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The Role of Family Practice in Different Health Care Systems

A Comparison of Reasons for Encounter, Diagnoses, and Interventions in Primary Care Populations in the Netherlands, Japan, Poland, and the United States

I.M. Okkes, MA, PhD; G.O. Polderman, MD; G.E. Fryer, PhD; T. Yamada, MD; M. Bujak, MD; S.K. Oskam, MSc, PhD; L.A. Green, MD; H. Lamberts, MD, PhD
Amsterdam and Amstelveen, the Netherlands; Tokyo, Japan; Katowice, Poland; and Washington, DC

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From the Academic Medical Center/University of Amsterdam, Division of Public Health, Department of Family Practice, Amsterdam (I.M.O., S.K.O., H.L.); Family Physician, Transition Project, Amstelveen (G.O.P.); the Robert Graham Center: Policy Studies in Family Practice and Primary Care, Washington, DC (G.E.F., L.A.G.); the Japanese Association for Development of Community Medicine, Tokyo (T.Y.); and the Silesian Medical School, Katowice (M.B.). Reprint requests should be addressed to I.M. Okkes, MA, PhD, Academic Medical Center/University of Amsterdam, Division Public Health, Department of Family Practice, Meibergdreef 15, 1105 AZ Amsterdam, the Netherlands. E-mail: ***i.m.okkes@amc.uva.nl****.*

- OBJECTIVE: Our goal was to compare the content of family practice in different countries using databases containing information on reasons for encounter, diagnoses, and interventions that are coded with or can be addressed by the International Classification of Primary Care (ICPC).
- STUDY DESIGN: In the Netherlands, Japan, and Poland data were collected identically with an electronic patient record (Transhis). For all face-to-face encounters the reasons for encounter, diagnoses, and interventions were coded according to the ICPC within an episode of care structure; prescriptions were coded with the ICPC drug code. Data were collected for research purposes and cannot be considered representative for family practice in these countries. We derived comparable estimates for the United States using visit data from the National Ambulatory Care Survey (NAMCS), with specific emphasis on the contribution of family physicians. NAMCS data were mapped to the ICPC and the ICPC drug code, and Dutch, Polish, and Japanese data were directly standardized for the 1996 US population. Data on utilization, reasons for encounter, encounters per episode of care, new episodes of care, and prescriptions were compared. We also present World Health Organization and Organisation for Economic Co-operation and Development data on health care delivery, efficiency, expenditure, and health status for each country.
- POPULATION: We included the following: from the Netherlands: 10 family physicians, 48.640 patient years, 1995-2000; from Japan: 6 family physicians, 17.082 patient years, 1996-1999; from Poland: 22 family physicians, 11.315 patient years, 1997-1999; and from the United States: NAMCS 1995-97 30 991 patient years 91395 visits (26% with a family physician).
- RESULTS: We found important differences and striking similarities. Differences in the numbers of episodes and of encounters per patient per year were small compared with differences in utilization per episode of care, including diagnostic and therapeutic interventions. Substantial differences were found in prescribing antibiotics, oral contraceptives, cardiovascular medications, and gastrointestinal therapies. Prescribing

behavior in the Netherlands and the United States was similar, while very different patterns were found in Japan and Poland. Similarities were much higher in patients' reasons for encounter than in diagnoses. Only 35 groups of symptoms/complaints covered the top 30s in all databases, at the same time including 45% to 60% of all symptom/complaint reasons for encounter.

The contribution of US family physicians to care for common symptoms and episodes was generally high, but patients evidently also see other providers; the overall US distribution was similar to the Dutch data. With approximately 50 diagnoses, 45% to 60% of all new episodes of care were covered. Large differences existed in the contribution of family practice to gynecology/obstetrics and psychosocial problems. The proportion of all encounters per 1000 patients per year covered by the top 30 was 70% to 75%.

