Purposes of Health Identification Cards in Belgium

Francis H. Roger France\textsuperscript{a}, Etienne De Clercq\textsuperscript{b}, Marc Bangels\textsuperscript{c}

\textsuperscript{a}Health Services Research, Ecole de Santé Publique de l’Université Catholique de Louvain
\textsuperscript{b}Unité d’Informatique Médicale
\textsuperscript{c}Unité de Sociologie et d’Economie de la Santé

Abstract

Although other alternatives might exist, identification cards have been chosen as an acceptable and adequate tool to be used to identify patients and health professionals. They are planned for a digital signature and for access to electronic health records as well as for health information exchange and for databases querying. Local applications might exist independently, but the Federal State has now developed BeHealth, a platform for health professionals, social security personnel as well as the great public to facilitate a common access to some health data. Security conditions have been defined and are described.

Keywords:
Electronic health record; Standards; Security

1. Specific identification cards in the healthcare sector

After years of discussions in Belgium, there is a consensus at the Federal Public Service for public health to isolate health data from others datasets because of their high sensitivity in nature. It is felt that we should avoid mix administrative data such as fiscal or penal records with health records.

1.1. Patient identifier

At the beginning, it was question of a unique identifier by patient. Now, it is admitted that the patient might have several unique identifiers in relation with various objectives. Three of them have been defined: 1) administrative purpose, 2) health care, 3) studies (research, statistics). These identifiers will be produced by a cryptographic method \cite{1} in order to protect confidentiality and patient’s privacy rights. The three defined objectives are processed by different professionals in relation to: 1) financial and administrative applications that should not be mixed with diagnoses, 2) electronic health records that contain diagnoses, treatments and other private information within the care process, 3) statistics and clinical studies that don’t have to be linked with health care process, as identification of patients are not needed and could be replaced by pseudonyms allowing to proceed to data checking.
These multiple unique identifiers by patient could be generated from the present “unique” social security number, but by an irreversible encrypted method. The social security unique identifier is printed with the citizen authorization on the identification card and inserted on a chip card called SIS for social security information*. This number contains, however, identifiable items such as the reversed date of birth, followed by a sequential number of three digits that is even for female and uneven for males, given in the sequential order of arrival at the Federal register when sent by each Commune of the country. This nine-digit number is followed by a check digit of two positions that is a remaining result of a division by 97. The SIS card main purpose is to reduce administrative formalities and to ascertain that the citizen is solvable and covered by the social security.

These identifiers could be read and copied by a human being. They should also take into account international developments, among which the European Directive on data protection [2]. Biological identifiers are not on the agenda in Belgium.

1.2. Health professionals identifier

A unique identifier by health professional is also proposed in Belgium. Before health cards, health professionals as citizens used their handwritten signature to represent themselves with an official symbol that could be verified on an identification card or on a passport. From now, a unique identifier will be obtained by health professional, most likely by using the electronic identification card. It will be associated to some attributes (specialty, time of recognition, …) certified by specific servers (validated authentic sources).

For healthcare purposes, the professional qualification could be specified and used in the whole country as well as abroad. Each physician in Belgium has a unique number in a comprehensive register. It takes into account requirements from the Physician Council (Ordre des Médecins), the Ministry of Health (diploma authentication) and the INAMI (Institut National d’Assurance contre la Maladie et l’Invalidité), the social security institution allowing reimbursement and recognition of specialty.

There is also “an Order of pharmacists” but no professional Order for nurses. Therefore, a cadaster of nurses is in progress at the Federal Public Service for Public Health. Another cadaster is in building for physiotherapists, dentists and s.o.

The authorization level for access to health data could be attributed by several organisations at a more local level. For example, a physician, recognized to practice medicine in the whole country and to be reimbursed at the level of his specialty, could be recognized as medical director of a hospital only if the institution gives him the rights that belong to his function such as to sign billing data for patient reimbursement. A general practitioner working some days as expert for a health insurance should distinguish his activities when using his identification, by taking the right attribute of his work.

2. The Trusted Third Party (TTP): a key organisation

A main public difficulty was to agree upon an organisation that could be entrusted by all participating parties to healthcare in order to manage unique numbering systems that have to be encrypted [3].

