Morbidity registration in general practice in the Netherlands

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Abstract Twenty-five years after the first morbidity registration in general practice in the Netherlands, there are six data bases that can be consulted and compared: the Continuous Morbidity Registration, the Monitoring Project, the Transition Project, the Dutch National Survey of General Practice, the Registration Network Family Practices and the Registration of the Sentinel Practices. These projects differ from each other concerning the aim, the design and planning, the operationalisation of the different concepts, the number of participating GPs and enrolled patients, the classification system and the duration of the registration period. The characteristics and the items about which information can be found in the standard output are summarized. A number of striking differences are illustrated with the incidence and prevalence rates of five frequent new and chronic episodes. One has to be aware of the characteristics and the pitfalls of every study in order to be able to use the data correctly. For example in the Monitoring Project prevalences for certain diagnoses are given; in the CMR, the Transition Project and the National Survey prevalence rates for certain and uncertain diagnoses together are given; in the RNH only point prevalences are published.

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Introduction

Since *Oliemans* performed the first morbidity survey in general practice, in the Netherlands, twenty-five years ago, many aspects of morbidity in Dutch general practice have been documented.[1]

At this moment, there are six data bases that can be consulted and compared; they contain morbidity figures from general practice, collected by general practitioners: the Continuous Morbidity Registration, the Monitoring Project, the Transition Project, the Dutch National Survey of General Practice, the Registration Network Family Practices and the Registration of the Sentinel Practices.[2-7] In this article, these registration projects are described with their advantages and limitations. The list of references is not complete, but restricted to the standard output, and the available publications in English. In *table 1* the main characteristics of these morbidity registrations are summarized; *table 2* shows the items about which information in the standard output can be found.

Continuous Morbidity Registration

The aim of the Continuous Morbidity Registration (CMR)[2] of the Department of General Practice of the University of Nijmegen is to collect data about the medical history of the enrolled patients, on a continuous and longitudinal basis. Both the encounters between patients and GPs, and the information from locums, specialists and hospitals form the basis of these data. Chronic diseases have been registered continuously, every year again, irrespective of the consultation behaviour of the patients. As a consequence, this data base is not a purely encounter-based registration, but comprises the medical information that is known to the GP.

The registered health problems are attached to four groups, according to their severity, from potentially life-threatening to less severe. The most severe problems comprise mainly physical health problems, which can hardly be influenced by the patients themselves, while the less severe problems are strongly influenced by illness behaviour.

As a result of the more than 20 years' duration of this medical registration, in a relatively stable population, it was possible to evaluate trends over time.

Based on these data, a Dutch textbook which is comparable with Hodgkins 'Toward earlier diagnosis', and a number of other articles were published.[8-12]

The reliability of the data is maintained by consensus meetings and uniformity tests of the participating GPs, and by control of the data by means of standard computer programs. The practice nurses are also engaged in the quality control of up-

Table 1 *Characteristics of six morbidity registrations*

	CRM	Mo	TR	NatS	RNH	Sentinel
Practices	4	5	22	103	47	approx. 50
GPs	6	12	38	161	15	approx. 70
Patients	12,000	16,863	40,796	335,000	47,000	+150,000
Duration	>20yrs	2 yrs	1 yr*	3months	>3yrs	>20 yrs
Period	71-now	79-81	85-88†	87-88	90-now	70-now
Classification	E-list	ICHPPC	ICPC	ICPC	ICPC	OC
Type of registration	encb	encb	episo	encb	probl	encb
Reliability quantified	–	+	+	+	–	–

OC = own criteria; encb = encounter-based; episo= episode-oriented; probl= problem list.
* at least one year; † first tranche;

dating the patient variables. The error rates are not quantified.

Monitoring Project

The aims of the Monitoring Project[3] were to collect diagnosis-related information to analyse morbidity and utilization patterns in family practice, to study the professional behaviour of GPs, and to illustrate that GPs all over the world share a common frame of reference, distinguishing them in a characteristic way from what specialists think and do. The project comprised a basic population of the patients who were enrolled during the whole registration period. Therefore, the data of the newborn babies and the deceased patients were not included in the standard tables, but were reported separately.

During the two GP training sessions, before the start of the project, each with 25 vignettes, the error rate was estimated as below 5 per cent. After the data collecting was finished, the information in the patient records was compared with the data in the computerized data base: the error rate was 4.2 per cent in the first year and 4.4 per cent in the second year. Most errors (65-79 per cent) were made by the coding doctors. The rate of missing data for the first and the second year was 1.4 per cent and 0.6 per cent respectively.