- CONCLUSIONS: Even under very different conditions there was substantial overlap in the top 30 symptom/complaint reasons for encounter, incidence rates, and encounters per diagnosis in the 4 countries we studied. This striking resemblance supports the concept of the reason for encounter as a core element of the consultation with a family physician. Similarities between the databases are much better reflected by the way patients formulate their demand for care than in the diagnoses by the family physician. Patients from the US also see providers other than family physicians for common problems; it remains unclear whether a limited group brings most of their health problems to a family physician or whether most people visit a series of primary care physicians. Possibilities to further develop episode-oriented epidemiology in family practice have considerably increased with this study. The potential for comparative studies has also increased with the introduction of complete electronic patient records based on the documentation of episodes of care with the ICPC and with its mapping to International Classification of Diseases-10th revision (or the 9th revision clinical modification).

key words **Episode of care; family practice; reason for encounter [non-MESH]; diagnosis; classification; prescribing [non-MESH]; comparative study (J Fam Pract 2002; 51:72)**

Internationally, family practice receives increasing emphasis. The World Organization of Family Doctors (WONCA) now has members from more than 80 countries, in several of which family practice has developed into a core element of health care delivery and a well-defined academic discipline. In the United Kingdom, Ireland, Australia, New Zealand, Scandinavia and the Netherlands, the development of family practice has benefited from a health care policy that arranged for direct access for all, and for a gatekeeping function of the family physician that has also resulted in the availability of databases reflecting the distribution of morbidity in family practice populations.[1-5] In the US, Japan and many European countries, however, the development of family practice is handicapped by a health care policy less favorable to the discipline. This has resulted in a paucity of information on the distribution of morbidity in the population.[6-12]

Primary care/family practice is characterized in the 1997 Institute of Medicine (IOM) definition as: "…the provision of integrated accessible health care services by physicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients and practicing in the context of family and community."[12] A particularly relevant unit of assessment for this definition is the episode of care, defined as a health problem from its first presentation to a health care provider till the last encounter for it.[12-14] This implies that morbidity and mortality rates are insufficient to characterize the content of health care; one must include the patient's perspective during episodes of illness and episodes of care.[7]

Over the years, WONCA has developed the International Classification of Primary Care ICPC as the ordering principle of the family practice domain. The ICPC describes episodes of care by reasons for encounter (reflecting the patient's perspective), diagnoses (reflecting the physician's perspective), and interventions.[3,15-19] On this basis, family practice databases can be created that allow international comparison.

Unfortunately, national representative databases fulfilling the requirements formulated by White and colleagues in 1961 are still not available.[7] The goal of this study is to compare the content of family practice in different countries, using existing databases that (minimally) contain data on reasons for encounter, diagnoses and interventions that are coded with, or can be addressed by ICPC in an episode of care structure.[7,18]

Family physicians in the Netherlands, Japan, and Poland have been collecting episode of care data over several years in listed populations, with an ICPC -based electronic patient record for all encounters, for research purposes and under controlled conditions. Recently, Green and colleagues noted a serious lack of such data in the US, resulting in problems when estimating essential indicators from available sources.[9] Since the publication of the IOM Report on Primary Care in 1996, pointing out that the available information in the US did not allow episode of care analysis, the increasing use of electronic patient records in family practice networks has not yet resulted in databases fulfilling all criteria for this study. However, the National Ambulatory Medical Care Survey (NAMCS) records reasons for visit and diagnoses, allowing an estimation of the family physician's contribution to ambulatory care; no episodes of care could be identified from NAMCS data.[20-23] It was decided to use these four databases in this study.

Obviously, comparative studies must take into account the major differences in the national health care systems; global data from these four countries indicate substantial differences in health care delivery, expenditure and health status **Table 1**.[24-26] Although it is impossible to directly relate these differences to the available databases, and family practice does not have a major impact on all of these outcomes, they can be helpful to better understand the study's results.

