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Case Report ■

General Practice Registration Networks in the Netherlands: A Brief Report

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A b s t r a c t   In the Netherlands, several general practice registrations exist. Groups of general practitioners register elements of patient care according to agreed-upon criteria, and these data are collected in a central database. By means of a questionnaire the authors interviewed the managers of all nine computerized registration networks extensively about the possibilities and limitations of their registration. In addition, respondents answered some questions with data from the central database of their network. Various items are collected by nearly all the registration networks, while other items are collected by only one network. Answering questions with data from the central database turned out to be difficult. Organization and manpower are the main obstacles.

■ **JAMIA.** 1999;6:173–175.

In the Netherlands general practitioners hold a key position in health care. They are the first health care professionals people see when they are ill, and they act as gatekeepers to secondary care. Most cases that present to a general practice are taken care of by the general practitioner alone.

The vast majority of general practitioners in the Netherlands register their patient data by computer.[1] They use their computer not only to collect and store patient data but also for practice organization and financial administration. Several software systems exist side by side, each with its own possibilities and obstacles.

In the Netherlands several general practice registration networks have been established in the past 25 years. A registration network is a group of general practitioners from different practices who collect elements of patient care according to agreed-on criteria.[2-4] The collected items are often coded. At reg-

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ular intervals these data are collected in a central database. We made a systematic inventory of these registrations.

Methods

By means of a questionnaire we interviewed the managers of all 14 registration networks. Data collection took place between summer 1995 and spring 1996 and all the managers participated. The questionnaire addressed objectives, methods, size, and content of the registrations, availability of morbidity items such as symptoms, diagnoses, side effects of therapy, and items referring to the management of the general practitioners and whether the registrations would enable further analyses in their databases and could be used as a sampling frame for follow-up studies. In addition, we asked the managers to answer some specific research questions with data from their central database, to determine whether obstacles would arise when answering research questions.

Results

Each registration network consists of a group of general practitioners from different practices. The size varies from 3 to 103 practices with 7 to 161 general practitioners. These general practitioners collect data daily from 10,000 to 200,000 patients. Mostly the general practitioners code the data themselves, using the

Table 1 ∎

Number of Computerized Networks in the Netherlands Registering Morbidity and Management Items

	Coded	Free Text	Restricted to Selected Diseases	Not Registered
Symptoms	1	2	2	4
Acute diseases	4	None	4	1
Chronic diseases	5	None	4	None
Side effects	3	None	None	6
Reasons for encounter	1	2	1	5
Physical examination	1	3	1	4
Diagnostic tests	2	3	2	2
Watchful waiting	None	3	None	6
Patient education	1	2	1	5
Follow-up policy	None	3	1	5
Referrals	8	None	None	1
Prescriptions	7	None	1	1

International Classification of Primary Care.[5] Nine of the registrations are computer based; two others are in a phase of transition from paper forms to computer registration. We consider only the nine computer-based registration networks, working with four different commercially available computer programs. They are all connected to a university.

It is a challenge for the managers of the networks to get the registering general practitioners on a par. The managers of five of these networks made a manual available to the participating physicians. Furthermore, all nine managers organize consensus meetings several times a year in which they discuss and create firm criteria for labeling the presented morbidity. This standardization is important for minimizing interdoctor variation with respect to labeling morbidity and interventions. The managers are responsible for the final quality of the registration and an optimal structure of the database; these are regularly tested through cross-checking for impossible codes and combinations.

Five registrations have developed a central database in which patients are not identifiable, for research purposes. Three of them have set up their database primarily as a sampling frame, allowing researchers to select patients with particular health problems for subsequent recruitment by the patient's general practitioner. Other objectives are education (one network), postmarketing surveillance (one), description and explanation of the "transition" from reasons for encounter to diagnosis (one), mapping the management of the general practitioner (three), improving such management (one), and policy development (one).

The content of the registrations concerns mostly mor-

bidity, connected to the management of the general practitioner in a specific case. Five registrations collect data of all morbidity, whereas four restrict themselves, for instance, to morbidity of a few chapters of the ICPC-classification or to chronic diseases only. Table 1 gives an overview of the different registered morbidity items and the management of the general practitioner.

Answering research questions with data from the central database turned out to be difficult. The managers answered fewer questions than they ought to have been able to answer on the basis of their registration data. Various reasons have been advanced for these disappointing results. A few registration networks collect items for specific disease groups only; a specific question can concern another disease. Organization and lack of manpower seemed to be the main obstacles.

Conclusion

When starting research with an existing database it is important from a methodologic viewpoint to be well informed about the method of registration of the specific network. Researchers should be quite specific in what they want from networks and choose the network that best fits their question. For this purpose a brochure has been written.[6] On the other hand it would be advisable for managers of the registration networks to make their networks better accessible for external researchers. They should develop and lay down procedures for situations in which outsiders ask for information. Good logistics are important. An adequate organization of the privacy of patient data asks for attention.

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ERRATUM

Omission of Abstract from Proceedings

The following abstract was omitted from the Posters section of the *Proceedings of the AMIA Annual Fall Symposium 1998*[1]:

<div align="center">

Developing Virtual Patients:
Taking a Lesson from the Tamagotchi
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In recent years, the Tamagotchi, an electronic virtual pet, has taken the world by storm. A Japanese invention, the toy requires the electronic pet owner to look after it with tender loving care through daily "feeding," "playing," and "toilet training" by pushing little buttons on a pocket-size screen. Failure to look after the pet results in its "death."

Since its release, young children and teenagers have become hooked on the toy, to the extent that several studies have found it to have undesirable sociologic and psychologic effects, particularly on school children. The children bring their pet to school in order to look after it when the toy beeps for attention, to the annoyance of teachers. Worse still, children have been found to grieve and suffer psychologic distress over the "loss" of their pet.

At the NUS Medical Informatics Program, we have found a positive use for the Tamagotchi concept in the development of virtual patients. Using VBscript and Active-X, we have constructed an inter-active Web site to train users in the proper care and management of a virtual patient who is diabetic. The site contains textual as well as video clips that show various elements of diabetes self-care, in-cluding the proper administration of insulin and the correct use of a glucometer. If the user dutifully looks after this virtual diabetic patient, the virtual patient will thrive and the disease will be well controlled. If management of the patient is neglected, the patient's condition will deteriorate in accelerated time.

The user can choose from three levels of "play." The amount of allowed deviation from stipulated criteria, such as caloric intake, decreases with increasing level of play (difficulty).

To speed up the game, an accelerated 24-hour clock is used, with the 24 hours played out in 30 to 50 minutes. There are reminders to inject insulin as well as reminders to eat regularly and not to skip meals.

User input is through the insulin module and the dietetics module. Clicking on the insulin module administers insulin to the patient, whereas clicking on the dietetics module feeds the patient. The user chooses from two different menus—(a) a mix-and-match menu that allows him to pick from basic food groups like staples/carbohy-drates such as rice or noodles, proteins, and fibers, or (b) a menu of prepared meals, including various types of fast foods and pop-ular local dishes available from food centers and canteens. As a food item is selected, the caloric intake for that particular meal combi-nation is registered on the screen in real time.

We consider the use of the Tamagotchi concept a novel way to ed-ucate patients, and the general public, on the importance of medi-cation compliance through a gaming approach. Such virtual pa-tients help promote awareness of the importance of self-care in the total management of chronic illnesses.

The virtual patients of the Medical Informatics Program can be ac-cessed from the MIP Multilingual health information Web site, Health ONE, at http://www.health1.nus.edu.sg.

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