Transition Project

The aim of the Transition Project[4] of the Department of General Practice of the University of Amsterdam is to gain a better understanding of morbidity patterns, and of professional behaviour in general practice, based on episode-oriented epidemiology. In the Transition Project episodes are analysed on the basis of data concerning the three basic elements of each encounter as defined in the ICPC: the patient's reason for encounter (RFE), the GP's diagnosis and the diagnostic and therapeutic interventions implemented. The inclusion of the patient's RFE underscores the essential role of the patient as an autonomous and competent individual, who is not merely a person with or without an illness or disease. Transitions are the changes which occur in the RFEs, the diagnostic interpretations and interventions, and the change in their interrelations as the episode progresses.

The first data base, which comprises 40,000 patient years and serves as a reference system, was closed in 1988 and is available on the 'Trans flop', a floppy disk with an interactive computer programme that enables the user to relate RFEs, diagnoses and interventions for each class of the ICPC. The second part, consisting of 35,000 patient years, was closed in 1993,

Table 2 *Information available in the standard output of five morbidity registration projects except sentinel practices*

	CRM	Mo	TR	NatS	RNH
Patient characteristics					
– per cent female	+	+	+	+	+
– per cent sick fund		+	+	+	+
– country of birth				+	
Practice characteristics					
– urbanization	+	+	+	+	
– region	+	+	+	+	
– distance to hospital	+	+	+	+	
Morbidity characteristics					
– incidence	+	+	+	+	
– incidence per sex-age group	+	+	+	+	
– prevalence	+	+	+	+	+
– prevalence per sex-age group	+		+	+	
– problems active/blind					+
– certainty diagnosis		+	+		
– number of encounters		+	+		
– follow-up encounters		+	+		
– home-visits		+			
– out of hours		+			
– duration of episodes			+		
– mutations			+		
– co-morbidity		+	+		
+ psychologic problems		+	+		
+ social problems		+	+		
+ other chronic diseases		+	+		
– severity	+				
– influence of seasons	+			+	
– defensive behaviour		+			
– inter-doctor variation		+	+		
– diagnostic interventions		+	+		
– therapeutic interventions		+	+		
– referrals to oth. prov. PHC*		+	+		
– referrals specialist		+	+		

* PHC= Primary Health Care

and will be added to the first part to form a large, final data base of 75,000 patient years. The registration of the reason for encounter with the diagnostic interpretation makes it possible to compute, for a given RFE, the a priori and a posteriori probability of a certain diagnosis, handling the new diagnosis at the start of the episode as a proxy of the 'a priori probability' and the diagnosis during a follow-up encounter as a proxy of the 'a posteriori probability'. For instance, in encounters with the RFE 'general weakness' (A04), a depression (P76) was diagnosed in 1.3 per cent at the start of the episode, and in 5.3 per cent of the follow- up encounters.

Based on the first tranche of the Transition Project, a Dutch textbook was published, and some 20 theses, of which one was written in English.[13][14] Furthermore, a book will be published that contains both findings of the Transition Project and translations of the ICPC into 7 European languages.[15]

The reliability of the first data base was quantified. At data-entry 0.6 per cent of the RFEs and diagnoses, and 1.0 per cent of the process codes were incorrect, while 1.1 per cent of the RFEs, 3.3 per cent of the diagnoses and 1.3 per cent of the process codes were erroneous, when the patient records were compared with the computer output.

National Survey

The aims of the National Survey[5] of the Netherlands Institute of Primary Health Care were to obtain insight, on a national scale, into the presentation of diseases, complaints, and problems in general practice, and into the actions taken by the GPs as a result of these presented problems; and to obtain insight into the factors that influence the presentation of health problems in general practice, and also the varying reactions by the general practitioners to the problems submitted to them. The study was organized with a random, non-proportional, stratified sample of GPs and practice nurses. The participating GPs were divided over four groups; over a period of three months, each group of GPs kept a complete record of the morbidity presented in their practice. All participating GPs were interviewed, and asked to complete a one week diary concerning workload, postgraduate education, and task perceptions. A random sample of 100 patients per practice was also interviewed, and asked to complete a health diary.[16]

Although a representative sample was aimed for, the final group of participating GPs contained more women, more young doctors, and fewer solists than the population of Dutch GPs as a whole, so that the data had to be weighted in order to obtain data which could be generalised to the Dutch population of GPs as a whole.

