

NETC@RDS for eEHIC, a step towards the electronic European Health Insurance Card

Noël NADER

¹SESAM-VITALE EIG, 5, blvd Alexandre Oyon, LE MANS, 72019 CEDEX 2, FRANCE
Tel: +33 (0)2 43 57 44 59, Fax: + 33(0)2 43 57 42 59, Email: noel.nader@sesam-vitale.fr

Abstract: The NETC@RDS project will achieve initial deployment of an online service for the announced electronic European Health Insurance Card (e-EHIC) in 15 EFTA/EU countries. The service has already been successfully tested in 85 pilots across 10 EU member states. The project is sponsored by the European Commission, DG INFSO e-TEN Programme.

This initial deployment project phase will extend the existing implementations and add new countries to enable (unplanned) health care access for European citizens who provide evidence of entitlement in any of the 305 service sites (566 service points) across the 15 participating European countries. This can be via an eye readable EHIC, or a national health insurance electronic card, or via certain National e-ID chip card issued by the responsible government authorities of the participating partners. An online verification provides assurance to support acceptance procedures for both health insurances and health care providers.

1. Introduction

During the European Council in Barcelona, Spring 2003, the Member-States and the EFTA countries decided paper entitlement forms for trans-European mobile citizens to receive health care during a temporary stay in any of the E.U member states -or in one of the EFTA countries- will be progressively removed and replaced by the European Health Insurance Card (EHIC) after 1st June 2004. To this end, decisions nr 189, 190, 191 stipulating which and how¹ paper forms will be replaced by the EHIC were published on the Official Journal of the European Union in October 2003. By Summer 2005, about 50 millions EHIC were already circulating. Thus, as being “another piece of Europe in your pocket” the EHIC turned to a quite successful story.

Currently the EHIC is a single-side eye-readable plastic -or even paper- card with only some administrative visual information on it. It can be either a standalone card (alike the French or Slovenian EHIC) or it can be laid on the rear side of the national –regional- health insurance card (e.g. alike German or Austrian national cards or Italian regional cards).

Since September 2002 and according to the recommendations of the European Commission, the NETC@RDS Consortium² has been working out and putting to the test practical solutions for the e-EHIC in pilot regions of 10 Member-States³.

¹ Concerned forms are currently E110, E111, E119, E128. It has to be noticed Decision nr 190 addresses the EHIC common model and technical specification.

² NETC@RDS is a Pan-European initiative sponsored by the European Commission, DG INFSO e-TEN Programme and 26 statutory Health Fund -or technical- organizations from 15 out of 30 Member-States + EFTA countries.

During the NETC@RDS project validation phase the Commission encourages partners to report experience to the CASSTM and interact with the CASSTM members as much as possible. The Commission also recommended every effort should be made to involve all the Member-States and other EFTA countries in the development of future common solutions. In this respect, a formal cooperation between the Technical Commission Ad Hoc Group e-EHIC and the NETC@RDS partners has been closely established by early year 2006. Further, partners agree to move on the way forward to the Initial Deployment Phase B for the service that is described in the following sections. During Phase B the consortium will be extended to 26 organisations from 15 EU/EFTA countries including the 10 member-states already participating in the project plus participants from Liechtenstein, the Netherlands, Norway, Romania and Poland. Sponsors from the industry as well as other self-sustainable partners are expected to join the consortium as well after Phase B kick-off.

As a next milestone the introduction of an electronic EHIC (e-EHIC) is foreseen for the medium run⁴. To this end, by Fall 2005, the CASSTM/Technical Commission nominated an “ad hoc Group e-EHIC” to work out requirements and specifications for the e-EHIC. Further, a CEN/ISSS Workshop e-EHIC sponsored by the DG Employment has been initiated by April 2007. It will publish a CEN Workshop Agreement (CWA) which will identify and propose to the Technical Commission all the specifications necessary for deploying the e-EHIC system. The Workshop time table is April 2007 – April 2009.

1. Objectives

The key measure is that any European citizen travelling in the participating regions, with their card and in need of non-planned medical treatment can benefit from the NETC@RDS service. The most important target users are the **insured European mobile citizens** who could be supported by the European-wide awareness and adoption of NETC@RDS services whenever they need to access unplanned health services in other participating countries.