Dutch family physicians are gatekeepers for listed and relatively healthy practice populations with universal access. This contrasts sharply with the US, where far more is spent on health care with disappointing health status indicators, and without a central position for family practice. Dutch family practice data on reasons for encounter, diagnoses and interventions are, by their nature, a close proxy for the population's demand, clinical need, and supply. Most Dutch family physicians use an electronic patient record, in which the use of ICPC for coding diagnoses is mandatory.[27-29]

In Poland, little is spent on a health care system with general access; health status is unsatisfactory. Over the past decade, Polish health care policy has strongly supported family practice, deploying a family practice retraining program for general internists, gynecologists, and pediatricians with an often-longstanding experience in hospitals.[27-29]

In Japan, health care contributes to a relatively long and healthy life at moderate costs; family practice has a weak position, being well developed in rural areas only. Family physician training is much like that in general internal medicine. Although the Japanese have freedom of choice and complete coverage, patients in the participating rural practices bring most health problems to their family physician, with the exception of practically all obstetric/gynecologic and most pediatric and psychiatric care for which they see specialists in the nearest cities.[10,11,30-36]

METHODS

Data from the Netherlands, Japan, and Poland were collected identically with an electronic patient record ("Transhis") as a part of the Transition Project of the Amsterdam University. For all face-to-face encounters, the reasons for encounter, diagnoses and interventions were coded with ICPC within an episode of care structure. Prescriptions were coded with the ICPC drug-code (derived from the Anatomical Therapeutic Classification [ATC]).[29,37]

In the Netherlands, 10 family physicians in 6 practices participated from 1995 to 2000. In Japan, 6 family physicians in rural health centers related to Jichi Medical School participated from 1996 to 1999. In Poland, the Family Practice Department of Katowice Medical School organized the study from 1997 to 1999) with 22 family physicians in 2 practices. Their population was assigned to them on the basis of census data. Therefore, families without 1 of its members having had at least 1 encounter with a participating family physician were excluded from the Polish data.

Since no such US data existed, we derived where possible comparable estimates using visit data from the NAMCS database.20 Sample physicians completed forms for a systematic random sample of office visits during a random 1-week period, coding up to 3 reasons for visit and diagnoses using the Reason for Visit Classification for Ambulatory Care (RVC) and the International Classification of Diseases-9th revision (ICD-9-CM).[38] Prescribed drugs were classified with

the National Drug Code Directory.[39] Data included all ages, all races, and both sexes. The 1995-1997 data were used (91,395 visits), with 2955 ambulatory care visits per 1000 US citizens (26% with a family physician).[20,22] Data were recoded with ICPC through mappings with RVC and ICD-9-CM, and ICPC drug codes were mapped with the major pharmaceutical groupings in NAMCS.[37,39,40]

The content of family practice was established by:

1. utilization indicators per patient/visit, per patient year, per encounter, per episode of care and per patient per year;
2. the distribution of reasons for encounter/visit by ICPC-chapter; most frequent (groups of) reasons for encounter expressed as a symptom/complaint; most frequent (groups of) diagnoses in new episodes of care; most frequent (groups of) diagnoses in encounters per episode. While the incidence of chronic health problems is considerably smaller than their prevalence it is more representative considerably smaller than their prevalence, it is more representative for the content of family practice. Therefore, for selected major chronic diseases cumulative prevalences for the complete observation period were calculated;
3. prescriptions per 1000 direct encounters and per 1000 patients per year.

To improve comparability, all Transhis data were directly standardized for the sex/age distribution of the 1996 US population, in effect using the NAMCS data (that we could not recalculate) as the standard. Utilization indicators and epidemiological rates were calculated using definitions from WONCA's International Glossary of Primary Care.[42]

RESULTS

Utilization

Substantial differences and similarities in utilization existed **Table 2** often comparable NAMCS data were unavailable to us. Differences in the numbers of episodes of care and of encounters per patient per year were smaller than those in utilization per episode. In Japan, utilization per episode was relatively high, as was the use of physiotherapy and additional testing; in Poland, counseling, electrocardiograms and laboratory tests were rather prominent. Home visits appeared to be common only in the Netherlands; however, the proportion of out-of-hours encounters was quite similar in the 3 Transhis databases. In the Netherlands and Poland, family physicians were actively involved in referring to specialists, as opposed to the situation in Japan.

