NIVEL Primary Care Database - Sentinel Practices 2013

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Foreword

The year 2013 was characterized for the Dutch Sentinel Practices by the efforts to integrate with NIVEL Primary Care Database, which has become effective at January 1st 2014. This integration has made it possible to receive and process digital data that are being monitored in the sentinel practices more effectively than before. Additionally, the integration with the NIVEL Primary Care Database meet the latest requirements of privacy protection. The registration of most topics of previous years were continued, with the exception of the streptococcus surveillance and the European study into the early diagnosis of abdominal cancer, for which the data collection had been completed.

In the second year of the surveillance of skin complaints caused by the oak processionary larvae less complaints were registered than expected, like the year before. Most complaints were registered in the months June through August, when the larvae develop hairs containing toxin and when these spread from the caterpillars and the nests. In 2013, the degree of nuisance was generally low, as other sources also indicated. In our registration most complaints were reported in the eastern parts of our country, mainly pruritus. Of the patients who were registered at the general practices with complaints none had been exposed to the hairs of the caterpillar during their work. This annual report offers a more extensive overview.

After a strong whooping cough epidemic in 2012, 2013 shows a much lower number of whooping cough reports. Thus, the incidence of whooping cough was in 2013 back at a non-epidemic level as shown in the annual report.

After the longest influenza season of the last 25 years, in 2012-2013, a late mild influenza season of eight weeks occurred from the beginning of

February 2014, which was dominated by infections with the influenza A(H3N2)-virus. Of all identified influenza viruses in the sentinel practices 54% was type influenza A(H3N2), 34% A(H1N1)pdm09 an 12% influenza B.

In 2013, Frank Slotman, a medical student, analyzed during 3 months the sentinel data concerning palliative sedation for his scientific traineeship, coached by the coordinator of the Sentinel Practices. The VU Medical Centre of Amsterdam awarded Frank Slotman the student research prize 2013 for his final report. This study has also been published in English in the British Journal of General Practice and in the Dutch 'Tijdschrift voor Geneeskunde' (Journal of Medicine). This study showed that, fortunately, in most cases (87,4%) the patient is involved in the decision-making process preceding palliative sedation. However, this was less frequently the case for patients with a chronic heart disease or COPD than for patients with cancer. The conclusion of the study is that extra attention should be paid to timely discussing end of life whishes with patients suffering from chronic respiratory and/or cardiovascular diseases and with elderly people with pending cognitive deterioration.

The end of life study and the study into sexually transmitted diseases and HIV generated in 2013 several interesting publications about how to approach these issues in Dutch general practices; the information is available in this annual report.

The data in this annual report are this year again taken form the sentinel GP network in which GPs, often year after year, are willing to systematically collect information about these diverse subjects. We are very grateful for their cooperation.

Prof. dr. F.G. Schellevis
Chairman of the Counseling Committee
Dutch Sentinel General Practice Network

1 Introduction

NIVEL Primary Care Database, Sentinel Practices, is an information system based on records kept by general practitioners (GPs). A national network of general practices, covers with the patients registered in these practices about 0.7% of the Dutch population. The network design takes account of the geographical distribution of the population and its distribution over areas with different degrees of population density (see pp 14-19). The GPs participating in the sentinel network, weekly assess and deliver data with regard to certain illnesses, events and procedures in general practice.

Since 2009, the data on the topics are exclusively electronically registered and delivered. Most GP-information systems now contain an application, the so-called sentinel module, that facilitates the registration of these data. For participating practices, not having the integrated module at their disposal yet, a web application has been made available. Supplementary data gathered via questionnaires still are mostly registered by pencil and paper. This annual report is based on data assembled electronically, either via the sentinel module or via the web application.

Each year an update is made of the composition of populations of the sentinel practices by gender and age. Consequently it is known to what population the gathered data are related (the epidemiological denominator). Usually, data are presented as frequencies per 10,000 men or women (see page 26). Each year the Counselling Committee selects the topics for which data will be registered. The Committee also considers requests and suggestions for new topics by other parties. If a decision is made for the inclusion of a new topic a supervisor working at Nivel or from outside who is responsible for analyses is assigned.
At least five conditions must be met for a disease or occurrence to be registered:

1 The importance of the topic must be described.
2 Strict and unambiguous criteria must be definable for the disease or occurrence to be registered.
3 Application of these criteria must not take too much time and must fit in with the GP's routine practice work.
4 A need must exist for representative information at the national level.
5 The Sentinel Practices must be the best source of information.

The recording of data for a topic is discontinued if the topic 'owner' feels that data has been collected for a sufficiently long period of time, or if a different registration system is collecting more or less the same information, or if insurmountable problems have arisen in the recording of data.

This report provides background information on each topic included in the registration for the first time. Refer to previous reports for information about "old" topics. See pages 167-170 for an overview of the years when topics were first included in the registration.

1.1 International cooperation

The Sentinel Practices have been participating in international projects since 1985.
At present the oldest international project is the European Influenza Surveillance Scheme (EISS). From August 2008 this international collaborative program of, among others, all EU-countries is executed by the European Center of Disease Control (ECDC) in Stockholm. In ECDC sentinel networks of GPs and national influenza centers of participating countries collaborate. Apart from all EU countries also Norway, Ukraine, Switzerland, Serbia and Turkey are involved. At the same time, flu data delivered to the ECDC are also delivered to the World Health Organization (WHO).

In end-of-life research also from the beginning (2005) work has been done in international cooperation, initially only with Belgium, but over the past years with more European countries, such as Spain and Italy.

2 Counselling Committee

A condition of the grant received from the Ministry of Health, Welfare and Sport is that the Counselling Committee that overviews the registration system must in principle consist of:

The committee members in 2013 were:

Counselling Committee:	Mrs. Dr. Ir. B.H.B. van Benthem, (RIVM)
	Drs. R. Poos, (RIVM)
	P.J. van Dalen, Ministry from VWS
	Drs. S.M. Handgraaf, Sentinel GP
	Dr. ir. J.Korevaar, NIVEL
	Dr. Ir. M.H. Mossink, Ministry from VWS
	Mrs. Dr. E.E. Stobberingh, MD PhD, microbiologist (Maastricht University Medical Centre)
	Mw. K. van Beek (NIVEL)
	Prof. Dr. F.G. Schellevis, PhD, NIVEL (Chairman)
Project leader:	Mrs. Dr. G.A. Donker, (GP and Epidemiologist)
Secretary:	Mrs. M. Heshusius-van Valen

The counselling committee met twice in 2013.
In close collaboration with other partners of NIVEL Primary Care Database, i.e. the National GP Association (LHV), and the Dutch GP Society (NHG), the Sentinel Practices project team consists of the following persons:

Project leader	Mrs. Dr. G.A. Donker, (GP and Epidemiologist)
Secretary	Mrs. M. Heshusius-van Valen (NIVEL)
ICT support	Mr. J. Gravestein, Mr. G. Opperhuizen and Mr. N. Daems (NIVEL) Mr. W Tiersma (IQ healthcare)
Contact	Mrs. C. Walk - (IQ healthcare) and Mrs. E. Wentink(NIVEL)

3 Sentinel Practices staff seminar in 2013

For the appropriate functioning of the Sentinel Practices it is of utmost importance that Sentinel GPs and their co-workers, the Counselling Committee, the topic managers and project leaders meet regularly. Every year, at the start of a new registration period, which runs from the first of January to December 31, an annual meeting is held. From 2009, this annual meeting is combined with other participants and GPs of NIVEL Primary Care database. The GPs could assemble their own programme by choosing from the various workshops that were provided. This meeting was highly appreciated.

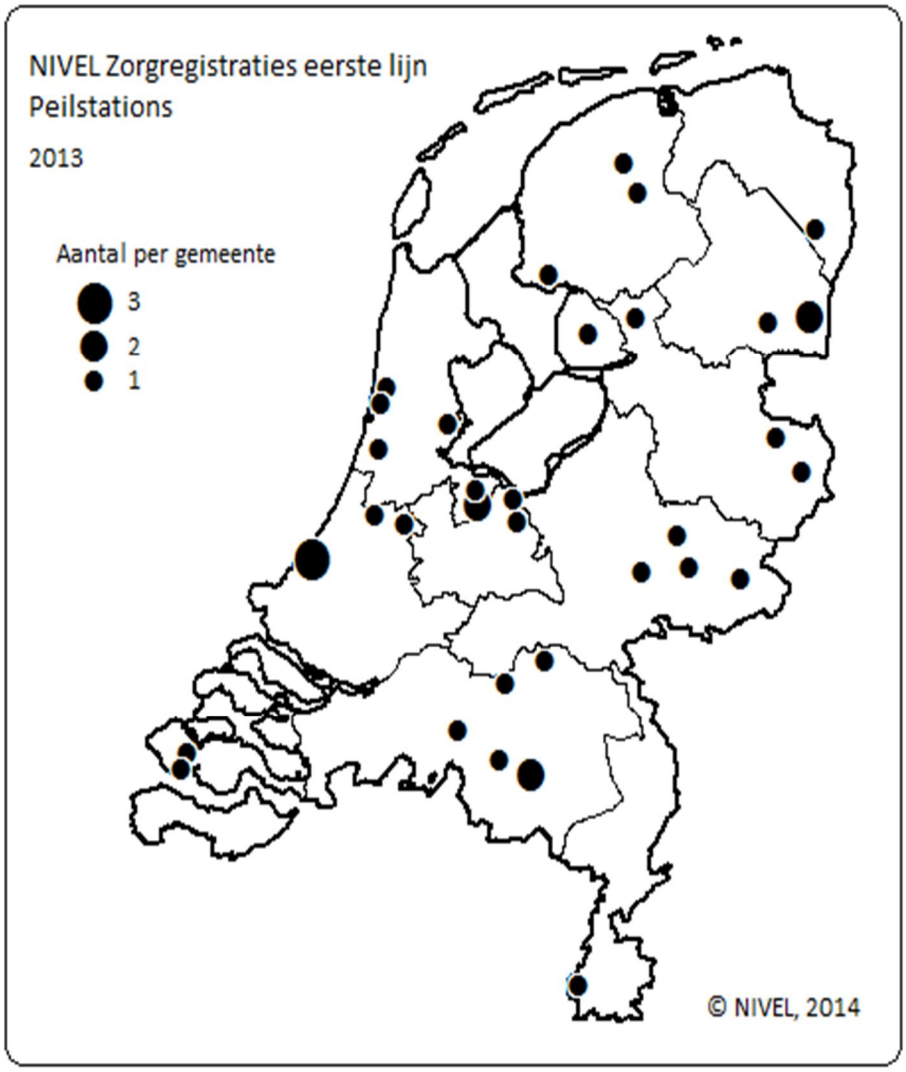
The program included presentations on the following subjects:

Prof. Dr. Peter Groenewegen (NIVEL, director)	Organization of primary care and performance.
Drs. Casper den Heijer (MUMC, physician)	(MR)SA in general practice: a problem in the Netherlands and Europe? Results of the APRES-study.
Dr. Nicoline van der Maas (RIVM)	The whooping cough epidemic of 2012. Are additional measures necessary?
Dr. Wim Opstelten (NHG, UU, GP)	The varicella-zoster-virus: from Pickles tot Takahashi.
Drs. Marcia Vervloet (NIVEL)	Lazy-Sunday afternoon. Variation in treatment adherence.
Dr. Robert Verheij (NIVEL)	Diagnoses in general practice. Appropriate for research?

Dr. Marijn Prins (NIVEL)	General practice care before and after treatment by a primary care psychologist.
Gé Donker (NIVEL, family physician-epidemioloog)	Cancer related gut feelings – a diagnostic instrument?
Drs. M. Heins (NIVEL)	Cancer is not only the patient's business. Care for the partner.
Dr. Margot Tacken (IQ healthcare)	Flu in the European context.
Drs. Susanne Claessen (VUMC, physician)	New developments in palliative GP care.

4 Methods

Figure 4.1



For location level practice see p. 165-166

4.1 Practices

There were 39 sentinel practices in the Netherlands in 2013. The number of participating GPs working in the sentinel practices was 56.

In this annual report the following breakdown and codes are used in processing and discussing the data:

N stands for the Groningen, Friesland and Drenthe province group (northern provinces);
O stands for the Overijssel, Gelderland and Flevoland province group (eastern provinces);
W stands for the Utrecht, Noord Holland and Zuid Holland province group (western provinces);
Z stands for the Zeeland, Noord Brabant and Limburg province group (southern provinces);
1 stands for address density category 5 (rural municipalities);[1]
2 stands for address density category 4-3-2 (urbanised rural municipalities and municipalities with urban features);
3 stands for address density category 1 (municipalities with 100,000 or more inhabitants).

Appendix 1 (pp159-164) contains a list of the GPs who participated in the sentinel practices in 2013. Two or more GPs cooperate at nine (24%) of the sentinel practices (two GPs cooperate in 4 practices, three in 2 practices, and four in three practices). The percentage of GPs working in a group practice nationwide in January 2013 was 71.7%; but 45% for the sentinel practices. In the sentinel practices a relative overrepresentation of single practice exists. There were eleven dispensing sentinel doctors, ten in rural areas and one in an urbanised rural municipality, which is 19.6% of the total number of sentinel GPs. The figure for the Netherlands as a whole is 6.8%.[2]

Tables 4.1 and 4.2 show the distribution of the number of sentinel doctors and sentinel practices in each province group and address density group in the 2004-2013 period.

Table 4.1 Distribution of sentinel GPs and sentinel practices per province group in the 2004-2013 period[3]

	N; Groningen, Friesland and Drenthe		E; Overijssel, Gelderland and Flevoland		W; Utrecht, Noord- and Zuid- Holland		S; Zeeland, Noord-Brabant and Limburg	
province-group	GPs	sentinel practices	GPs	sentinel practices	GPs	sentinel practices	GPs	sentinel practices
2004	12	5	7	6	23	17	14	10
2005	12	5	12	11	28	24	13	9
2006	10	4	9	9	25	22	9	7
2007	14	8	12	10	25	20	10	7
2008	14	8	12	10	24	19	11	8
2009	13	8	12	10	23	16	11	8
2010	12	8	13	10	23	14	15	9
2011	7	7	14	9	18	15	15	9
2012	7	7	10	8	21	14	17	10
2013	8	8	10	8	23	14	15	9

Table 4.2 Distribution of sentinel GPs and sentinel practices per address density in the 2004-2013 period

	1; rural municipalities ≤500/km^2		2; urbanised rural municipalities together with municipalities with urban characteristics 500-2500/km^2		3; municipalities with 100,000 or more inhabitants ≥2500/km^2		total	
address density	GPs	sentinel practices	GPs	sentinel practices	GPs	sentinel practices	GPs	sentinel practices
2004	6	4	39	25	11	9	56	38
2005	11	9	43	31	11	9	65	49
2006	11	9	28	21	18	14	53	42
2007	12	10	36	26	13	9	61	45
2008	14	11	33	25	14	9	61	45
2009	10	9	32	24	17	9	59	42
2010	14	11	36	23	13	7	63	41
2011	14	11	28	20	12	9	54	40
2012	14	11	30	21	11	7	55	39
2013	15	12	28	20	13	7	56	39

4.2 Practice populations

A census of most practice populations was held in 2013. The results of the census have been used in processing the Sentinel Practices data from 1 January 2013. The Sentinel Practices was designed with the aim of achieving a sample of approximately 1% of the population of the Netherlands.

However in recent years the sample is smaller due to budget constrictions. The design of the project aims to be representative by geographical distribution (the 'province groups' referred to above) and distribution over areas with different population density). A check was done to see whether these criteria were still met. The tables show that he northern part of the country is overrepresented, whereas the eastern and western regions are underrepresented. In the last few years, the Sentinel Practices represent 0.7% of the Dutch population. This is accounted for in the recruitment of new practices.

Table 4.3 Comparison of the population of the sentinel practices with the total population of the Netherlands, 2013

	population of the Netherlands**	population of sentinel practices* (with percentages)	
province group:			
N	1,718,485	18,836	(1.0)
E	3,553,582	22,137	(0.6)
W	7,533,529	48,145	(0.6)
S	3,973,979	30,704	(0.8)
gender:			
men	8,307,339	59,557	(0.7)
women	8,472,226	60,265	(0.7)
total (1-1-2013)	16,779,575	119,822	(0.7)

* Practices census 2013

** 1-1-2013 Netherlands Statistics *(Centraal Bureau voor de Statistiek).*

The total practice population of all Sentinel Practices at the beginning of 2013 was 119,822 persons, 0.7% of the Dutch population consisting of almost 17 million inhabitants. The table below shows the percentages of men and women in the Dutch population who are registered with the sentinel practices in 2013, with a breakdown by age group and province group in table 4.4.