The primary operators of the NETC@RDS services are **health care providers** in hospitals and ambulatory health care offices. Administrative staff in these medical units already frequently encounter persons coming from abroad and presenting their European Health Insurance Card. The value-added benefit of using NETC@RDS is that it can read the EHIC electronically. This enables manual and paper based administrative processes to be reduced and has the added benefit of providing an accurate electronic EHIC data set for post processing.

The secondary target users are **health insurance and cross border cost clearance organisations** which have signed the NETC@RDS General Agreement, involved in the reimbursement process. Electronic data capture and automated checking mechanisms will provide a much better base for clarification of inconsistencies, acquisition of statistical data, and improvement of the pan-European reimbursement process.

The project initial deployment project phase will roll-out operational services in all the targeted sites, including ones tested in the previous validation phases, and add new sites in other member states' locations to a total of 305 service sites served (566 service points across the participating countries), to enable "non-planned" health care for European citizens who provide evidence of entitlement. This can be done via an eye readable EHIC,

³ I.e. Austria, Czech Republic, Finland, France, Greece, Hungary, Germany, Italy (Regions of Lombardy and Venice), Slovak Republic, Slovenia.

⁴ See COM(2003)73 “Communication from the Commission concerning the introduction of a European health insurance card”, 17/02/2003, section 3.3.3 Phase 3: electrification.

or a national health insurance electronic card, or via certain National e-ID chip card issued by the responsible government authorities of the participating partners. An online verification provides assurance to support acceptance procedures for both health insurances and health care providers.

2. Methodology

The NETC@RDS service serves three distinct processes: automated data capture for identification based on a common set of data elements, on-line verification of entitlement rights via national portals, and minimal data provision which can contribute to subsequent back-office interstate-billing.

The specific content of the NETC@RDS service is predicated on the patient EHIC data, and verification data in the national health insurance databases. The specification of this data is provided by the European regulatory bodies.

The data capture is the first process step in which the information is taken from the carrier and transformed into a subsequent data object. This happens at the health care provider (e.g. a hospital) by automatic reading of a health insurance chip card, or by scanning of the EHIC.

Using the NETC@RDS application and an OCR⁵ or SCR⁶, healthcare facility staff read administrative data from the EHIC or national health insurance card of a European citizen requiring (non-planned) healthcare. Eligibility is then verified within a few seconds by checking the administrative data via two NETC@RDS portals against the database of the relevant health insurance authority. The electronic data set is processed and used as a proof of entitlement and guarantee of cross-border reimbursement. A transaction ID is also logged on the servers. These can be accessed by staff from involved insurance and cross border clearing institutions for specific audit cases, e.g. to clarify inconsistencies.

Data reading from electronic health insurance chip cards is reliable and offers high confidence in user identification and verification trustworthiness. As the majority of member states do not currently issue these cards the most frequent data capture modes (high volume cases for most of Phase B) will be via manual capture or optical character recognition of the personalised eye-readable elements on the EHIC. However, as the future of the secure e-EHIC is chip-card based, the service sites and workstation configuration of the project are selected and designed to ensure an adequate deployment and recorded use of chip enabled cards.

All involved servers and workstations constitute a secure network. It is required to authenticate the operator prior to access to the system. This authentication is handled by the portal in the country of stay, which controls access rights of its affiliated health care providers to the overall system. Each portal can be connected to one or multiple national/regional repositories in order to provide online checking services. Those services can vary from one country to another, thereby respecting the organisation of the national health insurance systems. Each transaction generates a log on each involved pair of portals. Those logs are identified by the unique transaction ID generated by the issuer country portal. The content of the transaction log is defined by each country and accords with their national data privacy rules. The only common key between those logs is the Transaction ID

⁵ OCR=Optical Card Reader.

⁶ SCR= Smart Card Reader.

(TID). This part of the source code can be customized. For instance, countries that do not wish to store personal information can make their logs anonymous. Those logs are available to help the liaison offices to resolve any potential conflicts and contribute as a record to the interstate billing processes.

3. Technology Description

The NETC@RDS project utilises state of the art technologies, directly suited to the requirements of the service in the following areas: web interfaces, end-to-end security over network of national service portals, data repositories and access point workstations, data protection, individual authentication and provision for back-end integration and auditing services. Each portal can be connected to one registry or multiple national/regional registries in order to provide an online checking service. The overall system architecture is that developed and proven during the market validation phase of the project. Figure 1 shows the *Example of an Austrian citizen requiring emergency health care in France*. The specific technology components are explained in the following sub-sections.

