私は情報をコーディネートするのも、情報を受け取る側に適切な責任を課すのも、ケアマネージャーが適任と考える。何故なら、今日、介護保険サービスを受ける殆どのケースで、ケアマネージャーは必ず介在し同席する。この極めて実質的な意味合いから、ケアマネージャーが情報共有を通した医療・介護の相互連携の促進を図るべきと考える。

では誰がケアマネージャーに情報を伝達するのか。希望としては病院や診療所の医者や介護施設が望ましい。ただこれは医者や施設に今までにない新しい義務を課すことになるため、導入には時間がかかる。当面の間は医者から医療請求書を受け取り、その内容にアクセスする市町村がその責を担うのが適切だと考える。ただ請求書から医学的内容の情報だけ抜き出してケアマネージャーに渡すのは別途情報技術の改革が必要になる。ケアマネージャーは情報を収集し、患者の生活の質の向上に寄与するが、同時に個人情報は守られなければならない。

【ディスカッション】

＜van der Waal＞最初に質問だが、日本ではなぜ75歳以上を後期高齢者として別枠にしているのか？

＜磯部＞75歳未満はみな同じ保険でカバーされている。75歳以上を別にするのは保険として管理するのが難しいからだ。つまりこの世代は保険料収入が僅かで、支出が大きい。医療保険支出は保険料と税金で50%ずつカバーされているわけだが、75歳以上については保険料のうち10%を75歳以上が負担し40%を若い世代が負担している。

＜van der Waal＞日本ではケアマネージャーがコーディネータということだが、オランダのCIZと同様、ケアマネージャーが介護認定を行うのか？

＜磯部＞介護認定は市町村が行う。

＜van der Waal＞では、市町村はどこから個別のClientの情報を得るのか？

＜磯部＞Clientやその家族が認定申請用紙に記入して申請する。

＜van der Waal＞例えばオランダで喫煙者が心臓麻痺を起こしたとする。彼は病院で治療を受け、そしてリハビリに進む。その後数日で退院し、帰宅する。ただ退院しても喫煙をやめる訳ではない。病院は再度心臓麻痺を起こさせないために喫煙をやめろとは必ずしも勧めないからだ。心臓麻痺を起しても、禁煙プログラムに入れる訳ではない。病院が経営を続けるためには患者がまた心臓麻痺を起してくれた方が都合がいいからだ。このような例はまだ他にもある。政府や地方自治体は予防が大事だと主張するが、病院側はまた違ったインセンティブを持っている。一方、保険会社の方も喫煙予防プログラムにそれほど投資したがらない。このようなケースの場合、日本ではどう対応しているのか。また日本では、予防を疾病に対する適切な対処法と認識させるために、どのような方法をとっているのか？

＜久保達彦＞かつて日本の医療保険は治療のみをカバーし、ワクチン接種をはじめとする予防プログラムをカバーしなかった。ただ現在は喫煙を含めた予防プログラムも一部カバーしている。従って病院が喫煙予防プログラムを実施すれば、病院は診療報酬が得られるはずだ。理想としては、とにかく費用効果が期待できる予防にまで、公的医療保険を広げることだ。公的医療保険のスタンスが徐々に変化していると思う。

オランダの医療・介護保険制度の一般的コーディネーション問題

Herbert Rolden

オランダの医療・介護保険制度のコーディネーションが直面している問題は大きく３つに分けられる。

最初は手順が官僚的であることで、これは市民に直接影響を与える。例えばLTC介護サービスをうける場合、まず認定してもらうために沢山の事務処理プロセスがあるCIZに申し込む。オランダにはAWBZ、ZVW、WMOの３つの法律があるため、個人サービスはAWBZが、ナーシング・ケアはZVWが、家事援助はWMOが提供する。結局市民は簡単なサービスを受けるにも、複数の機関に対応しなければならない。例えばClientがまず朝起きてシャワーを浴びるため個人サービスを頼むとする。その週は家事援助要員が来ないため、シャワーの後、ゴミ捨てを頼むが、個人サービスの要員からはゴミを捨てるのは仕事でないと断られる。３つの異なる法律、事務処理プロセス、役割があり、Clientにとっては誰がどのサービスをやってくれるか理解するのが、大変複雑だ。

２つ目は情報収集が統一化されていない。医療・介護サービス提供者はそれぞれが自分に必要な情報しか集めない。そして彼らは守秘義務に縛られているため、法律に違反する情報共有は行うことができない。患者に関わる情報は、どのような情報でも誰とも共有することはでず、共有が許されるのは特別の場合だけだ。

そしてその結果生ずるのが３つ目の立法の問題だ。医療・介護サービスの円滑化を図ると同時にClientの個人情報も守らなければならない。

まずZVWにおける主なコーディネーションの妨げは、守秘義務だ。また自分の情報のみを集めるだけでなく、互換性のない違うシステムを使用するのも非効率だ。情報共有とコーディネーションを改善してゆくためには、法律的側面も十分考慮に入れる必要がある。法的にどの情報をどのように有効にコーディネートするのか、プライバシーと技術的障害を考慮しながら、見極めなければならない。AWBZとWMOの問題は、国のたった一つの機関が認定手続きを行っていることだ。例えばClientが比較的緩い介護認定を受けようと手続きを初めた途端、状態が急に悪化してナーシング・ホームに行かなければならなくなったとする。その度毎に認定を受け直す必要があり、用紙に記入し、ダブルチェックを受けなければならない。

WMOに関しては、設置されてから日が浅いため、地方自治体は経験不足でどのようにClientの情報を集めていいかわかっていない。自治体それぞれの情報交換もなく、ベンチマークの問題もある。自治体がいかに効率的に情報を集めたら良いか、標準が定められていない。またWMOでは「規制された市場」も問題となっている。自治体はサービス提供者と１年ごとに契約を結ぶ。つまり１年ごとに契約を更新するわけで、問題はサービス提供者が頻繁に変わることだ。これでは長期的な情報共有システムを構築することができない。また規制された市場であるために、サービス提供者は自分の利益を追求するため、情報を共有するのには消極的だ。

オランダでは医療・LTCにおいて責任の所在がはっきりしている。まずGPが専門治療へのゲートキーパーとして最初の責任を負う。次の専門家は長期療養・介護サービスが必要かどうか判断する。そして３番目に、もしClientが長期的施設サービスを受けることになった場合には、ナーシング・ホームの医療専門家が責任を持つ。保健サービスでは、効率的な情報共

有と、明確な役割分担、責任の所在がはっきりしていることが大変重要だ。

将来的には、長期入所サービスに入ったClientの施設間移動を評価するトランスファー・ナースや、プライマリ・セクターでのネイバーフッド・ナースが重要になってくると思う。

