Technology To Simplify Administration 4

T he international comparisons examined thus far rest on the premise that aspects of other countries' systems might be less administration-intensive than the U.S. system. Adoption of some other system, or aspects of it, might then be a way to reduce administrative Costs here. However, aspects of health care administration that are essentially independent of the reimbursement system and changes in them also hold the potential for savings. Some of these are:

■ standardization of insurance claims forms,
. electronic submission and payment of insurance claims (which would require standardizing claim forms), and
■ the use of card and other technology to keep administrative and/or medical information in electronic format.

Although some health care reform proposals in the United States contain some or all of these changes, [1] consideration of such technological changes predates proposals currently before Congress to change the U.S. health care system. [2] Few of these efforts have relied on analyses of similar uses of technology to streamline administration in other countries. In large part (but not entirely), this is because there are few examples on which to draw.

[1] Another recent OTA report examines the assumptions and methods underlying estimates of national health expenditures under major health care reform proposals in the United States, including estimates of administrative costs (47). This report briefly reviews assumptions made about administrative savings expected from standardization and automation. but points out that such projected savings are relatively minor compared with other categories of health expenditures.

[2] Hearings held before the House Subcommittee on Health of the Committee on Ways and Means reviewed such efforts through April of 1992 (45).
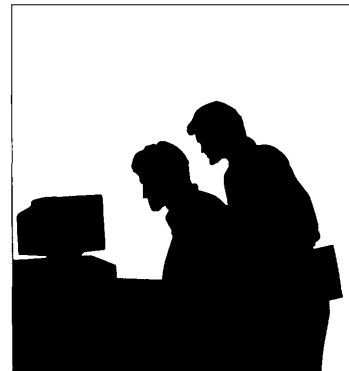
STANDARDIZATION AND AUTOMATION OF INSURANCE CLAIMS

The multiplicity of payers in the U.S. health care system results in no standard form or set of procedures through which providers or patients can be reimbursed for services. By definition, such mechanisms exist in countries that have single-payer systems. To the extent that these countries reimburse on a fee-for-service basis, this includes a standardized claim form and, in some countries, electronic claims filing and payment. Analysts suggest that a standard form in the United States would save money by reducing the amount of t i me providers and patients spend trying to understand and complete them **(37).** They claim that electronic submission and payment would reduce personnel and paperwork costs involved in preparing, processing, and paying claims. Estimates of the magnitude of these savings vary considerably, however (58).

In November 1991, then Department of Health and Human Services Secretary Louis Sullivan formed the public-private Workgroup for Electronic Data Interchange (WEDI) to standardize electronic communications in the health care industry. Through a steering committee and advisory groups, WEDI has issued two reports to the Secretary with recommendations and cost projections (57,58). The 1993 report suggests that the use of electronic communications to administer the current U.S. health care system could save $13 billion to $26 billion annually, not counting the initial implementation costs of $5 billion to $17 billion.[3]

Among the international comparisons reviewed earlier in this paper, only Sheils and Young specifically address the impact of automa-tion on administrative costs (37).[4] They estimate more modest savings from these changes than does WEDI. They also suggest that standardization of claims forms in and of itself is likely to result in only very small savings because most public and private insurers already accept HCFA's claim form in lieu of their own, and for those who do not, software exists for the easy creation of claim forms according to insurance companies' standards. Finally, Sheils and Young state that using a standardized format to process claims electronically would save about $0.50 per claim (according to unspecified industry data), resulting in $400 million in total annual savings.[5]

HEALTH CARDS

The use of card systems represents another potential change in the administration of health care in the United States. Health card systems comprise several underlying technologies and multiple applications designed to reduce costs, improve quality of care, or both (26). Card systems usually consist of the card itself and "readers' '-computer terminals or other devices that can read, translate, and in some cases, record and update data on the cards. The cards themselves can be of the following types (29):

■**Simple paper or plastic cards.** Most health insurance programs already use these to identify the card-holder and the type of insurance he or she carries. The issuer of the card prints or embosses the information directly on the surface of the card so that it can be read directly by another person. Some hospitals also use this type of card system to identify their patients. This is the least expensive of the card technolo-

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[3]WEDI breaks these estimates down into their component parts and indicates that they were prepared by a technical advisory group (58).

[4]Among the other major quantitative attempts to compare administrative costs in the United States and Canada (20,43,44,54), standardiza-tion and automation mayor may not be subsumed among the bundle of changes assumed to take place if a Canadian-style single-payer system is implemented in the United States.

