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The Probability of Specific Diagnoses for Patients Presenting with Common Symptoms to Dutch Family Physicians

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■ OBJECTIVE Our goal was to develop reliable data on the probability of specific diagnoses among patients of family physicians (FPs) presenting with common symptoms.

■ STUDY DESIGN A group of 54 Dutch FPs recorded the reasons for encounter, diagnoses, and interventions for all episodes of care between 1985 and 1995. Diagnoses could be modified during the episode of care, and a modified diagnosis was applied to all episode data.

■ POPULATION We used the listed patient populations of the 54 Dutch FPs, representing 93,297 patient years, 236,027 episodes of care, and 267,897 patient encounters.

■ OUTCOMES MEASURED The top 20 diagnoses related to 4 selected presenting symptoms (cough, shortness of breath, general weakness/tiredness, and low back symptom/complaints without radiation), per 100 patients, with 95% confidence intervals, stratified by age. In the standard tables, age-specific cells with fewer than 10 observations were excluded.

■ RESULTS The availability of an accurate estimate of prior (pretest) probabilities for common symptoms/complaints has great potential value for family practice as an academic discipline and for family physicians in that it can support their medical decision making. Stratifying data by age groups increases the clinical relevance of the prior probabilities.

■ CONCLUSIONS Though collected by Dutch FPs, the data in our study have a high face validity for other clinicians. Still, FPs in other countries should give priority to collecting their own probability databases.

■ KEY WORDS Family practice; probability; signs and symptoms [non-MESH]; classification; episode of care. *(J Fam Pract 2002; 51:31-36)*

KEY POINTS FOR CLINICIANS

- The pretest probability is the likelihood of disease before tests are ordered in a patient with a specific symptom or complaint.
- It is very helpful in the diagnosis and management of problems common in family practice.
- We have identified the pretest probability for the most common final diagnoses in patients with many common presenting symptom/complaints.

Estimating the probability of disease in unselected patients lies at the heart of the clinical competence of family physicians (FPs).[1,2] This probability is called the prior or pretest probability, because it precedes any diagnostic testing, including the history and physical examination. Based on this knowledge, FPs often decide that since the probability of a serious disease is low, the best thing to do is watchful waiting, thus preventing unnecessary harm and cost to the patient.[3,4] Moderate probabilities may trigger a diagnostic evaluation, and high probabilities may warrant empiric therapy without further diagnostic confirmation. For example, knowing that the probability of gastric carcinoma is exceedingly rare for a dyspeptic patient younger than 40 years supports a diagnostic approach that does not include initial endoscopy. A moderate probability of strep throat is a situation where a rapid strep test may be helpful.[5] Understanding the high prior probability of a urinary tract infection in young healthy women with dysuria