オランダの経験と日本への示唆

Marieke van der Waal

日本が現在直面している医療・介護サービス費用の増大は、オランダの問題であり、またヨーロッパの問題でもある。そして日本もヨーロッパも極めて裕福な国々だが、オランダには健康という意味では不平等が存在する。オランダの場合、高収入＋高学歴と低収入＋低学歴の間には、およそ7年の平均寿命の差がある。高収入＋高学歴の方が7年長く生きるということだ。平均寿命と健康寿命の統計をみると、様々な不公平がみてとれる。例えば社会経済的地位が低いグループは40%が喫煙の習慣を持っているのに対し、高いグループは10%である。当然社会経済的地位が低いグループの方が、癌や心臓病などにかかる医療サービス支出が大きくなる。そこでオランダでは社会経済的地位が低いグループに注目し、彼らが健康的なライフスタイルになるよう取り組んでいる。

オランダは第二次大戦後、医療、LTCを社会保険制度として構築してから修正に修正を繰り返してきた。これは日本も同じだと思う。SSH (Social Security Health care system) を採用している国は、医療制度が税金だけで賄われるNHS (National Health Service) を採用しているイギリスなどよりも支出が大きい。オランダのように、GP、医者、看護婦が国家公務員ではなく、民間企業のために働いていると、どうしても賃金が高くなる。これは国営の医療サービス事業よりも、社会保障医療・保険制度の方が支出が多い一つの要因でもある。このあたりで制度そのものについて視点を少し変えてみるのも悪くないと思う。

また、今まで我々は対GDP比での医療・LTC支出に関し、許容可能なレベルについて議論してきたか？　我々はアメリカの対GDP支出が非常に高いことを知っている。日本はオランダに比べて低いことも知っている。では許容可能な額はどれほどだろうか？　これについては全く議論されてこなかった。

私からみて日本の意外な点は消費税だ。日本は国の負債が非常に大きいため、消費税を現在の5%から8%に引き上げ、更に10%にする計画のようだが、オランダでは消費税を二種類に分けている。食料品などは6%、服や車、家などには21%だ。だから日本の消費税はオランダからみると大変低いといえる。

またもう一つ驚くべき点は、日本では介護保険料を40歳になって初めて納めるということだ。オランダでは働き始めて税金を支払うようになると、LTC保険料12.65%を支払う。もちろん日本に対してどうしろと言っている訳ではないが、これは我々にとっては驚きだ。

今オランダでは、高齢者は自分のために何ができるか、どの程度の費用を負担できるか考えるという、大きなものの見方の変化を求められている。オランダでは普通に歩行器を購入しようとすると65ユーロかかる。政府はもともと保険制度からの支給品だった歩行器をLTC

サービスから除外しよとしたが、大きなデモによって阻まれ成功しなかった。高齢者ホームやナーシング・ホーム(つまりオランダでは終焉の場所ということだが)には歩行器、車椅子、電気車椅子が全て備わっている。そして地下室には使い古されたそれらの器具が放置されている。中古品市場が存在しないためだ。これは介護サービス資格の付与の方針が間違っていると私は考える。

このような状況からオランダではものの見方の転換を求められている。日本も同じだと思う。我々は高額な介護サービスをより廉価な介護サービスにシフトする必要がある。オランダでは労働人口が縮小し、女性の社会進出も増えるため、退職したばかりの高齢者が脆弱な高齢者の介護をすることもオプションの一つと考えられている。

■

Carte Vitale 2 in French health insurance system

Marie-Anne Brieu (ILC-France)

Introduction

The "*Carte Vitale*" is the insurance card for France's national health insurance (NHI). It enables automated and direct reimbursement to a beneficiary or health care provider from the individual's primary health insurance fund. While its use is not mandatory, the Carte Vitale simplifies management of medical expenditures for the NHI system. The card is embedded with a microchip (also called a "smart card") and contains the beneficiary's basic social and medical insurance information, including the individual's social security number (N° INSEE)[i] to which every French citizen is entitled at birth.

Originally introduced in 1998, there have been many technological modifications and updates, leading to the most recent generation used since 2008 called "*Carte Vitale 2*". The main difference between earlier versions and the *Carte Vitale 2* is a photo of the beneficiary on the card, and additional electronic functions to allow the existence of electronic health records in the future along with other identification data. In addition, the card previously carried information for an entire family, simply declaring their eligibility for reimbursement of covered benefits under the French NHI system, whereas the *Carte Vitale 2* is for individuals (or his/her dependants, minors or spouse) only.

History

Background: Funding of Health Services[1, 2, 3, 4]

The NHI system (*l'Assurance Maladie*) under the social insurance system (*Sécurité Sociale*) in France covers an individual's basic health care benefits. The system is managed through different mandatory health insurance funds or regimes, which are determined by an

[1] Wikipedia, Caisse primaire_d'assurance_maladie <http://fr.wikipedia.org/wiki/Caisse_primaire_d'assurance_maladie>. Accessed 27 November 2013.
[2] L'Assurance Maladie En Ligne, AMELI <http://www.ameli.fr/l-assurance-maladie/connaitre-l-assurance-maladie/missions-et-organisation/la-securite-sociale/histoire-de-l-8217-assurance-maladie.php>. Accessed 27 November 2013.
[3] Rodwin V. G. The Health Care System Under French National Health Insurance: Lessons for health reform in the United States. *American Journal of Public Health* (93) 1: 31-37, 2003.
[4] Sandier S. V. Paris and D. Polton. Historical Background, Organizational Structure and Management. Chapters 1-3 from their report, *Health Care Systems in Transition: France.* Copenhagen. WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies, 2004. <http://www.euro.who.int/document/e83126.pdf>

individual's occupation (also called *Assurance-Maladie Obligatoire, AMOs*), and is primarily financed through employer and employee payroll deductions. There are three principal NHI funds that oversee the administration of insurance at the national level: the fund for salaried employees (*regime général;* approximately 84% of population), the agricultural fund (*Mutualité Sociale Agricole, MSA;* 7.2% of population), and the fund for independent professions and other self-employed workers (*Régime Social des Indépendants, RSI;* 5% of population). There are seven smaller plans for specific occupations are affiliated under the *regime général* and an additional 4 smaller funds. In addition, people not qualifying for any of the health insurance 'funds' by virtue of their profession or personal situation (i.e. unemployed people, [or low-income families and individuals]) are covered under the universal medical fund (*Couverture Maladie Universelle, CMU*), without premium payments for an annual income of 8,593€ for an individual or 18,045€ for a family of four.[5] The CMU fund covers approximately 1.6% of the population, and is also overseen by the *régime général.*

Under the *regime général*, the *Caisse nationale de l'assurance maladie des travailleurs salaries* (CNAMTS or CNAM) oversees coverage of health insurance and workplace accidents. There are approximately 129 agencies in charge of local management, reimbursement of costs, and direct relation with beneficiaries (*Caisse primaire d'assurance maladie* (CPAM)); at a regional (department) level, there are 16 funds whose responsibilities range from work accidents and illnesses to control of hospitals.