[5]Sheils and colleagues also assume that adoption of a Canadian-style system would reduce physician office administrative expenses for claims tiling and patient billing by 50 percent, but they do not indicate how much (if any) of this reduction is attributable to standardization and automation as opposed to the simplified reimbursement rules of a single payer (37).

gies and holds no more than the visible information.

- **Magnetic strip cards.** This technology is most familiar to Americans in the form of automated bank teller (ATM) and many credit cards. The magnetic strip on the back of the card can hold a limited amount of information such as the card-holder's identity and that person's insurance coverage. Information on these cards can be changed. The manufacturing costs of the cards range from $0.20 to S1.00. Readers cost between $300 and $800" (U.S.). Newer, more sophisticated magnetic strip cards can hold significantly more data. These cards cost two to four times more than conventional cards, and the readers are up to three times more expensive.

- **Smart cards.** This term refers (o a family of' related technologies in which a silicon microchip is embedded within a plastic, wallet-sized card. Some cards are made only for storing data, but true smart cards are able to process data as a computer would. The microprocessor's central processing unit (CPU) controls access to the card's memory (i.e., data storage) as well as communications with the smart card reader via metal contacts on the face of the card. Cards vary in the size of their memory and their ability to update data stored in their memory. The cards' manufacturing cost ranges from $1 to $50, depending on their capabilities, manufacturer, and quanitity produced. Readers for smart cards are cheaper than those for magnetic strip cards, ranging from $50 to $250. (Combined magnetic strip and smart card readers run between $700 *and $800.)*

- **Optical cards.** Like compact disks, these cards can record large amounts of in format ion in digital format, making them potentially useful for extended medical records. However, once information is recorded on the card, it cannot be changed. This technology is also expensive. with cards costing between $5 and $20 and readers from $3,000 to $4,000.

- **Holographic cards.** This technology. in which data is recorded in a hologram embossed on the surface of a plastic card, has been used mainly

as payment for public telephone calls. Its relatively large potential for fraud, its lack of flexibility, and the cost of its readers ($1 ,000) have limited interest in this technology for health care applications.

- PCMCIA/JEIDA **cards.** This technology refers to a standardized format defined by the Personal Computer Memory Card International Association (PCMCIA) and the Japan Electronics Industry Development Association (JEIDA). Such cards can store large amounts of information and are designed to fit into slots on the back of personal computers, terminals that are part of a larger computer network, or other electronic devices. Two manufacturers have developed smart cards that can be read in a PCMCIA, allowing any computer with such a slot and the necessary software to become a smart card reader. Although precise cost data on these cards are not available, they are more expensive than conventional smart cards, making this technology most cost-effective for applications involving the storage of large amounts of information.

Uses of card systems in health care to date can be divided into four categories that describe their functions. Some specific card systems currently in use have more than one function (See box 4-1.):

- **Health insurance card systems.** Designed to reduce administrative costs by simplifying insurance claims and reimbursement procedures and facilitating admission to hospitals or other medical institutions, these cards can contain information identifying the card-holder, his or her insurance policy, and information about covered services and the extent of payment. Such cards can be components of electronic data interchange systems that electronically reimburse providers without the use of paper claim forms.

- **Medical card systems.** These systems use cards to store patient medical information or to serve as a key to a larger computer database that contains such information. Their purposes are to 1) improve the quality of care by reducing the duplication of medical tests, preventing the use

BOX 4-1: Smart Cards in the French Health Care System

Smart card technology is largely a French Innovation, and France has begun to use smart cards in many sectors of its economy, including health care The French experience offers inslghts into the potential contributions and limitations of health card systems for other countries

The Uses of Smart Cards in the French Health Care System

French experiments with health cards Include examples of all four types of systems discussed in the text Insurance cards, medical cards, emergency cards, and health professional cards. These Include projects sponsored by the national government and the primary insurers in France as well as by commercial isurers and mutual aid societies that offer complementary private insurance, and projects designed for limited populations

Projects Sponsored by the National Government and Primary Insurers

Vitale/SESAM Card. Begun in 1989 by CNAM-TS (the National Health Insurance Administration, which administers the primary health insurance for 80 percent of the French population as part of the country's social security system), this experiment seeks to replace paper insurance claims forms with smart cards The experiment currently includes about 140,000 residents of Boulongne sur Mer (a city in northern France) who are insured by the social security system. Three-quarters of the city's medical professionals participate Encoded on the smart card is the card-holder's name, social security number, birth date, and information about the extent of coverage and payment under the beneficiary's insurance. To protect the security of Information contained on the card, it also contains a confidential code that the card-holder must enter into the reader at each medical visit The second stage of this experiment Will expand the cards to additional cities with hopes of including the entire nation by the year 2000 The major criticisms of Vitale/SESAM have come from physicians who complain that they are usually the ones to update Information on the cards, requiring time and resources. They also have complained that inclusion of a diagnostic code on the claim form, a novel concept in France, could jeopardize doctors' professional autonomy

