the eHR development, and the management options proposed by the independent consultant for the overall development programme of the eHR sharing system, FHB briefed the Legislative Council Panel on Health Services in details on 9 March 2009 on the development of the proposed eHR sharing system in a 10-year planning horizon, as well as the manpower and capital costs required for the planning, development, implementation and management of the programme. In the supplementary information subsequently submitted to the Legislative Council Panel on Health Services in May 2009, FHB gave a further account of the estimated capital cost for the First Stage development of the eHR sharing system, the specific plans and measures on data privacy and security protection and how the private sector can participate in the eHR sharing system.

Development Strategy of the eHR Sharing System

9. One of the main development strategies of the territory-wide patient-oriented eHR sharing system is the optimal use of the existing Clinical Management System (CMS) and technology of HA and the successful experience and invaluable expertise it accumulated in developing the CMS to promote the development of an eHR system and sharing infrastructure between the public and private healthcare sectors. One possible approach is to "transplant" the CMS of HA to the eHR system for adaptation and extension before making it available for the private sector.

10. However, the CMS Adaptation and Extension Component is built upon the eHR Sharing Infrastructure Core Component. This is because the private healthcare sector is comprised of a large number of healthcare service providers including private hospitals, private doctors and clinics, private laboratories, etc. In this respect, it is different from HA, which is a single medical institution with all the healthcare practitioners there being its employees, and its patients have already granted authorization to HA to store and use their medical records upon their admission into HA hospitals.

11. Hence, an eHR sharing system to be shared by public and private sectors has to provide sufficient authentication for healthcare providers and patients and sufficient control over access right so as to achieve the aim to protect privacy of personal data and ensure system security and standardisation of data and interface. Even if we directly use HA's CMS after adaption, we still have to develop the core components of the eHR sharing system for the above purposes.

12. At the same time, we have to take account of the electronic information systems being used or planned by private hospitals, private practitioners, private laboratories and other private healthcare service providers. Some of these systems are provided by individual information technology service providers. Although the coverage of these systems is not wide, and the practice of having individual patients' clinical data electrically stored is not common, individual healthcare service providers should have the right to select the electronic information system that suits their different business needs, be it the adapted CMS of HA or other system available in the private market. It is not feasible to oblige all healthcare service providers participating in eHR sharing to use totally HA's CMS, and neither is it a situation the healthcare professionals would like to see.

13. As the ultimate goal of the eHR sharing system is to connect the public and private sectors, it is necessary to allow private healthcare providers to choose their own systems. From the eHR sharing perspective, what is important is not that all service providers use the same system, but the capability of achieving certain common standards among different systems and interfacing with the eHR sharing infrastructure. This is also the reason that

the development of core components, adaptation components and standardisation and interfacing components proceed at the same time in our overall planning. The proposed eHR Office would also be tasked to coordinate the development programme, handle the security of personal data and the system as well as other policy and legislative issues relating to the system.

Participation of the Private Healthcare and IT Sectors

14. As mentioned in the above background information, the main purpose for the development of eHR sharing is to provide an infrastructure for healthcare reform, particularly in support of the reform proposals to enhance primary care and promote PPP. Thus, the participation of the private sector is one of the essential parts of this project. We also attach great importance to the role of the IT sector to provide the relevant system services. In view of the fact that 70% of the primary care services for the whole population in the territory are provided by private medical practitioners and clinics, in order to take forward the reform proposals to enhance primary care and promote PPP, the eHR sharing system must be able to serve both the public and private sectors. Implementing eHR in the public sector alone will not only fail to achieve the desired goal but also delay the progress of other reform proposals.

15. As such, an important part of the development programme of the eHR sharing system is the participation of private healthcare and IT service providers, including facilitating the development and deployment of electronic medical record (eMR) systems with sharing capabilities in the private sector, and encouraging private IT service providers to develop such systems and provide relevant services so as to promote the use of these systems by private healthcare service providers for connection to the eHR sharing platform.

16. Specifically, the Administration's strategy is to invite representatives from the both the public and private healthcare sectors to join our Steering Committee from the very beginning and participate in the formulation of a plan for the development of eHR sharing so as to ensure that that the development of the system has their support. They are also invited to put forward specific suggestions on how the private sector can be incentivised to participate in eHR sharing. The current overall development programme is devised based on the consensus reached after discussion in the Steering Committee for more than one year and it takes into account the actual situation of the private healthcare sector in Hong Kong. This enables us to devise a development programme that can best meet the needs of the private healthcare sector.