Table 4.4 Percentage of men and women in the Dutch population registered with sentinel practices, by age group, province group and for the Netherlands as a whole in 2013

	province group								Netherlands	
	N		E		W		S			
	m	f	m	f	m	f	m	f	m	f
0-4	1.1	1.0	0.5	0.6	0.6	0.6	0.7	0.8	0.6	0.7
5-9	1.1	1.1	0.6	0.7	0.6	0.6	0.7	0.7	0.7	0.7
10-14	1.2	1.2	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.7
15-19	1.2	1.1	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
20-24	1.0	1.0	0.6	0.5	0.6	0.6	0.8	0.8	0.7	0.7
25-29	0.9	1.0	0.5	0.4	0.6	0.6	0.9	0.9	0.7	0.7
30-34	0.9	1.0	0.5	0.5	0.6	0.6	1.0	0.9	0.7	0.7
35-39	1.1	1.0	0.6	0.6	0.6	0.6	1.0	0.8	0.7	0.7
40-44	1.1	1.2	0.6	0.7	0.6	0.6	0.9	0.8	0.7	0.7
45-49	1.3	1.3	0.7	0.7	0.6	0.6	0.8	0.7	0.8	0.7
50-54	1.3	1.1	0.7	0.6	0.7	0.7	0.7	0.6	0.7	0.7
55-59	1.1	1.0	0.6	0.6	0.7	0.7	0.6	0.6	0.7	0.7
60-64	1.1	1.1	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7
65-69	1.1	1.1	0.7	0.7	0.6	0.7	0.8	0.8	0.8	0.8
70-74	1.2	1.1	0.7	0.7	0.7	0.6	0.8	0.9	0.8	0.8
75-79	1.2	1.1	0.7	0.7	0.6	0.6	0.9	0.9	0.8	0.8
80-84	1.1	0.9	0.7	0.7	0.6	0.6	1.0	0.9	0.8	0.7
≥85	1.2	0.9	0.7	0.6	0.7	0.7	0.9	0.8	0.8	0.7
total	1.1	1.1	0.6	0.6	0.6	0.7	0.8	0.8	0.7	0.7

4.3 Scale and continuity of reporting

The number of days per year that each sentinel practice reports and the combined number of reporting days per week of all sentinel practices have been checked and processed since 1975. This check is made to monitor the completeness and continuity of reporting. The sentinel doctors are requested to let it be known when they are unable to report due to holidays or personal circumstances.
The maximum number of days on which reporting is possible depends on the number of weeks in the year and on the number of sentinel practices. The number in 2013 was 9,265: 52 weeks x 5 days x 33 sentinel practices; 6 practices registered 8, 13, 16, 26, 27 and 47 weeks, due to the discontinuation or the start of their participation during the year.

In table 4.5 the absolute numbers and percentages are presented.

Table 4.5 Maximum number and actual number of reporting days per year (2004-2013)

year	maximum number of reporting days	actual number (absolute)	reporting day percentage
2004	10,070	7,983	79.3%
2005	12,740	10,011	78.6%
2006	10,465	7,905	75.5%
2007	10,860	9,205	84.8%
2008	10,450	9,087	87.0%
2009	10,755	9,381	87.0%
2010	10,480	9,965	95.0%
2011	10,140	9,432	93.0%
2012	9,605	8,831	91.9%
2013	9,265	8,545	92.2%

The percentage of reporting days in 2013 is comparable to 2012. The table below contains a breakdown by province group and address density.

Table 4.6 Reporting by province group and address density in 2013

province group		address density	
N	95.2%	1	91.3%
E	92.4%	2	89.9%
W	89.3%	3	95.0%
S	94.1%		

Figure 4.2 shows the weekly reporting of all sentinel practices. The influence of public holidays is clearly visible. The average number of non-reporting days of all sentinel practices together per week is 14 (maximum is 195 days).

Figure 4.2 Number of days in 2013 that data were recorded

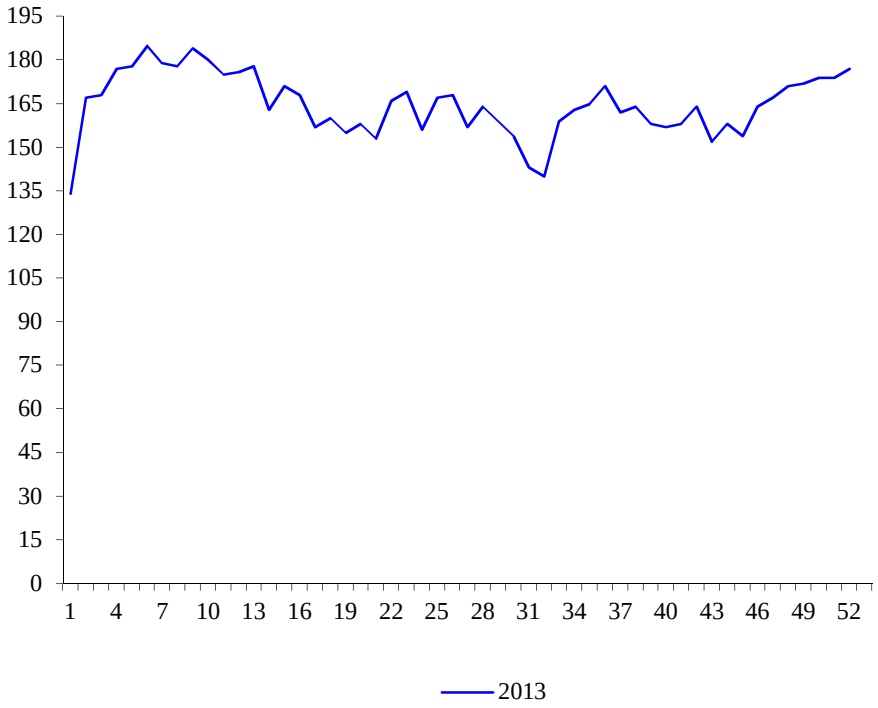


Table 4.7 shows the frequency distribution of the number of non-reporting days at each sentinel practice. The average number of non-reporting days per sentinel practice in 2013 was 18, which is less than in 2012 (19).
A breakdown into single and group practices reveals a significant difference, i.e. 23 and 4 days, respectively. This is in agreement with the hypothesis that in collaborative practices the continuity of reporting is better guaranteed.

Table 4.7 Frequency distribution of the number of non-reporting days per sentinel practice (2004-2013)

number of non reporting days	number of sentinel stations									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
0	2	1	2	3	8	-	5	7	4	7
1-9	-	-	1	8	3	7	18	12	18	16
10-19	-	1	1	6	15	8	8	10	6	5
20-29	3	4	3	5	4	10	4	5	3	3
30-39	3	7	4	5	2	9	5	1	2	2
40-49	9	12	8	6	4	4	1	2	1	-
50-59	15	11	8	5	1	1	-	-	1	2
60-69	2	4	7	2	2	1	-	1	1	-
70-79	-	2	-	1	2	-	-	1	1	1
80-89	1	2	1	-	1	-	-	-	1	1
90-99	-	1	1	2	1	-	-	-	-	1
≥99	3	4	6	2	2	2	-	1	1	1
total number of sentinel practices	38	49	42	45	45	42	41	40	39	39
average	55	56	61	37	31	33	13	19	20	18
median	52	49	66	31	17	23	7	11	8	8

Closer examination of the table reveals an increase in non reporting days over the years until 2006, after which it decreased but increased again in 2011 and 2012. A major failure to report i.e. no reporting by a sentinel practice on more than 50 days per year does occur in 2013 in six practices (15.4%) compared to 12.8% in 2012. The six practices that did not report in

2013 for more than 50 days did so for reasons of problems with the electronic registration. Illness of the GP, moving of the practice and shift to a new ICT system were the most frequent reasons for non-reporting over a prolonged period of time in the previous years.

4.4 Surveillance topics

In 2013 data were registered from the following topics. Between brackets the year is recorded in which the topic was entered for the first time.

1 Influenza (and influenza-like illnesses) (1970);
2 Pneumonia (2012);
3 Whooping cough (1998);
4 Gastro-enteritis (1996);
5 STD (2008);
6 Oak Processionary Larvae (2012)
7 End-of-Life study (2005);
8 Suicide (and attempted suicide) (1979);
9 Policy for symptoms mamma (2012);
10 Gut feeling (2010);
11 Request for euthanasia (1976);
12 Palliative sedation (2005);
13 Eating disorders (1985).

In principle, a weekly report is the base. This means that also patients that are seen by a locum doctor outside office hours, are reported, except influenza(like illness). Diagnosis by telephone or advices given by telephone are not reported; influenza is also here an exception.

An alphabetical list of all topics since 1970 is provided in appendix 2 (pp 167), together with the years during which the data were registered.

4.5 Analyses

This report contains the results of registration of topics in 2013. The data were processed at NIVEL.

Three tables are presented routinely for each subject:
1 absolute number of patients by gender and age group;
2 absolute number of patients by gender and province group;
3 absolute number of patients by gender and address density.

Tables 1, 2 and 3 are produced each week for surveillance purposes and each quarter and year for annual reporting purposes. For the participating doctors a feedback report is produced for each sentinel practice, presenting the average score per topic per 10,000 patients of the practice and this is compared to the averages of all sentinel practices.

With the exception of the information provided per sentinel practice, the data is also presented per 10,000 of the total practice population (relative frequencies). Frequencies have been rounded off. A frequency below 0.5 per 10,000 inhabitants is rounded off to '0'. '_' denotes that no cases were reported.
A frequency based on fewer than five reported cases is presented in brackets.
A frequency of new cases of a disease in a certain period of time is referred to as 'incidence' or 'incidence rate' in epidemiology. The term 'prevalence' refers to all cases of the disease that exist in a certain period of time or at a certain moment in time. There are also absolute and relative incidences and prevalences.
The cumulative incidence of periodic prevalence (per year) in general practice is calculated in this report in all instances per 10,000 inhabitants, men or women. Appendix 4 (p 171) shows the age structure of the Dutch population on 1 January 2013, which can be used to calculate absolute numbers for the Netherlands.

Data from practices reporting only 0, 1 or 2 days of the week are not processed i.e. the practice population is not included in the "denominator". In order to minimize underreporting reported cases during these days were included in the numerator. The practice populations of practices reporting

more than 2 days per week were processed normally.
A correction factor used to be applied because enquiries among sentinel doctors revealed that an absence of 1 or 2 days merely meant that the work was shifted to a different time. The practice populations are calculated based on practice registries of patients. The GPs are instructed to report for the Sentinel Practices topics exclusively on patients on their practice registry. This procedure is a little bit different from previous years, reason why all annual report figures have been recalculated over the years 2009 to 2013 to make comparison with previous years meaningful in this annual report.

The tables were produced using the weekly records, with frequencies being calculated on the basis of the average population present in the period concerned.

As mentioned in the introduction, the purpose of this report is to present data, not to provide a complete analysis of that data.

The following annual tables are included (pp 173-178).

1 Cumulative, i.e. all sentinel practices in a standardised format, year 2013, weeks 01-52, pp 1-3.[4]
2 Province group standardised according to illness, year 2013, weeks 01-52 pp 1-3.[4]
3 Address density, standardised according to illness, year 2013, weeks 01-52, pp 1-3.[4]

4.6 Extrapolation of observed frequencies to the Dutch population as a whole

For each topic a general impression is extrapolated of the numbers of patients, consultations, actions and events in the Netherlands. The figures presented are based on frequencies calculated using data recorded by sentinel practices. As pointed out in previous reports, readers should bear in mind when examining the tables that while the populations of the sentinel practices represent the Dutch population as a whole with reasonable accuracy (see also pages 16-20), the sentinel doctors are a select group. Consequently it is impossible to determine conclusively to what extent the results vary from the situation that exists in reality. Variations may differ depending on the nature of the topic. Caution should be exercised when examining topics that include intervention by a GP. Similarly, the 'suicide and attempted suicide'[5] topic appears to differ from data recorded elsewhere, probably because these occurrences are not always reported to a GP. With regard to the topics: end-of-life, pneumonia and sexually transmitted diseases only practices reporting these items in 2013 and previous years were included in the analysis in order to decrease underreporting. Nevertheless, readers should examine **not only** the extrapolated numbers, but should also refer to the chapters concerned. To allow correct interpretation of the extrapolated figures, the details of the total Dutch population per year are presented in table 4.8, in thousands.

Table 4.8 Dutch population by gender, in thousands, 2004-2013 (CBS)*

year	men	women	total
2004	8,046	8,212	16,258
2005	8,066	8,240	16,306
2006	8,077	8,257	16,334
2007	8,089	8,269	16,358
2008	8,112	8,293	16,405
2009	8,156	8,329	16,486
2010	8,203	8,372	16,575
2011	8,244	8,412	16,656
2012	8,283	8,447	16,730
2013	8,307	8,472	16,779

* Numbers as on 1 January of each year.

4.7 Confidence intervals

Reliability margins have to be applied when examining the incidence rates and prevalence rates estimated for the entire Dutch population. The table below provides an impression of the incidence rates and prevalence rates, for relative and absolute numbers.

The table should be read in the following way. If a frequency of 1 per 10,000 patients is observed in the sentinel practices' total population of approximately 119,822 patients (1st column), the 95% confidence interval is 0.43 – 1.57 per 10,000 (2nd column). It then follows that the estimated absolute number in the Dutch population is 1678 (3rd column), and that the 95% confidence interval is between 728 and 2,628. The table shows how these estimates relate to a frequency at the sentinel practices of 1 to 1,000 per 10,000 patients with some intermediate 'steps'. The confidence intervals are particularly high at the lower frequencies.

Table 4.9 Confidence intervals of estimates of incidence and prevalence and sentinel station practices per 10,000 and the absolute numbers

frequency per 10,000		Netherlands (absolute numbers)	
frequency	95%CI	absolute number	95%CI
1	0,43 - 1,57	1678	728 – 2,628
10	8,21 – 11,79	16779	13,777 – 19,783
100	94,37 – 105,63	167796	158,342 – 177,249
1,000	983,01 – 1,016,099	1677958	1,649,455 – 1,706,461

For the total groups of men and women separately, each comprising about half of the total population, the confidence intervals are only a little wider than shown in the table. For separate 5 or 10-year age groups, the intervals obviously are much wider, because these groups are smaller in size (with thanks to Dr. C. van Dijk, NIVEL).

5 Influenza(-like illness)

Topic owner: National Influenza Centre *(National Influenza Centre)* (1970-2013)

Introduction

Influenza is an important health care and public health problem.
Influenza has been linked to an increase in the number of consultations and visits by GPs, as well as to an increased workload in health care and nursing institutions, an extra load on hospitals as a result of more referrals and admissions and an increase in the mortality rate. In addition, absenteeism due to influenza means loss of production from the workforce and pupils not attending school.

Cases of influenza occur every year in the Netherlands and throughout the rest of the world. The usual 'influenza season' runs from week 40 to week 20 of the following year. In the so-called inter pandemic situation an influenza epidemic actually only occurs in the winter in the northern hemisphere. A pandemic also may occur outside this season and this phenomenon did happen in 2009. Since registration of influenza-like illness (ILI) began, the influenza epidemics have always started between mid-November and the beginning of March, except for the pandemic in 2009, that lead to an epidemic from the beginning of October (week 41) in the Netherlands, earlier than ever before over the 43 years of registration of ILI in the sentinel practices.

The history of well-described outbreaks of respiratory infections dates from 1173-1174. The incidence of airway infection described in that winter is considered to be a good description of an influenza epidemic. Since the end of the 12th century a number of descriptions of (sometimes worldwide) outbreaks of what appeared to be influenza do exist.
In the 20th and 21st century the world was hit by four pandemics (the Spanish flu (1918-1919), the Asian flu (1957-1958), the Hong Kong flu (1968-1970) and the Mexican flu (2009-2010) of which the flu outbreak in 1918-1919 made the most impression and left frightened people in its wake:

approximately 40 million dead throughout the entire world.
In 1933 various pieces of the influenza puzzle started to fall into place and the influenza virus was identified and held responsible for small or larger outbreaks of acute respiratory infections where it was not unusual for the infected person to die. It was also proven that influenza could be transmitted from animal to animal, from animal to human and from human to human.

After the 2nd World War the newly set up World Health Organisation decided in 1949 to monitor influenza. National Influenza Centres were established to track the occurrence of influenza and report to the WHO. However, it was only at the start of the 1960s that sentinel doctors began to register the occurrence of influenza among the population (in England and Wales). Other European countries followed. For example, the Netherlands set up the Sentinel Practices in 1970 as a representative national network that succeeded the local networks in a number of large cities.
At the start of the 1990s the quality of the influenza surveillance system was further improved. From 1992/1993, sentinel GPs in an increasing number of European countries took a nose and/or throat swab from patients with an influenza-like illness (ILI) or an acute respiratory infection. These swabs were then sent for further tests at the laboratory of the National Influenza Centre for virological determination. This procedure is also applied in the Netherlands.

