Chapter 6

A comparison of disease prevalence in general practice in the Netherlands and in England and Wales

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What is this chapter about?

General practice-based morbidity surveys have been conducted in the Netherlands and in England and Wales primarily to estimate disease prevalence and examine health inequalities. We have compared disease prevalence in general practice reported in the second Dutch National Survey of General Practice (DNSGP-2) with prevalence data collected in the same year (2001) in the Weekly Returns Service (WRS) in England and Wales. Diseases were selected according to interest and compatibility of classification (International Classification of Primary Care (ICPC-1), DNSGP-2; Read-International Classification of Disease (ICD)-9, WRS). Age- and sex-specific prevalence rates were standardised to the national census population of England and Wales (2001). Differences between the surveys were determined from non-overlapping 99% confidence intervals. Although many small differences were identified, the similarities were more striking. Important differences included higher prevalence of lung cancer, diabetes mellitus, mental disorders and musculoskeletal conditions in the Netherlands, and lower prevalence of prostate cancer (but not of benign prostatic hypertrophy), hypothyroidism and respiratory infections. Some of the differences identified may have been influenced by the use of different classification systems, others may relate to differing consulting behaviour, and some reflect true national differences.

Introduction

National morbidity surveys in general practice serve many purposes, chief of which is to describe the incidence and prevalence of disease in general practice indicating the morbidity profile in the community. For the majority of conditions, persons presenting to healthcare provide particularly useful information since they reflect the demand on healthcare facilities, and the knowledge and opinion of the community on the ability of the health service to respond to their needs and provide a basis for resource allocation. With few exceptions, conditions excluded from healthcare do not require essential treatment. Practice-based morbidity surveys also permit comparisons between groups and

over time. Surveys in differing countries provide a basis for international comparison of health problems, and opportunities to refine recording methods in the interests of harmonisation and of creating a truly comparative international framework for disease monitoring, as has been envisaged at a European level.[1]

In England and Wales, the history of national morbidity surveys started with the Survey of Sickness 1943–52 which was based on patient-reported symptoms/diseases and was very difficult to interpret.[2] The first major survey in general practice was conducted in 1956 and was based on the general practitioners' (GPs') interpretation and diagnosis for presented problems which were recorded on summary cards and analysed according to the rubrics of the International Classification of Disease (ICD) version 7.[3] Other national surveys followed in 1970/1971, 1980/1981, and 1991/1992.[4–6] The first two involved recording diagnoses in diagnostic indexes and the last of these collected data on patient-specific electronic medical records (EMR). All these data included patient-specific data on socio-economic and demographic characteristics. Data on referrals and – to a limited extent – on patient investigation were also collected. All diagnoses were analysed according to the ICD, most recently based on version 9 though data entry in the most recent survey was facilitated using the Read Code Thesaurus.[7] The recording methods established for that survey have been continued in the Weekly Returns Service of the Royal College of General Practitioners (WRS) and annual reports on disease prevalence are now available from this network.[8,9]

In the Netherlands, the first major general practice-based morbidity survey was conducted in 1987 and the second in 2001. The first survey was limited to a morbidity registration during a 3-months period per practice; the second survey included data from a full 12-months period.[10,11] Both surveys collected diagnostic data which were coded to the rubrics of the International Classification of Primary Care version 1 (ICPC-1).[12] In the 1987 survey, coding was carried out by trained clerks; in the 2001 survey the participating GPs coded the diagnostic information themselves. In both surveys, the GPs were specifically encouraged to report their interpretation of the consultation rather than merely record the symptoms prompting the reason for encounter. Both studies included patient-specific, sociodemographic data, and both examined other elements of practice activity including referrals to secondary care and prescriptions issued.

Similar research designs made comparison of morbidity patterns between UK and the Netherlands possible.

This study compares the findings on the prevalence of selected diseases as reported in the national morbidity study in the Netherlands in 2001 (second Dutch National Survey of General Practice – DNSGP-2),[11] with those reported in the WRS estimation of annual prevalence in the same year.[9] The selection of diseases was made on the basis of potential interest, compatibility of classifications and relative frequency.

How was it done?

Design

For a description of the methods of the DNSGP-2, *see* Chapter 2 of this book. For the study prescribed in this chapter the data of 8 of the 104 practices were excluded from the analyses; from three because of problems with data transfer, and from five because recording standards were not met. In total, data from 96 practices (185 GPs) were used in this study.

The WRS 2001 survey included data from 38 practices (163 GPs) out of the total 78 (378 GPs) who provided weekly returns in that year. Recruited practices were restricted to those with computer software capable of delivering an analysis over a full 12–month period. The standard software was originally designed to provide weekly and not annual data returns. Apart from the population monitored (considered below) the representativeness of these GPs and their practices has not been studied.