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TABLE 1

FINAL DIAGNOSES FOR EPISODES OF CARE STARTING WITH THE REASON FOR ENCOUNTER COUGH (R05) N=11092

Rank	*ICPC* Code	Diagnosis	Percentage of Patients Presenting with Cough Who Had This Final Diagnosis								Standardized Incidence (Cases/100 Patients/Year)
				Age (Years)							
			Total	0-4	5-14	15-24	25-44	45-64	65-74	75+	
1	R74	URI (head cold)	32.9±.9	40.1±2.1	35.6±2.6	36.7±3.3	34.4±1.9	29.9±2.1	27.4±2.2	23.9±2.4	9.7
2	R78	Acute bronchitis/ bronchiolitis	25.4±.8	23.7±1.8	20.4±2.2	17.8±2.6	18.5±1.6	26.1±2.0	34.3±2.4	39.5±2.8	4.7
3	R05	Cough	13.7±.6	10.5±1.3	12.4±1.8	15.9±2.5	15.8±1.5	15.4±1.6	12.4±1.7	14.0±2.0	1.9
4	R77	Acute laryngitis/tracheitis	9.0±.5	6.6±1.1	8.6±1.5	10.0±2.0	12.4±1.3	11.1±1.4	7.3±1.3	5.2±1.3	1.8
5	R75	Sinusitis acute/chronic	3.5±.3	1.2±.5	2.3±.8	4.2±1.4	5.7±.9	4.8±1.0	4.1±1.0	1.2±.6	3.1
6	A77	Viral diseases NOS	2.3±.3	3.3±.8	4.2±1.1	1.9±.9	2.1±.6	1.7±.6	1.4±.6	1.2±.6	2.8
7	R80	Influenza (proven)	2.0±.3	.9±.4	1.9±.7	3.1±1.2	2.6±.7	2.4±.7	1.6±.6	2.3±.9	.8
8	R96	Asthma	1.9±.3	2.9±.7	3.1±1.0	1.9±.9	1.4±.5	1.1±.5	1.6±.6	1.2±.6	.7
9	R81	Pneumonia	1.9±.3	1.9±.6	2.6±.9	1.7±.9	1.5±.5	1.0±.5	1.4±.6	3.7±1.1	.5
10	R83	Other infection respiratory system	.6±.1	.4±.3	-	1.4±.8	.6±.3	.7±.4	.9±.5	.6±.4	.2
11	R76	Tonsillitis acute	.6±.1	1.8±.6	1.3±.6	-	.3±.2	-	-	-	1.6
12	R91	Chronic bronchitis/ bronchiectasis	.6±.1	-	-	-	.3±.2	.8±.4	1.1±.5	1.6±.7	.1
13	R95	Emphysema/COPD	.5±.1	-	.6±.4	-	.3±.2	.9±.4	.9±.5	.8±.5	.2
14	R71	Whooping cough	.4±.1	.6±.3	1.7±.7	-	-	-	-	-	.1
15	R90	Hypertrophy/chronic infection T&A	.4±.1	1.1±.4	1.6±.7	-	-	-	-	-	.3
16	A97	No disease/prevention	.4±.1	.4±.3	-	-	.5±.3	.4±.3	.6±.4	-	8.5
17	H71	Acute otitis media/myringitis	.4±.1	1.7±.5	.5±.4	-	-	-	-	-	2.3
18	K77	Heart failure	.3±.1	-	-	-	-	-	1.4±.6	.9±.5	.5
19	R99	Other disease respiratory system	.3±.1	.3±.2	-	-	.3±.2	.4±.3	-	-	.3
20	R27	Fear of other respiratory disease	.3±.1	.4±.3	-	-	.4±.3	-	-	-	.2
		Absolute number of observations	11,092	2090	1281	832	2320	1842	1529	1199	

URI denotes upper respiratory infection; COPD, chronic obstructive pulmonary disease.

might allow an FP to confidently institute a telephone-based protocol, including empiric treatment for selected patients.

The development of a prior probabilities database requires access to large diverse practice populations with adequate continuity of care and good documentation of all episodes of care.[2,6,7] An "episode of care" is defined as a health problem from the first encounter with a health care provider through the completion of the last encounter related to that particular problem.[2,8,10,11] Early in an episode of care, FPs will often assign a symptom diagnosis such as chest pain, gastric pain, or otalgia; a substantial number of these diagnoses will change over time. Therefore, the observation period should allow for the most important modifications of diagnoses to become visible. Because 1-year incidence and prevalence rates are usually calculated, at least a 1-year study period is required; however, a longer period is preferable, especially for information on chronic diseases.[12]

Episodes of care are based on the relationship between the patient's reasons for encounter (RFE), the physician's diagnostic interpretation, and the related interventions over time.[13] Episodes of care are clearly distinguished from episodes of disease and episodes of illness. An episode of disease begins with its onset and continues until its resolution or the patient's death, while an episode of illness refers to the period that someone suffers from symptoms or complaints experienced as illness. Not every disease, and certainly not every illness, results in an episode of care.[2,13,14] Most episodes of care, however, are part of an episode of disease and/or illness. Health maintenance episodes can be considered a special form of episodes of care.[10,11] For example, screening for breast cancer (an episode of health maintenance) may prove the existence of the episode of disease well before the patient has symptoms (an episode of illness); an episode of care will follow.

The development of a prior probabilities database also requires a primary care–specific system of classification. The *International Classification of Primary Care* (*ICPC*) includes approximately 200 symptoms/complaints and 300 diagnoses common