1. **A secured portal of services for each nation.** This portal is based on the open source framework Struts. It is deployed on the open source servlet distributor Apache Tomcat. Moreover, this portal uses the following technologies from Apache: XML Beans for the management of the XML flows; FOP (File Object Parser) for issuing PDF document from XML dataflow; and, Log4j for the management of the logs. The portal is customized by each nation in order to adapt the interface to the national and/or regional database.
2. **An optional repository connected to the national portal.** Each smart card issuer is responsible for their own (optional) database repository. This contains the level of information that the country (or region) needs to validate a transaction. It could be a blacklist of smart cards in order to verify that the card used is not declared stolen or lost and/or a database that can check the rights status of each insured person.
3. **A client workstation.** This is a PC running Windows XP or Linux, and connected to the internet. Moreover, depending on the service provided, this station has a smart card reader and/or an Optical Character Recognition (OCR) scanner in order to capture the data from the cards. Some stations have a dual card reader or 2 individual card readers. These are used in instances where authentication of the health professional is made by using the Health Practitioner card.
4. **Secured connections between those elements over the internet.** The security process is achieved across 3 levels:
 - The security between the workstation and the portal is ensured by authentication using a software certificate or via Health Practitioner (or hospital member) Professional Smart Cards protected by PIN code (if already deployed by the country providing the health service)
 - The security between portals is ensured by using an SSL V3 authentication. This authentication is made using a server certificate via a common trusted Certificate Authority. At present this is provided by the Greek partner AUTH. In the longer term ~ (Full Deployment) consideration will also be given to other additional options such as commercial services (Verisign) and/or TESTA.

- The security between national portal and national repository is defined by each country but is audited by an independent third party in order to assure a global quality level. This security audit of all national portals is based on a common framework and as it is conducted by independent companies will assure the overall security level of the network. This is included in the subcontract budget of Phase B and WP5 will coordinate this audit based on a common framework.

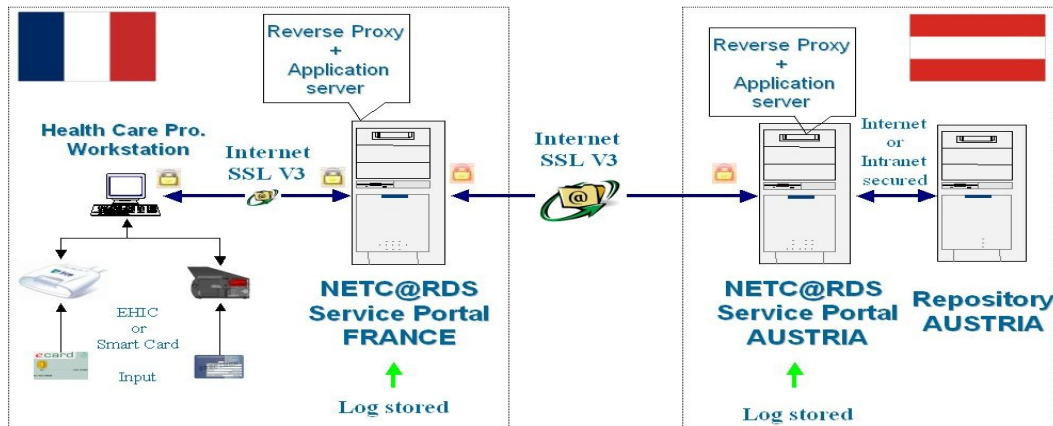


Figure 1. Example of an Austrian citizen requiring emergency health care in France

Given the critical importance of the national portals to cross-border interoperability and the need for secure cost effective, efficient interfaces and data (transaction) logs the open source solution adopted is from the Apache Software Foundation. This open source decision enabled a relatively quick and easy deployment across the heterogeneous environments of the consortium members.