Method

The GPs register patients who consult them for an acute influenza-like illness known as ILI, that meets the Pel criteria.[6] These are defined as follows: (Pel.1965)*)

1 An acute start, so a maximum prodromal stage of three to four days (included pre-existing infection of the respiratory system at not-ill-making level).
2 The infection should also involve rise in temperature of at least 38^0, Celsius, rectal.
3 At least one of the following symptoms should occur: cough, nasal catarrh, sore throat, frontal headache, retrosternal pain, myalgia.

*) Pel, J.Z.S., 1965 Proefonderzoek naar de frequentie en de aetiologie van griepachtige ziekten in de winter 1963-1964. Huisarts en Wetenschap 1965:86:321.

The age of the patient is also recorded.
The doctor is asked to take a nose and throat swab from 2 patients with ILI per week which are then sent for further testing to the National Institute for Public Health (RIVM) (Infectious Diseases Diagnostics and Screening Laboratory). In case no patient with ILI consults the GP in a week the GP is requested to swab a patient with another acute respiratory tract infection (ARI) for virological determination. The registration form accompanying the swabs contains besides the diagnosis (ILI or ARI) also information about symptoms, influenza vaccination (yes or no), use of antiviarals and recent travel history. In the RIVM laboratory the swabs are additionally assessed for respiratory syncytial virus (RSV), rhinovirus and enterovirus since 2008. The number of pathogens for which tests are performed may be adapted when necessary.
The results are analysed and reported throughout the year but they are presented in this report from week 40 to week 20 of the following year.

Results

In the 2013/2014 season the baseline above which an excess level of flu activity can be observed, was maintained at 51 per 100,000. This line is based on statistical analysis of the incidence of ILI during the last 10 seasons outside the epidemic period. Increased influenza activity is defined as the incidence of ILI exceeding the baseline of 51 per 100,000 for two consecutive weeks and if samples sent to RIVM are found to contain influenza viruses in a substantial percentage. The method for calculation of the baseline was developed by the previously functioning European Influenza Surveillance Scheme (EISS) in order to harmonize the baselines of the various European Countries, taking into account the variety in health systems.
The season 2013/2014 was characterized by a mild influenza epidemic from week 4 to and including week 11 in 2014. The incidence of influenza like illness (ILI) fluctuated around the epidemic baseline for several weeks in the respiratory season 2013/2014. In week 7 of 2014 the peak of the mild

epidemic was recorded with 8.6 per 10,000 population after which the incidence decreased fairly fast to baseline levels in week 12. Also in weeks 2, 15 and 16 the incidence was above the epidemic baseline. The cumulative ILI incidence was in the season 2013/2014 comparable to the seasons 2010/2011 and 2011/2012, but lower than the incidence in the seasons 2009/2010 and 2012/2013. The ILI incidence was almost the entire season for the youngest age group of 0-4 years (Figure 5.1).

Between week 40 of 2013 through week 20 2014 340 ILI and 483 ARI swabs were sent to the RIVM by the sentinel GPs. In total influenzavirus was found in 68 ILI and ARI swabs of which 37 times (54%) A(H3N2), 24 times (35%) A(H1N1)pdm09 and 7 times (10%) type B. This season was dominated by type A influenza viruses, especially type A(H3N2).

Remarkable was the low percentage of influenzavirus (17%) found in the swabs of sentinel GPs during the first 6 weeks of the influenza epidemic 2013/2014 compared to three previous epidemics (40% in 2009/2010, 58% in 2010/2011 and 54% in 2012/2013). In contrast to three previous epidemics a high percentage of rhinovirus (15%) and respiratory syncytial virus (RSV,19%) was found during the epidemic 2013/2014; rhinovirus was found in 15% of the swabs in 2009/2010, 3% in 2010/2011 and 5% in 2012/2013 and RSV in 2% of the swabs in 2009/2010, 9% in 2010/2011 and 6% in 2012/2013. In week 9 to and including week 18 the percentage of swabs containing influenzavirus (average 31%, range 10-45%) was more comparable to previous epidemics. The incidence of ILI fluctuated around the epidemic baseline during this period.
This season was dominated by influenzavirus type A(H3N2) after a domination of influenzavirus type B in the previous season. Virologically the season was surprising due to a relatively low percentage of swabs containing influenzavirus and a relatively high percentage of swabs containing rhinovirus and RSV. All but one of 37 A(H3N2), 24 A(H1N1)pdm09 and 7 type B influenza viruses tested for the susceptibility of antiviral drugs oseltamivir and zanamivir proved to be normally sensitive. One influenzavirus A(H1N1)pdm09 strain showed a strongly decreased sensitivity to neuraminidase inhibitors.

Marked regional differences in influenza activity were observed this season. The highest ILI incidence (12.5 per 10,000 inhabitants, figure 5.2) was noted

in week 8 in the eastern part of the country.
The incidence was the highest in the rural area (Figure 5.3). As usual, the highest ILI incidence did occur in the age group 0-4 years, which was not vaccinated this season, like the previous two seasons (Figure 5.4). Detailed analyses of viruses in the NIC (location EMC) and the WHO-collaborating centre in London showed that the viruses in this season's flu vaccine were similar to the circulating viruses, so vaccinated persons were relatively well protected.

Figure 5.1 Number of incidental patients with influenza-like illness per week per 10,000 inhabitants, for the Netherlands in, 2011/2012, 2012/2013 and 2013/2014

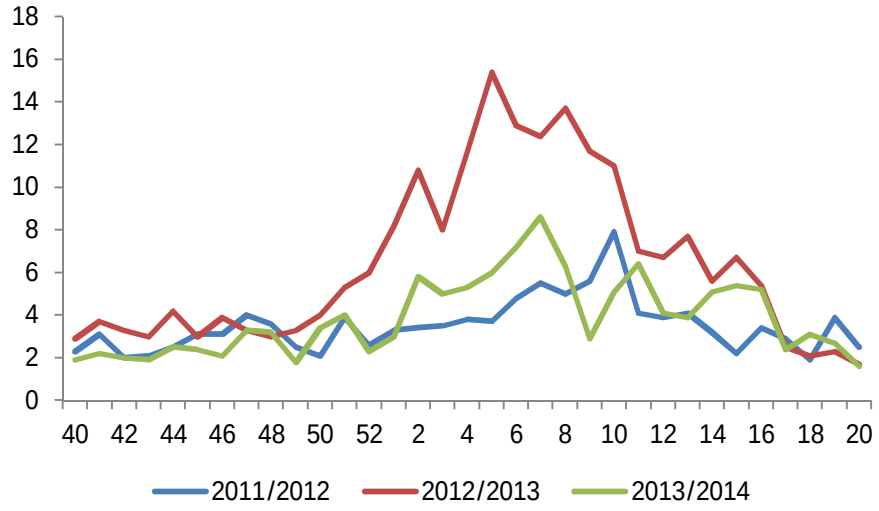


Figure 5.2 Number of incidental patients with influenza-like illness per week per 10,000 inhabitants, according to population density in 2013/2014

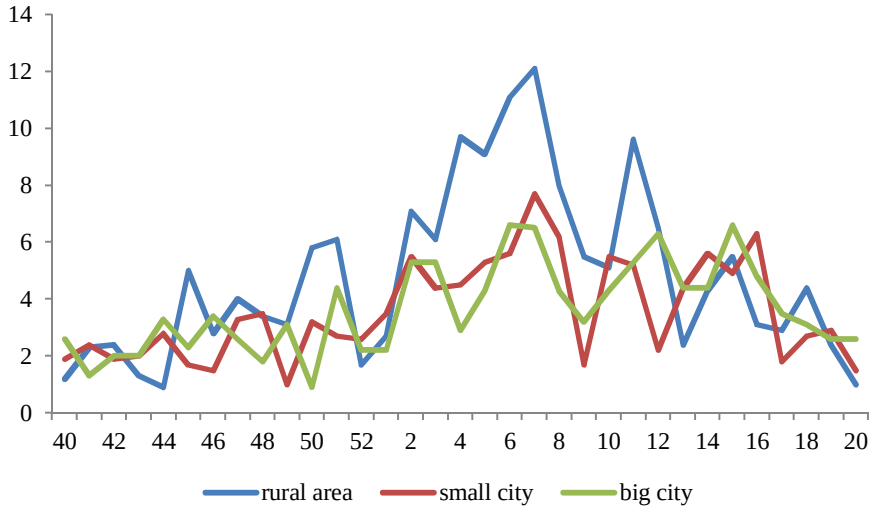


Figure 5.3 Number of incidental patients with influenza-like illness per week per 10,000 inhabitants, per province group in 2013/2014

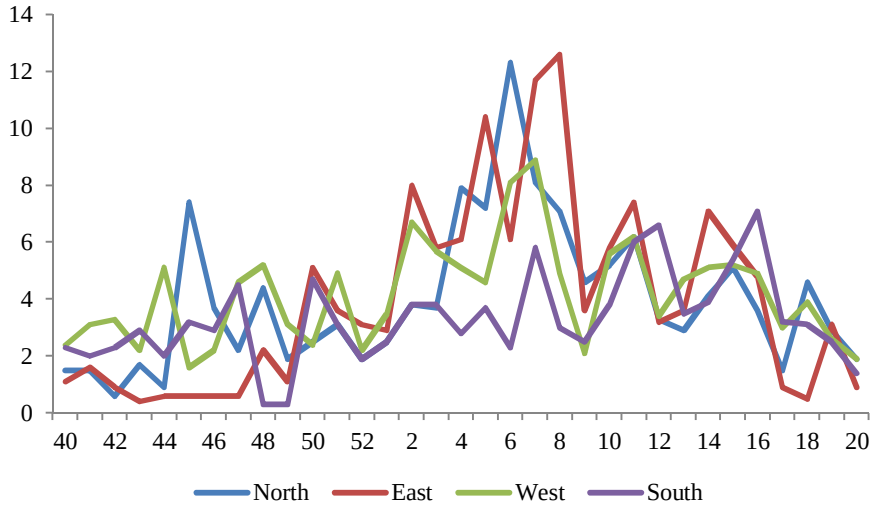


Figure 5.4 Number of incidental patients with influenza-like –illness, per 10,000 per age group, season 2013-2014

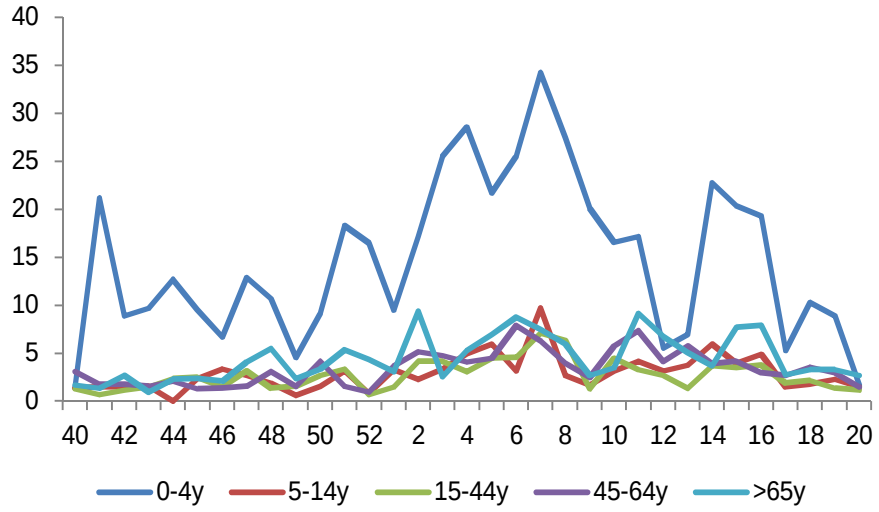


Table 5.1 Number of incidental patients with influenza(-like illness), per 10,000 inhabitants, 2003-2013

year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
total calendar year	71	208	109	141	168	309	130	171	170	256	
highest weekly incidence per 'season'		26	14	8	7	15	19	11	8	15	9

Extrapolation

Table 5.2 Extrapolation of incidence rates influenza like illness to the Dutch population

	frequency incidence rate (per 10,000)*	Netherlands** (absolute numbers)
topic year	total (m+f)	total (m+f)
influenza like illness		
2004	71	116,000
2005	208	339,000
2006	190	310,000
2007	141	231,000
2008	168	276,000
2009	309	453,000
2010	130	212,000
2011	171	285,000
2012	170	284,000
2013	256	430,000

* number influenza like complaints per 10,000 men and/or women (data from sentinel practices)

** extrapolation of the incidence rates to the Dutch population as a whole (for the year in question), rounded off to the nearest thousand

Discussion

The season 2013/2014 was characterized by a late mild epidemic of 8 weeks dominated by influenzavirus type A(H3N2). This season a relatively low percentage of influenzavirus was found in swabs sent by sentinel GPs during

the first 6 weeks of the epidemic compared to three previous epidemics. After week 8 in 2014 the percentage of influenza positive swabs increased and the ILI incidence was fluctuating around the epidemic baseline. The epidemic started in week 4 of 2014 and lasted for eight weeks. The peak incidence was reached in week 7 of 2014; 8.6/10,000 were reported that week by the GPs. Thereafter the incidence decreased fairly fast and fluctuated for several weeks around the epidemic baseline. As usual the highest incidence did occur in the age group 0-4 years. The incidence among persons ≥65 years was relatively low. Analyses of viruses isolated in the Netherlands showed that the viruses of this season's influenza vaccine showed similarity with the circulating influenza viruses, thus vaccinated persons were relatively well protected.

This topic will be continued.

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6 Pneumonia

Topic owner: Mw. Dr. R. van Gageldonk, RIVM (2007-2010, 2013)

Introduction

Thanks to the Sentinel Practices since years a good overview is available of the incidence of influenza like illness (ILI) and influenza virus in the Dutch population.[7]
Pneumonia is one of the most important complications of ILI and a potentially life threatening disease. Most information concerning incidence, risk factors, ethiology at the moment is generated from secondary care, reason why population incidence and trends are unknown. This is the reason that important information is lacking for adequate disease management.[8]

The pneumonia surveillance was initiated in 2007 to support 'pandemic preparedness'. As pneumonia is one of the most important complications of influenza, a combination of influenza and surveillance strengthens the knowledge of epidemiology of both diseases. Pandemic preparedness remains important after the 2009 pandemic, especially due to the circulation of highly pathogenic avian influenza viruses. To enhance successful interpretation of fluctuations during a pandemic knowledge of historical patterns is essential, reason why continuous surveillance of influenza and pneumonia is necessary.

The goal of the pneumonia surveillance is a nationally representative overview of geographic and seasonal trends in the incidence of pneumonia in primary care, stratified by age and gender, compared to incidence of ILI incidence and trends.

Method

The general practitioners are asked to register new patients with the clinical diagnosis of pneumonia with ICPC-code R81. It is not essential that the diagnosis has been confirmed by x- ray. Still, it is asked whether a thorax photo has been made and whether the patient has been hospitalized.
The following questions are asked:
- Has a sample been taken for culturing?
- Has the diagnosis been confirmed by x-ray?
- Is the CRP level increased?

When pneumonia is caused by ILI this will be recorded in the patient record and usual virological examination for ILI will take place by sending nose and throat swabs to RIVM. Results of the virological examination are reported after about one week.

Data from sentinel practices reporting about pneumonia not at all or only once were excluded from the annual analysis because it is unlikely that pneumonia does not or hardly occur in a whole year in a given practice. Including the data of these practices would lead to an underestimation of the incidence in general practice.

Results

In 2013 the results are based on 29 reporting sentinel practices. Results of 10 practices were not included, 6 practices reporting no case (in 1 practice due to a long lasting illness absence of the GP) and 4 practices reporting only one case of pneumonia. Table 6.1 shows the number of patients with pneumonia per region and address density. The incidence of 49 cases per 10,000 is slightly lower than in the period 2007-2010, but higher than in 2012. The incidence is like in 2012 lowest in rural areas.

Table 6.1 Number of patients with pneumonia per 10,000 inhabitants, per province group, address density and for the Netherlands, 2007-2010, 2012-2013

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2007	39	47	62	61	73	45	68	54
2008	48	47	76	64	94	48	69	59
2009	62	72	66	35	93	48	73	62
2010	65	48	76	22	75	49	46	55
2012	16	30	60	38	15	66	30	46
2013	23	33	65	44	18	73	29	49

* 1: ≤500/km^2 2: 500-2500/km^2 3: ≥2500/km^2

Seasonal influence

Comparison of the incidence per season during the period 2007-2010 shows that pneumonia occurs mostly in winter (first trimester) and less often in summer (third trimester). In 2012 and 2013 this was also the case and the peak was in the first trimester concurrent with the influenza epidemic (table 6.2).

