

ANNEX E

Additional information on participating countries current use of electronic medical and electronic patient records by health care providers

Many countries provided details about the current use of electronic medical and patient record systems. This information complements the results presented in Chapter 4 of this report.

In the *United Kingdom*, England and Scotland have established facilities for the exchange of electronic records within primary care practices; and also among primary care offices when a patient changes to a new practice. Specific transactions are also shared between primary and secondary care in England including orders, results, referrals, discharges and appointment bookings. A patient summary record is also available nationally to authorised users. Scotland reports that all primary care providers exchange patient data on demographics, referrals, lab results, and medications using a common gateway (SCI) that can be accessed by secondary care providers and can be used to transfer patient records. In Scotland, patient emergency care summaries are extracted nightly from primary care practices and can be accessed by hospitals providing emergency and acute care. A more detailed electronic medical record is shared among clinicians, which is targeted to supporting the care of patients with chronic health conditions.

In Scotland, all medical specialists work within hospitals and are able to access and share lab results and medical images and are able to view medications prescribed in primary care. Some hospitals enable medical specialists to update patient records electronically and to update medication information. England reports that all hospitals are able share information electronically including ordering and reporting, letters, clinical notes and medical images. Scotland reports that hospitals access the same gateway for demographics, referrals, lab results, medications and record transfers as do primary care physicians, providing a single view of a patient record. Medical specialists, who are resident in hospitals in England, benefit from these services.

Poland reported that primary care physicians and medical specialists in some private health care networks of clinics and hospitals are sharing patient medical data regarding physician visits and laboratory results. A consortium of hospitals in Lower Silesia is sharing radiation results electronically. As of 2014, it will be mandatory for all health care providers in Poland to use electronic medical records.

In *Denmark*, primary care physicians and medical specialist physicians are able to send and receive information regarding laboratory tests; to order prescription medicines; and to

communicate electronically with other physician offices, hospitals, physiotherapists and municipalities. Primary care physicians and medical specialists are using e-prescription services where their prescriptions are submitted electronically. Most of these requests (80%) are transferred electronically to a prescription repository that is accessible by all pharmacies for dispensing. All primary care physicians (general practitioners) in Denmark will be required to use electronic medical records for their patients by 1 April 2013.

Hospitals in Denmark are able to share electronically by means of EDI or web services: laboratory information, medications lists, and diagnosis and treatment information. All lab test results are accessible to health professionals working within hospitals through a national lab test portal. All hospitals and private labs exchange data using structured international EDI/XML standards. This includes 100% of discharge summaries, outpatient notes, casualty ward notes, x-ray reports, lab test orders, and lab test results. This information is shared among hospitals and between hospitals and primary care physicians and private medical specialist physicians.

A common electronic medications list has been implemented in three regions in Denmark and will be fully implemented in 2012. This medications list will be inclusive of both private and hospital dispensing. A common electronic journal for primary and secondary care is almost fully developed and is undergoing final pilot testing in 2012. The e-journal will enable physicians to see and update records for their patients including diagnosis and treatment information over time (coded diagnosis, episodes of care, treatments, and coded surgical interventions).

In Estonia, primary care and medical specialist physician offices and hospitals share a common functionality where all are able to send and receive lab tests and medical imaging results; to see and update an electronic medications list for their patients that includes any medications prescribed by other physicians; to see hospital in-patient and emergency room records for their patients electronically and to see and update an electronic health record for their patients including diagnosis and treatment information from multiple physicians and over time.

Finland results for primary care and medical specialist physicians refer to the public sector, where 100% of physicians are using electronic medical records. Most primary health care physicians in Finland work in the public sector and there is no data for the minority who work in the private sector. For medical specialist care, the proportion in the private sector that is using electronic records for their patient diagnosis and treatment information is about 60%.

In Finland, the sharing of records among health care providers, including primary care physician offices, medical specialist physician offices and hospitals, is at a regional level only. Most hospital districts (19 of 21) have joined a regional system for sharing patient data. All hospital districts have acute care hospitals as well as primary care and specialist physicians. Hospital districts have a local system for exchanging lab results and digital images, and most have implemented sharing of electronic patient records, written radiology statements, electronic referrals and electronic discharge letters.

Most primary care centres in Finland (68%) have joined at least one regional system for sharing data. Most share digital images (76%); radiology results (59%); lab tests and results (71%); electronic referrals (85%); hospital discharge letters (85%); and consultation letters from other health care providers (84%). Some (19%) use tele-video consultations with secondary care providers and 35% receive an electronic ECG from ambulances.

Sweden reports that primary and specialist care and hospitals are all fully using electronic records. Within Sweden, patient data is shared among different care units, including hospitals and primary care that are located within the same county council (health authority). Individual care givers that are contracted by the health authority typically share patient data within the county's system. There are, however, some exceptions.