The quality of the data was assured by consensus training, uniformity tests of the participating GPs and the coding field workers, and by computer programmes. With 30 paper vignettes, the agreement among the GPs was >90 per cent in 21 of 29 vignettes, and >70 per cent for 27 of 29 vignettes. The average agreement among the decentral coding field workers was 80 per cent for codes of diagnoses at the level of encounters but varying between the different chapters of the ICPC. The data entry was checked by comparing the data input of a sample of 2 per cent of the encounter forms with the data forms. Here, errors were found in 1.1 per cent of the checked forms, usually concerning one variable. In 0.05 per cent of the encounters and 1.3 per cent of the episodes an incompatibility between diagnosis and age or sex was found.

Registration Network Family Practices

Since 1990 several departments of general practice have developed computerized morbidity registration networks, in Rotterdam based on registration of problem lists, in Utrecht and Groningen based on encounters.

At present, the most developed system is the Registration Network Family Practices of the University of Limburg (RNH).[6]

The chief goal of the RNH is to establish a computerized, anonymous data base with a limited set of patient characteristics, and all relevant health problems. The RNH is not based on encounters, but on so-called problem lists.[17] For this aim, a problem is defined as anything that has required, or does, or may require health care management, and has affected, or could significantly affect a person's physical or emotional well-being. In practice, a presented problem is registered on the problem list, if it is presented over a period of more than 6 months, or more than 3 times per year.

The problem lists of the patients are updated daily in response to an encounter, or as the result of a referral to a hospital. The variation in the number of the patients included from the different practices is not accounted for. Four times a year, once a year in English, a report is published with the sex-age distribution of the patients included and the number of active and inactive problems. From those, the point prevalence is calculated as the frequency of the ICPC codes divided by the number of persons present in the data base.

During a limited period of time, more detailed data are collected for special projects.[18]

The quality of the database is not quantified but guaranteed by several mechanisms, such as peer review, special software for data control, feedback from the Medical and Social Information Center on the data provided, ongoing refinement of instructions and guidelines, and random checks of data provided.

Sentinel practices

In 1970, a network of sentinel practices was developed that was of sufficiently national distribution, and adequately representative of the Dutch population.[7] Before that, the local sentinel practices in the cities of Amsterdam, The Hague, and Rotterdam were already functioning, while in 1990 a new GP sentinel network was established in Groningen. The objective of the sentinel practices is to collect reliable data of importance to the planning, implementation and supervision of policy in the field of public health, gaining insight

into the morbidity pattern of the Dutch population, insofar as it belongs to the care given by GPs, and also into the gauging of medical techniques performed by GPs. In the national sentinel practice the included 1 per cent of the Dutch population is monitored by means of practice censuses, once every two years. Over the years a weekly registration of varying topics took place, for example infectious diseases, chronic disorders, (suspicion of) myocardial infarction, accidents and injuries, abortus provocatus, contraception and sterilisations, mental health problems, referrals, cervical smears and the request for euthanasia. From 1970-1988 57 items were registered during at least one year and 9 extra topics were incidentally investigated.

Discussion

These morbidity registrations reveal an interesting picture of general practice in the Netherlands regarding the morbidity patterns, as well as the utilization and the professional behaviour of GPs. There are many similarities and quite striking differences among the different studies.

In the first place, there is a principal difference between, on the one hand, the morbidity studies, performed by a well-trained, selected group of GPs, and aimed at collecting relevant information about general practice, such as medical histories of patients, episodes, transitions over time, and diagnostic and therapeutic interventions; and on the other hand, the global studies with representative, large data bases, which aim at health services research and policies. The data collected in the first type of study, such as the CMR and the Transition Project, are comparable with the efficacy of general practice 'the extent to which a service produces a beneficial result under ideal conditions'; the data from the National Survey are comparable with the effectiveness of general practice, the effect achieved in relation to the efforts expended in terms of money, resources and/or time. The same applies to the morbidity studies in Great Britain.[19] However, the sentinel practices have to be distinguished, because they only give information about a limited number of items.

In the second place, due to differences in the aims, the design and planning, the operationalisation of the different concepts, the registration period, and the classification systems, a number of striking differences are found. In *tables 3* and *4,* these differences are illustrated. Among the incidence rates, the RNH data are missing because incidence rates are not published, and only episodes of longer duration or higher frequency are recorded on the problem lists. 'No disease' was not recorded in the CMR or the Monitoring Project, because this label was not included in the E-list, or in the ICHPPC-2.[20] Among the prevalence rates, those from the National Survey are missing, because a prevalence rate computed for a period of 3 months is not relevant for chronic diseases, nor comparable with the prevalence rates for a period of one year. 'Oral contraception' and 'osteoarthritis' are missing from the CMR, because of missing, respectively incomparable categories in the E-list.