Population denominator

In the DNSGP-2, the total practice population was determined on the basis of the administrative registration of the patient in the practice computer; personalised data about age and sex were extracted. Population data were extracted at the beginning and at the end of the registration period, and the mathematical average (mid-time) was used as the epidemiological denominator (*n* all ages = 375 899) in all age groups, except children aged less than 12 months, where for the purpose of comparison with the national population, we estimated the population at risk from the number of person days included in the 12–month study period.

The WRS population was defined from a count of all persons registered at the midpoint of the survey (*n* all ages = 325 850).

Disease prevalence

The one-year period prevalence of disease was examined in the respective 12–month survey periods (DNSGP-2 12 months per participating practice between May 2000 and April 2002, 87% in calendar year 2001; WRS 1 January to 31 December 2001) on the basis of a consultation with the recording GP on at least one occasion in this period for the specified condition or group of conditions. Conditions were grouped into clusters to match as well as possible the ICD-9 three-digit and major subgroup categories. Conditions creating substantial difficulty for matching were either excluded from this study or considered at a lower level of precision – e.g. by ICD chapter. Diseases and groups of diseases examined are detailed by the codes in the two classification systems in Appendix 6.1.

Prevalence rates per 10 000 were generated separately by gender and in age groups (<1, 1–4, 5–14, 15–24, 25–44, 45–64, 65–74, 75 years and over). Gender-specific age-standardised prevalence rates (SPR) were calculated by applying the age-specific incidence rates from both surveys to the national population estimate for England and Wales established in the national census

for 2001.[13] Confidence intervals (99%) were calculated, based on the proportion of the population consulting, and study differences were defined as non-overlapping confidence intervals.

What was found?

The populations surveyed, and the percentage of the respective national populations are given in Table 6.1: differences between the survey populations and the national populations with regard to the age and sex distribution are small.

Data on selected diseases are reported as gender-specific SPRs in ICD chapter order in Table 6.2.

SPRs for infectious diseases show differences between the Netherlands and England and Wales with respect to chickenpox (approximately 50% lower in the Netherlands), herpes simplex in females (lower in the Netherlands), infectious mononucleosis (approximately 50% higher in the Netherlands) and candidiasis in females (lower in the Netherlands).

The SPRs for breast and bladder cancer were similar; for lung and bronchial cancer SPRs in the Netherlands exceeded the rates of England and Wales for males; and for prostate cancer the rate in the Netherlands was lower. SPRs for all benign neoplasms were similar, but SPRs were lower in the Netherlands for those involving the skin.

SPRs for diabetes mellitus reported in the Netherlands were approximately 30% higher than in England and Wales. Also, in the Netherlands, the SPR for females exceeded the male equivalent, whereas the opposite was observed in England and Wales. For hypothyroidism, rates among females were lower in the Netherlands than in England and Wales. Male SPRs for gout were identical, but in females the SPR was higher in England and Wales. Differences between the countries in the prevalence of hypothyroidism and diabetes were explored further in persons aged over 25 years (*see* Figure 6.1, p. 50). For hypothyroidism, the prevalence in the Netherlands fell after the age of 65 years, whereas for diabetes mellitus it increased: the opposite was reported for England and Wales.

Table 6.1 Size of the survey populations and percentages of national populations by age and sex

	The Netherlands				England and Wales			
Age	Male		Female		Male		Female	
(years)	*n*	%	*n*	%	*n*	%	*n*	%
<1	2 258	2.13	2 123	2.10	1 937	0.65	1 861	0.65
1–4	9 516	2.34	8 777	2.27	8 083	0.62	7 577	0.62
5–14	24 002	2.38	22 792	2.36	21 664	0.63	20 652	0.63
15–24	22 984	2.39	23 552	2.53	20 117	0.63	20 010	0.64
25–44	61 538	2.42	59 676	2.43	50 671	0.68	49 419	0.64
45–64	46 811	2.35	44 968	2.31	39 583	0.65	39 131	0.63
65–74	12 498	2.25	14 407	2.22	11 665	0.57	12 969	0.56
75+	7 638	2.25	13 364	2.11	7 491	0.52	13 020	0.52
Total	186 727	2.36	189 172	2.37	161 211	0.64	164 639	0.62

Table 6.2 Standardised prevalence rates for selected diseases and disease groups in the Netherlands (NL) and England and Wales (E&W) by sex, by ICD chapters and ICD codes (per 10000)