In general, the compulsory NHI funds cover approximately 75% of the costs depending on the service (ranges from 60% for basic care to 100% for hospital visits) with the balance considered a copayment, which is waived for the elderly, disabled or impoverished.[ii] The remainder of the costs, as well as non-covered benefits, are either paid out-of-pocket by the individual directly (approximately 11% of expenditures) or covered by supplementary health insurance plans (*Assurance Maladie Complementaire, AMC;* approximately 12.4% of expenditures), provided by non-profit mutual-aid societies (*Mutelles)* or private commercial companies. The annual fees for AMCs, which can range from 500€ to more than 1800€ per year and on average cost approximately 20% of a household's gross income on health, are usually paid for by an individual directly or their employer.

Previously, patients had to pay directly for the health services (i.e. doctor consultations, outpatient services and exams, prescription drugs) rendered at the visit. Afterwards, they obtain reimbursement from their local CPAM, and then their supplementary insurance plan if they have one. Previously, patients had to submit a paper proof of payment or claim

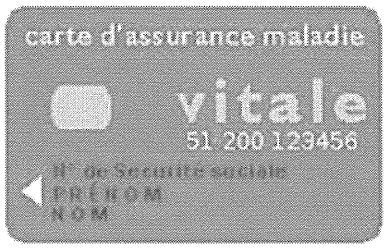
[5] French-Propoerty.com, Couverture Maladie Universelle (CMU). <http://www.french-property.com/guides/france/public-services/health/cmu/protection-complementaire/.>. Accessed 23 January 2014.

("*feuille de soins*") to their local CPAM for reimbursement; however, it was decided in 1991 to switch to an electronic system, although this has taken years to become operational.

Emergence of the Carte Vitale

Founded in 1993 by the three principal NHI funds, the *Groupement d'Intérêt Économique SESAM-Vitale* (GIE SESAM –Vitale)[iii], is responsible for project supervision of the *SESAM-Vitale* system (*Système Électronique de Saisie de l'Assurance-Maladie*).[iv] *SESAM-Vitale* is a program designed to make paperless billing for health insurance in France, based on the *Carte Vitale* card. Initially, switching from the paper-based system to a plastic smart card was expected to help "replace a huge quantity of paper records and save an estimated $17 billion over a 10-year period;"[6] in 1998, it was hoped to create an annual savings of two billion francs.[7] Prior to launching this national system, a dozen local experimentations of health cards were already using similar smart card technology throughout France. Between 1994 and 1998, four pilot experiments were run (in Vitre, Boulogne and Lilliers, and Charleville- Mézières) with a total circulation of 550,000 cards, although each of the plans used different cards visually.[8]

Different Generations



Since its universal adoption of the current visual appearance in June 1997, the *Carte Vitale* has seen many different generations, which increasingly evolve with each new generation in terms of components and embedded functions.

La Carte Vitale 1:[9] In April 1998, the first "familial" *Carte Vitale* cards were distributed in the region of Bretagne; it was not until July 1999 that all those eligible (37 million beneficiaries at the time) were in possession of the card. It contained the administrative data of the insured beneficiary, as well as all his/her eligible dependents (spouse and children) up to 19 recipients. This version of the *Carte Vitale* had only 4KB of memory, and like most smart cards, its duration only lasted 3 years. Since it was expected to be replaced at the end of the 20th century by *Carte Vitale* 2, along with a new "health component", there were not fields containing the end date of one's right to universal health coverage. From September 2001, the manufacturers began the distribution of "personal" cards, rather than familial, for all beneficiaries over the age of 16 years.

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[6] Lassey ML, Lassey WR, and Jinks MJ (1997). *Health Care Systems Around the World: Characteristics, Issues, Reforms;* Prentice Hall, Upper Saddle River, NJ, 07458, USA.

[7] Wikipedia, SESAM-Vitale <http://fr.wikipedia.org/wiki/SESAM-Vitale#GIE_SESAM-Vitale>. Accessed 27 November 2013.

[8] SESAM-Vitale <http://www.sesam-vitale.fr/nous-connaitre/histoire.asp>. Accessed 27 November 2013.

[9] Wikipedia, Carte Vitale <http://fr.wikipedia.org/wiki/Carte_Vitale>. Accessed 6 November 2013.

There have been several generations of *Cartes Vitale* 1: V1, V1bis and V1ter. "*SCOT 400*" was the name historically used to refer to the first generation (V1) of *Cartes Vitale* deployed from 1998 to June 2003. "*IGEA*" was the generic name for the second generation (V1bis) of *Carte Vitale* deployed starting in July 2003. The *IGEA 440* generation, used from 2004 to 2006, had a bug preventing the electronic signature or blocking the card during updates in the terminals. As a result, nearly an estimated 2 million cards had to be replaced.[v] In addition, these 2 generations of cards contain no physical or technological way to specify an end date of rights to coverage, therefore allowing permanent coverage.

In April 2004, the report of the General Inspectorate of Social Affairs explained that there were 10 million *Cartes Vitale* outstanding; in other words, 60 million had been issued when there were only 50 million cardholders 16 years or older. Therefore, the *Carte Vitale V1ter* generation was introduced to eliminate the problems with previous generations. Unlike the V1 and V1bis cards, the date of expiry is always present in a V1ter card.

However, the supply of chips of the older generation was not guaranteed after 2007, as card manufacturers could not keep outdated production lines to produce new *Carte Vitale* 1 cards. In addition, after joining the *SESAM-Vitale* in 2000, the supplementary health plans expected to have a "complementary component" on the card, to help inscribe their necessary data for electronic claims.[10]

Arrival of Carte Vitale 2:[11] The appointed project of *Carte Vitale 2*, with a component for medical information, was something long discussed but slowly put into place.[vi] After numerous postponements, Philippe Douste-Blazy (French Minister of Health) pledged that the *Carte Vitale 2* would be deployed in the last trimester of 2006 and then distributed until mid-2008. However, it was not until March 2007 that the first forms were sent to policyholders, and the first *Carte Vitale 2 cards* were delivered in May 2007. Similar to the *Carte Vitale 1* distributed ten years before, dissemination began in the Bretagne region for those individuals having no *Carte Vitale* (i.e. card was stolen, lost, or unusable, or minors aged 16 and new members), spread gradually to the region of "*Pays de la Loire*" and finally to the rest of France.

According to NHI funds, the cost of the card would be 2.20 €, plus 0.50 € for the photo, for a total of 2.70 € per *Carte Vitale 2* card. (The cost of the *Carte Vitale 1* was 3.66 € when it was launched in 1998.) The government designated 35 million Euros to the project of updating and adding photos.[12] However, this cost does not include the management fees in receptions of funds to help some insured beneficiaries to complete the application files of this card.