Reasons for Encounter

The distribution of reasons for encounter by ICPC-chapter illustrates the wide scope of family practice, as well as differences resulting from national health care systems **Table 3**. Digestive, circulatory, musculoskeletal, respiratory, and skin problems were frequent in all databases. Psychological problems were frequent in Dutch and US primary care, while digestive problems were very prominent in Japan. However, general problems, including prevention, were less frequent. The very limited contribution of Japanese family physicians to gynecologic/obstetric care and psychological and social problems is clear.

The top 30 reasons for an encounter expressed as a symptom/complaint are presented in **Table 4**. The rank order is derived from the highest frequency per 1000 listed patients (NAMCS: per 1000 US-population). In the US (last column), the relative contribution of family practice to care for common symptoms/complaints appears to be generally high but unevenly distributed; the overall US distribution was rather similar to the Dutch data. Only 35 groups of symptoms/complaints covered the top-thirties in all databases, at the same time including 45% to 60% of all symptom/complaint reasons for encounter.

Diagnoses

Table 5 and **Table 6** present the diagnoses in the same format as **Table 4**; NAMCS-data on new episodes of care per 1000 patients per year were unavailable. The distribution of the incidences of common conditions in **Table 5** reflects disease presented to a family physician: respiratory infections, prevention, trauma, gastrointestinal, musculoskeletal and skin problems were frequent in the 3 databases. Approximately 50 diagnoses covered 45% to 60% of all new episodes of care. Large differences, again, existed in the contribution of family practice to gynecology/obstetrics and to psychosocial problems.

Upper respiratory tract infections were far more often diagnosed in Japan and Poland than in the Netherlands, and Polish family physicians diagnosed more tonsillitis and strep throat. In Japan, the family physician's contribution to prevention was very low, and very high to care for intestinal problems.

Table 6 shows the most frequent face-to-face encounters per episode of care per 1000 patients per year for all four databases, together with the family physician's contribution to the NAMCS data. Again, data from the Netherlands and NAMCS were relatively similar, and family physicians in the US had a relatively important contribution to care for most common episodes of care. The very high overall number of face-to-face encounters per 1000 patients per year in Japan was rather evenly distributed over the most common episodes of care. The proportion of all encounters per 1000 patients per year covered by the top thirty for each country was 70% to 75%.

Prescribing

Only information on prescriptions by a family physician per 1000 encounters was available for the US. The same rate was calculated for the other 3 database, also, in addition to the number of prescriptions per 1000 patients per year **Table 7**. Data on prescriptions per 1000 direct encounters in the four countries indicated both similarities and differences. For example, family physicians in the US prescribed more antimicrobial agents than the Dutch, while the choice of antibiotics strongly differed. Dutch physicians prescribed many laxatives, while Polish physicians prescribed many antidiarrheals Cardiovascular treatment in the Netherlands and the US was rather similar, although the choice of drugs differed. Data per 1000 patients per year provided a rather different perspective on prescribing; especially in Japan, and to a lesser extent, in Poland, the large number of encounters per episode resulted in large differences between data per year versus per encounter.

DISCUSSION

Considerable progress has been made in the methods for the analysis of the content of family practice.[42-48] Episodes of care are a critical unit of analysis, and it is timely to recognize the importance and feasibility of using episodes of care prospectively in electronic patient records.[12]

A major limitation of international comparative studies on the content of family practice is that no nationally representative data on reasons for encounter, diagnoses and episode of care over time are available. The Dutch, Japanese, and Polish data used in this study reflect the contribution of highly motivated, research-oriented family physicians who were not representative for their respective national family practice conditions; rather, they documented in much clinical detail what the content of family practice could be in these countries under optimal conditions. The US NAMCS data were representative for the national health care system, but they lacked data on episodes of care over time. The increasing use of electronic patient records in US practice networks is a very encouraging development, but has not resulted yet in a database that fulfills the criteria for this comparative study.