4. Developments (during initial deployment of the service)

- Maintenance and versioning of software packages (both client and server sided)
- Integration of national and European software (parts), applications and drivers
- Adaptation of the existing portals based on recurrent and previous project phases feedback from national deployment leaders
- Support with integration of the NETC@RDS services into national and European health care/information systems
- Cooperation with industrial providers in order to facilitate the integration of the NETC@RDS services into existing HIS (hospital information systems) and medical practice software solutions
- Cooperation with industrial providers in order to foster the support of national health/insurance cards by suitable readers (national smart cards), drivers and OCR (EHIC) systems
- Promotion of the NETC@RDS deliverables as future guidelines and/or European standards (i.e. via contributions to CEN WS CEN/ISSS Workshop on Interoperability of the electronic European Health Insurance Cards -WS/e-EHIC- as well as to CEN TC 251 Health Cards in close cooperation with other EU Initiatives)
- Contact for requests, feedback, suggestions and demands (from healthcare providers, partners, industrial providers and standardisation bodies).

5. Results

All insured members of the social security systems in the European Union and EFTA partner nations, which compose about 57% of the EU-27 population⁷ are eligible to avail of the services, subject to the applicable rules in operation. The European citizens will have access to NETC@RDS service providers (medical units) in 15 European nations. Based on the projections to install at least one service site per 1 Million inhabitants with typically a minimum of 10 units per nation, in total 305 service sites including 566 service points (PCs) will be established .

Since September 2002, the NETC@RDS Consortium has developed and tested practical solutions for the implementation of the e-EHIC in 85 hospitals or ambulatory care offices in pilot regions of 10 Member-States (see table Figure 2).

Today NETC@RDS is a growing Pan-European Consortium initiative representing 15 of the 27 Member-States plus two EFTA countries⁸ willing to introduce an electronic EHIC that is accepted in specific pilot sites. It mirrors the overall European situation with having both card-issuing and non card-issuing nations involved.

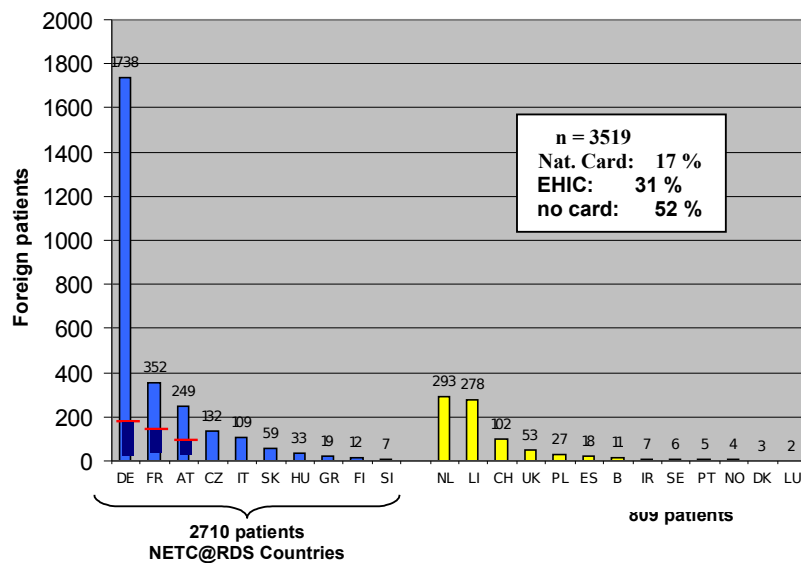


Figure 2: Results observed in project pilots during a 6 months period

6. Business Benefits

Based on NETC@RDS partners' investigation of country/region conditions, an extensive range of benefits accrue from use of NETC@RDS, as clearly identified in the Final Report of the Validation Phase:

- Ease of use and direct access benefits for citizens: increasing acceptance and level of application of medical provision needed on the basis of benefits in kinds in Europe according to European regulation 1408/71 and 574/72.
- Financial benefits for citizens: EU Regulation stipulates statutory health practitioners will apply the same rate for health care costs delivered to EHIC holders as they would apply for the national or local insured citizens. Indeed, in case no

⁷ 495 Million by end of 2005

⁸ Norway and Liechtenstein

social insurance entitlement would be shown by foreign visitors then higher rates may be applied by health practitioners. In view of this differential and the NETC@RDS service availability, the acceptance of the eye-readable EHIC is fostered and more citizens will likely receive treatment in accordance with minimum legally applicable tariffs.