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[10] Wikipedia, Carte Vitale 2 <http://fr.wikipedia.org/wiki/Carte_Vitale_2>. Accessed 6 November 2013.

[11] Wikipedia, Carte Vitale 2 <http://fr.wikipedia.org/wiki/Carte_Vitale_2>. Accessed 6 November 2013.

[12] French Sénat, Projet de loi relative à l'assurance maladie <http://www.senat.fr/rap/a03-425/a03-4257.html>. Accessed 27 November 2013.

While updating one's card with a photograph was mandated in 2004, general rollout has been slowly achieved, and the card is far from being used widespread.[vii] Between May 2007 and April 2008, only 1.9 million Carte Vitale cards were issued (nearly one million in 2007), whereas in previous years there were 1.5 million annual replacements for lost or stolen *Carte Vitale 1* cards. Although, by the end of 2007, more than 90% of the new cards issued by the different compulsory plans were *Carte Vitale 2* cards. By 2012, approximately 15 to 16 million updated cards with photograph had been produced, at an estimated cost excluding distribution of 177 million Euros, most likely pushing renewal of all the cards in distribution to another eight years. [13] According to the 2011 SESAM-Vitale Annual Report, 20 million *Carte Vitale* 2 cards with the insured's photo have been released since 2007 (4.5 million cards alone in 2011), followed by an additional 4.4 million cards distributed 2012.[14]

Since updating requires people to send in their photographs, rather than having the insured go somewhere in person to perform this operation, take-up has been slow. In one year, 30% of the 3 million people invited to send their photo had still not responded, and 20% of the 2 million requests received were unusable because of outsized photos.

Timeline of *Carte Vitale* Implementation and Generations	
1998	April: generic *Carte Vitale* card introduced
1999	July: 37 million cardholders[viii]
2001	September: Distribution of "personal" cards, rather than familial
2004	April: 50 million *Carte Vitale* cards, with an additional 10 million excess in circulation
2007	*Carte Vitale 2* introduced
2008	April: Only 1.9 million new *Carte Vitale 2* cards had been issued
2011	20 million *Carte Vitale 2* cards updated with photographs
2012	Additional 4.3 million *Carte Vitale 2* cards distributed; Total of 66 million cards updated
2013	*Current number unavailable*

Designer and Manufacturer

Although the card remains the property of the compulsory plans, *Carte Vitale* is managed and deployed by *GIE SESAM–Vitale*, as previously noted. This organization is therefore responsible for identifying the contracts for those organizations that manufacture and supply the cards.

The operating system ("masque") was originally made by Bull-CP8, a subsidiary of Groupe Bull who specializes in the design and development of operating systems used in

[13] I-Med blog: Vers une carte Vitale 3? <http://www.i-med.fr/spip.php?article458>. Accessed 27 November 2013.
[14] Rapport d'Activité 2012, SESAM-Vitale <http://www.sesam-vitale.fr/pratique/catalogue/index.html>. Accessed 23 January 2014.

smart cards, in 1993. [15, ix] However, starting in April 2004, Sagem Défense Sécurité developed the operating system of the new card. This operating system is implanted on two components of 32KB of memory (compared to earlier generations with only 4KB of memory).

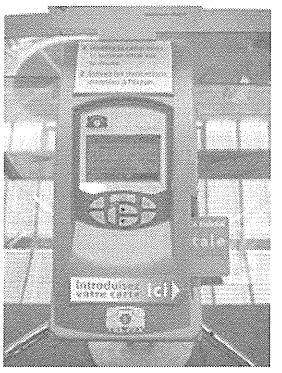
Carte Vitale 2 required the construction of a new "infrastructure of card issuance" ("portal of card issuance and management of orders of customization"). In May 30, 2006, Axalto and Gemplus International were chosen to provide the customized *Carte Vitale 2* cards. The contract was for a minimum of 8 million cards over an initial period of two years, renewable twice for a period of one year. [x]

Management of the back-office of *GIE SESAM -Vitale* was granted to Experian, associated with Sagem Défense Sécurité, on 17 June 2006. Their role is to process *Carte Vitale* requests received in the mail by scanning application forms and providing the scanned photos to the issuance portal. By contract, Experian must ensure the processing of 1.5 million cases every month within 24-48 hours; the contract is for a minimum of 24 million processed forms completed by the insured. [16]

Present Situation

How Does It Work?

To use a *Carte Vitale*, a certificate of social security must be delivered to the individual's compulsory fund at their local CNAM office. This certificate acts as a paper attestation to the individual's right to coverage and is sufficient for reimbursement of care.



At the time of the visit, the healthcare provider swipes the *Carte Vitale* into a card reader (*see image at right*), similar to a credit or debit card. Previously, this enabled direct reimbursement from the fund to the patient's bank account within five days of the service. However, now once the card is verified, the doctor can bill the compulsory fund directly for reimbursement, and payment is sent directly to the provider from the insurance fund in contrast to direct payment by the patient (*"tiers payent"*). In addition, some providers also accept proof of the individual's supplementary insurance to bill those plans directly rather than the patient paying upfront first.

As part of an essential component of the *SESAM-Vitale* system, the card helps transmit a standard and secure billing flow for care benefits, including:

- of electronic care sheets (*feuilles de soins électroniques*, *FSE*) to the portals of the compulsory funds; and

[15] Wikipedia, Carte Vitale <http://fr.wikipedia.org/wiki/Carte_Vitale>. Accessed 6 November 2013.
[16] Wikipedia, Carte Vitale 2 <http://fr.wikipedia.org/wiki/Carte_Vitale_2>. Accessed 6 November 2013.

- of electronic reimbursement claims (*demandes de remboursement électroniques, DRE*) to the portals of the supplementary health insurance plans.

This structure allows for the automated management of the invoicing/billing of care, while providing faster processing of applications for reimbursement of medical expenses as well as a decrease in administrative costs by the plans. In 2012, the system processed nearly 1.17 billion secured transactions for the compulsory funds and 11 million requests for electronic reimbursement to the supplementary plans, in relation to 306,000 health providers.[17] Currently, there are 315,900 health providers in the SESAM-Vitale system.[18]

Who's Covered?