Belgium reports the sharing of electronic patient records among primary care physician and medical specialist physician offices and hospitals. Data shared include laboratory results, access to patient longitudinal data about diagnosis and treatments, patient summary information, electronic prescribing and secured messaging. Primary care physicians in Belgium have the responsibility to update and publish patient summaries.

France has recently begun implementing a national electronic health record system and some components of this system are still in the testing phase. At present, about 100 000 patients have an electronic health record in this system. The system enables primary care physician offices, medical specialist offices and hospitals to share information about patient diagnosis, treatment, emergency-room care, prescription medicines, laboratory tests and medical images. Records are also shared with other health care providers, such as nurses and physiotherapists. The only exception is for pharmacists who hold records in a separate system, for now. Patient consent is required before information is shared. There are legal provisions in place for emergency situations where access to an EHR may be required and a patient is unable to give consent.

All primary care physicians use the same EHR system in *Iceland*. Electronic records are shared among providers within each of Iceland's seven health care districts, but not yet across districts. Among medical specialist physicians, however, there is little sharing of electronic records. Some laboratory test results and medical imaging results are shared across districts via a secured Internet with results available to physicians and hospitals. Physician discharge letters are shared electronically across providers (physicians and hospitals) and across geographic boundaries. There is a project underway to enable prescription medications information to be similarly shared. Planning for the connection of district EHR systems is also anticipated.

In *Germany*, physician offices and hospitals are required to capture data on diagnosis and treatment to support billing claims. Electronic documentation for medical purposes beyond billing is less common, but is increasing. According to a recent survey of the German Medical Association (BÄK), 93% of physicians use electronic systems for diagnosis, 75% for procedures, 69% for management of a medication plan, and 43% for communications. Some physicians (14%) use e-mail to communicate information to patients, 15% use e-mail to communicate with other physicians and 8% to communicate with hospitals. Hospitals in Germany focus on in-patient care, with ambulatory emergency treatment provided by physician offices. Electronic capture and sharing of radiology and laboratory results is common between hospitals and other physicians. Some hospitals (14%) use e-mail for communications. The exchange of structured data is limited in Germany.

In *Portugal*, most primary care physician offices and half of medical specialist offices are using electronic medical records and some are also able to send and receive laboratory test and medical imaging results electronically; to see and update an electronic medications list for their patients that includes medications prescribed by other

physicians; to see hospital in-patient and emergency room records for their patients; and to contribute to their patient's shared electronic health record. There is no sharing of information thus far, however, between the private and public sectors. Most hospitals are capturing in-patient (70%) and patient emergency room (95%) records electronically. Public sector hospitals receive clinical referral information from all primary care units. Some hospitals in the Northern Region share a common imaging database as well as emergency services records for paediatrics. Some hospitals also have outposts in primary care centres that are connected with the hospital's central database.

In *Austria*, primary care physician and medical specialist physician offices are receiving laboratory test results, medical image results, and hospital discharge letters electronically. Hospitals also receive laboratory test and medical image results electronically and, within regions, there is some sharing of electronic patient records among hospitals.

The *Netherlands* reports physicians are required to record patient encounters for billing purposes. The sharing of electronic clinical information about patients between primary care physicians and after-hours health providers is very common. The electronic sharing of information between physicians and hospitals is also occurring, but paper forms are still often used. There are very few systems that enable the sharing of electronic patient information among primary care physician offices and other health care providers. Virtually all hospitals use electronic patient records. In some regions, hospitals share and exchange data with regional care givers, such as primary care physicians, laboratories and pharmacists. In other regions, sharing is more limited. There are some hospitals that do not share information electronically, even among hospital wards.

Slovenia reports a high proportion of physician offices and hospitals using electronic records. Sharing of electronic laboratory orders and results occurs in hospitals, certain larger primary and specialist care organisations and between some independent laboratories and physician offices. Laboratory test results are not shared, however, among hospitals. Some dental care practices have electronic access to x-ray images. The health insurance card enables providers to access all medications prescribed to patients that were reimbursed by national insurance. A teleradiology pilot project is underway to share images among major hospitals and even with some home-based radiology specialists.

Results for the *United States* are for all office-based physicians in both primary and specialty care that have at least a partially electronic system for capturing patient information. Results for hospitals are for those who have replaced paper forms with electronic records in at least one unit as reported by the 2011 American Hospital Association Annual Survey, Information Technology Supplement. In the United States, a growing number of hospitals are attesting that they meet the requirements of federal regulations related to the implementation of certified electronic patient record technologies and the proportion is expected to rise. While there is no specific data on hospital emergency rooms, there is anecdotal evidence that hospital emergency departments tend to be the first hospital services to convert to electronic records from paper forms. The most common form of electronic patient data sharing among office-based physicians and hospitals are e-prescribing, laboratory and diagnostic findings, and care summaries at points where patients transition from one provider to another. Exchange types and rates of usage vary by state, by region, by organisation, by network of health care organisations, and by health care trading area.