It is clear that under very different conditions, substantial proportions of all symptom/complaint reasons for encounter, incidence rates, and encounters per diagnosis are covered with the respective top thirty distributions for the four countries studied. Reasons for encounter as a representation of the patient's demand for care and the diagnoses as the physician's interpretation of the need for care follow a common pattern. Given the limitations of the study, they allow us to globally characterize the family physician's contribution to national health care systems in different countries. The striking resemblance in the distribution of common symptoms and complaints supports the concept of the reason for encounter as a core element of the consultation with a family physician. Similarities between the four databases are

much better reflected in the manner that patients formulate and express their demand for care than in the diagnoses assigned by family physicians.

Family practice appears to become what the profession, the patients, and the national conditions permit; it is akin to an antibody reacting to the specific antigens of a nation.[44-51] Given the substantial variations across countries, several of the "resulting antibodies" appear to be remarkably similar, which suggests a coherence derived from the way people become sick and seek care. The substantial differences in incidence and utilization in episodes of care for common diseases usually allowed an interpretation along these lines. In the discussions with the national project leaders, their interpretations and explanations had high face validity, allowing a better understanding of the data as characteristic for the position of family practice in the four countries. For example, the high utilization for hypertension in Japan can be explained by legal limitations to the amount of medication per prescription, while the high utilization for upper respiratory tract infection and prevention in Poland also reflects formal requirements. Also, the important role of psychological problems in Dutch, and to a lesser extent in US family practice, reflects its importance in training programs, in contrast with the near absence of such problems in Japan and Poland.

Gynecology and obstetrics are in the core business of family practice in the Netherlands, but in the US, gynecologists provide a substantial contribution in addition to the role of family physicians. Japanese family physicians play practically no role in this area, while in Poland the role of family physicians is limited to gynecology with only a small contribution to contraception and pregnancy. Although respiratory problems are important for family physicians wherever they work, the high incidence and utilization in Poland can also be explained by the need for sickness certification from the first day of illness.

The Japanese system requires multiple encounters per episode during a short period of time. For example, patients with sinusitis, bronchitis, gastritis, or a self-limiting musculoskeletal problem, are often seen 3 or more times per week. In the Netherlands, the health care system requires a large number of repeat prescriptions or refills by the family physician. A trained medical secretary practically always deals with this, and these encounters are considered as "indirect encounters." The utilization per episode of care in Poland and the Netherlands is rather similar.

The uneven distribution in the relative contribution of family practice to the care for common conditions indicated that US patients also see other providers for common problems. The NAMCS data cannot tell us whether a limited group of the population brings most of their health problems to a family physician, or whether most people visit a series of physicians (Ob/Gyn, Eye, ENT, Psychiatry) depending on who they consider most fit for each problem.[51,52]

The ample use of endoscopy, x-ray, and ultrasound in Japan and of electrocardiograms in Poland contrasts with a relatively modest use of diagnostics in the Netherlands. The referral rate to specialists in the Netherlands is a reliable indicator of the role of secondary care; the very low referral rate in Japan reflects how in a rural area patients seek care either of their family physician or of specialists in a nearby city, to whom they have direct access. The high referral rate in Poland also probably reflects the attitude of former hospital specialists who were practically overnight transformed into family physicians.

It is difficult to interpret all differences in prescribing, because the US data do not include the quantity of medication; in the Transition Project's data, "Defined Daily Doses" are used to better understand prescribing patterns. This study's data reflect substantial differences in prescribing antibiotics, oral contraceptives, and cardiovascular and gastrointestinal therapies.[53-56] Prescribing behavior in the Netherlands and the US is rather similar, while very different patterns are found in Japan and Poland. Antibiotic use in upper respiratory tract infections differs largely: the Dutch prescribe infrequently and almost always use penicillins, the Japanese rarely prescribe penicillins.