17. As a next step, subject to the approval of the proposals on the setting up of an eHR Office and funding application for developing the eHR sharing programme, we plan to launch an eHR Engagement Initiative (EEI) to invite private healthcare and IT service sectors to submit proposals on their

engagement in the development of the eHR sharing system. Apart from providing capital investment for the development of eHR sharing system, the Government has also planned to fund individual eHR sharing partnership projects as part of its IT infrastructural development for healthcare. The principle of Government investment is that no subsidies will be provided to cover the day-to-day operation of private healthcare providers. Private sector partners shall be responsible for their own hardware and recurrent costs, as well as the costs incurred by the development of any additional or special components of their systems.

18. As the private healthcare providers can use different systems for their own purposes and to connect to the eHR sharing platform, we have not estimated the cost for the private healthcare sector to participate in eHR sharing. However, since the Government will bear the costs for research, development and infrastructure, we have reasons to believe that the cost to be borne by the private sectors participating in eHR sharing will not be too much. There are now private IT firms providing eHR system services. For a private practitioner, the cost for setting up such a system in a private clinic is around $20,000, and the monthly service fees including the network fee range from $800 to $1,500. We expect that in future the cost for individual practitioners using a sharable eHR system will be about the same. This is also one of the important incentives in the comprehensive development plan to attract the private sector to participate.

19. The ePR Pilot Project launched since 2006 is well received. The project has thus far enrolled over 64 000 patients, over 1 350 private healthcare professionals, 12 private hospitals and 10 other private or non-governmental organisations (NGOs) providing healthcare-related services. According to the survey and review on the project conducted by the Administration last year, participating doctors and patients are very positive to the project and satisfied with personal data privacy and system security. They also greatly support sharing of patient records and consider that it can help improve the quality of healthcare and enable private doctors to provide more suitable services for patients. Most doctors are enthusiastic about the development of two-way record sharing in future, and many doctors even ask for further extension of the scope of medical records that can be shared. In view of the feedback and experience in the pilot project, we are optimistic about the support and participation of private healthcare providers.

20. Meanwhile, the Administration will also promote gradual implementation of eHR sharing system in the private healthcare sector through the introduction of PPP projects. For instance, private doctors participating in the Cataract Surgeries Programme (providing subsidy for patients to have cataract surgeries performed by private ophthalmologists) and the Tin Shui Wai Primary Care Partnership Project are already using the ePR system provided by the Administration. In addition, the Elderly Health Care Voucher Pilot Scheme (providing partial subsidy for the elderly to enable them to choose their

own private primary care services in their local communities that best suit their needs) and the Influenza Vaccination Subsidy Scheme (providing subsidy to children for influenza vaccination) also help promote the use of computers and network by private healthcare service providers and the establishment of an electronic healthcare service platform.

21. Promotion of PPP projects through the eHR sharing system not only reduces the administrative costs and expenditure of the projects, but also helps the Administration monitor the services provided under PPP and their quality. Judging from the participants' favourable response to the existing projects, we expect that with the availability of more service choices under the PPP pilot projects, coupled with the further extension of the eHR sharing pilots, there will be wider participation by the private healthcare service providers, and more healthcare service providers and members of the public will benefit from eHR sharing.

Financial and Manpower Resources Required for the eHR Sharing System

Non-recurrent Expenditure

22. In October last year, we commissioned an independent consultant with extensive programme management expertise in the development of large-scale system and infrastructure to assist us in formulating a Programme Management Plan (PMP) for implementing the eHR programme and ascertaining the estimated costs required for the implementation of the programme. After examining the structure and details of the programme, the consultant has made an assessment of the estimated expenditure on the proposed development of the system and infrastructure which meet the required technical standards and confirmed that the amount of estimated expenditure is at a reasonable level for the implementation of the programme.

23. It is estimated that the Government will invest a non-recurrent expenditure of $1,124 million in the next decade for developing and implementing the eHR sharing system. The estimated capital cost for the First Stage of the eHR development programme (2009-10 to 2013-14) is $702 million.