The pitfalls concerning the comparability of data from the different studies are impressive. Sometimes point prevalences are given, most of the time period prevalences are calculated. The diagnoses included in the numerator of the prevalence rate differ. Sometimes the prevalence rate is calculated for certain diagnoses only,[3] sometimes the certain and uncertain diagnoses are taken together,[4] in other studies again, the certainty of the diagnoses is not recorded at all.[25] Furthermore, the health problems of the numerator of the prevalence rate are recorded during periods of different duration (*table 1*). In the CRM, which is not purely encounter-based, a cumulative prevalence is attained that ap-

Table 3 *Incidences of 5 frequent new episodes per 1000 enlisted patients per year (National Survey per 3 months)*

	CRM	Mo	TR	NatS	RNH
R 74 U.R.I. (head cold)*	200	126	102	(31)	
A 97 No disease			57	(11)	
R 78 Bronchitis/bronchiolitis acute	32	45	39	(10)	
L 03 Low back complt w/o rad.sympt†	11	50	30	(0.4)	
H 81 Ear wax		37	32	(8)	

* R74 in ICPC = 240 'coryza, common cold incl rhinitis, sore throat without temperature' and 241 'febrile common cold and infleunza-like disease' in the E-list.
† L03 in ICPC is not compatible with E-list classification.

Table 4 *Prevalences of 5 frequent known episodes per 1000 enlisted patients per year except for the National Survey*

	CRM	Mo	TR	NatS	RNH
K 86 Uncomplicated hypertension	59	69	64		61
W11 Family planning/oral contracept*		60	52		
T 90 Diabetes mellitus	16	16	17		30
L 89 Osteoarthritis allied condit.†		19	20		34
K 76 Chronic ischemic heart dis.	14	15	14		14

* W11 not registrated in E-list and RNH.
† L89 (Monitoring and Transition) = L89 osteoarthritis hip + L90 osteoarthritis knee (National Survey and RNH).

proaches the prevalence in the population, but that does not indicate to what extent the GPs are consulted for the recorded problems.

Until now, the ICPC is used in half of the studies, usually using the criteria of the ICHPPC-2-defined for the component 'diseases and diagnoses' (*table 1*). The E-list and the ICPC have a large number of incomparable categories. The E-list does not have symptom diagnoses, which in the other data bases form a fair number of the diagnoses.[20] [21]

In the Netherlands, a large amount of continuity in the relation between patients and GPs exist. This was evaluated as >75 per cent of encounters and episodes, in studies in which patients were followed for one, two or three years. In the National survey, a registration period of only three months was chosen with the consequence that many aspects cannot be studied, among which continuity, prevalence and incidence rates per year, utilization in chronic episodes, and follow-up encounters.

All studies describe measures to assess and assure the quality of the collected data. Therefore, it is essential that the coding system be used correctly by all participating doctors. That requires training, repeated and detailed group discussions of the participating GPs and practice nurses, and follow-up meetings. These conditions are fulfilled in all studies, except in the sentinel practices. In the Monitoring Project, the Transition Project, and the National Survey, the errors were quantified. Based on these calculations, in the Transition Project 5 per cent of the episode titles proved incorrect. As a consequence, less reliable conclusions can be drawn concerning episodes with incidences and prevalences <1/1000. *Lamberts & Wood* confirmed this when they calculated the diagnoses that did not exist, e.g. R79 (non-existent but close to R78 'acute bronchitis'), and N78 (non-existent but close to N79 'concussion'). These non-existent episodes were as frequent as the episode X76 'breast cancer' and episode A81 'multiple trauma'.[22] In the RNH unaccounted for are the variation in the number of problem lists per practice, and the possible selection.

Both for education, research, and policies, morbidity figures form an important basis. Therefore, it is important that these data are available and consultable, without interpretations. That is the case in the Monitoring Project and the Transition Project. To date, the CRM and the National Survey only make incidences and prevalences available, both for different sex-age groups and for the total population of enlisted patients. In the National Survey these data are completed by findings concerning urbanisation, region, season and type of insurance. A complete standard output per episode both from the CMR and the National Survey would be of importance.

Conclusion

Depending on the objectives, the operationalization of the concepts, the classification systems used and the registration period, the studies differ in many aspects. One has to be aware of the characteristics of every study and the pitfalls to be able to use the data correctly. As a consequence, only balanced and differentiated judgments can be made based on the aggregated data.