- Costs savings and time Benefits for health care providers: provision of quick and efficient registration process in all health care provider receptions optimises allocation of human resources whilst avoiding later labour-intensive collection of the information required to issue the bill⁹.
- Quality Benefits for health insurance organisations: improving control and monitoring of cost for health care provision.
- Costs savings for health insurance organisations: reducing EHIC fraudulent usage and improving interstate reimbursement thanks to the NETC@RDS trans-European interoperable infrastructure.
- An additional potential advantage for European citizens is the possible contribution of NETC@RDS to enable interoperable e-Health application relying on its infrastructure, such as transmission of limited clinical data.
- Fostering and speeding-up the development of the European industry of e-Health services on the European market (call for tenders) thanks to broad acceptance of industrial standards based on the NETC@RDS certification.

7. Conclusions

In practical terms the cross border reading of health insurance chip cards and online verification of both national health insurance cards and the visual EHIC has been implemented. The established online verification infrastructure for cards or entitlement rights is the first real Pan-European interconnection of different member states in the e-Health sector. Potential benefits of this approach include the future transmission of other data relevant to the social protection sector (e.g. students, job seekers, mother and child, pensioned, ...) as well as of medical data, since the secure infrastructure is capable of extension to other services.

The central positioning of the project is to serve as an experimental test bed for the electronification of the EHIC and its results are now proposed for consideration for European regulatory bodies.

A concrete benefit for mobile citizens will be the broader range of permissible access tokens and procedures in pilot sites: in many cases when the visual EHIC is not available, “third party payment” can be granted thanks to e.g. a domestic health insurance card.

With Phase B the number of pilot sites will be increased at least to 305 health care providers offering the NETC@RDS services. Highly available online verification servers will be set up in all participating nations, with a legal framework in place to regulate the terms and condition of delivery and acceptance of the entitlement data set. The initial deployment activity will be accompanied by an evaluation of the services and dissemination of project results to foster the further extension of the solution and future anchoring into European legislation.

⁹ Costs savings: Phase B Initial Deployment figures and numbers will be under responsibility of WP7 Social & Economical impact deliverables.

The specific objective of the project to involve as many partners as possible, including those from “the not-yet NETC@RDS Member States” to reach a critical mass has been successfully accomplished by the gradual increase of the project consortium from initially 4 nations in 2002 to now the 15. The sustainability of the efforts is underlined by participation of major social security organisations and governmental backing. Potential European funding and by herewith documented formal support by the European Commission shall enable the NETC@RDS consortium and its participating social security organisations to deploy the eEHIC solution in a sustained manner.

The project deployment is in accordance with the Community regulatory framework and the specific rules issued by the Administrative Commission on Social Security for Migrant Workers (CASSTM), which plays a crucial strategic coordination role amongst Member States in this area. In this light, the NETC@RDS for e-EHIC project activities have been complementary to the CASSTM mission, outlining possible solutions and perspectives. The key service concepts around which the project partners have established fruitful cooperation and gained concrete outcomes include security and trust, on-site implementation, integrated infrastructure, interoperable platform, market validation and self-sustainability.

Further main perspectives for project Full Deployment Phase C – planned for the long run - are:

- Adoption of the NETC@RDS recommendations for smooth and stepwise introduction of the e-EHIC.
- Harmonised integration of the service in national/regional infrastructures and front desk applications
- Full Deployment of the service in the whole Europe (EU+EFTA countries)
-
- Extension of the service towards new applications in the Health and Social Protection sector (training, jobs seeking, mother & child benefits, pension benefits).
-
- Self-sustainable permanent structure to be a link between stakeholders of the NETC@RDS-based services.
- Paving the way for a European Labour Market whereas fostering worker’s mobility thanks to easier access to pan-European public e-services.

The project partners are now extending the NETC@RDS service to Initial Deployment Phase in 15 countries, i.e. 13 E.U Member-States as well as Liechtenstein and Norway. Further new partners from non-yet NETC@RDS participating countries are welcome to join the consortium as service users and/or providers (e.g. Portugal, Luxembourg ...). This expansion of the existing robust technological base is aiming at progressively increasing the number of service points for preparing the Full Deployment of an E.U-wide interoperable public on-line service within and between all Member States and with other relevant countries. Thus, the NETC@RDS Pan-European initiative will be a corner stone that will help the EU Member-States and other European countries to build-in a common framework of public services enabling free movement of mobile citizens all across Europe.

References

- [1] [NETC@RDS](http://www.netcards-project.eu) Phase A2-3 Final Report (www.netcards-project.eu, www.netcards-eu)
[2] http://ec.europa.eu/employment_social/social_security_schemes/healthcare