A platform called Be-Health [4] for a common access to telematics in the healthcare sector has been financed in order to allow healthcare professionals as well as social security actors and the citizen to deal with the health information they need. On 23 December 2004, the Belgian Government accepted to appoint as technical partner a semi-public organisation called SMALS (société de mécanographie pour l’application des lois sociales), as the TTP

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* Social Security Royal Decree of 16-10-1998

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for the health care sector. In order to ensure security, cryptography is used, based on an algorithm that transform clear text to cipher text on the sending site and vice versa on the receiving end. The same algorithm is used in both sides with different keys.

With BeHealth common access, strict identification procedures using the digital identification keys are now in development. A cryptographic key is a string of bits controlling the behaviour of the algorithm. In an assymmetric system, one key is used for encryption, and the other for decryption. The private key is given to the keyholder on the card, while the other key, called public key is made available to all users that wish to share cryptographic functions with the keyholder. We had the opportunity to contribute to the BeHealth project in a working group of experts* belonging to the Federal Public Service for Public Health, the INAMI, the National Inter-Mutualist College, the cross-point databank of social security and the Commission Norms for Telematics in Health Care in a project that will be coordinated by the FEDICT (Federal Public Service for information and communication technology).

The objective of Be-Health is to allow citizens and patients as well as healthcare and social security partners to have access uniformly to added value services and to information already available in the various organisations in a secure way. Each certification body (Commune, Council of physicians, …) will communicate to a Trusted Third Party (TTP). Authenticated data and the authentic sources of data will be validated both for health professionals and for “patients” (see Figure 1). Authorisations will be specified following their access rights. Security will be also extended to the communication network system.

![Figure 1 – A public key infrastructure (PKI) for the healthcare sector in Belgium: Three “unique identification numbers” are proposed by patient, in relation to three different objectives, obtained from the social security identifier (SIS), by a Trusted Third Party (TTP), with two encrypted keys, one public and one private.](image)

In order to guarantee security and the respect of objectives of Be-Health, a sectorial health committee “healthdata” will be included in the commission for the protection of the private life on the basis of Art. 36bis of the Law of 8 December 2002 in relation to the protection of private life. The first budget for this development during the year 2005 is relatively modest, given the philosophy to use all components that exist in order to minimize costs: 1.45 million euros have been accepted by the Government.

* The Be-Health working group was made of Mr R. De Ridder, R. De Brandt, O. Schneider, J.P. Dercq, D. Cuypers, Th. Gravet, M. Bangels, G. De Moor, F.H. Roger France, J. De Cock, V. Nys, P. Vererbruggen, J. Hermesse, F. Robben and E. Quintin

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3. The electronic ID card

The Belgian experiment of the electronic identification card is new and at a scale that has never been encountered. The security level should be higher than for bank cards. In supplement to identifiers printed on the ID card, (name, date of birth, …), encrypted private keys will be available in the chip. Attributes (physician, medical director, …) to be used for specific purposes won’t be on the chip but available in specific federal registers that have to be validated.

Its development began with the distribution of the new electronic identification card in ten Belgian communes in 2003. Priorities were given to newborns, new inhabitants as well as the renewal of old ID cards. The whole country should be covered by 2008 and each card will be valid for a period of 5 years. If a card is lost or destroyed a new one could be obtained in a delay of 7 days.

For healthcare purposes, a difficulty might be that all patients won’t be covered by this ID card. Among exceptions, let’s quote newborns, at least during the first days before their birth is declared to the Commune, foreigners without employment in the country, tourists from another continent. …

4. The use of professional cards for health purposes

Several applications will require health identifiers that could be obtained with the digital ID card:

1) A signature: a digital signature [5] is more secure with an electronic ID card than with passwords linked to a local card. Health professional signatures are needed for treatment prescription (drugs, physiotherapy) as well as for requests of diagnostic tests, specialist advice, nursing care and s.o. Physicians sign also medical certificates for disability for work, school absences, … as well as for health insurance, admission prolongation discharge of patients, accident’s declaration, refund applications, … A signature is also required to validate medical reports being a discharge letter, an operating room protocol or laboratory results. Minimum Basic Data Set (MBDS) registration should also be certified by a signature. Medical directors of hospitals sign collective hospital inpatients invoices as well as outpatients statement invoices.

2) Another use of professional cards is to enable secure access to identifiable electronic health records [6]. The proposed tool might authenticate the requester and give access to authorized persons, by category of health professional. It would assure repudiation and should be documented by access journalling.

3) It allows also the exchange of health information about identifiable patients [7]. Each patient could be asked to declare to any institution in which he will be treated the identification of health professionals who treat him, especially the name of his general practitioner. Encrypted messages signed by a sender and addressed to a receiver would use the electronic signature. Message authentication could be verified by a hashing mechanism that would disclose whether the message was the same as the one sent.