In Korea, results reported for primary care physician offices, with 63.5% using electronic records to capture patient diagnosis and treatment information, are from a 2005 survey and are for clinics. No clinics are exchanging patient information electronically. All public health care centres (providing primary care), however, are using electronic medical records and are sharing information on prescription medications electronically. Medical specialist physicians in Korea work within tertiary/general hospitals and other hospitals. A 2001 survey indicated that 66% of tertiary/general hospitals and 52% of hospitals were using electronic medical records.

Some hospital groups in Korea are using proprietary standards to share clinical information within their own network. As part of the Seoul National University Bundang Hospital Information Interchange Pilot Project, 35 clinics in Seongnam City and Yongin City are sharing patient information, diagnosis, laboratory test results, prescription medications and medical imaging results using HL7 CDA transfer standards and semantic standards (coded data).

Spain reports that most primary care centres and physician offices are using electronic medical records. Sharing of electronic records in primary care occurs within health centres or primary care networks. Primary care offices may also request specialist consultations within hospitals for patients electronically. It is common for primary care offices and medical specialists to order tests and to receive laboratory test results, medical images and/or medical image results electronically. The use of electronic patient records varies widely among regions and hospitals in Spain and estimates for specialists and hospitals are approximate and are based on public health care networks. Within hospitals, sharing of records typically does not extend beyond the hospital or the hospital's network. In a group of regions, however, there is a project underway to enable hospitals to share a minimum set of clinical reports including lab results, medical images and other reports with other hospitals throughout the country.

Switzerland reports that the use of ICT is common for reimbursement processes but not yet for medical documentation within primary care physician and medical specialist physician offices. There are several regional projects to share patient information electronically among health care providers. Health Info Net (HIN) offers secure data exchange among physician offices and can be used for a variety of information including reports, and radiology and laboratory results. This secure connection is offered to 80% of physician offices. By 2011, 50% of hospitals in Switzerland had an electronic clinical information system implemented and 40% were in the process of implementing this system. The use of ICT to send and receive data among hospitals is rapidly increasing. There are, however, major differences among hospitals in data sharing capabilities because of differences in regional needs.

Israel reports a high degree of use of electronic records among physician offices and hospitals; however, at present, records are shared among providers within each of Israel's four HMOs only. As part of the national EHR plan, a project to develop data sharing across HMOs and between physicians and hospitals was initiated in 2012 and is to be completed in two years.

Results for Canada for primary care and medical specialist care are from a national physician survey and are therefore for physicians and not physician offices (National Physician Survey, 2010). Results identify the percentage of physicians that use electronic records to enter or retrieve patient clinical notes. The survey found that the most

commonly reported shared information was laboratory tests and diagnostic images (41.5% of primary care physicians and 33.4% of medical specialists). A smaller share of physicians had access to an external pharmacy or pharmacist electronically (9.9% of primary care physicians and 6.6% of specialists) or to other external systems (24.6% of primary care physicians and 26.4% of medical specialists). Hospitals in Canada are encouraged to adopt electronic patient records and to exchange information via electronic health record systems as they are deployed. There are no statistics for this sector.

In *Japan*, there is no clear distinction between primary care and medical specialist physicians and the statistics presented refer to both. A small proportion of pioneering hospitals and clinics have introduced electronic medical record systems. According to a survey of health care facilities in Japan in 2008, a small proportion of acute care hospitals (14.2%) and clinics (15.2%) were using electronic medical records and only 1.5% of both groups were sharing patient data electronically with other health care providers.

Physicians in *Japan* are encouraged to develop official networks to provide better disease-specific care pathways for patients through the use of financial incentives. The sharing of electronic medical records, however, is not a prerequisite and only a small number of hospitals and clinics have introduced EMRs. It is likely that the financial incentives currently provided to establish networks are not sufficient to motivate providers to introduce electronic medical records.

In *Mexico*, the largest federal health care institutions (IMSS and ISSSTE), offering both primary and tertiary care, are using electronic health records for patients and do enable physicians to share patient information electronically within the same institution. Physicians are also able to order services electronically. Other public and private health care providers in Mexico have varying levels of deployment and exchange of electronic records. Private medical specialist physician offices in Mexico are not connected to the electronic health record systems of the federal institutions. Few are able to exchange electronic information among service providers in their network.

The sharing of electronic records across primary care physician offices in *Singapore* is limited; however, national plans are in place to extend clinical communications capability in future. Results for hospitals are for public sector institutions. Public sector institutions in Singapore, and the medical specialist physicians working within them, are often sharing documents with other public sector institutions through an exchange solution (EMRX). Electronic records shared include radiology and laboratory results, prescribed medications, and diagnostic results.

While hospitals in *Slovakia* are not currently sharing patient data electronically, work is underway for the future use of an archive for medical images and for electronic communications. In *Indonesia*, there are electronic patient records in use by primary care and medical specialists offices and in hospitals but the implementation of electronic medical records varies widely as does the sharing of patient information electronically. The most common tool is an electronic record of patient diagnosis and treatment.



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