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Samenvatting

Vijfentwintig jaar na Oliemans is in Nederland de morbiditeit in de huisartspraktijk en het huisartsgeneeskundig handelen behoorlijk gedocumenteerd. Er zijn inmiddels zes bestanden die geraadpleegd kunnen worden: de Continue Morbiditeitsregistratie, het Monitoringproject, het Transitieproject, de Nationale Studie van ziekten en verrichtingen, het Registratienet Huisartspraktijken van de Rijksuniversiteit Limburg en het Nationale Peilstation Project. Deze projecten verschillen van elkaar in doelstelling, opzet en werkwijze, aantal deelnemende huisartsen en ingesloten patiënten, classificatiesysteem en registratieduur. De kenmerken van deze projecten alsmede de items, die in de standaardoutput te vinden zijn, worden in tabellen samengevat en geïllustreerd met de incidentie- en prevalentiecijfers van vijf frequent voorkomende nieuwe en bekende episoden. Om de gegevens uit deze registratieprojecten te kunnen gebruiken moet men terdege op de hoogte zijn van de eigenaardigheden van de registraties. Zo wordt de prevalentie in het Monitoringproject voor de zekere diagnosen berekend, in de CMR, het Transitieproject en de Nationale Studie voor de zekere en onzekere diagnosen samen, terwijl in het RNH alleen puntprevalenties worden gegeven.

Primary care. Concept, evaluation, and policy

Starfield B. New York/Oxford: Oxford University Press, 1992. 262 pages. ISBN 0-19-507489-0. Price USD 18.95.

Barbara Starfield, noted scientist in the field of primary care and related health services research and Professor at the Johns Hopkins University, has published a comprehensive book on primary care in the United States of America. Its purposes are to provide knowledge to practitioners and trainees, to stimulate research and to inform policy makers. The main issues of the book are the concept of primary care, measurement and evaluation of the essential components of primary care, and policy. The book opens with a description of the essentials of primary care. Four unique attributes of primary care are distinguished: first-contact care, longitudinality, comprehensiveness, and coordination. The five essential features of primary care, also valid for other types of medical care, are: adequate medical records, continuity of personnel, communication between practitioner and patient, quality of care and advocacy for patients. So far, the common features of primary care in the industrialized countries are adequately summarized, although utility of medical management might be considered as an additional essential feature. When the author claims that these features should result in two so-called derivative features (family centeredness and community orientation), she seems to overlook some realities. Today, those two notions have lost a great deal of their relevance and purpose in the big cities with their complex, multi-layered populations. Although still important in rural regions and developing countries, these concepts are.no longer universal. Starfield mentions four structural conditions for primary care (avaliability, continuity, range of services and definition of the eligible population), of which the last one is a complicated matter in primary care systems in which patients do not register with one physician. Appropriate translation of structure into activity is said to require two central process elements of the health service system: utilization and problem recognition. Although those two elements do bring about the medical encounter, I wonder if they should be considered health system processes, but that is more a semantic point.

In some of the structural conditions and unique features of primary care, the system in the USA radically differs from the ones in western European countries. The author readily recognizes the disadvantages of the system in the USA. She extensively discusses the desirability of fundamental changes in accordance with the 'European' system and offers many useful suggestions. The one vital suggestion I missed is to limit access to specialists strictly to the patients referred by primary care physicians. At the time, the author could not have been aware of the fact that the Clinton administration is highly interested in a recent structure design for the Dutch health care system. In this plan, the general practitioner remains the (financial and medical) gatekeeper; also a basic health insurance covering 70 per cent of all expenses is proposed for all.

One chapter in the book compares primary care systems in ten industrialized countries (north western Europe, Canada, Australia and the USA). Five health system characteristics, the four 'unique features' and the two 'derivative features' of primary care receive a score between 0 and 2 (poor vs. high development). The unweighted scores are averaged, resulting in a 'primary care score'. The scores are compared to satisfaction indices, health indicators and expenditures. Although the selection and weight of the characteristics and hence the average score is somewhat questionable and the origin of indicators not undisputed, there are some interesting results that correspond with other research data. The relationship between primary care score and health indicators is not convincing. No relationship exists between expenditure and health indicators. On the other hand, the combination of a high primary care score and high satisfaction is positively correlated with health indices.

The book concludes with research and policy agendas. Research agendas are closely related to specific policies and research cultures. Starfield sums up an extensive list of possibilities but fails to mention priorities that reflect the needs in the USA. Therefore this chapter seems to be useful only as an exhaustive inventory. Much of the suggested research is in fact already under way in Europe. The policy agenda is interesting as a summary of the problems in the primary care system in the USA. As mentioned above, at least one vital suggestion is missing here.

To summarize: Starfield's book is indeed a comprehensive one, and undoubtedly important for the American market. Although European primary care physicians may be interested in similarities and differences between the USA and Europe, the usefulness of this book for Europan primary care is very limited. The chapters on essential elements of primary care and on cross-national comparisons of care systems, albeit with shortcomings, are recommended.

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