5. Application in a teaching hospital

In Saint-Luc Hospital at the University of Louvain in Brussels, a large teaching hospital of more than 1000 beds and 350000 outpatient visits a year, the first priorities for electronic
signature was drug prescription developed since 1996. The second priority since two years
is access right to the electronic health record and the third one concerns the signature to
validate discharge letters.

Up to now, only an internal system is used [8], as the Belgian electronic identification card
is not yet widely available for all physicians. A local smartcard allows authentication
through an electronic warden, a password and an identification number that can be read on
± 1200 PCs. In order to have access to the medical record of the patient, a documentation
system called “Medical Explorer” has been developed in JAVA. It allows to reduce the
number of paper records and to work more and more with paperless records. It gives access
to all clinical reports and technical protocols as well as to laboratory data, imaging reports.

Access rights are given only to authorized health professionals. Physicians and head
nurses can consult the whole electronic health record while some secretaries and some
nurses cannot have access to everything but only to tables of contents and to the laboratory
tests performed, not to results.

Access can be obtained (the record is open) if the patient is present or in the file of the
appointments to outpatient visits or technical acts (using ultragenda software). The presence
of a patient is ascertained when he comes in emergency room or if he is admitted as
inpatient or as day-case. The patient record is open 5 days before a planned admission to 15
days after his discharge. It is closed otherwise and can only be opened by a physician who
has been in charge of the patient. A dialogue for justification is installed and each access is
listed on a journal on the opening screen of the session. There is a security committee to
check the respect of confidentiality for personal health data in the health system. A security
officer has been appointed halftime. He is a former nurse. As a rule, each physician can
always have access to a record but if flags or special security measures have been activated,
his access will systematically be examined by the security officer. Furthermore, in order to
assure to the personnel of the hospital the respect of the rules, a random selection of persons
has been decided. An overview is organised with the security officer and the patient in
order to review all accesses made to his record if he wishes to identify abnormalities to be
investigated.

It has been decided to ask to each patient to sign a contract where he designates the
physician to whom he wishes reports to be sent, like to his general practitioner. But a
patient could also forbid some health professionals to have access to his record. In this case,
he could rediscuss the matter in case of need of care with this physician. Otherwise, the
health professional could limit his responsibility.

6. The federal health network “FLOW”

A prototype has been designed in Belgium supported by the Federal Government to allow
links between health records in hospitals and in general practice. Up to now, there is a
voluntary participation to the Flow project [1]. The medical record can be opened or closed
following the same rules as in St Luc but the access number to the patient is still the SIS
number and not yet the ID card encrypted number. In the next future, this identifier should
be depersonalised and replaced by an encrypted double key.

In this perspective, the Belgian electronic ID card could play a key role in access to health
data as well as for electronic signature and responsibility of health professionals in their
practice. There remain some question marks. Among them : will there be sectorial cards,
one for healthcare, another one for banking and financing, another for cultural purposes?
Each citizen could not carry 100 cards on him for various purposes. Experience will show
the way in which such questions could be solved in practice.
Another difficulty that has been mentioned is the exception. The lack of citizenship in the country should not forbid patients to have access to healthcare. Replacement solutions should be prepared. An important aspect that has not been fully appreciated is the context in which information is asked. A dialogue has to be planned about objectives of access to identifiable health data. In principle, only the physician who has a contract with the patient, confident in him, can have access to his record, not all physicians in the institution. It would, however, be a disaster if a physician could not obtain access to a record for administrative reasons because he is not well identified as the personal physician of this patient in emergency. Solutions have to be found. An easy one could be to mention the name of the physician who asked an advice or a procedure if the patient did not address himself directly to this physician or to this nurse. Solutions have to be tested and adapted progressively.

7. Conclusion

In conclusion, several major steps have been accomplished recently in Belgium in order to obtain unique identifiers specific to health for citizens as well as health professionals identifiers.

Both are based on the delivery of the Belgian electronic identification card that is currently distributed in the country. Irreversible encryption through a Trusted Third Party (the SMALS) has been planned in 2005 in the framework of a common portal (Be-Health) for access to health data.

Security measures are proposed in order to ensure confidentiality (irreversible encryption, identifiers linked to purposes, taking in account context) of verifiable authenticated requesters and receivers of health data, in function of authorizations. Each access will be documented and there will be a structured organisation to follow security conditions, including a security officer.

8. References


Websites


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