Conclusions

The main conclusion of our study is that family practice varies as a customized service, determined by a combination of factors, including the burden of disease; the habits, customs, and training of physicians; the regulations promulgated by government and guilds; the way people understand their symptoms; and the availability of money, services, tools, and goods. Another important conclusion is that, paradoxically, while the need to document reasons for visit was first

acknowledged in the US many years ago, US family practice still has not been in the position to document their contribution to national health care in sufficient clinical detail focussing on episodes of care over time.[7,9]

The recommendation of the IOM to “foster the development of standards for data collection that will ensure the consistency of data elements and definitions of terms, improve coding, permit analysis of episodes of care, and reflect the content of primary care” has not yet resulted in the availability of such (nationally representative) data to be included in a comparative international study.

The possibilities for international cooperation to further develop episode-oriented epidemiology in family practice have, however, increased considerably over the past decade. Further, the potential for international comparative studies in family practice has increased with the introduction of complete electronic patient records based on a standardized documentation of episodes of care with ICPC together with its mapping to ICD-10 (or, for the time being, ICD-9-CM). Now is the time to make a wide use of the new possibilities in routine documentation of patient-physician encounters in family practice by family physicians, wherever they work.[57-60]

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REFERENCES

1. Mainous III, AG Baker R, Love MM, Pereira Gray D, Gill JM. Continuity of care and trust in one’s physician: evidence from primary care in the United States and the United Kingdom. Fam Med 2001;33:22–7.
2. McCormick A, Fleming D, Charlton J. Morbidity Statistics from General Practice. Fourth National Study 1991-1992. London: HMSO, 1995.
3. Lamberts H, Wood M, Hofmans-Okkes IM, eds. The International Classification of Primary Care in the European Community. With a multi-language layer. Oxford: Oxford University Press, 1993.
4. Bridges-Webb C, Britt H, Miles DA, Neary S, Charles J, Trayner V. Morbidity and treatment in general practice in Australia. Med J Aust 1992;157:Suppl19 Oct:S1–S56.
5. Health Statistics in the Nordic Countries. Copenhagen: NOMESCO, 1998.
6. Marsland D, Wood M, Mayo F. Content of family practice. A statewide study in Virginia with its clinical, educational and research implications. J Fam Pract 1976;3:22–68.
7. White KL, Williams TF, Greenberg BG. The ecology of medical care. N Engl J Med 1961;1961:885–92.
8. Starfield B. Is US health really the best in the world? JAMA 2000;284:483–5.
9. Green LA, Fryer GE, Yawn BP, Lanier D, Dovey SM. The ecology of medical care revisited. N Engl J Med 2001;344:2021–5.
10. Smith BW, Demers R, Garcia-Shelton L. Family medicine in Japan. Arch Fam Med 1997;6:59–62.
11. Tsuda T, Aoyama H, Froom J. Primary health care in Japan and the United States. Soc Sci Med 1994;38:489–95.
12. Donaldson MS, Yordy KD, Lohr KN, Vanselow NA, eds. Primary Care. America’s Health in a new Era. Committee on the Future of Primary Care, Institute of Medicine. Washington DC: National Academy Press 1996 Washington, DC: National Academy Press, 1996.
13. Hornbrook MC, Hurtado RV, Johnson RE. Health care episodes. Definition, measurement and use. Med Care Rev 1985;42:163–218.
14. Lamberts H, Hofmans-Okkes IM. Episode of care: a core concept in family practice. J Fam Pract 1996;42:161–7.
15. Lamberts H, Wood M, eds. ICPC. International Classification of Primary Care. Oxford: Oxford University Press, 1987.
16. ICPC-2. International Classification of Primary Care. Second edition. Oxford: Oxford University