TABLE 2

FINAL DIAGNOSES FOR EPISODES OF CARE STARTING WITH THE REASON FOR ENCOUNTER SHORTNESS OF BREATH (R02); N=2505

Rank	*ICPC* Code	Diagnosis	Percentage of Patients Presenting with Cough Who Had This Final Diagnosis							Standardized Incidence (Cases/100 Patients/Year)
				Age (Years)						
			Total	0-4	5-14	15-24	25-44	45-64	65-74	75+	
1	R748	Acute bronchitis/ bronchiolitis	27.3±1.7	28.7±5.6	30.0±7.9	18.1±6.2	23.7±4.0	28.7±4.6	33.5±4.3	25.8±3.2	4.7
2	R96	Asthma	9.7±1.2	17.4±4.7	22.3±7.2	23.5±6.8	13.9±3.2	7.2±2.6	5.4±2.1	3.4±1.3	.7
3	K77	Heart failure	8.9±1.1	-	-	-	-	4.5±2.1	12.6±3.0	21.0±3.0	.5
4	R02	Shortness of breath/ dyspnoea	8.6±1.1	-	7.7±4.6	6.0±3.8	10.5±2.9	10.1±3.0	8.0±2.5	9.9±2.2	.3
5	R98	Hyperventilation	8.0±1.1	-	7.7±4.6	18.8±6.3	13.0±3.2	15.7±3.7	5.9±2.1	2.8±1.2	.9
6	R74	URI (head cold)	6.6±1.0	19.0±4.9	8.5±4.8	8.1±4.4	9.8±2.8	3.7±1.9	3.0±1.6	3.5±1.4	9.7
7	R77	Acute laryngitis/tracheitis	3.2±.7	15.0±4.5	8.5±4.8	-	2.5±1.5	1.9±1.4	-	1.3±.8	1.8
8	R81	Pneumonia	3.2±.7	3.2±2.2	-	-	2.1±1.3	2.1±1.5	2.6±1.5	5.4±1.7	.5
9	R95	Emphysema/COPD	2.8±.6	-	-	-	-	3.5±1.8	5.2±.2.0	3.5±1.4	.2
10	K76	Ischemic heart disease	2.1±.6	-	-	-	-	2.4±1.5	2.6±1.5	4.1±1.5	.8
11	A97	No disease/prevention	1.9±.5	3.2±2.2	-	-	1.8±1.3	2.1±1.5	1.3±1.0	1.6±.9	8.5
12	A77	Viral disease NOS	1.3±4	2.8±2.1	-	-	1.8±.1.3	-	1.3±1.0	.9±.7	2.8
13	R91	Chronic bronchitis/ bronchiectasis	1.3±.4	-	-	-	-	2.1±1.5	2.6±1.5	1.3±.8	.1
14	R75	Sinusitis acute/chronic	1.0±.4	-	-	-	2.3±1.4	-	-	-	3.1
15	K78	Atrial fibrillation/flutter	.8±.4	-	-	-	-	-	2.4±1.4	1.3±.8	.2
16	A85	Adv effect medical agent in proper dose	.8±.3	-	-	-	-	1.6±1.3	1.5±1.1	1.0±.7	2.6
17	R99	Other disease respiratory system	.8±.3	-	-	-	1.6±1.2	-	-	-	.3
18	P01	Feeling anxious/nervous/ tense	.5±.3	-	-	-	-	-	-	-	1.4
19	P02	Acute stress reaction	.4±.3	-	-	-	-	-	-	-	.9
20	A96	Death	.4±.2	-	-	-	-	-	-	.9±.7	.5
		Absolute number of observations	2505	247	130	149	438	376	460	705	

URI denotes upper respiratory infection; COPD, chronic obstructive pulmonary disease; NOS, not otherwise specified.

in family practice. Almost all have an incidence of at least 1 per 1000 patients per year.[13-15]

Since 1985, the members of the Transition Project of the University of Amsterdam Department of Family Practice have been contributing to episode-oriented epidemiology in family practice. We have developed a large prospective database that provides reliable probabilities of diagnoses for symptoms or complaints in a patient of a specific age and sex, suitable for the support of family physicians' decision making.[2,7-9,16] This article describes the database in more detail and presents data for 4 common symptoms.*

METHODS

From 1985 to 1995, 54 Dutch FPs in 23 locations routinely coded episode data for all direct (face-to-face) encounters with their listed patients; within the Dutch health care system, all citizens are listed (registered) with an FP. Each participating FP collected data during a period of at least 1 year; the registration period for patients ranged from 1 to 10 years (mean 2.4).[2,9,16] For each encounter, the patient's reasons for the encounter, the diagnoses, and the interventions ordered by the physician were coded according to the *ICPC*. Data were entered on a special encounter form with a copy for a central data entry and included 93,297 patient years, with 236,027 episodes of care and 267,897 direct patient encounters.