	Males		Females	
	NL	E&W	NL	E&W
Chapter I: infectious diseases				
infectious intestinal disease	214	200	238	222
chickenpox	25[a]	46	22[a]	39
herpes simplex	16	20	35[a]	50
infectious mononucleosis	10[a]	6	14[a]	7
candidiasis	56	62	239[a]	271
Chapter II: neoplasms				
carcinoma lung/bronchus	16[a]	9	7	5
carcinoma prostate (males) breast (females)	25[a]	36	43	40
carcinoma bladder	5	6	2	2
all benign neoplasms	137	129	231	213
benign neoplasms skin	76[a]	95	127[a]	162
Chapter III: metabolic disorders				
hypothyroidism	18	24	104[a]	135
diabetes mellitus	271[a]	214	317[a]	173
gout	72	73	25[a]	17
Chapter IV: blood and blood-forming organs				
iron deficiency anaemia	32[a]	21	121[a]	68
other deficiency anaemias	18	14	33[a]	21
Chapter V: mental disorders				
mental disorders	828[a]	625	1325[a]	964
anxiety neuroses	151	177	328[a]	427
depression	166[a]	78	362[a]	177
Chapter VI: diseases of the nervous system and sense organs				
Parkinson's disease	13	15	15	12
epilepsy	32	37	31	30
multiple sclerosis	3	5	7[a]	12
glaucoma	16	23	25	27
cataract	27	33	44[a]	58
acute otitis media	239[a]	267	233[a]	282
otitis externa	169	172	172	182
Chapter VII: diseases of the cardiovascular system				
hypertensive disease	599[a]	528	755[a]	712
ischaemic heart disease	226	233	156	149
heart failure	85[a]	58	102[a]	59
cerebrovascular disease	91[a]	68	103[a]	67
varicose veins	31[a]	50	105	92
haemorrhoids	67	70	103[a]	86
Chapter VIII: diseases of the respiratory system				
acute respiratory infection	1015[a]	1569	1335[a]	2149
acute sinusitis	265[a]	550	488[a]	1260
chronic obstructive pulmonary disease	372[a]	457	400[a]	488

	Males		Females	
	NL	E&W	NL	E&W
Chapter IX: diseases of the digestive system				
diseases of the oesophagus and stomach	213[a]	250	241[a]	280
inguinal hernia	48	57	6	6
Chapter X: diseases of the genito-urinary system				
urinary tract infection	107[a]	143	696[a]	590
benign prostatic hypertrophy	66[a]	62	–	–
Chapter XII : diseases of the skin and subcutaneous tissue				
skin infections	297[a]	392	293[a]	463
eczema/dermatitis	516[a]	588	664[a]	763
psoriasis	56	60	50[a]	70
Chapter XIII: diseases of the musculoskeletal system				
rheumatoid arthritis	32[a]	20	71[a]	48
dorsopathies	721[a]	492	846[a]	688

[a]Non-overlapping 99% confidence intervals between NL and E&W within sex.

SPRs for iron deficiency anaemia and for other deficiency anaemias were higher in the Netherlands, the latter only in women.

The SPRs for mental illness were higher in the Netherlands. More detailed analysis disclosed lower levels of anxiety among females but higher levels of depression both in males and females.

Among nervous system disorders, SPRs for Parkinson's disease, epilepsy, glaucoma, and external otitis were similar, but for multiple sclerosis the rates in the Netherlands were lower although the twofold male excess over female was

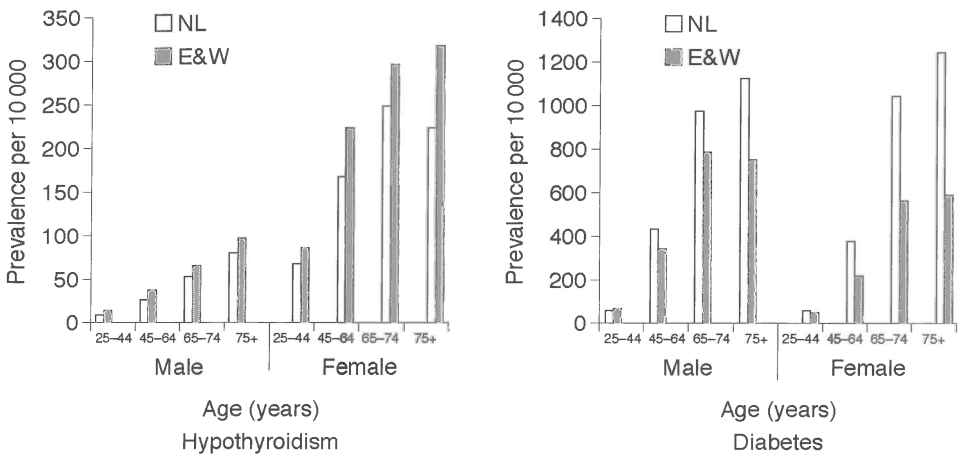

Figure 6.1 Hypothyroidism and diabetes. Prevalence per 10 000 by age and sex. NL: Netherlands; E&W: England & Wales.

similar in both countries. SPRs for cataract in females and for acute otitis media were lower in the Netherlands.