Santal Card. This card, first used **in** 1987, holds both admministrative Insurance and medical information for patients treated in any one of eight hospitals in Saint-Nazaire, a region of western France In addition, 300 medical professionals outside the hospital including 11 medical laboratories accept the card In addition to reducing administrative costs within the hospital and simplifying admission procedures, the designers of this card hope it Will improve the flow of information among hospitals, laboratories, and other medical providers The medical information contained on the card is limited to recent tests and treatment and basic information needed in an emergency, although the administrative identifiers on the card could be used as a key to more complete data files By October 1992 about 35,000 cards and 160 card readers were in use In addition to expanding the number of card holders, administrators of this card system plan to use more sophisticated smart card technology as it is made available Cards with greater storage capabilities will allow for additonal Information, including drug prescriptions and nursing records

The Health Professional Card. Already in existence for some local projects like the Santal card described above, the Ministry of Social Affairs and Integration is working with all parties in France using health card systems to develop a standard format for Health Professional cards As described in the text, physicians and other health professionals will use these cards to gain access to information on patients' cards or in other computerized databases, they serve as a means of preventing unauthorized access to confidential patient records.

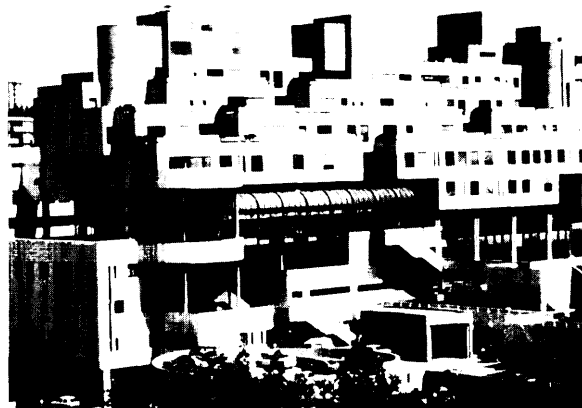## BOX 4-1: continued: Smart Cards in the French Health Care System

Projects Sponsored by Complementary Insurers

Carte Sante. This project uses smart cards to create portable adminlitrative and medical files for patients and to initate payment to medical professionals With this card, patients do not have to pay physicians out-of-pocket and then seek reimbursement from their Insurer Since 1989 the Federation of Mutual Insurance Companies of France (FMF) has issued 250,000 cards and 1,000 card readers to beneficiaries and providers in the regions of Provence-Alpes-Cote d'Azur, Rhone Alpes, Languedoc Roussillon and Burgundy FMF provides complementary Insurance coverage for services and copayments not reimbursed by social security or other primary health Insurers The administrative file contains patient identifying data and information about the patient's "reimbursement rights" under his or her Insurance policy and other Information needed to pay the provider The medical file contains emergency medical Information and records of preventive health services received

Sante-Pharma Card. This card eliminates the need for patients to pay pharmacists in advance for their prescription drugs Launched in 1986 it is the result of an agreement among insurers (both primary and complementary) and the national pharmaceutical syndicate The card, which contains informaton about the patients complementary insurer and pharmaceutical coverage, is used along with the paper social security card indicating the patents primary health Insurer and an optically read paper claim form Two milllon cards are in use in 76 administrative zones (called departments) representing 77 percent of French pharmacies. Pharmacies file about 800,000 Insurance claims each month

Projects Designed for Specific Populations

French Army Health Card. This smart card contains administrative Information on patients treated in French army hospitals Since 1988 the Army has implemented this project on an experimental basis in two hospitals with the potential to expand to 20 others The card which holds no medical Information and is not used as a means of paying providers, has two forms The "personal" card is provided to patients who are treated at Army hospitals on a long-term or recurring basis and gives them direct access to all hospital services A "shuttle" card is provided to patents who are expected to have a short one-time hospital stay The cards are designed to eliminate paper records by recordng patient identlfying in-

The Robert Debre' Hospital in Paris is part of the French health care system, which is characterrzed by universa/ coverage, mu/t/p/e insurance schemes financed through payroll taxes, and public and private providers

formation data on Insurance coverage and the number of previous hospital stays. As of November 1992 60000 personal cards and 30000 shuttle cards were in use A total of 270 hospital employees were authorized to use the system on 55 card readers