Press, 1998.
17. Okkes IM, Jamoulle M, Lamberts H, Bentzen N. ICPC-2-E. The electronic version of ICPC-2. Differences with the printed version and the consequences. Fam Pract 2000;17:101–6.
18. Hofmans-Okkes IM, Lamberts H. The International Classification of Primary Care (ICPC): new applications in research and computer-based patient records in family practice. Fam Pract 1996;13:294–302.
19. Klinkman MS, Green LA. Using ICPC in a computer-based primary care information system. Fam Med 1995;27:449–56.
20. Ambulatory Care Visits to Physician Offices, Hospital Outpatient Departments and Emergency Departments: United States 1995,1996, 1997 [Series 13, No. 129, 134, 143].
21. Franks P, Clancy CM, Nutting PA. Defining primary care. Empirical analysis of the National Ambulatory Medical Care Survey. Med Care 1997;35:655–68.
22. Woodwell DA. National Ambulatory Medical Care Survey: 1997 Summary. Advance Data 1999;305:1–28.
23. Stafford RS, Saglam D, Causino N, Starfield B, Culpepper L, Marder WD, et al. Trends in adult visits to primary care physicians in the United States. Arch Fam Med 1999;8:26–32.
24. OECD Health Data 99. A comparative analysis of 29 countries. Paris: OECD Health Policy Unit, 2000 (CD ROM).
25. WHO. World Health Report 2000. Health Systems: improving performance. Geneva: World Health Organization, 2000.
26. Evans DB, Tandon A, Murray CJL, Lauer JA. Comparative efficiency of national health systems: cross national econometric analysis. BMJ 2001;323:307–10.
27. Okkes IM, Groen A, Oskam SK, Lamberts H. Advantages of long observation in episode oriented electronic patient records in family practice. Meth Inf Med 2001;40:229–35.
28. Van Boven C, Dijksterhuis PH, Lamberts H. Defensive testing in Dutch family practice. Fam Pract 1997;44:468–72.
29. Okkes IM, Oskam SK, Lamberts H. The development of a probability database in family practice. An empirical approach to obtaining reliable prior probabilities in Dutch family to obtaining reliable prior probabilities in Dutch family practice. J Fam Pract 2002;51:31–6.
30. Mierzecki A, Gasiorowski J, Pilawska H. The family doctor and health promotion - Polish experience and perspectives. Eur J Gen Pract 2000;6:57–61.
31. Sabbat J. International assistance and health care reform in Poland: barriers to project development and implementation. Health Policy 1997;41:207–27.
32. Watson P. Health differences in Eastern Europe: preliminary findings from the Nowa Huta study. Soc Sci Med 1998;46:549–58.
33. Froom J, Aoyama H, Hermoni D, Mino Y, Galambos N. Depressive disorders in three primary care populations: United States, Israel, Japan. Fam Pract 1995;12:274–8.
34. Ikegami N, Campbell JC. Medical care in Japan. N Engl J Med 1995;333:1295–9.
35. Yamada T, Yoshimura M, Nago N, Inoue Y, Asai Y, Koga Y, et al. A study on the outcomes of health problems (the concept of 'episode of care,) based on clinical statistics using the International Classification of Primary Care (ICPC). Jpn J Prim Care 2000;23:213–23.
36. Yamada T, Yoshimura M, Naoki N, Asai Y, Koga Y, Inoue Y, et al. What are common diseases and common health problems? The use of ICPC in the community-based project. Jpn J Prim Care 2000;23:80–9.
37. De Maeseneer J. The ICPC classification of drugs. In: Lamberts H, Wood M, Hofmans-Okkes IM, eds. The International Classification of Primary Care in the European Community. With a multi-language layer. Oxford: Oxford University Press, 1993.pp.163–70.
38. Reason for visit classification for ambulatory care. National Center for Health Statistics, US Public Health Service, Hyattsville MD, USA. Department of Health, Education and Welfare Publication 1979. 74 pp.