24. A breakdown of the estimated non-recurrent expenditure for the First Stage of the eHR development programme by components is as follow:

eHR Components	**2009-10 $'000**	**2010-11 $'000**	**2011-12 $'000**	**2012-13 $'000**	**2013-14 $'000**	**Total $'000**
(a) eHR Sharing Infrastructure Core Component	33,985	101,538	112,327	113,146	103,617	**464,613**
(b) CMS Adaptation and Extension Component	11,358	35,080	41,612	39,613	40,697	**168,360**
(c) Standardization and Interfacing Component	4,657	14,382	17,061	16,241	16,686	**69,027**
Total	50,000	151,000	171,000	169,000	161,000	**702,000**

25. A breakdown of the estimated non-recurrent expenditure for the First Stage of the eHR development programme by categories is as follows:

	2009-10 $'000	**2010-11 $'000**	**2011-12 $'000**	**2012-13 $'000**	**2013-14 $'000**	**Total $'000**
(a) Computer hardware	6,821	10,658	11,427	9,470	10,077	**48,453**
(b) Computer software	5,461	6,587	8,600	7,390	8,640	**36,678**
(c) Costs of the project development team	14,696	50,307	64,230	64,656	63,257	**257,146**
(d) Service implementation	16,882	54,023	56,749	51,940	51,654	**231,248**
(e) Communication lines and equipment	1,000	2,000	7,000	5,000	4,000	**19,000**
(f) Data centre service	450	8,562	450	8,563	0	**18,025**
(g) Training	1,107	5,100	5,700	4,995	5,600	**22,502**
(h) Office accommodation	3,575	13,681	16,795	16,953	17,769	**68,773**
(i) Miscellaneous	8	82	49	33	3	**175**
Total	**50,000**	**151,000**	**171,000**	**169,000**	**161,000**	**702,000**

Recurrent Expenditure

26. As regards the recurrent expenditure, it mainly relates to the proposed eHR Office and the expenditure incurred by technical support provided by the HA's IT Service (HAITS). The relevant expenditure will be used for co-ordinating the development of strategies and plans, the implementation of various development work and related policy issues, as well as the future operation, maintenance and further development of the sharing system. Our estimation of recurrent expenditure at this stage is based on the operation of an eHR sharing system accessible by the whole population and all the healthcare service providers. The actual expenditure would depend on the prevailing number of users and utilization of the system.

27. The Administration has earmarked about 260 million as the recurrent expenditure for 2009-10 to 2011-12. The breakdown of the estimated annual recurrent expenditure from 2009-10 to 2011-12 is set out below.

	2009-10 $'000	**2010-11 $'000**	**2011-12 $'000**
(a) Professional support services of eHR sharing system	6,524	26,325	48,255
(b) Hardware maintenance	0	1,362	4,447
(c) Software maintenance	0	1,606	5,152
(d) Administrative and office costs	15,346	17,232	20,067
(e) Information system hosting service	0	7,844	7,844
(f) Staffing of eHR Office	10,375	13,833	13,833
Total	**32,245**	**68,202**	**99,598**

28. The annual recurrent expenditure for the development of the eHR System after 2011-12 is expected to increase gradually with the progress of implementation, the scale of operation of individual components, and the participation rates of individual citizens and healthcare service providers. According to the latest estimate, when the territory-wide eHR system is in full operation and covers all the doctors and patients, an annual recurrent expenditure of $202 million is required. However, the actual annual recurrent expenditure will depend on the progress of the system development. The Administration will assess the required recurrent expenditure based on the actual situation.

29. However, the annual recurrent expenditure of the eHR sharing system, which amounts to $202 million even when it is available for use by the whole population, is less than 1% of the Government's recurrent expenditure on health (which is estimated to be $35.7 billion in 2009-10). Even if the

expenditure for HA's CMS ($198 million) and Department of Health's eHR Team ($23 million) is included, the total annual recurrent expenditure is estimated to be $423 million, which is about 1.2% of the overall health budget. It remains at a very low level as compared with the IT expenditure incurred in other institutions.

Manpower Resources

30. To plan, develop, implement and manage the territory-wide population-wide eHR sharing system, to handle the various policy and legal issues including data privacy and security arising from the system, and to engage the various stakeholders in the private sector as well as the general public in its development, we plan to set up an eHR Office in the third quarter of 2009. The eHR Office will be comprised of a number of grades so as to provide the necessary support for the implementation and continuous development of eHR. In addition, the HAITS will set up a technical team, comprising IT professionals and support staff, to provide technical support. Meanwhile, in order to develop and upgrade the relevant systems to connect with the eHR sharing platform in the public sector (including HA and DH), i.e. HA's CMS and DH's eMR system, professional expertise will have to be hired for the development and management work. The above work will require about 200 to 300 staff.

31. In the eHR Office, there will be 3 directorate posts (comprising 1 supernumerary post of Administrative Officer Staff Grade B as Head/eHR Office, 1 supernumerary post of Administrative Officer Staff Grade C as Deputy Head/eHR Office and 1 permanent post of Chief Systems Manger as Chief Systems Manager/eHR Office) and 16 permanent non-directorate posts to provide the necessary support (comprising 1 Chief Executive Officer, 1 Senior Executive Officer, 1 Senior Management Services Officer, 2 Administrative Officers, 2 Systems Managers, 3 Executive Officers II, 2 Personal Secretaries I, 1 Clerical Officer and 3 Assistant Clerical Officers). We will also create at a later stage one permanent Principal Executive Officer post subject to the development and the implementation progress of the overall eHR programme development. DH will also set up an eHR Team comprising 1 Senior Medical and Health Officer, 1 Senior Executive Officer and 18 IT professional and supporting staff.