Table 6.2 Number of patients with pneumonia per 10,000 inhabitants per quarter, 2007-2010, 2013

	weeks 1-13	weeks 14-26	weeks 27-39	weeks 40-52
2007	18	11	9	15
2008	19	13	9	17
2009	20	10	12	21
2010	21	13	9	13
2012	18	9	7	11
2013	22	11	4	11

Age distribution

The incidence of pneumonia is the highest in the age group 0-4 years and the elderly (≥65 years). The highest incidence occurs in persons of ≥85 years: 266 per 10,000. In elderly persons between 75 and 85 years of age the incidence is higher in men than in women. In the younger age groups the differences between men and women are inconsistent, but in 2013 the incidence in women in the age group 55-64 years was relatively high (table 6.3).

Table 6.3 Number of male and female patients with pneumonia per 10,000; per age group and for the Netherlands, 2012-2013

	2012			2013		
age group	m	f	t	m	f	t
≤1	185	(31)	109	-	(24)	(13)
1-4	79	69	74	(25)	38	31
5-9	28	(6)	17	23	24	23
10-14	(16)	(17)	16	21	(4)	13
15-19	(22)	(17)	20	(4)	26	15
20-24	-	(5)	(3)	(13)	21	17
25-29	(16)	35	26	(17)	25	21
30-34	(20)	(26)	23	(8)	22	15
35-39	(19)	14	17	(8)	41	24
40-44	43	26	35	44	30	37
45-49	35	44	39	44	45	45
50-54	(19)	34	27	44	35	40
55-59	59	71	65	39	91	66
60-64	59	75	67	58	93	75
65-69	76	105	91	74	112	93
70-74	94	106	100	94	74	86
75-79	98	67	81	142	81	109
80-84	206	60	116	186	109	141
≥ 85	(110)	249	209	270	265	266
total	43	48	46	43	54	49

The numbers between brackets are based on N<5

Extrapolation

Table 6.4 Extrapolation of incidence rates to the Dutch population

	frequency incidence rate (per 10,000)*			Netherlands** (absolute numbers)		
topic year	m	f	total (m+f)	m	f	total (m+f)
pneumonia						
2007	55	54	54	44,000	45,000	89,000
2008	67	59	59	54,000	43,000	97,000
2009	62	61	62	51,000	51,000	102,000
2010	57	53	55	47,000	44,000	91,000
2012	43	48	46	36,000	41,000	77,000
2013	43	54	49	36,000	46,000	82,000

* number of patients with pneumonia per 10,000 men and/or women (data from sentinel practices)

** extrapolation of the incidence rates to the Dutch population as a whole (for the year in question), rounded off to the nearest thousand

Discussion

The registration of pneumonia shows a clear correlation with the seasons: the highest incidence occurs in the first trimester of 2013, concurrent with the influenza epidemic. Only at old age (75-84 years) the incidence in men is higher than in women, probably due to more co-morbidity in men related to smoking in these age categories (COPD and cardiovascular disease). The

incidence of pneumonia is in 2012 and 2013 at a lower level compared to the previous registration period 2007-2010. Results of 10 practices were not included due to probable underreporting.

This topic will be continued in 2014.

Publications based fully or partly on NIVEL Primary Care Database, Sentinel Practices

Spuesens EBM, Meijer A, Bierschenk D, Hoogenboezem T, Donker GA, Hartwig NG, Koopmans MPG, Vink C, Van Rossum AMC. *Macrolide resistance determination and molecular typing of Mycoplasma pneumoniae in respiratory specimens collected between 1997 and 2008 in The Netherlands.* J Clin Microbiol 2012;50(6):1999-2004. DOI:10.1128/JCM.00400-12

7 Whooping cough

Topic owner: Dr. H. de Melker, (RIVM) (1998-2013)

Introduction

Whooping cough is an acute, very infectious disease of the upper airways that is caused by the bacteria *Bordetella pertussis* and in some cases by *Bordetella parapertussis*.
Notably in children younger than 3 months whooping cough may have very serious complications such as brain damage and convulsions**,** actelectasis of the lungs, pneumothorax, and pulmonary emphysema and even death.
Immunity is built up both after having had whooping cough and after having a vaccination, but in both cases the immunity decreases again with the passage of time.
Vaccination against *Bordetella pertussis* has been included in the Dutch government's vaccination programme since 1952. The percentage of people reached by this programme is high (≥ 96%).

The vaccine that was developed in the 1950s was effective in preventing the infection but did not wipe out the bacteria. The bacteria remained in circulation and in spite of the large numbers of people who have been vaccinated the incidence of whooping cough in the Netherlands has been increasing since 1996. Every few years it reaches epidemic levels. Analysis of the available data showed that the proportion of vaccinated people among the indicated disease cases of whooping cough had increased.[9] Therefore, since July 2001 children at four years of age received revaccination with acellular whooping cough vaccine. Since 2005 the whole cell whooping cough vaccine component in the first year of life has been replaced by a combination vaccine with an acellular whooping cough component.

Whooping cough is one of the diseases included in the national mandatory notification. However, the development of the illness and the criteria for registration lead to significant under-reporting and the number of notifications do not reflect the real picture. Underreporting may be caused by

3 reasons. Firstly, many people, notably adults who have been coughing for a few weeks, do not quickly decide to consult a doctor. Secondly, if a patient consults a doctor and the doctor suspects whooping cough, then a laboratory test will not always be requested. Thirdly, not all GPs report all proven cases of whooping cough to the health authorities.

Direct registration of whooping cough in general practice is one way of gaining insight into the extent of under-reporting. At the end of the 1990s information about the incidence of whooping cough was not available in general practice and was just as difficult to obtain from other sources. Further research into the changes in the epidemiology of whooping cough was considered desirable, especially after the introduction of an improved vaccine in 1998. In 1998, it was decided to explore prevention of whooping cough and the diagnostic method in the sentinel surveillance. Because of the recent changes in the strategy of vaccination against whooping cough it is desirable that monitoring will be continued. In 2010, further analysis into the shifts in epidemiology and age distribution took place, since the introduction of the acellular vaccine and in 2012 this was done as well and compared to the national mandatory notification register (Donker and van der Maas).[10,11]

Method

The sentinel doctor is asked to register every patient with whooping cough, divided up into gender and age group. A case description is not easy because of the often atypical development of whooping cough in vaccinated people. The sentinel doctors use the following definition for whooping cough: Long-term cough (longer than 3 weeks) with more or less typical characteristics and/or proof of *Bordetella pertussis/parapertussis* infection (according to the protocol of the National Coordination Centre for Combating Infectious Diseases (*Landelijke Coördinatiestructuur Infectieziektebestrijding*).

Using an additional questionnaire, a difference is made between clinical whooping cough that is not laboratory-confirmed and a symptomatic infection (typically or not) with *Bordetella pertussis/Bordetella parapertussis* that is confirmed by a laboratory test. By making this distinction, insight may be obtained into the frequency of whooping cough

diagnosed by the GP on basis of clinical signs only.
A few weeks after registering a case of whooping cough the GP is asked to provide additional information about the registration and about the results of the laboratory test if one was requested. The GP will also be asked whether the patient has ever been vaccinated against whooping cough and if so, how many doses of inoculation have been applied.
The information, together with other sources of information about the occurrence of whooping cough, is used by the Centre for Infectious Diseases, Epidemiology and Surveillance of the RIVM at Bilthoven to interpret the progress of whooping cough in the Netherlands.

Results

The number of new cases of whooping cough per 10,000 patients per region and by population density is presented in table 7.1.

In 2013 26 patients were reported with whooping cough amounting to 3 per 10,000 patients. This incidence is comparable to previous non-epidemic years, which means a decrease of the incidence to one third of the incidence of the epidemic year 2012 (see table 7.1). An epidemic occurs every three to four years. Since the introduction of the acellular vaccine - for four year olds in 2001 and for zero year olds in 2005 – the epidemics were supposed to be decreasing, but the contrary appeared to be true in 2012.[11] The incidence in 2012 was comparable to the incidence in 2004, after implementation of the revaccination at four years of age, but before introduction of the accellular vaccine.

Table 7.1 Number of patients with whooping cough by province group, address density and for the Netherlands as a whole, per 10,000 people, 2004-2013

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2004	6	10	8	9	7	7	12	8
2005	0	6	6	11	6	6	5	6
2006	1	7	2	1	7	2	2	3
2007	4	6	4	8	7	5	3	5
2008	3	1	3	15	5	5	2	5
2009	2	6	5	0	2	4	2	3
2010	3	2	3	3	1	4	3	3
2011	-	3	2	4	2	2	3	2
2012	23	5	8	7	10	9	9	9
2013	3	1	2	5	2	3	2	3

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$2500/km^2

No consistent differences have been found in province group and population density during all the years of registration.

Distribution by age group

Table 7.2 shows the numbers of patients with whooping cough per 10,000 inhabitants and per age group.

Table 7.2 Number of patients with whooping cough by age group per 10,000 inhabitants, 2004-2013

age group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
≤1	(29)	(8)	(18)	(8)	9	(17)	(8)	(9)	(32)	(-)
1-4	35	30	17	17	8	18	(4)	11	12	17
5-9	33	18	(7)	10	9	7	(4)	(3)	15	(2)
10-14	23	10	10	17	24	7	12	(5)	30	(3)
15-19	10	(3)	(7)	14	6	7	(4)	(6)	16	(3)
20-24	(3)	-	-	(3)	(2)	(2)	(4)	(3)	13	(-)
25-29	-	-	-	0	(3)	-	(1)	-	(7)	(2)
30-34	6	5	(3)	(6)	(2)	(3)	(3)	(2)	(5)	(3)
35-39	6	4	(1)	(1)	(4)	-	-	(1)	(3)	(5)
40-44	-	(1)	-	(5)	6	(5)	(3)	(2)	10	(-)
45-49	(3)	6	-	6	(1)	(1)	(3)	(1)	9	(1)
50-54	(6)	(4)	-	0	(1)	(1)	(1)	(1)	(5)	(5)
55-59	(3)	(5)	-	(1)	(4)	(1)	(1)	-	(7)	(-)
60-64	-	(6)	-	(2)	(2)	-	(3)	(1)	(3)	(2)
65-69	(5)	-	-	0	-	-	(2)	(2)	(6)	(2)
≥70	(0)	(2)	-	-	-	(2)	(1)	-	4	(1)

The numbers between bracket are based on N<5

Whooping cough may occur at any age. Analysis of the period 1998-2009 in three groups of 4 years shows that since the introduction of the acellular vaccine – for four year olds in 2001 and for zero year olds in 2005 – the peak incidence gradually shifts from toddler to teenager.[10] In 2012, the highest incidence is found in the age groups 10-19 years (teenagers) as well, but in 2013 the peak incidence was in the age group 1-4 years.

Extrapolation

Table 7.3 Extrapolation of incidence rates whooping cough to the Dutch population

	frequency incidence rate (per 10,000)*	Netherlands** (absolute numbers)
topic	total	total
year	(m+f)	(m+f)
whooping cough		
2004	8	13,000
2005	6	9,800
2006	3	4,900
2007	5	8,000
2008	5	8,000
2009	3	5,000
2010	3	5,000
2011	2	3,000
2012	9	15,000
2013	3	5,000

* number whooping cough per 10,000 inhabitants (data from sentinel practices)

** extrapolation of the incidence rates to the Dutch population as a whole (for the year in question), rounded off to the nearest thousand

Discussion

In spite of the large number of people being vaccinated against whooping cough it still does occur relatively often in the population and 2012 showed an obvious epidemic. In 2013 the incidence is less than one third of the epidemic year 2012, but comparable to other non-epidemic years. Whooping cough occurs in all age groups. Since the introduction in 2001 of vaccination

with an acellular vaccine at the age of 4 years and the replacement of a cellular vaccine by an acellular vaccine in the first year after birth in 2005, the peak incidence gradually shifts towards teenage groups. During the 2012 epidemic the highest incidence was also found in teenagers, but in 2013 the peak incidence occurred in the age group 1-4 years. In the mandatory notification reports the incidence up to and including 7 years is low and the peak incidence occurs in children and adolescents from 8 years old. A comparison of mandatory notification reports and the sentinel surveillance does not show a difference in age distribution. A publication of the whooping cough epidemic in 2012 comparing mandatory notified cases and the sentinel surveillance was published in December 2012 in Huisarts & Wetenschap (Donker en Van der Maas).[11]

The topic will be continued in 2014.

Publications based fully or partly on NIVEL Primary Care Database, Sentinel Practices

Van der Maas NAT, Kemmeren JM, Lugner AK, Suijkerbuijk AWM, Donker GA, Buisman A, Berbers GAM, Van Els CACM, De Melker HE, Mooi FR. Pertussis. In: Schurink-van 't Klooster TM, De Melker HE, editors. *The National Immunisation Programme in the Netherlands* – developments in 2013. Bilthoven 2014, RIVM report 150202002/2013:36-43

Donker Gé, van der Maas Nicoline. *De kinkhoestepidemie van 2012.* Huisarts en Wetenschap 2012;55(12):571

Donker Gé, van der Gevel Joost. *Kinkhoest van kinder- naar tienerziekte.* Huisarts en Wetenschap 2011;54(2):53

Greeff de Sabine C. Lugnér Anna K. Heuvel van den Danielle M, Mooi Frits R, Melker de Hester E. *Economic analysis of pertussis illness in the Dutch population: Implications for current and future vaccination strategies.* Vaccine 2009;(27):1932-1937

8 Acute gastro-enteritis

Topic owner: Dr. W. van Pelt (RIVM-CIE) (1992-1993) (1996-2013)

Introduction

Gastro-enteritis is among the top ten illnesses in the Netherlands in terms of incidence. It is an illness that places a considerable burden on the primary health care system.[12]
Gastro-enteritis was added again to the surveillance of the Sentinel Practices in the Netherlands in 1996. Also in 1992 and 1993 the subject has been registered by the sentinel practices.
Initially (until 1999) the investigation mainly focused on the assessment of trends in the incidence of gastro-enteritis, campylobacteriosis and salmonellosis and the burden of health care involved, also with regard to specific pathogens. The results of this research have been published before.

Since 2000 this topic has been maintained in accordance with the first of the above aims: the monitoring of trends in the incidence of acute gastro-enteritis in general practice. In 2001-2002 supplementary information was collected about laboratory diagnosis of patients sent in for consultation within the frame-work of regular health care. The results of this study are published elsewhere.[13]
In 2013 a study was published comparing gastro-enteritis in children 0-4 years consulting GPs in the sentinel practices versus children attending day care centers.[14]

Method

Sentinel GPs are asked to report patients with a new episode of gastro-enteritis. A new episode includes that the patient is seen for the first time during the current episode and has not shown symptoms for at least 14 days following an earlier report. Patients who consult their GP solely by phone are not reported.

Since 2003 it was requested to only report the occurrence of acute gastro-enteritis and to indicate whether or not a faeces test was performed. No other questions with regard to the indication or result of the test are asked as was done before in 2001 and 2002.

The sentinel doctors adhere to the following definition of gastro-enteritis:
- thin stools three or more times a day, differing from the normal situation for the person concerned, or
- thin stools and two of the following symptoms: fever, vomiting, nausea, stomach ache, stomach cramps, blood or mucus in the stools or
- vomiting and two of the following symptoms: fever, nausea, stomach ache, blood or mucus in the stools.

Results

Table 8.1 shows the number of reports of acute gastro-enteritis, by province group, address density and for the Netherlands as a whole.