SPRs for hypertensive disease were higher in the Netherlands. SPRs for heart failure and cerebrovascular disease were substantially higher in the Netherlands. For ischaemic heart disease no differences between the two countries could be found. The male SPR for varicose veins was lower and the female SPR for haemorrhoids higher in the Netherlands.

SPRs for all three diseases of the respiratory system under study were considerably lower in the Netherlands.

The SPRs for diseases of the oesophagus, stomach and duodenum (DOSD) were lower in the Netherlands, but SPRs for inguinal hernia did not differ.

Rates in the Netherlands for urinary tract infections were lower in males but higher in females than their equivalents for England and Wales. SPRs for benign prostatic hypertrophy were similar in both countries.

SPRs for skin conditions were lower in the Netherlands than in England and Wales. Age-specific data for psoriasis (*see* Figure 6.2) suggest that GPs in the Netherlands reported fewer young people with psoriasis than GPs in England and Wales. SPRs for dorsopathies and rheumatoid arthritis were higher in the Netherlands.

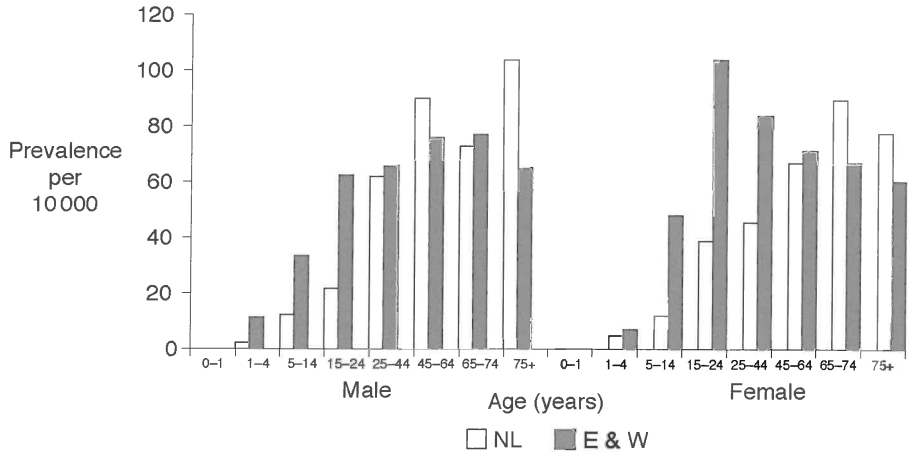

Figure 6.2 Psoriasis. Prevalence per 10 000 by age and sex. NL: Netherlands; E&W: England and Wales.

What to think about it

These results are discussed from two perspectives: the practical issues surrounding international comparative studies, and the clinical significance of the differences identified.

Comparative studies

We experienced serious limitations in trying to compare data collected in ICPC-1 codes (DNSGP-2) with data collected as Read codes mapped to ICD-9 (WRS).

The Read code is a hierarchical thesaurus with many more terms than are found in ICD and thus grouping to three-digit ICD-coded categories was straightforward. There are fewer ICPC-1 codes than ICD codes and, therefore, we were only able to map several ICPC-1 codes to ICD in broader groups. Even then problems occurred related to the inherent structures of the respective coding systems. For example, herpes simplex and herpes zoster are classified as part of the infectious disease chapter in ICD, but are part of the skin chapter in ICPC; malignancies are grouped together in ICD but are included in the appropriate anatomical chapter in ICPC. The ICD presents problems where conditions can be coded in more than one place – e.g. several infections can be coded by causative organism or clinical manifestation, or coded in both places. The ICPC classification does not allow for dual classification in this way though where possible it integrates symptoms within particular chapters of the classification. It involves the collection of symptoms that may be entered as an alternative to a diagnosis. When considering the prevalence of intestinal infectious diseases, it is necessary to search a wide range of symptomatic and diagnostic codes. In the ICD, non-specific symptom codes are included in Chapter 16 'Symptoms, signs and ill-defined conditions', and are used where there is no reasonable diagnostic alternative. The net result of these constraints was the considerable restriction in the number of conditions compared, and the limitation to those diagnostic groups where an acceptable level of coding comparability was achieved.