Carte Vitale is available to all individuals over the age of 16, who are also French citizens or those entitled and living in France; children under the age of 16 are included on the card of their parent or guardian.[19] Those individuals over the age of 16, who are dependants of others (*ayant droits*), are listed on the social security and health insurance accounts of the main beneficiary but will have possession of their own *Carte Vitale* card. Minor dependents of child welfare (*l'aide sociale à l'enfance, ASE*) also have *Carte Vitale 2* cards with their own social security number. [20, xi] In addition, those people who have moved to France permanently and have become residents for an uninterrupted period of 5 years or more,[xii] who work in France more than 40 hours a month, or are full-time students under the age of 26 years can be eligible for the *Carte Vitale*. [21] Valid throughout the life of the cardholder, assuming they remain eligible for health insurance coverage, the cards are free of charge and given by the compulsory funds to all of their beneficiaries. [xiii] (Of note, except for production and distribution costs, the majority of costs for the GIE SESAM-Vitale system are funded by the compulsory (86%, or 64% for CNAMTS alone) and supplementary (14%) plans. Other "ad-hoc" expenses are supported by the General Assembly.)[22]

The card may only be used within France; however, those French citizens working in the French Principality of Monaco do not have a *Carte Vitale* because they are attached to the *Caisse de Compensation des Services Sociaux (CCSS)*. *Carte Vitale* is also considered complementary to the European Health Insurance Card (eEHIC) when a cardholder is outside of the country.[xiv] Recipients of state medical assistance (*l'aide médicale d'État, AME*) do not have a *Carte Vitale* and their data is retrieved from a paper certificate. Non-residents

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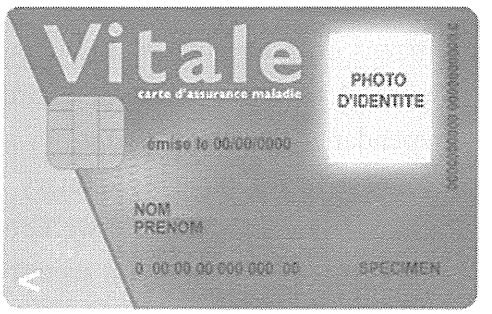
[17] Rapport d'Activité 2012, SESAM-Vitale <http://www.sesam-vitale.fr/pratique/catalogue/index.html>. Accessed 23 January 2014.
[18] SESAM-Vitale, Les chiffres-clés de la facturation < http://www.sesam-vitale.fr/divers/chiffres/chiffres-cles_facturation-sv.asp>. Accessed 22 January 2014.
[19] Carte Vitale, The French Health Insurance Card < http://www.french-property.com/guides/france/public-services/health/health-card/>. Accessed 11 November 2013.
[20] Wikipedia, Carte Vitale 2 <http://fr.wikipedia.org/wiki/Carte_Vitale_2>. Accessed 6 November 2013.
[21] Wikipedia, Carte Vitale <http://fr.wikipedia.org/wiki/Carte_Vitale>. Accessed 6 November 2013.
[22] Rapport d'Activité 2012, SESAM-Vitale <http://www.sesam-vitale.fr/pratique/catalogue/index.html>. Accessed 23 January 2014.

must use their country's insurance card, such as the European Health Insurance Card, or purchase private coverage while in France. [23]

In addition, health providers also use a registered smart card (*Carte de Professionnel de Santé,* currently called the *CPS3*), whose use is theoretically limited to one individual, and must be used in conjunction with the patient's *Carte Vitale* in order to transmit billing information to Social Security,[24] or for direct reimbursement from the plans. Initially deployed to ambulatory care sector providers (mainly physicians and pharmacists), it has now been extended to inpatient care providers and all categories of health care personnel. In 2009, 84% of billing in the ambulatory care sector was transmitted electronically.[25] Also supplied by Oberthur Technologies, there were approximately 1.5 million of these cards in February 2011.[26]

Components

The *Carte Vitale* is identical for all compulsory funds. Currently, the *Carte Vitale 2* contains the following information: [27, 28]



1. Visible data on the card (*see image at right*): Includes appearance of a "V" and an "L" in Braille, a serial number unique to the card, the date of issuance, and cardholder identification data (such as the individual's social security number (N° INSEE); his/her first and last names -- or if the applicant requests, their common name; a recent color photograph[xv, xvi] including the face and bareheaded; and a sign of identification embossed on the card); [29]

   AND

2. The card also has the capability to enter the following data electronically through the bar code located on the back of the card:
   - All data mentioned above, as well as the period of validity of the card, the name of the cardholder if different from commonly used name, other names if

[23] Wikipedia, Carte Vitale <http://fr.wikipedia.org/wiki/Carte_Vitale>. Accessed 6 November 2013.
[24] Wikipedia, Carte Vitale <http://fr.wikipedia.org/wiki/Carte_Vitale>. Accessed 6 November 2013.
[25] Chevreul K et al (2010). France: Health System Review, *Health Systems in Transition* 12 (6), European Observatory on Health Systems and Policies.
<http://www.euro.who.int/__data/assets/pdf_file/0008/135809/E94856.pdf>. Accessed 23 January 2014.
[26] The Smart Sense: *The Online Newspaper for SMART Technologies* <http://thesmartsense.com/25375>. Accessed 4 December 2013.
[27] Wikipedia, Carte Vitale <http://fr.wikipedia.org/wiki/Carte_Vitale>. Accessed 6 November 2013.
[28] L'Assurance Maladie, La Carte Vitale < http://www.ameli.fr/assures/soins-et-remboursements/comment-etre-rembourse/la-carte-vitale/mettre-a-jour-votre-carte-vitale.php>. Accessed 27 November 2013.
[29] Wikipedia, Carte Vitale 2 <http://fr.wikipedia.org/wiki/Carte_Vitale_2>. Accessed 6 November 2013.

applicable, date of birth, address and digitized photograph identical to the one on the card;

- Entitlements and information under basic health insurance through their compulsory fund;
- Physician of choice of the cardholder (*médécin référent*). If a patient is registered and part of a health care group, their rate of refund will be higher;
- Where appropriate and subject to consent, the circumstances of the cardholder under his supplementary health insurance plan (i.e. rights to *couverture maladie universelle complémentaire (CMUC)*;
- Where appropriate, rights to any exemption from co-payment if you have the title of a long-term illness (*affection de longue durée, ALD*),[xvii] maternity, accidents at work, etc. This includes the situation of the cardholder in matters of occupational accidents or diseases, including the last recognized occupational diseases or sicknesses;
- Data on access to care in case of stay or residence in another EU Member State or party to the European Economic Area (*currently not activated*);
- Details of a person to contact in case of an emergency, if the cardholder gives consent (*currently not activated*); AND
- An indication that the owner has been informed of the provisions and regulations regarding organ donation (*currently not activated*).