Table 8.1 Numbers of cases of acute gastro-enteritis by province group, address density and for the Netherlands as a whole, per 10,000 men and per 10,000 women, 2004-2013

		province group				address density			Netherlands
		N	E	W	S	1*	2*	3*	
2004	male	76	115	90	135	141	91	109	103
2005		73	125	90	101	131	82	117	96
2006		85	135	112	167	121	119	126	121
2007		69	36	110	110	66	77	135	86
2008		92	53	89	130	105	71	150	90
2009		90	50	95	79	80	72	109	81
2010		101	67	86	104	89	84	110	90
2011		52	50	61	50	62	46	64	54
2012		63	91	70	102	83	83	79	82
2013		57	80	77	137	58	90	132	91
2004	female	61	102	98	107	136	82	97	94
2005		45	112	96	108	100	87	107	93
2006		71	124	122	143	107	122	112	117
2007		67	36	122	139	56	95	134	95
2008		83	57	91	152	88	79	158	93
2009		87	80	103	84	99	77	124	91
2010		129	67	97	124	111	100	110	104
2011		63	70	85	73	70	62	103	75
2012		77	91	88	132	106	90	111	99
2013		69	97	116	181	82	119	175	122

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$2500/km^2

Table 8.1 Numbers of cases of acute gastro-enteritis, by province group, address density and for Netherlands as a whole, per 10,000 men and per 10,000 women 2004-2013 (cont.)

		province group				address density			Netherlands
		N	E	W	S	1*	2*	3*	
2004	total	68	109	94	121	138	86	103	98
2005		59	119	93	104	116	85	112	94
2006		78	129	117	155	114	120	119	119
2007		69	36	116	124	61	86	135	90
2008		88	55	90	141	92	75	154	91
2009		89	65	99	81	89	74	117	86
2010		115	67	92	114	100	92	110	97
2011		57	60	73	62	66	54	84	65
2012		70	91	79	117	94	87	95	91
2013		63	89	97	158	70	105	153	107

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$2500/km^2

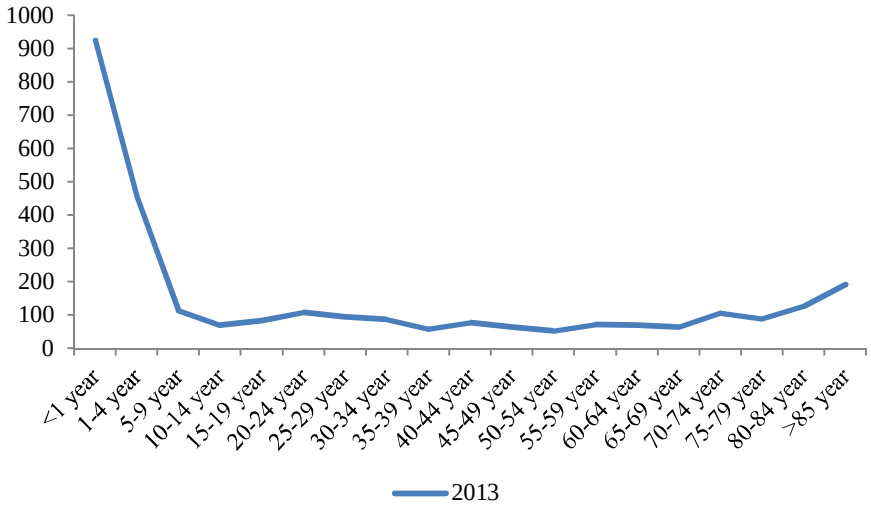
The highest incidence for men and women was seen in 2006.
In 2013 the incidence is somewhat higher than average in the preceeding years. The highest incidence is found in 2013 in the big cities and the southern part of the country. The difference between men and women has been inconsistent over time, however in 2013 the incidence in women was higher than in men like in the preceeding five years.

Age distribution

Table 8.2 Numbers of patients with acute gastro-enteritis per 10,000 inhabitants, 2004-2013

	total									
age group (year)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
≤1	765	687	690	588	689	586	766	554	684	925
1-4	341	296	472	349	368	326	350	240	324	455
5-9	136	163	156	114	114	101	118	83	111	113
10-14	80	79	107	56	61	89	68	36	57	69
15-19	82	100	84	53	54	58	79	46	73	83
20-24	99	80	121	84	85	78	98	62	65	109
25-29	87	72	104	82	80	66	90	38	68	94
30-34	99	67	80	84	83	77	92	47	86	87
35-39	71	56	86	44	72	56	57	41	71	59
40-44	55	55	61	38	56	54	56	34	41	77
45-49	70	49	65	49	44	45	58	41	57	63
50-54	67	57	67	57	42	38	54	32	33	52
55-59	57	57	67	76	53	61	51	58	67	71
60-64	48	78	61	48	54	42	66	43	75	69
65-69	58	76	92	63	73	89	55	53	73	64
70-74	54	82	102	100	61	58	89	44	89	107
75-79	101	98	125	131	119	86	104	79	120	89
80-84	115	131	193	152	141	107	142	84	104	128
≥85	104	131	166	152	174	1242	226	216	249	193

Figure 8.1 Numbers of patients with acute gastro-enteritis in 2013, by age group per 10,000 inhabitants



During the whole registration period, most cases of acute gastro-enteritis were diagnosed among babies and 1-4 years olds. In 2013 this was higher than in preceeding years. Similarly as during the years 2004-2012, a higher incidence was found once again for persons older than 75 years in 2013.

Seasonal influences

Table 8.3 shows the numbers of cases of acute gastro-enteritis that were reported per season.

Table 8.3 Numbers of patients with acute gastro-enteritis per 10,000 inhabitants from 2004-2013, arranged per quarter

quarter	1 : weeks 1-13	2 : weeks 14-26	3 : weeks 27-39	4 : weeks 40-52
2004	25	22	24	27
2005	30	19	24	21
2006	41	28	27	23
2007	25	24	18	22
2008	37	18	17	16
2009	28	15	22	22
2010	37	21	20	20
2011	23	14	13	14
2012	23	21	19	27
2013	31	28	23	25

Similarly as in most earlier years the highest incidence in 2013. is seen during winter time (first quarter), but less pronounced compared to previous years.

Faeces test in cases of acute gastro-enteritis

Table 8.4 shows a summary of the number of reports of acute gastro-enteritis for which the GP requested a faeces test, arranged per province group, by address density and for the Netherlands as a whole.

Table 8.4 Number of times that the GP requested a faeces test in cases of acute gastro-enteritis, per province group by address density and for the Netherlands as a whole, per 10,000 inhabitants for 2004-2013

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2004	17	29	24	20	30	15	34	22
2005	21	13	25	22	18	19	33	21
2006	35	10	32	18	22	24	34	26
2007	20	33	29	13	16	25	31	25
2008	6	3	13	22	9	11	13	11
2009	10	5	13	8	8	8	16	10
2010	15	8	9	9	9	10	11	10
2011	2	5	9	3	4	4	10	6
2012	7	14	12	10	7	11	16	11
2013	5	9	15	14	6	12	19	12

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$2500/km^2

The number of requests for faeces tests in 2013 was slightly higher than in previous years. In 2013, the number of requests for a test was the highest in the big cities and in the western provinces.

Age distribution

Table 8.5 shows the number of requests for a faeces test in cases of acute gastro-enteritis per age group and per 10,000 persons.

Table 8.5 Number of requests for a faeces test in cases of acute gastro-enteritis per age group per 10,000 inhabitants from 2004-2013

age group (year)	2004	%	2005	%	2006	%	2007	%	2008	%	2009	%
≤1	49	6	82	11	45	6	118	17	28	4	(50)	4
1-4	45	13	57	16	61	13	77	18	30	8	32	12
5-9	30	15	18	10	25	16	27	19	(6)	5	(7)	7
19-14	15	19	24	23	19	17	9	14	(3)	5	(3)	4
15-19	17	21	32	24	26	31	21	29	(8)	15	(1)	2
20-24	22	22	17	17	42	35	29	26	12	14	14	23
25-29	22	25	16	19	41	39	35	30	13	16	15	30
30-34	27	27	22	25	31	38	25	23	10	12	(6)	9
35-39	17	24	20	27	19	22	24	35	12	17	14	31
40-44	23	42	22	28	23	38	13	25	(9)	16	(8)	26
45-49	20	29	19	28	10	15	22	31	(9)	20	(5)	14
50-54	24	36	12	18	22	33	18	24	12	29	(4)	11
55-59	23	40	16	22	19	28	14	15	15	28	13	39
60-64	12	25	17	18	27	43	26	35	(8)	15	(4)	10
65-69	32	60	25	25	20	22	23	27	(9)	12	15	42
70-74	19	32	13	14	21	21	15	13	(5)	8	17	57
75-79	(7)	7	3	3	26	19	10	7	(9)	8	(3)	4
80-84	(10)	9	20	13	31	16	17	10	13	9	-	0
≥85	(7)	7	0	0	(7)	4	(12)	7	(2)	1	(15)	8

% = number of faeces tests: number of reports of acute gastro-enteritis x 100

Numbers in brackets are based on N<5

Table 8.5 Number of requests for a faeces test in cases of acute gastro-enteritis per age group per 10,000 inhabitants for 2004-2013

age group (year)	2010	%	2011	%	2012	%	2013	%
≤1	(15)	2	28	7	53	9	52	6
1-4	31	10	25	10	37	14	40	9
5-9	10	8	8	10	15	16	(4)	4
19-14	8	14	(3)	(9)	10	23	10	14
15-19	16	26	-	-	13	26	17	20
20-24	11	13	(6)	(9)	11	17	17	16
25-29	10	13	(5)	(10)	10	23	15	16
30-34	15	17	(5)	(10)	13	20	12	14
35-39	(5)	10	9	21	16	33	(7)	12
40-44	9	18	(4)	(10)	7	24	20	26
45-49	9	20	(4)	(13)	(4)	9	10	16
50-54	6	13	(4)	(12)	(2)	(4)	10	19
55-59	(5)	12	9	18	12	23	8	11
60-64	(5)	8	(4)	(10)	(6)	10	(3)	4
65-69	13	32	(2)	(3)	(6)	(7)	10	16
70-74	13	31	(2)	(6)	15	22	12	11
75-79	(5)	5	(3)	(4)	(10)	(13)	(3)	3
80-84	(7)	5	(4)	(5)	9	16	(4)	3
≥85	(4)	2	(5)	(2)	(6)	(2)	(10)	5

% = number of faeces tests: number of reports of acute gastro-enteritis x 100

Overall, the number of registered requested faeces tests per 10,000 people per age group shows the same pattern as for the total number of reports of acute gastro-enteritis per age group. In absolute numbers most requests for a faeces test were made in 2013 for 0-4 years olds.

However, this is not the case for the number of faeces tests per age group as a percentage of the total number of reported cases of acute gastro-enteritis in that age group. In adults a faeces test is performed more often.
Children (≤ 15 years old) with acute gastro-enteritis consult their GP more often than older children or adults. However when people of 40-44 years of age consult their GP with the symptoms of acute gastro-enteritis the GP will relatively more often request a faeces test in 2013.

Extrapolation

Table 8.6 Extrapolation of incidence rates gastro-enteritis to the Dutch population

	frequency incidence rate (per 10,000)*			Netherlands** (absolute numbers)		
topic year	m	f	total	m	f	total
gastro-enteritis						
2004	103	94	98	83,000	86,000	164,000
2005	96	93	94	77,000	77,000	154,000
2006	121	117	119	98,000	97,000	194,000
2007	86	95	90	71,000	80,000	151,000
2008	90	93	91	73,000	77,000	150,000
2009	81	91	86	66,000	76,000	142,000
2010	90	104	97	74,000	87,000	161,000
2011	54	75	65	45,000	63,000	108,000
2012	82	98	91	68,000	83,000	152,000
2013	91	122	107	76,000	103,000	180,000

* number gastro-enteritis per 10,000 men and/or women (data from sentinel practices)

** extrapolation of the incidence rates to the Dutch population as a whole (for the year in question), rounded off to the nearest thousand

Discussion

In 2013 the incidence was higher than in previous years, but not as high as in 2006. In 2006 the incidence was the highest, predominantly in the first quarter. Similarly as in 2002/2003 this coincided with a high incidence of Norovirus and in 2006, 2009 and 2010 a Rotavirus epidemic occurred.[15,16] This was however not the case in 2013. Laboratory examination showed less positive results for Campylobacter, salmonella and rotavirus in 2013.[16]

As part of regular health care GPs request a faeces test relatively more often in 2013 for patients in the age group 40-44. This is also the result of a difference in consultation behaviour between cases of acute gastro-enteritis involving children (≤ 15 years old) and cases involving adults (≥ 15 years old). This second group consults the doctor when they have more serious symptoms that last longer. Diarrhoea following a trip abroad occurs more often in adults.[15]
A comparison of the incidence of gastro-enteritis in the Sentinel Practices with the incidence in children visiting day care centres showed a twofold incidence of gastro-enteritis in children 0-4 years of age visiting day care centres. One third of day care centres reported the absence of hand washing protocols before meals (34%) and after visiting the toilet (15%) or to not daily clean the toilets (17%) (see publication Enserink et al. 2013).[15]

This topic is unchanged continued in 2014.

Publications based fully or partly on NIVEL Primary Care Database, Sentinel Practices

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Brandhof van den WE, Bartelds AIM, Koopmans MPG, Duynhoven van YTHP. *General practitioner practices in requesting laboratory tests for patients with gastro-enteritis in the Netherlands*, 2001-2002; BMC Family Practice 2006;7:56

9 Sexually Transmitted Diseases (STD)

Topic owner: Mrs. dr. I. Van den Broek (RIVM)(2008-2013)

Introduction

Together with respiratory, gastro-intestinal and urinary tract infections, Sexually Transmitted Diseases (STD) are the most frequently occurring infectious diseases in the Netherlands. Chlamydia, gonorrhea, syphilis, HPV-infection, hepatitis-B and HIV infection are the most important STDs.

National surveillance of STD is predominantly performed by the electronic SOAP registration of the RIVM, used since 2004 by the STD out patients clinics of the municipal health agencies (GGD), and through registration of infections by the HIV Monitoring Foundation. The municipality out patients clinics offer low threshold STD-care to high risk groups. In recent years the number of STD consultations at the municipality out patients clinics has increased substantially.

However, it is estimated that GPs account for 65-75% of all STD-related consultations. This was recently confirmed by the results from the Sentinel Practices topic "STD related consultations", from estimates based on data from NIVEL Primary Care Database and compared to the data of municipality out patients clinics. In previous years GPs have noticed a steady increase in the number of STD-related consultations.[17] This increasing trend is also described in the annual surveillance report of the RIVM.[18] Therefore, registration by the Sentinel Practices, may serve as a welcome addition to these data, especially because the questionnaires that have been included will provide insight into the background and reasons of a request for an STD test. The topic Sexually Transmitted Diseases for men and women started from 1-1-2008 and was preceeded by more specific topics and target groups such as 'fear of HIV' and 'urethritis in men'. In this chapter only data regarding STD-related consultations by sentinel GPs are being reported. The collected additional data are published separately.[17-19]

Method

The sentinel GPs are instructed to register this topic as a new STD consultation, except if a consultation was asked for information on i.e. prescription of anticonceptives. Proof of STD is not mandatory for registration. Also fear of STD and the possibility of STD and/or HIV should be registered. In addition a questionnaire addressing additional information emerging from the consultation should be completed. If diagnostic STD-tests are requested, a form with the test results should be added to the questionnaire. The diagnostic tests for chlamydia, gonorrhea, trichomonas, genital Herpes infection, hepatitis B, HIV and/or syphilis are performed by the regional laboratory of the participating practice. Only sentinel practices reporting STD more than once per year were included, as in practices without any or with only one STD related consultation underreporting is assumed.

Results

The results are based on data from 37 reporting practices. Only 2 practices were excluded for assumed underreporting, both reporting 1 case.
The number of STD-related consultations per10,000 patients per province group and address density are presented in table 9.1.The incidence is the highest in the western part of the Netherlands and in the big cities. The number of STD-related consultations was in 2013 comparable to the previous years.

Table 9.1 Number of new STD-related consultations per province group, address density and for the Netherlands as a whole per 10,000 in 2008-2013

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2008	35	38	65	50	20	46	88	49
2009	40	27	73	48	28	40	98	51
2010	37	32	61	51	32	49	62	48
2011	35	36	83	60	34	56	83	61
2012	45	38	70	72	38	66	74	61
2013	41	39	80	64	33	66	87	62

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$ 2500/km^2

Age distribution

In table 9.2 the data on new STD-related consultations are shown per age group. The age group between 15 and 35 years consults the GP most frequently for these problems. More women than men consult the GP for STD and/or fear for HIV.

Table 9.2 Number of new STD-related consultations per age group and per 10,000 inhabitants, 2008-2013

	2008			2009			2010		
age group	m	f	t	m	f	t	m	f	t
10-14	0	12	6	-	19	9	-	(3)	3
15-19	32	121	76	74	149	111	52	98	97
20-24	178	302	241	180	251	216	167	218	215
25-29	141	175	158	154	175	165	158	152	145
30-34	58	116	87	75	110	93	81	91	90
35-39	64	90	77	77	72	74	58	69	68
40-44	47	49	48	67	29	48	28	38	39
45-49	23	38	31	46	38	42	25	33	32
50-54	10	23	16	19	17	18	18	22	21
55-59	16	14	15	(12)	23	18	22	21	20
60-64	5	15	15	18	-	9	14	11	11
65-69	5	10	8	-	(4)	(2)	-	(2)	(2)
70-74	13	0	6	(11)	(14)	13	(5)	(5)	(5)
75-79	-	-	-	(7)	(5)	(6)	-	(3)	(3)
80-84	-	-	-	-	-	-	-	(4)	(4)
≥85	-	-	-	-	-	-	(16)	(5)	-
total	38	60	49	47	55	51	40	56	48

The numbers between bracket are based on N<5

Table 9.2 Number of new STD-related consultations per age group and per 10,000 inhabitants, 2008-2013(cont.)