Since the FPs had a well-defined practice with listed patients, a precise denominator could be established for the calculation of rates. In the Netherlands, patients can, in principle, not seek specialist care without a referral by their FP. Therefore, especially in a longer observation period, an FP will document a close approximation of the distribution of episodes of care in the Dutch population. In 1 year, 73% of listed patients have a direct encounter with their family physician; in a 2-year observation period this is 92%. It is therefore unlikely that a substantial group of listed patients receive specialist care without their FP's being aware of it.[12]

A diagnosis could be modified during the course of an episode. If that occurred, the modified diagno-

*A larger set of prior probabilities is available on the *JFP* Web site, www.jfponline.com.

TABLE 3

FINAL DIAGNOSES FOR EPISODES OF CARE STARTING WITH THE REASON FOR ENCOUNTER GENERAL WEAKNESS/TIREDNESS (A04); N=5915

Rank	*ICPC* Code	Diagnosis	Percentage of Patients Presenting with Cough Who Had This Final Diagnosis								Standardized Incidence (Cases/100 Patients/Year)
			Total	Age (Years) 0-4	5-14	15-24	25-44	45-64	65-74	75+	
1	A04	General weakness/tiredness	37.5±1.2	16.9±3.7	32.3±4.6	43.3±3.6	40.5±2.3	38.0±3.0	38.4±3.6	37.5±3.0	2.7
2	A77	Viral disease NOS	8.2±.7	14.9±3.5	12.0±3.2	8.0±2.0	7.9±1.3	7.0±1.6	8.0±2.0	6.0±1.5	2.8
3	R74	URI (head cold)	4.3±.5	11.7±3.1	8.8±2.8	3.6±1.3	3.4±.9	3.3±1.1	4.2±1.5	2.5±1.0	9.7
4	B80	Iron deficiency anemia	3.5±5	4.0±1.9	7.2±2.5	4.4±1.5	4.2±1.0	1.6±.8	2.4±1.1	2.7±1.0	.7
5	A97	No disease/prevention	2.8±.4	3.7±1.9	3.5±1.8	5.2±1.6	2.6±.8	2.9±1.0	1.0±.7	1.9±.8	8.5
6	R78	Acute bronchitis/bronchiolitis	2.7±.4	4.7±2.1	4.0±1.9	1.1±.8	1.4±.6	3.0±1.1	2.4±1.1	4.3±1.3	4.7
7	A85	Adv effect medical agent in proper dose	2.1±.4	-	-	1.1±.8	.8±.4	3.4±1.1	4.2±1.5	3.8±1.2	2.6
8	P76	Depressive disorder	1.9±.3	-	-	.8±.7	1.3±.5	3.2±1.1	3.4±1.4	2.7±1.0	.7
9	P99	Other mental disorder	1.8±.3	-	-	3.4±1.3	3.6±.9	1.5±.8	-	-	.7
10	R75	Sinusitis acute/chronic	1.8±.3	-	3.2±1.7	1.4±.8	2.5±.7	1.7±.8	1.6±.9	.8±.5	3.1
11	R80	Influenza (proven)	1.7±.3	-	-	1.7±.9	1.6±.6	2.6±1.0	2.3±1.1	1.3±.7	.8
12	P02	Acute stress reaction	1.6±.3	-	-	1.9±1.0	2.8±.8	1.6±.8	1.1±.8	.6±.5	.9
13	P01	Feeling anxious/nervous/tense	1.5±.3	-	-	1.2±.8	1.8±.6	2.2±.9	1.7±1.0	.8±.5	1.4
14	Z05	Problem working conditions	1.4±.3	-	-	2.5±1.1	2.7±.8	1.5±.8	-	-	1.2
15	R76	Tonsillitis acute	1.0±.3	7.0±2.5	2.0±1.4	.8±.7	.9±.4	-	-	-	1.6
16	P03	Feeling depressed	1.0±.2	-	-	-	1.1±.5	1.4±.7	1.3±.8	.8±.5	.5
17	A75	Infectious mononucleosis	.8±.2	-	1.8±1.3	3.2±1.3	1.0±.5	-	-	-	.2
18	R81	Pneumonia	.8±.2	-	3.2±1.7	-	-	.7±.5	1.3±.8	1.0±.6	.5
19	H71	Acute otitis media/myringitis	.8±.2	8.7±2.8	2.2±1.5	-	-	-	-	-	2.3
20	R98	Hyperventilation	.8±.2	-	-	-	1.0±.5	1.0±.6	1.1±.8	.6±.5	.9
		Absolute number of observations	5915	402	400	726	1680	996	697	1014	

NOS, not otherwise specified; URI, upper respiratory infection.

sis was applied to all episode data in the analysis. New and ongoing episodes of care were included in a registration year if dealt with at least once; in case of a follow-up encounter in a later registration year, the episode was included again as an ongoing episode. As a consequence, an episode of a chronic disease (eg, diabetes, hypertension) coded in 2 or more registration years was included more than once in the annual prevalence.[17] The average yearly practice population served as the denominator.