If there are any changes in circumstances (i.e. pregnancy, birth, long-term diseases (ALD), etc.), the *Carte Vitale* can be updated in an online terminal, present at all pharmacies, the counter of local CPAM, or in some healthcare facilities; in addition, updates can be mailed to individual health plans if the cardholder is immobile. In 2012, there were 41,350 places to update cards, mostly in the pharmacies, and this resulted in 66 million cards being updated online.[30] Currently, there are 46,400 active and approved locations to update, resulting in more than 5 million attempts per month by cardholders to update.[31]

Since 2007, the *Carte Vitale* must be updated each year after its date of issue.[xviii] If this is not done, cardholders cannot benefit from the advanced exemption of fees for benefits in kind of health insurance (in other words, people can be exempt for paying fees for services prior to billing, if they present updated cards showing health coverage, rather than paying first and submitting for reimbursement). In addition, during an update, and if eligibility of health insurance has expired, the *Carte Vitale* can be deactivated to prohibit use at health providers' offices; it can be reactivated later if the rights are opened again. [32]

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[30] Rapport d'Activité 2012, SESAM-Vitale <http://www.sesam-vitale.fr/pratique/catalogue/index.html>. Accessed 23 January 2014.
[31] SESAM-Vitale, Les chiffres-clés autour de la carte Vitale < http://www.sesam-vitale.fr/divers/chiffres/chiffres-cles_carte-vitale.asp>. Accessed 22 January 2014.
[32] L'Assurance Maladie, La Carte Vitale < http://www.ameli.fr/assures/soins-et-remboursements/comment-etre-rembourse/la-carte-vitale/mettre-a-jour-votre-carte-vitale.php>. Accessed 27 November 2013.

The NHI funds are currently responsible for replacing stolen, damaged or lost cards for free. In 2004, the Department of Social Security proposed that the cost of replacing lost cards should be borne by the respective insured beneficiary. This measure, although ultimately rejected by Parliament, would have yielded an estimated 4 to 12 million Euros per year, taking into account only the cost of the cards or the total replacement procedure respectively. Now, the declaration of loss of passport, an identity card or the *Carte Vitale* can be performed online via <Mon.service-public.fr>, a web portal of French administration created in early 2009 to simplify the process.

Security Features:[33] In March 2005, Jacques de Varax, Director of *GIE SESAM – Vitale*, explained that the *Carte Vitale 2* "will be the key to safe personal health" (in other words, the personal health record).[xix] In effect, it was expected that the card would be able to contain authentication and signature certificates to ensure the electronic signature functions properly, to protect access to the card's information, and to authenticate the card as the cardholder's health insurance card. For these purposes, the *Carte Vitale 2* includes an "IAS" component (identification, authentication and signature), but it is currently not enabled.[xx] The Department of Social Security (*DSS*) estimated that the costs of implantation of authentication certificates in the *Carte Vitale 2*, and management of the Public Key Infrastructure (*l'Infrastructure à clés publiques, IGC*), would have been 50 to 130 million euros per year for the first five years. (For each card, the annual cost of such certificates would be 0.85€ to 2.2€.)

Payment History (l'Historique des Remboursements):[34] Since 2007, physicians can access online all care, medications and tests their patients have received, and that had been reimbursed by health insurance regimes, for the previous twelve months, with the goal of avoiding drug interactions and duplicate exams.[xxi] Non-reimbursed medicines (i.e. contraceptive pills, drugs advice) as well as those provided by hospital pharmacies were not available. This consultation requires the joint presence of the *CPS* Health Professional Card and the *Carte Vitale* of the patient.[xxii] In 2012, there were 4.3 million authentication requests to view payment history.[35]

The Court of Audit in France, in its report published in September 2008, said that the estimated cost for this project for the period 2005-2008 would be about 10 million euros for CNAM, a million for the social plan for independents (RSI) and a few hundred thousand euros for the agricultural Mutual Assistance (MSA) and the public service unions.

Pharmaceutical Record:[36,37] "Babusiaux" experiments aim to analyze patterns of drug consumption of insurance members to officially improve the quality of care and generate

[33] Wikipedia, Carte Vitale 2 <http://fr.wikipedia.org/wiki/Carte_Vitale_2>. Accessed 6 November 2013.
[34] Wikipedia, Carte Vitale <http://fr.wikipedia.org/wiki/Carte_Vitale>. Accessed 6 November 2013.
[35] Rapport d'Activité 2012, SESAM-Vitale <http://www.sesam-vitale.fr/pratique/catalogue/index.html>. Accessed 23 January 2014.
[36] Wikipedia, Carte Vitale <http://fr.wikipedia.org/wiki/Carte_Vitale>. Accessed 6 November 2013.

savings.[xxiii] Therefore, the *Carte Vitale* can also be used since 2009 at a national level, in those pharmacies that are connected, to supply the contents of the pharmaceutical record.[xxiv] Pharmacists identified by their *CPS* card have access to the last four months of drugs dispensed in different pharmacies connected to the portal helping to prevent duplicate prescriptions and unwanted drug interactions. Unless stated otherwise by the patient, all the dispensed drugs reimbursed or not will be listed. (Hospital delivery is excluded from this project.)

This information is located on a site whose main contractor is the National Council of the Order of Pharmacists (*le Conseil national de l'Ordre des pharmaciens, CNOP*). Archives are kept for the past three years use by the host Santeos.

In practice however, for identifying pharmacy records, the social security number is not used. The *SESAM- Vitale* software of pharmacies is backed by reading the *Carte Vitale*, which then serves to generate a temporary identifier, the number of pharmaceutical record (*le Numéro du Dossier Pharmaceutique, NDP)*. Experts believe it will take at least five years for the unique health identifier to be operational and replace this temporary identifier.

Fraud:[38] Currently, much of the existing fraud relates to paper certificates and forged prescriptions. To fight against this, since June 2004, pharmacies' software operate a national list of those *Carte Vitale* cards that are in opposition.[xxv] This "liste d'opposition électronique" (LOE) contains the serial numbers of all *Carte Vitale* cards put in opposition of the compulsory funds if it has been reported lost or stolen (to avoid usage of the duplicate card), has been subject to misuse, or if it is invalidated by the regime who issued it. [39]

Previously, the manufacturer either mailed an updated list each month directly to the pharmacists or sent an update to a technical hub (*l'organisme concentrateur technique, OCT*) between the 18th and 22nd of each month, which then forwarded the list to pharmacists.[xxvi] Since March 2009, following a national convention of pharmacists[xxvii], the list of opposition for *Carte Vitale* changed, and is now incremental and must be downloaded every day.

Currently, the LOE only applies to pharmacists, but there could possibly be an extension to all health providers following new agreements at future conventions. A new law, proposed by the National Assembly,[xxviii] would allow the director of the local *CPAM* to impose a financial penalty against those health providers, institutions and insured who had committed fraud, and would depend on the severity of such fraud. [40]

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[37] Chevreul K et al (2010). Ibid.
[38] Wikipedia, Carte Vitale <http://fr.wikipedia.org/wiki/Carte_Vitale>. Accessed 6 November 2013.
[39] Vitale Infos Equipements : La Liste d'Opposition des Cartes Vitale chez les pharmaciens (2004) <http://www.ameli.fr/fileadmin/user_upload/documents/pharmaciens_loe_br.pdf>. Accessed 27 November 2013.
[40] French Sénat, Projet de loi relative à l'assurance maladie <http://www.senat.fr/rap/a03-425/a03-4257.html>. Accessed 27 November 2013.