	2011			2012			2013		
age group	m	f	t	m	f	t	m	f	t
10-14	-	(4)	(2)	-	-	-	-	(11)	(5)
15-19	65	227	146	51	161	105	51	201	123
20-24	216	321	269	182	270	226	231	285	258
25-29	135	248	193	171	315	245	165	259	213
30-34	130	144	137	128	132	130	75	158	117
35-39	55	66	61	78	95	86	84	78	81
40-44	53	60	57	56	46	51	42	84	63
45-49	36	(12)	24	41	35	38	43	61	51
50-54	27	44	35	24	35	29	28	27	28
55-59	(14)	(13)	14	35	24	29	30	30	30
60-64	(13)	16	14	(10)	(13)	12	20	(10)	15
65-69	(4)	-	(2)	22	(8)	15	(4)	-	(2)
70-74	(11)	-	(5)	-	-	-	(5)	(5)	(5)
75-79	-	-	-	(23)	-	(10)	-	(6)	(3)
80-84	-	-	-	-	-	-	-	-	-
≥85	-	-	-	-	(8)	(6)	-	-	-
total	49	72	61	51	70	61	49	74	62

The numbers between bracket are based on

Extrapolation

Table 9.3 Extrapolation of incidence rate STD-related consultations to the Dutch population

	frequency incidence rate (per 10,000)*			Netherlands** (absolute number)		
topic year	m	f	total (m+f)	m	f	total (m+f)
STD						
2008	38	60	49	31,000	50,000	81,000
2009	47	55	51	38,000	46,000	84,000
2010	40	56	48	33,000	47,000	80,000
2011	49	72	61	41,000	61,000	102,000
2012	51	70	61	42,000	59,000	102,000
2013	49	74	62	41,000	63,000	104,000

* number STD per 10,000 men and/or women (data from sentinel practices)

** extrapolation of the incidence rates to the Dutch population as a whole (for the year in question), rounded off to the nearest thousand

Discussion

As expected, the highest incidence of new STD-related consultations were reported in the big cities and the western part of the Netherlands, where most of the big cities are located, with an age peak between 15 and 35 years. GPs are consulted more frequently by women than by men for STD and/or fear of HIV. These trends are seen in all practices of NIVEL Primary Care Database.

The incidence rates from the sentinel practices are lower than from NIVEL Primary Care Database due to differences in the applied criteria for STD-

related consultations, for which a questionnaire was filled in at the sentinel practices in comparison with those for the STD-episodes based on ICPC codes in the Dutch Primary Care Database. The additional data from the questionnaires were compared with the data from the Dutch Primary Care Database and other sources. Several articles in English and Dutch were published about STD and HIV related consultations in general practice in 2013 and data were presented at international conferences at several occasions.

This topic will be continued in 2014.

Publications based fully or partly on NIVEL Primary Care Database, Sentinel Practices

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Trienekens Suzan CM, van den Broek Ingrid VF, Gonker Gé A, van Bergen Jan EAM, van der Sande Marianne AB. *Consultations for sexually transmitted infections in the general practices in the Netherlands: an oppertunity to improve STI/HIV testing.* BMJ Open; doi:10.1136/bmjopen-2013-003687

Donker GA, Dorsman S, Spreeuwenberg P, Van den Broek I, Van Bergen J. *22 jaar HIV-gerelateeerde consulten in de huisartsenpraktijk. Een dynamische cohortstudie.* Ned Tijdschr Geneeskd 2013;157:A6995

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Donker G, Dorsman S, Spreeuwenberg P, Van den Broek I, Van Bergen J. *Twenty-two years of HIV-related consultations in Dutch general practice: a dynamic cohort study*. BMJ Open 2013;3:e001834. Doi:10.1136/bmjopen-2012-001834

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Trienekens SCM, Koedijk FDH, van den Broek IVF, Vriend HJ, Op de Coul ELM, van Veen MG, van Sighem AI, Stirbu-Wagner I, van der Sande MAB. *Sexually transmitted infections including HIV, in the Netherlands in 2011*. Annual STI-report RIVM, available at: http://www.rivm.nl/rapporten

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Vriend HJ, Donker GA, Bergen van JE, Sande van der MAB, Broek van den I. *Urethritis bij de man in de huisartspraktjik. SOA's vooral op jongere leeftijd.* Nederlands Tijdschrift Geneeskunde 2009;153:A323

Donker Gé, Wolters Irmin, Bergen van Jan. *Huisartsen moeten risicogroepen testen op hiv*. Huisarts en Wetenschap 2008; 51:(419)

10 Oak Processionary Larvae

Topic owner: Ir. A.G. Zijlstra, GGD region Twente and GGD IJsselland, department Environment and Health (2012-2013)

Introduction

From 1987 the oak processionary larvae are a yearly returning problem in a large part of the Netherlands. In the past, the oak processionary larvae mainly occurred in the south of the province North-Brabant and the adjacent part of the province of Limburg. The populations reached in the south a provisional peak in 1996. A year later, far less were spotted and it was anticipated that the insect would leave the Netherlands or that a natural balance would be created. However, from 2003 the larvae spread further over the Netherlands.[20,21] By now, the geographical range of the larvae covers all provinces. In 2010 the most northern nests have been found in the city of Groningen.
The spread of the oak processionary larvae has increased dramatically in the past few years throughout the Netherlands, therefore, the complaints about the hairs of the oak processionary caterpillar too are anticipated to rise dramatically. During the months of June up to and including August people may be most troubled, when the caterpillars have developed hairs containing an irritant toxin and these spread from caterpillars and the nests.[22,23] Health complaints related to the hairs of the oak processionary caterpillar may also occur during these months. Almost everybody who has been in contact with the hairs is troubled by minuscule barbs in the skin, eyes and respiratory tract. How big and serious the complaints are differs from person to person.

Health complaints
GPs often see patients with complaints of skin, eyes and respiratory tract that have possibly been caused by contact with the characteristic hairs of the oak processionary caterpillar. [21] Especially during the months June up to and including August, these hairs may cause serious complaints. But also in later months people may have complaints when the hairs spread from the empty nests. The hairs easily penetrate the skin, the eyes and the respiratory tract

and stay there because they have barbs. This way, they may cause painful little wounds. In addition to this “mechanical effect” of the hairs, an allergy-like effect may occur. The toxins from the hairs cause an allergy-like skin rash, swellings, red eyes and itching (pseudo-allergic reaction). Also, part of the population may develop an allergy from the proteins that are released from the hairs. Not all people do react the same to the hairs of the caterpillar. However, once someone has been in contact with the hairs of the oak processionary caterpillar more often, the reaction can be even much stronger. Research shows that complaints such as itching and skin rash occur most often. Of the people with complaints related to the oak processionary caterpillar 89% turn out to report itching as well as skin rash as effect on their health.[24]

The oak processionary larvae have dramatically expanded their habitat in the Netherlands over the past few years and they occur now everywhere in the Netherlands. The trouble and health complaints caused by the hairs of the caterpillar are expected to grow in the whole country although the season 2012 was milder than the previous season. However, insight in the number of reported cases in the country by GPs and pressure on the general health care is lacking. Reported health problems related to the hairs of the caterpillar are not being registered adequately. The registration in the Sentinel GP Network aims to acquire insight into the incidence and trends of the skin complaints reported to GPs that are related to the hairs of the oak processionary larvae.

Method

The registration of health complaints caused by exposure to the hairs of the oak processionary caterpillar is focussed on the ICPC classification ‘Skin and Subcutis (S)’.
The GP reports complaints possibly caused by the oak processionary caterpillar by answering positively a pop-up question in the sentinel-module by the ICPC-codes:

- S01 - Pain/sensitivity skin
- S02 - Pruritus/itching
- S06 – Local redness/erythema skin
- S98 - Urticaria
- S29 – Other skin disease/subcutis

The pop-up question is: ‘Does it concern (possibly) complaints caused by the oak processionary caterpillar?’ In case of a positive answer a short questionnaire is filled in regarding the character, localization and degree of disturbance by the complaints. In this short questionnaire work related exposure to the hairs of the oak processionary caterpillar is also noted.

Results

During the season of the caterpillars in 2013, comparable to 2012, only a few reports were registered of complaints caused by the oak processionary caterpillar (N=10, of which 5 in the eastern part of the country). The incidence for the Netherlands is calculated, based on that number, at 10.1 per 100,000. Because of the small number, the incidence is not presented per region and address density, but the number of reported cases is presented (table 10.1).

Table 10.1 Number of reported complaints caused by the oak processionary caterpillar in 2012-2013, per region and population density

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2012	2	7	1	1	5	6	-	11
2013	-	5	2	3	-	8	2	10

* 1: ≤500/km^2 2: 500-2500/km^2 3: ≥2500/km^2

Season influences, age, complaints and exposure

After 11 reported cases in 2012, in 2013 10 cases were reported. However, only 2 questionnaires were received in 2013, one from the southern (week 29) and one from the eastern part of the country (week 32). Both questionnaires identified itching as the main problem caused by oak processionary caterpillar for these patients. The reported cases combined for 2012 and 2013 show furthermore that complaints caused by the oak processionary caterpillar occur in children as well as adults and is widely spread over age categories.
The completed questionnaires for both years show that the oak processionary caterpillar causes itching in all registered patients. Only one patient reported in 2012 had in addition to itching also eye complaints. Most patients experience the complaints for the first time. None of the patients reported work related exposure of the hairs of the oak processionary caterpillar (not in table).

Extrapolation

Table 10.2 Extrapolation of reported patients with complaints caused by the oak processionary caterpillar in the Dutch population

	frequency incidence (per 100.000)*	Netherlands** (absolute numbers)
topic	total	total
year	(m+f)	(m+f)
oak processionary caterpillar		
2012	10.7	1,800
2013	10.1	1,700

* number oak processionary caterpillar per 100,000 men and women (data from Sentinel Practices)

** extrapolation of the incidences in the Dutch population (of the year concerned), rounded off at hundreds

Discussion

During the season of the caterpillar in 2013 comparable to 2012 only few patients with oak processionary caterpillar related complaints have been registered. The number of patients that consulted the GP in the Netherlands with complaints caused by the oak processionary caterpillar can be estimated, based on the registration of the Sentinel Practices, at 1,800 in 2012 and 1,700 in 2013 with a wide 95% confidence interval (1,000-3,200 and 900-3,100 respectively). All patients were troubled by itching. None of the patients reported work related exposure to the hairs of the oak processionary caterpillar.
Despite the large error margin it may be concluded that the number of patients reported in the Netherlands is far lower than the anticipated number

based on literature. The GGDs of the province of Brabant estimated in 1997 that of the 917,000 inhabitants over 52,000 had health complaints caused by the hairs of the oak processionary caterpillar. It was estimated that around 33% of these consulted the GP in the period from May to and including August.[24] In 2008 it was estimated that every year around 80,000 people in the Netherlands were experiencing health complaints caused by the oak processionary caterpillar.[21] The oak processionary caterpillar has more widely expanded its habitat in the Netherlands from then onward.
The fact that in the current registration less patients have been registered than anticipated, can have several causes. It is known that the occurrence of complaints follows the curve of the plague; a mild plague season results in less complaints.[25] The past two seasons were mild. Also, people may use more self-care (once they are familiar with the complaints) resulting in less GP contacts.
The presence of the oak processionary caterpillar during the summer months and the related symptoms after exposure have become familiar to many people. Many municipalities provide information to the community about presence of and the control measures taken against oak processionary caterpillars. Under-registration may also occur, because the registration of the oak processionary caterpillar was a new topic in 2012 in the Sentinel Practices and GPs were relatively unfamiliar with the symptoms caused by contact with the hairs of the caterpillar. The registration using ICPC codes has been used to prevent under-registration.

No conclusion can be made based on these low numbers and further monitoring is required. We may conclude that in the Sentinel Practices low numbers of oak processionary caterpillar related complaints were found in 2012 and 2013.

The topic will be continued in 2014.

11 End-of–Life research

Topic owner: Prof. L. Deliens, Free University Brussels (2005-2013)

Introduction

The percentage of persons not dying acutely, and therefore needing medical treatment and care at the end of life, is increasing. Most people die at old age, and the mortality per 1000 persons is increasing because of the absolute and relative increase in the number of elderly people. Because of this demographic change it is increasingly important to offer adequate care at the end of life, aiming at the highest quality of life possible.
At population level, nationally and internationally, scientific knowledge is lacking in how patients actually die. Existing epidemiological studies have assessed how many persons die, from what disease, and whether death was preceded by an end of life decision with the intentional or accidental effect that life was shortened. However, information about care at the end of life, the place of death, the specific problems of the patients, the quality of dying and the role of the GP in providing terminal care, is limited.
Therefore, research on these topics is mandatory, to improve the care of patients in the final months before dying. GPs are highly involved with the decease of most patients. If patients die outside the practice (hospital or other institutions), they are informed about this event. Therefore, they are particularly apt to provide data about end of life decisions. With this information indicators for quality of care at the end of life are developed. In this chapter only information is provided on the number of deaths per region, address density, season and age group. Additional research with regard to care provided at the end of life will be published separately.

Methods

Sentinel physicians are asked to report the death of a patient, registered in their practice, who did not die unexpectedly or acutely. The GP is also asked

to provide additional information on the type of care the patient may have received during the last 3 months before dying and from which caregiver, which disease(s) have led to the decease of the patient, what type of care the patient preferred, the place of death, and the amount of suffering the patient has encountered shortly before dying. A similar, but more extensive research program is currently being performed in Belgium, Italy and Spain. The data of these four countries are compared and results are published as a consortium. Only sentinel practices that have registered ≥1 death are involved in the analyses, because 0 or 1 death in one year is suspect of underreporting.

Results

The number of patients per 10,000 reported for the end-of-life study is presented in table 11.1, per province group and by address density and for the Netherlands from 2005 to and including 2013. The numbers are based on 38 sentinel practices with ≥1 registration in 2013. One sentinel practice was excluded in 2013 due to only one reported death and known long lasting illness of the sentinel GP in that practice. Most reported cases came from the northern part of the country and from practices in the rural areas. In the western part of the Netherlands the registrations are lower than in previous years. Possibly especially in large cities patients have, more than in previous years, spent the last stage in a nursing home or hospice which is not part of the general practice.

Table 11.1 Number of reported End-of-Life study per 10,000 inhabitants, per province group, by address density and for the Netherlands, 2005-2013

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2005	26	50	46	62	40	49	40	48
2006	37	49	53	60	36	54	50	50
2007	43	42	65	52	40	50	83	52
2008	46	44	50	38	50	44	47	46
2009	48	55	51	44	53	46	59	50
2010	52	51	54	51	48	53	54	52
2011	50	36	33	37	44	34	36	37
2012	71	55	32	63	60	53	39	51
2013	73	60	34	64	63	53	41	53

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$2500/km^2

Seasonal influences

The number of patients per 10,000, reported in the end-of-life study, grouped by quarter is presented in table 11.2.

Table 11.2 Numbers of reported End-of-Life study by quarter, per 10,000 inhabitants, 2005-2013

	weeks 1-13	weeks 14-26	weeks 27-39	weeks 40-52
2005	13	11	12	11
2006	12	12	16	11
2007	14	12	12	13
2008	12	10	13	11
2009	13	13	11	13
2010	15	13	11	13
2011	10	8	7	12
2012	12	13	12	14
2013	14	13	12	13

In 2013 the reported number of end-of-life cases was the highest in the first quarter. In that quarter a mild long lasting influenza epidemic occurred in The Netherlands as well.

Age distribution

The age distribution of the patients reported for the end-of-life study in 2013 is presented in table 11.3.