As is the case in all time-consuming morbidity studies, the participating FPs were selected, highly motivated, and in this respect, not representative of the average Dutch FP. The database was used in numerous studies, however, and its reliability consistently proved to be high: Approximately 2% of all episodes appeared to be missing in the paper record, and another 2% were erroneously included in the database. The complete reference database is available in Dutch on a CD-ROM attached to a family practice textbook. It includes all combinations of an RFE, a diagnosis, and an intervention for 7 standard age groups at the start of episodes and during follow-up, together with data on comorbidity.[9]

Our paper focuses on prior probabilities, expressed as the top 20 final diagnoses for 4 common reasons for encounter presented at the start of an episode of care[18,19]: cough, shortness of breath, general weakness/tiredness, and low back pain without radiation. All probabilities are presented for the total population and for 7 standard age groups, as percentages with 95% symmetric confidence intervals.[20] Cells with fewer than 10 observations were excluded. Incidences standardized for the 1995 Dutch population were provided.

RESULTS

Table 1 shows that for the RFE "cough," the patient's age had a substantial impact on the probabilities. The diagnosis of acute bronchitis was common overall but especially in the very young and the very old. This table illustrates the relationships between a common symptom and several diseases with a relatively high incidence (the last column). The prior probabilities were well distributed over the standard table: empty cells occur infrequently.

"Shortness of breath/dyspnoea" as an RFE is associated with a very different distribution of diagnoses than found with cough, especially in the

TABLE 4

FINAL DIAGNOSES FOR EPISODES OF CARE STARTING WITH THE REASON FOR ENCOUNTER LOW BACK SYMPTOMS/COMPLAINTS WITHOUT RADIATION (L03); N=4238

Rank	*ICPC* Code	Diagnosis	Percentage of Patients Presenting with Cough Who Had This Final Diagnosis							Standardized Incidence (Cases/100 Patients/Year)
				Age (Years)						
			Total	0-4	5-14	15-24	25-44	45-64	65-74	75+	
1	L03	Low back symptoms/ complaints without radiation	69.9±1.4	-	56.9±12.7	72.2±4.3	71.2±2.2	73.9±2.5	66.7±4.0	58.1±4.7	3.7
2	L18	Muscle pain/fibrositis	6.2±.7	-	10.3±7.8	7.9±2.6	7.5±1.3	5.2±1.3	3.7±1.6	4.9±2.0	2.6
3	L86	Lumbar disc lesion/radiation	6.0±.7	-	-	2.2±1.4	6.7±1.2	6.8±1.4	5.8±2.0	5.6±2.2	.7
4	L85	Acquired deformities of spine	3.2±.5	-	10.3±7.8	5.0±2.1	3.9±.9	1.8±.8	1.9±1.1	3.0±1.6	.4
5	L84	Osteoarthritis of spine	1.6±.4	-	-	-	.4±.3	.9±.6	4.1±1.7	6.5±2.3	.2
6	L81	Other musculoskeletal injury	1.6±.4	-	-	2.9±1.6	1.0±.5	.9±.5	1.3±1.0	4.4±1.9	2.4
7	L99	Other musculoskeletal disease	1.3±.3	-	-	-	.9±.5	.9±.6	2.6±1.3	2.3±1.4	1.4
8	L89	Osteoarthritis	1.0±.3	-	-	-	-	.8±.5	2.4±1.3	4.0±1.8	1.4
9	N99	Other neurological disease	.8±.3	-	-	-	.8±.4	1.3±.6	-	-	1.1
10	U95	Urinary calculus	.4±.2	-	-	-	.4±.3	.6±.4	-	-	.3
11	L02	Back symptoms/complaints	.4±.2	-	-	-	.5±.3	-	-	-	1
12	L19	Other multiple/unspecif muscle symptoms/complaints	.4±.2	-	-	-	.4±.3	.7±.5	-	-	.4
13	L79	Sprains & strains NOS	.4±.2	-	-	-	-	-	-	-	1.3
14	U70	Pyelonephritis/pyelitis acute	.4±.2	-	-	-	-	-	-	-	.2
15	L88	Rheumatoid arthritis/allied conditions	.3±.2	-	-	-	.4±.3	-	-	-	.2
16	L95	Osteoporosis	.3±.2	-	-	-	-	-	1.1±.9	-	.1
17	U71	Cystitis	.3±.2	-	-	-	-	-	-	-	2.2
18	A77	Viral diseases NOS	.2±.1	-	-	-	.4±.3	-	-	-	2.8
19	D06	Other localized abdominal pain	.2±.1	-	-	-	-	-	-	-	1.3
20	L76	Other fracture	.2±.1	-	-	-	-	-	-	-	.3
		Absolute number of observations	4238	5	58	418	1626	1163	538	430	