39. The collection and processing of drug information. 1980 series 2, no. 90 NCHS Report.
40. Wood M, Lamberts H, Meijer JS, Hofmans-Okkes IM. The conversion between ICPC and ICD-10. Requirements for a family of classification systems in the next decade. J Fam Pract 1992;9:340–8.
41. Bentzen N, ed. An International Glossary for General/Family Practice. Fam Pract 1995;12:341–69.
42. Grumbach K, Selby JV, Damberg C, Bindman AB, Quesenberry C Jr, Truman A, et al. Resolving the gatekeeper conundrum: what patients value in primary care and referrals to specialists. JAMA 1999;82:261–6.
43. Stange KC, Zyzanski SJ, Jaén CR, Callahan EJ, Kelly RB, Gillanders WR, et al. Illuminating the 'Black Box'.. A description of 4454 patient visits to 138 family physicians. J Fam Pract 1998;46:377–8
44. Stange KC, Jaén CR, Flocke SA, Miller WL, Crabtree BF, Zyzanski SJ. The value of a family physician. J Fam Pract 1998;46:363–8.
45. Rosenblatt RA, Hart LG, Gamliel S, Goldstein B, McClendon BJ. Identifying primary care disciplines by analyzing the diagnostic content of ambulatory care. J Am Board Fam Pract 1995;8:34–45.
46. Rosenblatt RA, Hart G, Baldwin L, Chan L, Schneeweiss R. The generalist role of specialty physicians: is there a hidden system of primary care? JAMA 1998;279:1364–70.
47. Mold JW, Green LA. Primary care research: revisiting its definition and rationale. J Fam Pract 2000;49:206–8.
48. Perry Dickinson W, Stange KC, Ebell MH, Ewigman BG, Green LA. Involving all family physicians and family medicine faculty members in the use and generation of new knowledge. Fam Med 2000;32:480–90.
49. White KL. Fundamental research at primary care level. Lancet 2000;355:1904–6.
50. Starfield B. Primary Care: balancing health needs, services and technology. New York, NY: Oxford University Press,1998.
51. Greenfield S, Keller A, Kravitz R, Manning W, Nelson E, Rogers W, et al. Variations in resource utilization among medical specialties and systems of care. JAMA 1992;267:1624–30.
52. Green LA, Miller RS, Reed FM, Iverson DC, Barley GE. How representative of typical practice are practice-based research networks? A report from the Ambulatory Sentinel Practice Network Inc (ASPN). Arch Fam Med 1993;152:939–49.
53. Metlay JP, Stafford RD, Singer DE. National trends in the use of antibiotics by primary care physicians for adults patients with cough. Arch Intern Med 1998;158:1813–8.
54. Nyquist A-C, Gonzales R, Steiner JF, Sande MA. Antibiotic prescribing for children with colds, upper respiratory tract infections, and bronchitis. JAMA 1998;279:875–7.
55. Pincus H, Tanielian TL, Marcus SC, Olfson M, Zarin DA, Thompson J, et al. Prescribing trends in psychotropic medications: primary care, psychiatry, and other medical specialties. JAMA 1998;279:526–31.
56. Wang TJ, Stafford RS. National patterns and predictors of beta-blocker use in patients with coronary artery disease beta-blocker use in patients with coronary artery disease. Arch Intern Med 1998;158:1901–6.
57. Ornstein S. Electronic medical records in family practice: the time is now. J Fam Pract 1997;44:45–8.
58. Stephens GG. The intellectual basis of family medicine revisited. Fam Med 1998;9:642–54.
59. Green LA, Nutting PA. Family physicians as researchers in their own practices. J Am Board Fam Pract 1994;7:261–3.
60. Nutting PA, Beasley JW, Werner JJ. Practice-based research networks answer primary care questions. JAMA 1999;281:686–8.