Table 11.3 Numbers of reports End-of-Life-study, per 10,000 inhabitants, by age group, 2005-2013

age group	2005	2006	2007	2008	2009	2010	2011	2012	2013
≤1	(26)	(21)	(20)	(22)	-	-	(30)	-	(11)
1-4	(0)	(0)	(10)	(2)	-	(4)	-	-	(5)
5-9	-	(0)	(0)	0	-	-	(2)	-	-
10-14	(3)	(0)	(0)	0	(2)	-	-	-	-
15-19	(3)	0	(0)	0	(2)	(3)	-	(2)	(7)
20-24	0	(2)	10	(4)	(3)	(1)	-	4	-
25-29	(1)	(2)	(2)	0	(3)	(1)	(2)	-	(2)
30-34	0	(2)	(2)	(6)	2	(3)	(2)	9	-
35-39	7	(2)	(5)	(6)	(3)	(4)	(2)	9	(5)
40-44	10	(6)	(4)	(6)	8	8	(3)	(2)	15
45-49	10	13	14	11	15	9	8	15	21
50-54	20	19	24	32	36	26	19	21	22
55-59	38	21	27	40	33	40	18	34	36
60-64	68	87	62	62	47	58	43	52	50
65-69	85	80	120	64	79	90	75	86	84
70-74	131	173	138	137	178	145	88	133	137
75-79	268	282	248	201	229	231	174	238	195
80-84	402	426	413	308	362	370	266	407	354
≥85	1106	915	918	761	809	840	627	774	806

The numbers between bracket are based on N<5

In the first year of life babies die from, among other things, incurable congenital diseases. In 2012, 2010 and 2009, no cases of end of life in the youngest category were reported. Subsequently the mortality rates are low until the age of 55, after which they steadily increase.

Extrapolation

Table 11.4 Extrapolation of the reported deaths to the Dutch population

	frequency incidence rate (per 10,000)*			Netherlands** (absolute numbers)		
topic year	m	f	total (m+f)	m	f	total (m+f)
End-of-Life study						
2005			48			78,000
2006			50			82,000
2007			52			87,000
2008			46			75,000
2009			50			82,000
2010			52			86,000
2011			37			62,000
2012			51			85,000
2013			53			89,000

* number of deaths per 10,000 inhabitants (data from sentinel practices)

** extrapolation of the incidence rates to the Dutch population as a whole (for the year in question), rounded off to the nearest thousand

Discussion

In the Netherlands the total mortality amounted to 141,245 in 2013, 8.4 per 1000 inhabitants. (Dutch Statistics, www.CBS.nl). Part of the patients who die are not under the direct care of a GP, such as patients in nursing homes or hospices. Therefore, registration by GPs results in a lower incidence rate than registered by CBS, because nursing homes have a high death rate and admission to a hospice generally is meant for terminal care.

According to the second Dutch National Survey of General Practice the mortality rate reported in general practice is 41 per 10,000.[26] This lower rate may be due to underreporting. In the sentinel practices, with a rate of 53 per 10,000 that appears to be the case too, but to a somewhat lesser extend. Extrapolation shows that 63% of the total number of estimated deceased patients are reported in this registration. Apparently, not all deceased patients are reported by the sentinel GPs, this could be due to the care being taken over by a nursing home or a hospice. Underreporting may also be due to the extensive questionnaire that has to be filled in for this project. Nevertheless, the study provides a wealth of information with regard to the primary care provided at the end of life in the Netherlands. It has resulted in various publications and presentations at international meetings. A comparative study with the end of life care in Belgium, Italy and Spain has also been published in several scientific papers.

The topic is maintained in 2014 and some subjects in the questionnaire have been changed.

Publications based fully or partly on NIVEL Primary Care Database, Sentinel Practices

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Van den Broek IVF, Trienekens SCM, Donker GA, Van Bergen JEAM, Van der Sande MAB. *General practitioners in the Netherlands miss opportunities to test for STI-HIV during STI-related consultations.* Poster presentation annual conference International Society of Sexually Transmitted Diseases Research (ISSTDR), Vienna, Austria, 14-17 July 2013, abstract book

Van den Block L**,** Onwuteaka-Philipsen B**,** Meeussen K**,** Donker G**,** Giusti F**,** Miccinesi G**,**Van Casteren V**,** Vega Alonso T**,** Zurriaga **O,** Deliens L. *Nationwide continuous monitoring of end-of-life care via representative networks of general practitioners in Europe*. *BMC Family Practice* 2013, **14**:73 doi:10.1186/1471-2296-14-73. Published: 3 June 2013

Evans N, Pasman H.R. Vega Alonso T, Van den Block L, Miccinesi G, van Casteren V, Donker G, Bertolissi S, Zurriage O, Deliens L, Onwuteaka-Philipsen B. *End-of-Life Decicions: A Cross-National Study of Treatment Preference Discussions and Surrogate Decision-Maker Appointments.* PLoS ONE 8(3):e57965. Doi:10.1371/journal.pone0057965

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Abarshi E, Echteld M, Philipsen B, Donker G, Block van den L, Deliens L. *Transities in zorgsetting aan het levenseinde in Nederland. Vijfde onderzoeksforum Nederland-Vlaanderen*, workshop 17 november 2007

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12 (Attempted) suicide

Topic owner: Mrs. Dr. G.A. Donker (NIVEL) (1979-2013)

Introduction

In consultation with the Health Care Inspectorate, this topic is included in the sentinel surveillance since 1979.
Research on suicide is also carried out in other institutions (e.g. hospitals, prisons) in order to gain insight into the scope, trend and other aspects of suicide and attempted suicide.

Method

The name of the topic is also its definition. The primary question is not whether the patient's attempt was successful, but whether the patient intended to commit suicide.
At the same time the Health Care Inspectorate made a request for additional data to be collected about the reported cases. To this end a questionnaire was designed. The form included questions about whether the attempt had been successful and about the method employed. Other questions relate to characteristics of the patient and features of care, such as contacts with health care institutions prior to the suicide (attempted suicide).

Results

The absolute numbers of reported cases (which exceeds the number of patients as recurrence is not rare) in the years 2004-2013 were, 55, 71, 24, 49, 28, 40, 46, 33, 39 and 67 respectively.

The number of attempts per province group and by address density per 10,000 inhabitants is shown in Table 12.1. Breaking down the numbers into subgroups is of limited value in view of the low frequency.
In 2006, 2008 and 2011 the lowest number of suicide (attempts) of the last 10 years is reported. When address density is taken into account the highest incidence is consistently found in the big cities, except for 2002, 2007 and 2012.
The distribution by province group shows a less consistent picture, possibly due to the small number of cases. In 2012 and 2013 the incidence was the highest in the southern region.

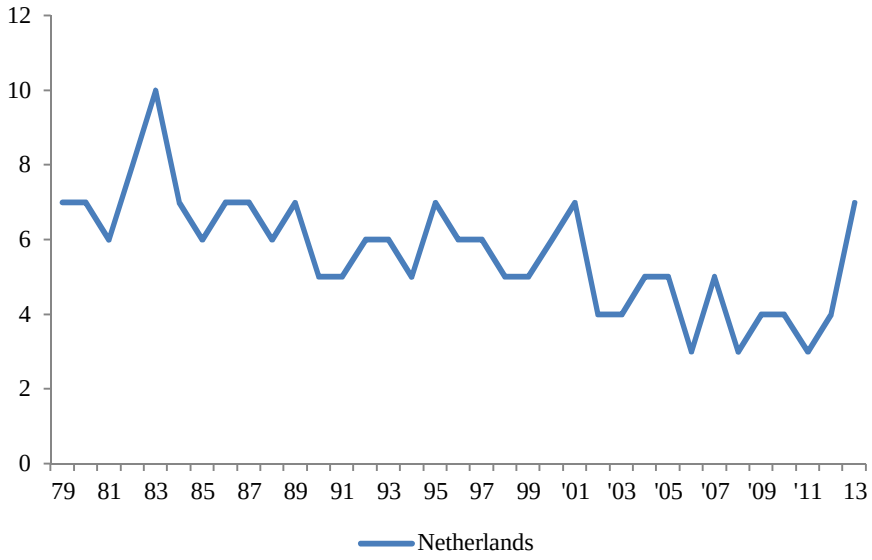
Table 12.1 Number of (attempted) suicides reported per 10,000 inhabitants, per province group, by address density and for the Netherlands as a whole, 2004-2013

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2004	2	3	6	6	3	5	9	5
2005	4	9	6	2	2	6	8	5
2006	1	4	3	1	1	3	3	3
2007	3	4	6	4	6	4	6	5
2008	1	3	4	2	1	3	4	3
2009	3	4	5	3	3	3	7	4
2010	5	2	5	3	3	3	7	4
2011	3	1	4	3	4	3	4	3
2012	4	5	4	6	3	6	3	4
2013	7	4	7	9	5	7	8	7

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$ 2500/km^2

The figure shows the initially gradually decreasing trend in the number of attempted suicides registered in general practice during a period of 34 years. The past 10 years the incidence is more or less stabile with small fluctuations. In 2013 the incidence is the highest of the past 10 years.

Figure 12.1 Number of (attempted) suicides reported per 10,000 inhabitants for the Netherlands as a whole, 1979-2013



Age distribution

In 2013 the number of suicide attempts peaked in the age groups 20-24 and 50-54 years, however in other years no specific age group was prominent. On the other hand, through the years the lowest incidences were found in the youngest age group (0-14 years) and in the age group ≥ 65 years and that was also observed in 2013.

Table 12.1 shows the frequency of suicide and attempted suicide per 10,000 inhabitants, by age group in the last 10 years.

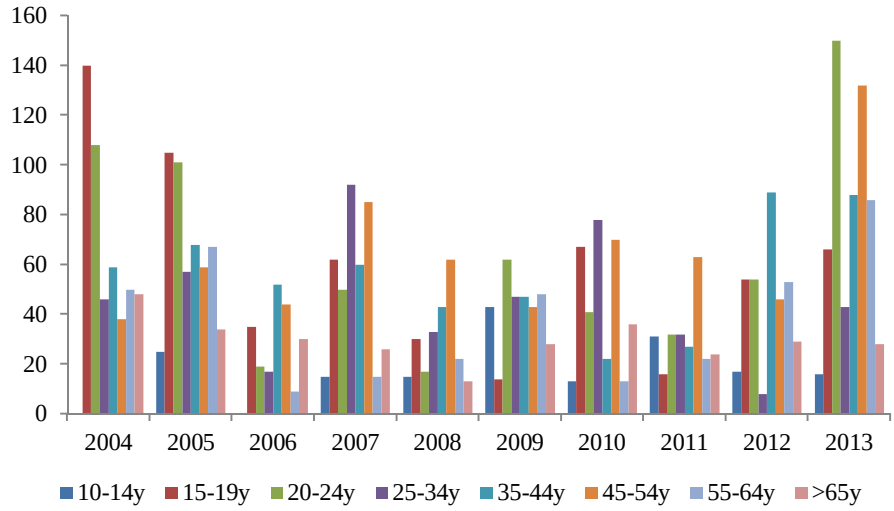
Table 12.2 shows the frequency per 100,000 inhabitants by age group in the last 10 years.

Table 12.2 Number of (attempted) suicides reported per 100,000 inhabitants, by age group, 2004-2013

age group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
10-14	-	(25)	-	(15)	(15)	(43)	(13)	(31)	(17)	(16)
15-19	140	105	(35)	(62)	(30)	(14)	67	(16)	(54)	(66)
20-24	108	101	(19)	(50)	(17)	(62)	(41)	(32)	(54)	150
25-34	46	57	(17)	92	33	47	78	(32)	(8)	43
35-44	59	68	52	60	43	47	(22)	(27)	89	88
45-54	68	59	44	85	62	43	70	63	46	132
55-64	50	67	(9)	(15)	(22)	48	(13)	(22)	53	86
≥65	48	34	(30)	(26)	(13)	28	36	(24)	29	28

The numbers between brackets are based on N<5

Figure 12.2 Number of (attempted) suicides reported per 100,000 inhabitants by age group, 2004-2013



Extrapolation

Table 12.3 Extrapolation of the incidence rate of (attempted)suicide to the Dutch population

	frequency incidence (per 10,000)*	Netherlands** (absolute number)
topic	total	total
year	(m+f)	(m+f)
(attempted)suicide		
2004	5	8,000
2005	5	8,000
2006	3	5,000
2007	5	8,000
2008	3	5,000
2009	4	7,000
2010	4	7,000
2011	3	5,000
2012	4	7,000
2013	7	12,000

* number (attempted)suicide per 10,000 inhabitants (data from sentinel practices)

** extrapolation of the incidence rates to the Dutch population as a whole (for the year in question), rounded off to the nearest thousand

Discussion

The numbers of suicide and attempted suicide in 2013 are the highest in the past 10 years. In the previous 9 years the numbers were stable preceeded by a declining trend.
In 2013 the highest numbers were seen in the age groups 20-24 and 50-54 years; however the breakdown in age groups is of limited value due to the small absolute numbers which may lead to large fluctuations. Over the years, the registration does not show a preferential age group, although low incidences are consistently observed in the youngest (≤15 years) and the oldest (≥ 65 years) age groups.

This topic is continued in 2014.

Publications based fully or partly on NIVEL Primary Care Database, Sentinel Practices

Donker GA, Wolters I, Schellevis F. *Risk factors and trends in attempting or committing suicide in Dutch general practice in 1983-2009 and tools for early recognition.* European Journal of Public Health 2010;20(S1):50 (Oral Presentation 3rd European Public Health conference Amsterdam, November 2010)

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13 Policy for symptoms mamma

Topic owner: Mrs. Dr. M. Hooiveld, NIVEL (2012-2013)

Introduction

In the past few years, the number of new diagnoses of breast cancer in women between 40 and 49 years has increased considerably. It is anticipated that the peak in breast cancer incidence has not yet been reached and that the incidence will continue to grow over the next 10 years. However, women of 50 years and older are being invited for breast cancer screening and not younger women. The introduction of the digital mammography, providing better results for young women and women with a dense breast pattern, has aroused the discussion again about the lowest age limit. With the increased attention in the media and more awareness concerning breast cancer, however, the question arises “how many women, regardless of their age, consult their GP because of complaints or abnormalities of the mamma or fear for breast cancer and what is GPs’ policy in these cases?” Information about the current state of affairs is extremely relevant for policy makers when the expected turnout and the cost effectiveness in lowering the age limit for screening is discussed. This information is not available from primary care at the moment.

Objective

This topic aims to quantify the policy of GPs in case of complaints or symptoms of the mamma and the underlying reasons to act as they do.

Method

The structure of the topic is in agreement with the NHG-Guideline Diagnostic of mamma carcinoma. The registration is based on answering a

few questions after registration in the HIS of one of the following ICPC-codes:
X18 – pain in breast(s)
X19 – lump/swelling breast
X20 – symptoms/complaints nipple
X21 – other symptoms/complaints breasts
X26 – fear for breast cancer
X76 – malignancy breast
X79 – benign neoplasm breast
X88 – mastopathy/cyst breast

As the specific ICPC-subcode for a familial burden for breast cancer is rarely used, this is separately questioned in the questionnaire.

As complaints of breasts and breast cancer are rare below the age of 25 years, GPs are requested to only complete the questionnaire in women aged ≥25 years. When the woman is in the target group a questionnaire is filled in and sent in. The first question of the questionnaire is whether the registered ICPC-code is new or belongs to an already known episode. An interval of 2 years is followed, comparable to the population screening. When a women has consulted the GP during the past two years, for one of the complaints or abnormalities of the mamma, then we define this a known episode. When a patient has never before consulted the GP for this health problem or when it is a repeated presentation with an interval of more than 2 years (for example a relapse), we define it a new disease episode.
A problem that has never been presented before to the GP could have been presented to another GP in the past two years (for example when the patient has changed GPs recently); in this case it is of course a known disease episode.
The second question is whether further diagnostic examination or referral has been indicated. The following different answers are possible in this case:
1 No indication for further diagnostic examination. This includes also, for example, a follow-up when the woman is in another stage of the cycle, or when it concerns a check-up for the results of a mammogram or echoscopy without indications for malignancy.
2 Referral to an outpatients' mamma clinic.
3 Referral to a department of radiology for mammography or echographic examination.

4 Referral to a department of Clinical Genetics or an outpatients' clinic Inheritable Tumours.
5 Otherwise, i.e. (description).

The third question concerns the underlying motivation for further diagnostic examination or a referral (if applicable). The following aspects can be distinguished:
1 Indications for possible malignancy, for example a lump, nipple discharge, skin changes, etc.
2 Local palpable abnormality in gland tissue without indications for malignancy, including mastopathy.
3 Referral based on the results of a mammogram or echoscopy, possible malignancy.
4 Check-up after breast cancer treatment.
5 Localized and persistent complaints about pain or sensitivity or a lump that the woman does feel but the doctor does not feel.
6 Preventive reasons in case of a familial burden in breast cancer.
7 For reassurance in case of fear for breast cancer without any of the above mentioned indications.
8 Otherwise, i.e. (description).

Results

Analysis of the data per region and address density shows that in the western part of the country less women than the average number consulted the GP with these complaints and that practices in rural areas over both years combined score higher than the practices in the cities (Table 13.1). These data may include some double counts of women consulting their GPs more than once a year for the same symptoms, so interpretation needs to be cautiously done.