Paris Sante Card. This is one of several card systems developed by local health authorities to improve access to health services for poor jobless, or homeless indviduals Available since 1989, it is the result of an agreement among the city of Paris and 6,800 health providers The local health authority

BOX 4-1: continued: Smart Cards in the French Health Care System

administers health Insurance through the national social security system for unemployed individuals and their familles. The card is made of embossed plastic This system could use smart card technology in the future, although there currently are no specific plans to do so The card allows beneficiaries free choice of any participating provoder and providers file paper claims for which they receive payment within 10 days (a process that took as long as six months)

Dialybre Card. This smart card contains both administrative and medical information for kidney dialysls patients receiving care at any of three French hospitals Begun in 1989, it is designed to provoie dilaysis patients greater freedom to receive treatment at a location other than where they usually go It avoids duplication of medical records, reduces the time necessary for admissions, and offers greater communicatoin among facilities providing care to an individual patient In addition to patient identifiers and Insurance Information, the card contains emergency medical data and the patient's dialysis history As of 1992 about 1,100 of France's 15,000 dialysis patients had cards, Financed by Insurance companies, private foundations, and drug firms, the system is currently expanding to at least 50 dialysis centers with the long-term goal of revolving all 600 such facilities.

Issues Raised by the Use of Smart Cards in France

The experiments with smart cards in France have given rise to a number of general or cross-cutting issues that must be considered in their expansion to involve larger numbers of people and institutions or to their transfer to other countries Among the most significant are 1) standardization of technology and format, 2) patient confidentiality, 3) professional autonomy, and 4) costs

Standardization. Gwen the large number of different health card experiments under way on a relatively small scale m France, standardization of the technology and design of the system is likely to be necessary if any of these projects are to be Integrated into one or two cards that uses a single type of reader Such Integration may be a means of achieving economies of scale in establishing and running card systems, although they could run counter to the concerns over confidentiality and professional autonomy outlined below.[1] Standardization of card systems is not just a concern in France, but throughout the European Community, which has established standards for data to be included on emergency medical cards Furthermore, Germany has already begun to provide smart cards with administrative health Insurance Information to its citizens Other European nations are conducting their own smart card experiments The problem of standardization of technologies is complicated by the multiple choices available to policy makers and the rapidly growing capabilities of smart cards and other new technologies One strategy for standardization in France would be the full Implementation of a card system in a program that Involves all or most French citizens. The natural candidate would be the Vitale/SESAM card being developed by the CNAM-TS that covers 80 percent of the French population. The final design of that card could take the needs of smaller systems into account Once Vitale/SESAM is in place, smaller systems might feel an economic Incentive to adapt their design to the larger system To date, the government has not begun to provide the Vitale/SESAM card to all social security beneficiaries

Patient Confidentiality. As in the United States, confidentiality of patient medical records **is** a major public concern. To develop appropriate poilcies for the use and protection of all prviate records in France, the Parliament established a commission (Commssion Nationale de l'Informatique et des Libertes, or CNIL) that enforces a 1978 law governing Information systems and Individual rights, CNIL must approve all government programs that establish information systems on French cittzens, including smart card projects The health professional card and security codes that patients must enter to gain

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[1] Standardization could Increase the amount of patient Information to which an individual could potentially gain unauthorized access, although It does not affect the probability of overall unauthorizec access

access to these records are two measures designed to protect computerized medical records. However even with these safeguards, there IS not yet a consensus or even a proposal to establish a full medical record in any electronic form in France

Professional Autonomy. An issue in France that has not been a major concern to date in the United States concerns the autonomy of medical professionals In particular, they worry that the inclusion of detailed medical records on health cards or other computerized systems will make them vulnerable to questioning of their medical Judgment by other physicians, insurers, or the government This concern has contributed to the limited amount of medical records included in computerized systems and has even kept diagnostic information off Insurance claim forms

Costs. Setting up a card system involves slgnificant costs in choosing the appropriate technology decidnig what information is to be placed on the cards, having the cards manufactured and distributed and educating patients, providers, and administrators in their use Although standardization of card systems would offer opportunities for economies of scale, some organization must bear these initial start-up costs The ongoing costs and risks of using a card system must also be weighed against its benefits

The French Health Care System

The French health care system is characterized by universal coverage of the population through one of several programs financed through payroll taxes (comprising contributions from both employers and employees), a mixture of public and private hospitals, ambulatory care offered mainly through private-practice physicians, patient choice of providers, and professional autonomy for physicians