Comparison between ICPC and ICD-9 classified illnesses is possible, but only for a restricted set of conditions.

This comparison of national data concerned disease prevalence and was possible because person-specific data were examined. Comparisons of episodes of illness would be more difficult. The WRS protocol requires doctors to define the episode type at each consultation, whereas the DNSGP-2 definition of episode is based on a retrospective clustering of the data on the basis of the episode typing. This distinction relates partly to the fact that the WRS is rooted in the provision of weekly surveillance data. WRS data were extracted from the practices as tabular summaries, and individual patient-specific data were not collected. DNSGP-2 data were collected as an anonymised person-specific linked data set. Linked person-specific data permit more detailed study of morbidity and socio-economic variables and of linked morbidities. However, collection of linked data increases the costs and complexity of morbidity surveys, not the least because of the ethical issues surrounding the capture of sociodemographic data.

Clinical significance of the findings

The two national datasets were obtained in countries operating within broadly similar healthcare systems in which patient registration and the gatekeeper role for GPs with restricted access to secondary care is usual. Though there are certainly differences, and these are statistically significant because of the large population samples, and because we have used person- rather than practice-based data to calculate the confidence intervals, the similarities are more

striking than the differences. These are seen in a wide variety of conditions. In contrast, for some conditions the differences could be very important and they require further research. Some of these are considered here.

Diabetes mellitus and hypothyroidism

The opposing differences in the two countries could be real, but our findings suggest that the GPs in the Netherlands may be missing cases of hypothyroidism, and GPs in England and Wales may be missing cases of diabetes mellitus, both in the older population. The natural history of conditions which are essentially degenerative diseases prompts an expectation of increasing prevalence with age.

Prostatic cancer

The differing SPRs for prostatic cancer contrast with similar results for breast and bladder cancer, and are particularly interesting when set against the similar SPRs for benign prostatic hypertrophy. No structured screening programmes based on estimation of prostate-specific antigen (PSA) levels in blood exist in either country, though the routine investigation of men with symptoms suggestive of urinary obstruction would normally involve investigation of the level of PSA. Differing intensity of investigation by biopsy might also partly explain the differences in national rates.

Respiratory infections

SPRs for respiratory disorders were approximately 25% higher in England and Wales, though sex distribution was similar in both surveys. In both countries the incidence of respiratory infections has reduced considerably over the last 10 years. These reductions are evident in both upper and lower respiratory infections. Interestingly, the SPRs for otitis media were reduced in the Netherlands, compared with those in England and Wales, by a similar amount as other respiratory infections. The SPRs for otitis externa was similar in both countries. The twofold female excess over males for acute sinusitis reported in both surveys, and the much more frequent use of this diagnosis in the Netherlands, call for further investigation.

Musculoskeletal conditions

Back problems are a major cause of illness and carry high economic costs. Prevalence rates were higher in the Netherlands than in England and Wales, but it seems unlikely that the total community prevalence for back conditions is greater in the Netherlands. Accordingly, this difference may reflect a different attitude to healthcare interventions for back problems. Physiotherapy and related services are available by referral from GPs and privately by open access in both countries and the arrangements in both are similar. In the Netherlands, GPs do not undertake sickness certification, whereas in England and Wales sickness certification is required for persons absent from work for more than a week.

Conclusions

Though there were differences in disease prevalence between these national surveys measuring healthcare utilisation in primary care, the similarities were more striking. The high consistency of the gender relativity for many conditions was particularly interesting, and attention is drawn to diabetes where this was not the case. Many conditions showed large and, even if previously known, unexplained sex differences, calling for further investigation – for example multiple sclerosis, acute sinusitis and rheumatoid arthritis. The respective national systems for primary healthcare provision are similar, but differences in patients' expectations may influence the results of this type of comparison, as illustrated here for musculoskeletal problems. There may also be systematic differences in the diagnostic preferences of doctors, as illustrated in the contrasting results for anxiety and depression, the high prevalence of acute sinusitis but otherwise lower prevalence of respiratory infections in DNSGP-2. The comparison has also highlighted differences which may reflect the alertness of doctors; for example the opposing differences in the prevalence of hypothyroidism and of diabetes, and the differing prevalence of prostatic cancer. The age-specific data presented in the figures suggest that doctors in the two countries are weighting diagnostic decisions differently according to the person's age. Not all differences can be readily explained, and these probably reflect true differences between the countries concerned including infectious mononucleosis, carcinoma of the lung and bronchus, respiratory infections and possibly diabetes and rheumatoid arthritis.

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