NOS denotes not otherwise specified.

very young and the very old (Table 2). Asthma and acute laryngitis typically occur in the young, while chronic obstructive pulmonary disease, ischemic heart disease, and heart failure occur in the old. Hyperventilation had a peak in young adults. In this table, the relation between a less common symptom and several less common diseases is illustrated. In this case, more empty cells are found. Both cough and shortness of breath mainly relate to respiratory and cardiovascular diseases.

The RFE "tiredness" (Table 3) was associated with several common diseases, but a much wider range of clinical possibilities is apparent. Quite often, this RFE resulted in the symptom diagnosis “tiredness.” Major age differences existed for several diagnoses.

Table 4 shows that the RFE "low back symptoms/complaints without radiation" quite often led to the same symptom diagnosis. Also, the rather skewed age distribution of low back complaints shows: most cells were insufficiently filled, while age differences for the most common diagnoses appeared to be relatively small.

DISCUSSION

Family practice can be characterized by the specific distribution of health problems and disease in its population, as distinct from the distributions in the general population and in specialists' populations. Increasingly, empiric data indicate how morbidity patterns and the distribution of reasons for visit in family practice differ from those in hospitals. The availability of age-specific prior probabilities of common symptoms and complaints for diagnoses in family practice has great potential. Diagnostic labels often have the disadvantage of a relative uncertainty, caused by a more or less arbitrary attribution of different symptoms and signs (eg, syndrome diagnoses, psychiatric diagnoses). Symptoms and complaints on the other hand have the advantage of relative certainty, because they represent the patient's ill health irrespective of the diagnostic label they are given. In the daily work of FPs the importance of the absence or presence of a symptom must be considered in light of the distribution of disease in the family practice setting.

Therefore, such data would not only seem to be

crucial for the further development of family practice as an academic discipline or for the design of intervention studies but also has direct practical consequences for clinicians. This information can directly support FPs' medical decision making and improve communication with patients. The process of finding common ground about diagnosis and management could especially profit from a realistic estimate of probabilities, bridging the gap between the patient's perspective, as reflected in the presenting symptoms, and the clinical perspective of the FP who wants to provide optimal care.[21]

Several important types of distributions are shown in Tables 1 through 4: a very common symptom in relation to highly incident diagnoses, a less common symptom leading to less incident diagnoses, and symptoms primarily resulting in a symptom diagnosis with the same label. Also, it is evident that the range of clinical considerations resulting from a presenting symptom can vary from a relatively limited to a very wide morbidity spectrum.

Sex-specific symptoms and complaints (eg, menstrual problems) typically result in rather specific distributions, as is illustrated in the database available on the *JFP* Web site. The distribution of diagnoses for symptoms that occur in both sexes may be different not only for age groups but also for sex/age groups.

The value of prior probabilities increases with the availability of data on incidence of diseases in the same population, allowing an estimation of the positive and negative predictive values. Since 1995, data collection has occurred electronically. Later in 2001, a database twice the size will become available that allows more precise estimations for finer age/sex distributions and symptom combinations. Although from Dutch family practice, these data have a high face validity for clinicians wherever they work.[8] Nevertheless, it would seem that FPs in the United States and other countries should give priority to collecting their own reliable probability databases.[4,22,23]

In the Netherlands, Japan, and Poland, an international comparative study has taken place with an electronic patient record, using *ICPC*. (See page xxx in this issue for the abstract of this article.) Based on a comparison of these databases with US NAMCS data (1995-1997), tables similar to those presented in this paper for the most frequent symptoms and complaints have been made available on the *JFP* Web site.[24,25]

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