32. A breakdown of the staffing arrangement for the First Stage of eHR development programme is as follows:

	2009-10	2010-11	2011-12
(a) Electronic Health Record Office	19	20	20
(b) HA's support for eHR	79	148	178
(c) HA's support for CMS	125	125	122
(d) DH's eHR team	20	23	23
Total	**243**	**316**	**343**

33. The manpower requirement of the First Stage of the eHR development programme and the relevant systems in the public sector by types of post is listed below:

	2009-10	2010-11	2011-12
(a) Administrative/Executive Officer	9	10	10
(b) Medical and Health Officer/ Health Informatician	10	13	18
(c) Project/System Manager	25	31	31
(d) System Analyst	47	64	70
(e) System Analyst/Programme Manager	105	144	148
(f) Computer Operator	30	34	41
Total	**243**	**316**	**343**

34. As mentioned in paragraph 28 above, the number and categories of manpower requirement after 2011-12 on the development of the eHR sharing system will depend on the implementation progress, the scale of operation of individual components, and the participation rates of individual citizens and healthcare service providers. However, with the design and development work (incurring non-recurrent expenditure) gradually completed, the work concerning daily operation and maintenance (incurring recurrent expenditure) will be gradually increased, and the number of staff required and the estimated expenditure are expected to be comparable with the level in 2011-12 and will not continue to increase substantially. According to the latest estimate, when the territory-wide eHR is in full operation and covers all the doctors and patients, the required manpower is estimated to decrease back to about 200 people. Nevertheless, the actual number will depend on the progress of the system development. The Administration will also assess the manpower required based on the actual situation.

35. On the other hand, the development of eHR sharing system will create demand for skills, expertise and resources such as software development tools and hardware to establish and operate the eHR and its related services, which in turn will create a lot of job opportunities in the local market. Successful implementation of the eHR will help further develop local IT expertise and equip IT service providers with the necessary systems and valuable experiences which will help them tap into other health systems in the region. All the expertise developed may be conducive to the future development of Hong Kong into a service and training centre of e-Health in the Asia-Pacific region, including security, technical infrastructure and development, standards development, health informatics, data mining, clinical research, legal and privacy.

Consultation with the Public and Stakeholders

36. As mentioned above, the development of the eHR sharing system as an infrastructure to support the healthcare reform received broad support in the first stage public consultation on healthcare reform in 2008. The current development programme of eHR sharing is based on the consensus reached among public and private healthcare professionals after deliberation and is supported by the healthcare sector. At the special meetings of the Legislative Council Panel on Health Services held on 10 May 2008 and 17 May 2008, there were discussions on the proposal of eHR development, and members of the public and bodies attending the meetings indicated support for the development programme. Besides, when members of the Legislative Council Panel on Health Services were briefed on the development programme of eHR sharing at the meeting on 9 March 2009, submissions from most of the groups were in favour of the development programme. As a next step, we will continue to expand the scope of engagement, including launching the eHR EEI to engage private healthcare and IT service providers in the development of the eHR sharing system.

39. Meanwhile, as set out in the supplementary paper we submitted to the Legislative Council Panel on Health Services on 12 May this year, we are planning on a series of tasks to protect the personal data privacy and system security of the eHR sharing system–

(a) To conduct, in collaboration with the Office of the Privacy Commissioner for Personal Data and the Office of the Government Chief Information officer, Privacy Impact Assessment, Privacy Compliance Audit, Security Risk Assessment and Security Audit in respect of the whole eHR Programme and individual development designs and projects.

(b) To consult the relevant professions and stakeholders as well as the general public on issues concerning data privacy and security,

including the voluntary participation by both patients and healthcare providers, the authorisation and consent required for records access, user authentication and access control of the system, logging and audit of access to system, and system security and privacy protection measures.

(c) To explore, based on the outcomes of the consultation with stakeholders and the public, the necessary long-term legal framework for safeguarding the privacy and security of personal health data with particular attention to the context of the eHR sharing system, and to prepare for the drafting of any necessary legislation having regard to existing applicable legislative provisions and the overseas legal experience.

Advice Sought

40. Members are invited to note the content of the paper.

Food and Health Bureau
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