Patients usually pay their physicians directly on a fee-for-service basis and are reimbursed by insurers. Physician fees are set through negotiations among the government, insurers, and providers, although physicians are free to charge patients more than these fees. Public and most private nonprofit hospitals receive fixed budgets A small number of private, for-profit hospitals handle most surgical and obstetric cases, receiving revenues on per-diem or fee-for-service basis Eighty-four percent of the population has private health insurance to cover services not paid for by their primary Insurance

In 1990 France spent 91 percent of its gross domestic product on health care Payroll taxes cover 74 percent of personal health expenditures, with another 16 percent being paid out-of-pocket by patients and their families The remainder is financed through public subsidies and complementary private health Insurance

SOURCES : VG Rodwin, S Sandier, "Health Care Under French National Health Insurance, " *Health Affairs* fall 1993 pp 110-131, E M Monod, A Tour d Hor[zon of Health Cards In Europe, *Srnarf Card Techno/ogy/nfernaf/ona/* (January 1994), E M Monod Ministry of Social Affairs and Health, International Relations Republic of France Personal communications Mar 30, 1994 June 13 1994 N Paquel C Frizzole *S* Glaziou *Smart Cards in the French Health Care System* Final Report Unpublished OTA Contract Paper Paris France 1993

of therapies or procedures incompatible with the patient's overall medical condition, and helping to ensure that patients with chronic or special medical conditions receive needed services; 2) facilitate communication between institutions, such as hospitals and patients' personal health professionals; 3) simplify hospital admissions; and (4) help in the collection of health statistics. Technological limitations and concern over the privacy of medical records have limited the extent of card systems designed to hold extensive amounts of information.

■ **Emergency card systems.** These systems contain only essential information identifying the card-holder and medical information—such as

Smart card systems, which have played an increasing/y signifi-cant role in health care systems of France and other European countries, consist of smart cards (left) and readers (right) used to read and update information contained on the cards

chronic illnesses, blood type, and allergies—important in case of medical emergency. If available over wide geographic regions, such systems could make travel safer, especially for those with existing medical conditions.

- **Health professional card systems. These systems** are designed to help protect the security of patient medical information and are used in conjunction with other card systems or larger computerized databases. Issued to individual health professionals, they serve as access keys to patient information. They can be designed to limit the health professional's access to only those data needed to perform his or her job.

Understanding the potential for card systems in this country comes, in large part, from experiences with them in other countries. While experience in other countries may be instructive when considering potential applications and problems of card systems, analysis of their cost implications offer minimal lessons for the United States for several reasons:

- The underlying technologies and their costs are changing rapidly;
- The level of costs associated with card systems in many countries depends heavily on those countries' reimbursement systems, which may differ fundamentally from that of the United States; and

- Most experience with card systems in other countries so far has been limited to demonstration projects among very specific populations or geographic areas; applications among larger groups for extended periods may realize economies or diseconomies of scale not found in initial experiments.

In an attempt to understand more about another country's experience with cards, OTA commissioned an analysis of France efforts to use so-called smart cards in their health care system. Smart cards, which are usually the size of credit cards, have an embedded silicon microprocessing chip that can store and process information. Usually issued to patients or health providers, they can store administrative or medical information or serve as a key to gain access to a larger medical computer system. In addition to describing the various applications of this technology in France, the OTA-commissioned analysis also examines some of the difficulties experienced in implementing smart card projects. (See box 4-1 for a summary of this analysis.)

Health cards are just one piece of an overall system for administering health care and maintaining medical records. The decision to use cards or to choose a specific type of card technology is dependent on the intended application, the system's users, and the cost.

In France implementation of card systems was hindered by concerns over the confidentiality of card systems and difficulties in getting physicians, administrators, and patients to keep information on cards or other computerized medical records. These issues are likely to arise in the United States should a card system be implemented. However. concerns arising from French physicians' tradition of not sharing diagnostic or therapeutic information with other health professionals or payers should not cause problems in the United States.

The Clinton Administration's proposed Health Security Act (S. 1757) would issue every American citizen and legal resident a Health Security Card. Some Administration documents have indicated that this card would employ *a* magnetic strip rather than smart card technology. reflecting an attempt to reassure patients that these cards will protect their privacy by containing only basic identification information similar to that contained on a bank automated teller machine card rather than encoding any sensitive medical records (50).[6]

In reality, the experience from France, where patient privacy also has been a major issue, suggests that protection of such privacy has less to do with the choice of magnetic strip or smart card technology than with the privacy safeguards built into the overall computer system. Any kind of system has the potential to limit the amount of information in the system and access to it (29).

The Administration has given no assurance that the adoption of Health Security Cards will result in administrative savings apart from the adoption of standardized claim forms (50).

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[6]Another recent OTA study examines privacy issues in computerized medical records in greater detail (46).