Future Development

Integration with Personal Health Records and Care Coordination Pathway

Ahead of most other countries, France has long used smart cards for keeping electronic medical records; "more than one-half million were in use in 1994"[41] and were expected to be integrated with the *Carte Vitale* system. With the passage of the *Act of Health Insurance Reform* in August 2004, the country has made more of an effort to improve quality of care while also fighting against abuse and waste. However, while the capacity to hold much of the proposed information exists within the current generation of *Carte Vitale 2*, the majority of these integration have yet to be activated to date.

Health Component:[42,43] Early in the *SESAM-Vitale* program, a health component was expected to be quickly added to the new *Carte Vitale* to help group information gathered by outpatient and inpatient providers. In other words, a mini-electronic, portable medical record (*carnet de santé*) was to replace the paper health record to aid with the continuity and coordination of care, as well as define the content of the health component and the conditions of access for different categories of health providers. [xxix] The decision to include this information is determined by the patient on a voluntary basis, but was offered along with financial incentives (increase in reimbursement rates for those opting in, or increased co-payments for those who opt out). In May 2006, the specifications of the *SESAM- Vitale* software integrated the management of the Coordinated Care Pathway. The personal medical record will contain health information (allergies, test results, current medications , etc.); created and updated by the physician of his choice, this record will be computerized, in strict compliance with the medical confidentiality. Following the delay of the *Carte Vitale 2* program, as well as the announcement of the generalization of the Personal Medical Record for 1 July 2007, this health component became obsolete. Instead, the new *Carte Vitale 2* contains a reduced "medical component".[xxx]

In September 2006, it was announced that the new *Carte Vitale 2* would also allow the integration of new services (i.e. declared doctors, organ donation, etc.). This includes mention of the care coordination pathway along with the physician of choice for treatment (currently only their General Practitioner), monitoring and orientating the care system for each insured person aged 16 and older.[xxxi] The mention of "declared attending physician" should have been integrated into the *Carte Vitale 2* by mid 2007, as well as an indication that the cardholder "is aware of the regulatory provisions on organ donation", but there was nothing as of March 2009. [44]

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[41] Lassey ML, Lassey WR, and Jinks MJ (1997). Ibid.
[42] Wikipedia, Carte Vitale <http://fr.wikipedia.org/wiki/Carte_Vitale>. Accessed 6 November 2013.
[43] Chevreul K et al (2010). Ibid.
[44] Wikipedia, Carte Vitale 2 < http://fr.wikipedia.org/wiki/Carte_Vitale_2>. Accessed 6 November 2013.

Emergency Component:[45] The Health Insurance Reform Act also planned for the *Carte Vitale* to contain details of the person to contact in case of need; in other words, it would include an emergency component "in order to receive the necessary information for urgent interventions" so that health providers can complement care after the express consent of the cardholder. However, this too has not been integrated as of 15 March 2009.

Connection with Other Smart Cards[46]

Carte DUO: Following recommendations in the Babusiaux report, the French Federation of Insurance Companies (*Fédération Francaise des Sociétés d'Assurances, FFSA*) began an experiment with a smart card *DUO,* developed by *GIE SESAM –Vitale* and supplied by *Oberthur Technologies*. This microchip located on the supplementary health insurance card contains an administrative component to modernize direct payment to health providers by making transactions more secure. It started in June 2007 in the department of Bouches-du-Rhone (conducted by insurers SOGAREP, AMIS, Aviva, AXA, GAN, Groupama and MMA), and gradually extended to Calvados, the Deux-Sèvres, in the Seine-Maritime, in the Var and in Vienna. However, this card remains experimental, as currently the majority of those individuals possessing supplementary insurance have paper "*Carte de Tiers-Payant*" instead.

In 2007, 55,000 *cards DUO-FFSA* were delivered, with 140,000 total cards to be distributed in the pilot.[47] This card, sent directly to the insured by the insurer, does not need to be updated at least once per year like the *Carte Vitale* cards and does not contain a photo identification. It therefore reflects the true situation of the insured and beneficiaries. The insurer, in the event of non-payment of the contract, may be put into opposition. It is often used in conjunction with the *Carte Vitale* by pharmacists equipped with new billing software. The tests began with the third-party payer pharmacy, then for radiology, and then to other health providers. The cost is borne exclusively by the supplementary insurance agency, and was estimated in 2005 at about 2.20€.

NETC@RDS:[48] The European electronic health insurance card (e-EHIC; or *La carte électronique européenne d'assurance maladie, e-CEAM*) is the electronic version of the European Health Insurance Card. (5.2 million EHIC cards were distributed in 2011, followed by an additional 5.4 million in 2012.) [49] This project, announced in 2010, offers the ability to progressively make paperless all forms of support; without this service, mobility of insured Europeans throughout the European Union would be prevented. It enables access to health

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[45] Wikipedia, Carte Vitale 2 <http://fr.wikipedia.org/wiki/Carte_Vitale_2>. Accessed 6 November 2013.
[46] Wikipedia, Carte Vitale <http://fr.wikipedia.org/wiki/Carte_Vitale>. Accessed 6 November 2013.
[47] Oberthur Technologies, Health Solutions: ID-ONE Health (2010) <oberthur.se/get_downloadsection_file.aspx?id=113>. Accessed 3 December 2013.
[48] NETC@RDS: A Step towards the Electronic EHIC <http://www.netcards-project.com/web/frontpage>. Accessed 27 November 2013.
[49] 2011 and 2012 Rapport d'Activité, SESAM-Vitale

care and guarantees the payment of medical bills performed in different European health institutions, if the European citizen provides evidence of their entitlement to coverage.

The European NETC@RDS consortium (Germany, Austria, Finland, France,[xxxii] Greece, Hungary, Italy, Liechtenstein, Norway, Netherlands, Poland, Czech Republic, Romania, Slovakia, and Slovenia) is responsible for the development of this electronic card. The NETC@RDS portal contains the following information:

- Acquisition of the identification data of the patient by scanning the EHIC card or directly reading in the *Carte Vitale* terminal;
- Secure verification of online rights on the NETC@RDS portal;
- Editing a NETC@RDS electronic form; AND
- Exchange of data between the health facility and the European Agency for the financial management of care.

Starting in 2002-2003, the first step, called "Phase A1", consisted of a feasibility study with five partners from four different countries. The next phase in 2004-2006 (Phase A2-A3) expanded to 85 European hospitals (including the Georges-Pompidou European Hospital); the project involved twenty partners from ten countries. Finally, the third phase "B" started in June 2007 and was completed in 2009. In 2008, new service outlets were opened in France (Saint Roch Hospital in Nice, Deaconess Clinic in Strasbourg) and in Germany (Lorach). The objective of Phase B was to deploy and evaluate a trans-European tele-service for paperless management of care. There are currently 206 facilities (hospitals and clinics) and around 500 points of service participating, located in 16 EU countries.

In theory, cardholders present either an electronic EHIC or their own national electronic health insurance card to verify to the participating health provider that they have approved health insurance coverage. While *Carte Vitale 1ter and 2* cards contain components reflecting data on whether the cardholder possess E128, E112 and E111 forms and an optional NETC@RDS component, these have currently not been activated.

In addition, it is difficult to deploy an interoperable system while each European country presents specific constraints in terms of technology or structure of its health information systems system. Some states have launched their own national program for electronic health cards, similar to France's system with *SESAM-Vitale*. Others have their own electronic health card; for example, Germany has the eHealth card launched in 2008 by AOK (Allgemeine Ortskrankenkasse), the Lombardy region in Italy has the SRS-CISS card (or the "Carta Régionale dei Servizi, which is a card of services including health), Austria has an ecard, and Belgium has the SIS card.

What's Next? In 2012, presidential candidate Nicolas Sarkozy proposed launching a new biometric *Carte Vitale* (*Carte Vitale 3*) to curb benefit fraud, similar to how French

passports and identity cards were updated with biometric systems.[50] However, how this would be accomplished remains unclear since Sarkozy lost the election.

While the new *Carte Vitale 2* card clearly has begun to improve security, reduce fraud and simplify integration of medical services, distribution still needs to be more widespread nationally. In addition, many of the card's more technologically-advanced measures need to be activated to take full advantage of its potential. Once these steps have been taken, a discussion on future steps may be more realistic.

List of Acronyms

ALD: *Affection de Longue Durée*
AMC: *Assurance Maladie Complementaire*
AME: state medical assistance (*l'Aide Médicale d'État)*
AMO: *Assurance-Maladie Obligatoire*
ASE: *l'Aide Sociale à l'Enfance*
CCSS: *Caisse de Compensation des Services Sociaux*
CMU: *Couverture Maladie Universelle*
CMUC: *Couverture Maladie Universelle Complémentaire*
CNAMTS or **CNAM**: *Caisse Nationale de l'Assurance Maladie des Travailleurs Salaries*
CNOP: *le Conseil National de l'Ordre des Pharmaciens*
CPAM: *Caisse Primaire d'Assurance Maladie*
CPS: *Carte de Professionnel de Santé*
DRE: *Demandes de Remboursement Electroniques*
DSS: Department of Social Security
eEHIC: electronic-European Health Insurance Card (also called *La carte électronique européenne d'assurance maladie, **e-CEAM***)
FFSA: French Federation of Insurance Companies (*Fédération Francaise des Sociétés d'Assurances)*
FSE: *Feuilles de Soins Electroniques*
GIE SESAM–Vitale: *Groupement d'Intérêt Économique SESAM-Vitale*
IGC: Public Key Infrastructure (*l'Infrastructure à Clés Publiques)*
INSEE code: Social security number issued by *l'Institut National de la Statistique et des Etudes Economiques*
LOE: *Liste d'Opposition Electronique*
NDP: *le Numéro du Dossier Pharmaceutique*
NHI: national health insurance
OCT: technical hub (*l'Organisme Concentrateur Technique)*

[50] I-Med blog: Vers une carte Vitale 3? <http://www.i-med.fr/spip.php?article458>. Accessed 27 November 2013.

[i] The individual's social security number (N° INSEE) usually takes the following format, although there are exceptions: "*syymmlloookkk cc*, where:

- *s* is 1 for a male, 2 for a female,
- *yy* are the last two digits of the year of birth,
- *mm* is the month of birth, usually 01 to 12,
- *ll* is the number of the department of origin (2 digits, or 1 digit and 1 letter in metropolitan France, 3 digits for overseas),
- *ooo* is the COG number of the commune of origin with a department (3 digits in metropolitan France or 2 digits for overseas),
- *kkk* is an order number to distinguish people being born at the same place in the same year and month, given by the *Acte de naissance*, and
- 'cc' is the "control key" (01 to 97, equal to 97, or to 97 if the number is a multiple of 97)."

[Wikipedia, INSEE code <http://en.wikipedia.org/wiki/INSEE_code#National_identification_numbers>. Accessed 4 December 2013.]

[ii] Amounts reimbursed to patients are calculated on the basis of negotiated rates minus a copayment, depending on the kind of service. However, close to one third of French physicians have opted to charge fees in excess of the nationally negotiated charges, and these additional charges may be (partially) covered by a patient's supplementary plan. (Rodwin V. G. and S. Sandier. Health Care Under National Health Insurance: A public-private mix, low prices and high volumes. *Health Affairs* (12) 3:113-131, 1993.)

[iii] SESAM-Vitale (www.sesam-vitale.fr) is an enterprise that responds to the project management needs between health insurance plans regarding the operation of the SESAM-Vitale program, and is coordinated by the National Health Insurance Fund for Salaried Workers (CNAMTS) through its Department SESAM-Vitale (DSV). Its members are composed of both agencies offering mandatory or compulsory health insurance; and contains representatives of health providers, health facilities and governmental ministers on its steering committee.

[iv] Created by the Act of 27 January 1993.

[v] However, replacement of cards that were lost, stolen, or unusable or with this malfunction (*IEGA 440 component*), were expected to last at least until 2013.

[vi] The original launch date for the *Carte Vitale 2*, replacing all *Carte Vitale 1* cards, was 31 December 1999. On 3 November 1997, during the parliamentary debate for the Finance Bill of 1998 in the National Assembly, Jérôme Cahuzac (Special Rapporteur of the Committee on Finance, General Economy and Plan for Health) stated: "The *Carte Vitale 2*, meanwhile, will include information of health hazards, and will be distributed in the first half of 1999 and then more widespread." Because of delays *l'Assurance Maladie* had to cancel the 11.9 million *Carte Vitale 2* cards that were ordered in January 1997 and were expected to be distributed in 1998.

[vii] In its annual report on "the enforcement of the financing of social security" for 2007, presented on 10 September 2008, the Court of Auditors explained that CNAMTS was not able to meet the unrealistic schedule of generalization of the *Carte Vitale 2,* "starting from 2006 and in 18 months. Generalization, began in late 2007, will not be achieved for several years."

[viii] Since 1998, 90 million of Carte (1) Vitale cards were manufactured by Axalto / Schlumberger, Oberthur, Gemplus, SOLAIC / Schlumberger Sema.

[ix] In February 2001, Schlumberger bought Bull-CP8 for $325 million and then outsourced this activity to Axalto.

[x] In June 2006, Axalto and Gemplus merged forming Gemalto. To avoid dependence on a single supplier, other manufacturers had to be selected (Oberthur Technologies, Sagem Orga, or the German Giesecke & Devrient).