Table 13.1 Number of women ≥ 25 years per 10,000 where the GP was consulted for complaints regarding the breast(s), per province group, in address density and for the Netherlands, 2012-2013

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2012	261	257	112	262	276	181	77	203
2013	306	318	169	319	289	231	289	257

* 1: ≤500/km^2 2: 500-2500/km^2 3: ≥2500/km^2

Age distribution

The number of reported women who consult the GP with complaints of the breast(s) is rather high in all age groups from 25 to 80 years. Above the age of 85 years this number is much lower. The number is not strikingly lower in the age group of 50 to 75 years, the group that is screened for breast cancer every other year, compared to the group younger than 50 years.

Table 13.2 Number of women per 10,000 per age group ≥25 years who consulted the GP with complaints of the breasts, 2012-2013

age group	2012	2013
25-29	220	205
30-34	238	226
35-39	216	340
40-44	222	310
45-49	270	281
50-54	260	307
55-59	151	236
60-64	190	249
65-69	200	293
70-74	169	207
75-79	163	171
80-84	47	183
≥85	95	159
total	203	257

Numbers between brackets are based on N<5

Extrapolation

Table 13.3 Extrapolation of women ≥25 years who consult the GP every year for new complaints of the breast(s), of the Dutch population

	frequency number (per 10,000) women ≥25 years*	Netherlands** (absolute numbers)
topic	v	v
year		
mammary cancer		
2012	203	171,000
2013	257	218,000

* number screening breast cancer per 10.000 women ≥25 years (data sentinel practices)

** extrapolation of the numbers at the Dutch population (of the year concerned), rounded at thousands

Discussion

The registration of women ≥25 years who visit the GP with complaints of the breast(s) show that many women consult their GP for this problem. The difference between the group of women of 50-75 years who are examined every other year with a mammogram in the national population screening program and the younger women is small. From the age of 85 the number of women who consult the GP fort his problem is much lower.

This topic will be continued in 2014.

14 Gut feeling related to cancer diagnosis

Topic owner: Dr. G.A. Donker, NIVEL (2010-2013)

Introduction

During their training, GPs learn systematically by asking questions and by examination, to synthesize a diagnosis. In practice, GPs not only apply a structured approach, but also use their intuition and experience. The difference between "feeling right versus not-right" plays a role in this. Stolper et al (2009) in Maastricht studied the concept "gut feelings".[27, 28] GPs described in focus groups the different aspects of "gut feelings". These GPs indicated that the "gut feeling" is sometimes almost a physical sensation. Often there is a "gut feeling" without any objective arguments, distrust in the situation because of insecurity about the prognosis of complaints and the need to intervene. It may be a sudden feeling, but also a slowly arising feeling. GPs differ in the extend of experience and/or use of "gut feelings". Men, as well as women, indicate to know this feeling. Knowledge of the history and the context of a patient play a role. But that may go in two directions. Knowing the patient may facilitate the "gut feeling", but it may also interfere by a way of sympathy or reluctance, feeling guilty. Training and experience also play a role. Often experienced GPs report this feeling. It is part of a rather automatic process. GP trainers say it can be learned: reflection on one's own professional behaviour is a way to use one's feelings as part of the process of making a diagnosis.
Stolper et al. conclude that the "gut feeling" often acts as a diagnostic instrument.[28, 29] The "gut feeling" mainly works as an alarm bell or a compass. It stimulates to find objective reasons for this feeling, and stimulates, as such, the diagnostic process.

The existence of a "gut feeling" is broadly considered as shown in the assertion of the "Centraal Tuchtcollege voor de Gezondheidszorg" (Central Disciplinary Committee of Health Care) at 11 December 2008, as published in "Medisch Contact". The Disciplinary Committee judged that "the internist

wrongly ignored his ‘gut feeling’.
Stolper et al. (2010) clarified the diagnostic meaning of the “gut feeling” in general practice with literature search, focus groups of GPs and by consulting experts in a Delphi consensus procedure.[27-29]
In addition to Stolper’s study we have conducted quantitative research from the beginning of 2010 and we have monitored in daily general practice to what extent GPs intuition (“gut feeling”) may contribute to an early diagnosis of cancer. This pilot project may serve as a preparation of an international research project.
Objective of this study is to highlight the following aspects:

- Characterise patients that arouse GPs feeling (intuition, gut feeling) that cancer may exist in this case.
- Make explicit the factors that cause this gut feeling/intuition in GPs.
- Make explicit the characteristics of GPs as well as patients that could possibly partly influence the “gut feeling”, such as gender, age, number of years of experience as a GP and study the other factors of the meaning of this clinical intuition for forecasting the diagnosis cancer.

Method

1 GPs fill in a questionnaire for this study, for every patient that gives them a feeling that something is not right and that cancer might be diagnosed.
2 GPs register the diagnostic ICPC code “A29” for every patient that gives them a feeling that something is not right and that cancer is possible, in the patient’s electronic file. It concerns all patients where this feeling is aroused related to cancer: from those patients that give the GP only a vague gut feeling, to those patients whose diagnosis is almost sure at the first examination.
3 The GP fills in the questionnaire with patient data and the care provided.
4 Three months after the consultation, the GP receives a second questionnaire to evaluate the diagnosis of the case arousing the gut feeling.
5 The results of the questionnaire are reported separately.

Results

GPs reported cancer related gut feelings in 2013 in 7 per 10,000 patients per year (Table 14.1).

Table 14.1 Number of patients per 10,000 inhabitants causing the GP a gut feeling of possible cancer, per province group, by address density and for the Netherlands as a whole in 2010-2013

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2010	6	14	15	7	13	9	15	11
2011	10	12	9	8	17	8	7	10
2012	3	13	6	6	8	8	2	7
2013	10	13	4	6	8	8	5	7

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$ 2500/km^2

At this stage of the study, regional differences in the frequency of occurring gut feelings cannot be considered yet as very meaningful. A first analysis of the first year of the data collection via questionnaires has been published in 2011 in Huisarts & Wetenschap.[30] These analyses showed that cancer related gut feelings are often triggered by a combination of signs and symptoms, i.e. weight loss e.c.i., a palpable tumor, a patient rarely consulting the GP, symptoms lasting longer than expected or patient's appearance. In most cases cancer related gut feelings pursue the GP to diagnostic requests or referral to a specialist. In two third the cancer related gut feeling resulted in a diagnosis and in one third a cancer diagnosis was confirmed.

Age distribution

Table 14.2 Number of patients per 10,000 inhabitants according to age group, causing the GP a gut feeling of possible cancer in 2010-2013

	2010			2011			2012			2013		
age group	m	f	t	m	f	t	m	f	t	m	f	t
40-44	(2)	21	12	-	(5)	(2)	(3)	(3)	(3)	-	(3)	(1)
45-49	(6)	(4)	5	(7)	(2)	(5)	(3)	-	(1)	(8)	(5)	6
50-54	16	12	14	16	(3)	9	-	(6)	(3)	(5)	(3)	4
55-59	23	20	22	(12)	15	13	(10)	-	(5)	(3)	(12)	8
60-64	38	15	27	25	20	23	16	32	24	15	19	17
65-69	31	(13)	22	40	19	29	30	(16)	23	18	24	21
70-74	39	(12)	25	(15)	(9)	12	(21)	-	(10)	20	23	21
75-79	37	(9)	21	57	51	54	45	(18)	30	60	11	34
80-84	58	30	41	(23)	58	44	(24)	(8)	(14)	62	22	39
≥ 85	(30)	49	43	(52)	45	47	(37)	48	44	31	14	20
total	12	10	11	10	9	10	8	6	7	8	7	7

The numbers between brackets are based on N<5

In general, the frequency of gut feelings increases as the patients are older, in line with the increasing incidence of cancer at that age. It is more frequent in men like in previous years. Patients younger than 40 years sporadically cause gut feelings concerning cancer. These data have been collected, however, they are not shown in the table above. The incidence in the higher age groups is therefore, higher, than in the general population, where the group of younger than 40 years has been included in the calculation. In 2013 the scores are comparable to 2012 and lower than in the previous two years due to the fact that the GP actively needs to recognize the cancer related gut feeling and is not alerted by a specific ICPC-code. Undoubtedly the

presented figures in our study underestimate the frequency of existence of cancer related gut feelings.

Extrapolation

Extrapolation to the Dutch population show cancer related gut feelings in 12,000 cases in 2013 similar to 2012.

Table 14.3 Extrapolation of the incidence rate of gut feeling in GPs to the Dutch population

	frequency incidence rate (per 10,000)*			Netherlands** (absolute number)		
topic year	m	f	total (m+f)	m	f	total (m+f)
gut feeling						
2010	12	10	11	10,000	8,000	18,000
2011	10	9	10	8,000	8,000	17,000
2012	8	6	7	7,000	5,000	12,000
2013	8	7	7	7,000	6,000	12,000

* number gut feeling per 10,000 men and women (data from sentinel practices)

** extrapolation of the incidence rates to the Dutch population as a whole (for the year in question), rounded off to the nearest thousand

Discussion

Gut feelings in GPs about possible cancer occur more often as patients are older and slightly more in men than in women. This is consistent with the increasing incidence at higher age and the slightly lower life expectancy for men than for women. The incidence of 7 gut feelings per 10,000 registered patients, that we found in 2013 and 2012, seems low compared to the

reported incidence at the web site of the union of integrated cancer centers of 60 incident cancer cases per 10,000 inhabitants in 2012.[31] Less serious cases of cancer, like skin cancer, is expected to be diagnosed by GPs and treated without causing any gut feeling.
Analysis of questionnaires will have to show more characteristics of the gut feeling of symptoms, patients and GPs. The analyses of the questionnaires have been published in 2011 in Huisarts & Wetenschap[30,31] and these data have been presented at the international Ca-PRI conference in 2011 and 2013. The presentation in 2013 won the best abstract price.[32,33]

The topic will not be continued in 2013. The foundation Stoffels-Hornstra has awarded a grant for the analyses of the questionnaires.

Publications based fully or partly on NIVEL Primary Care Database, Sentinel Practices

Donker GA, Dorsman S. *Cancer-related gut feelings among Dutch general practitioners.* Oral Presentation Ca-PRI conference Birmingham 14-16 April 2013, United Kingdom. Abstract book Ca-PRI conference 2013, best abstract price

Korevaar J, Heins M, Donker G, Rijken M, Schellevis F. *Oncologie in de huisartsenpraktijk.* Huisarts & Wetenschap 2013;56(1):6-10

Donker G en Dorsman S. *Niet-pluisgevoel: een diagnostisch instrument*. Huisarts & Wetenschap 2011;54(8): 449.

Donker GA. *Cancer-related gut feelings among general practitioners in the Netherlands.* Oral Presentation Ca-PRI conference 25-27 May 2011, Noordwijkerhout, The Netherlands. Abstract book Ca-PRI conference 2011

15 Requests for Euthanasia

Topic owner: Dr. G.A. Donker, (NIVEL) (1976-2013)

Introduction

Since 1976 requests for euthanasia to the GP of patients with incurable disease are reported. Since 2011 a question has been added whether the euthanasia request resulted in performing euthanasia.

Methods

At the start of the year, the sentinel doctors are informed that the annual monitoring will be conducted. At the end of the year, all sentinel doctors receive a form in which they are asked to state whether patients with incurable disease have requested euthanasia or assistance in suicide in the past year and, if so, the reason for the requests. The doctors are also asked to report the age, gender, disease and nursing location and whether or not a 'euthanasia declaration' was signed.[34] Since 2011 a question was added whether the euthanasia was performed and if so whether the euthanasia was reported at the Regional Assessment Committee for Euthanasia.

Results

All Sentinel Practices answered the questionnaire concerning whether requests for euthanasia occurred in their practice or not in 2013. In 2013 the number of requests is 48 (30 men and 18 women) from 39 reporting practices. This amounts to 4.8 per 10,000, slightly higher than in the previous five years (4.6, 3.5, 4.5, 3.4 and 3.5 per 10,000 in 2012, 2011, 2010, 2009 and 2008, respectively). Of the patients who requested euthanasia in 2013 87% had a malignancy, which is slightly more than in previous years (76% in the period 1976-2012). Most patients were tended at home or a care home for the elderly, two patients in a hospice and one in a

nursing home. In 82% of the cases (N=31) the request is supported by a living will. Forty five patients asked for euthanasia. Three patients requested physician assisted suicide and two patients had not chosen between the two methods yet. In 75% of the cases the SCEN-doctor (Support and Consultation in Euthanasia in the Netherlands) was called in and 31 out of 48 (65%) euthanasia requests were carried out. These were all reported to the Regional Assessment Committee for Euthanasia. If the SCEN-doctor is not called in, the reason is (almost always) that the eventual application of euthanasia or physician assisted suicide was not yet relevant, or the patient died without intervention. Patient data are reported at the end of the paragraph.

Requests for euthanasia 2004-2013

Table 15.1 shows the distribution of the number of requests by province group by address density and by gender.

Table 15.1 Absolute numbers of patients who requested GPs to participate actively in euthanasia, by gender, province group, address density and for the Netherlands as a whole, 2004-2013

			province group				address density			Netherlands
absolute	m	f	N	E	W	S	1*	2*	3*	
2004	15	13	3	3	16	6	2	19	7	28
2005	13	22	2	7	23	3	5	24	6	35
2006	11	18	2	4	21	5	4	18	10	32
2007	16	16	9	7	14	2	9	18	5	32
2008	17	20	7	5	19	6	8	20	9	37
2009	20	18	5	5	22	6	3	21	14	38
2010	28	27	8	12	23	12	12	37	6	55
2011	24	12	6	8	15	7	12	18	6	36
2012	24	19	7	14	15	7	13	23	7	43
2013	30	18	2	8	25	13	12	25	11	48

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$2500/km^2

The data per 10,000 inhabitants (not shown because of small numbers) indicate that in 2013 the number of requests in the big cities (5.3 per 10,000) is higher than in the previous three years.

Age distribution

The age distribution of patients who requested euthanasia is shown in table 15.2.

Table 15.2 Absolute numbers of patients asking their GP for euthanasia or physician assisted suicide per age group, 2004-2013

	≤54	55-64	65-74	75-84	≥85	total
2004	3	6	13	5	1	28
2005	4	8	13	8	2	35
2006	3	5	10	7	7	32
2007	3	5	12	7	5	32
2008	5	8	8	12	4	37
2009	8	5	14	6	5	38
2010	10	8	11	12	14	55
2011	3	3	11	13	6	36
2012	5	7	17	9	5	43
2013	9	7	11	16	5	48

Overview of reported requests

Since 1976 the sentinel general practice network has collected data on 1368 requests for euthanasia or physician assisted suicide, 707 (52%) by men. The International Classification of Diseases (1975, 9th version) was used to obtain insight into the illnesses underlying the requests for euthanasia or physician assisted suicide. One of the problems in classification is the co-morbidity, which is inherent to old age. Another problem is that sometimes no disease is reported at all: in the ICD-9-group of symptoms and not fully described diseases the requests of three very old aged are included with motivation “completed life”, a 91 year old lady who was “tired of life”, a 99 year old bedridden patient without described disease and a 97-year old with cachexia.

Five categories of illnesses are used:
- malignant neoplasms;
- cardiovascular diseases;
- chronic obstructive pulmonary diseases;

- symptoms and insufficiently defined illnesses;
- other diseases, including dementia, neurological and endocrine illnesses and AIDS.

Table 15.3 indicates the diseases underlying the request for euthanasia or physician assisted suicide. In 2013 the distribution is comparable to previous years.

Table 15.3 Diseases leading to euthanasia requests, 1976-2013

	N	%
malignant neoplasms	1032	75
cardiovascular diseases	79	6
chronic obstructive pulmonary diseases	58	4
symptoms and insufficiently defined diseases	69	5
other diseases	130	10
total	1368	100

Over the years, the reported percentage of living wills has increased from 15% in 1984 to 82% in 2013. This percentage was the highest in 2009 with 92% living wills in the reported requests. Discussing a request for euthanasia in an early stage of the illness is expected to have led to a slight decrease of this percentage in the last years. Nowadays more requests for euthanasia are reported at an earlier stage of disease where performing the euthanasia is not yet a wish.

Discussion

The registration of the requests for euthanasia or physician assisted suicide by the Sentinel Practices shows consistently a slightly higher percentage in men, around 52% versus 48% in women over the period 1976-2013. In the mentioned studies so far one other result is consistently present: mainly patients with a malignant disease ask for euthanasia and in this group euthanasia is practiced relatively more frequently. Also, it is concluded that the percentage of patients with a malignant disease at higher age is decreasing. The data of the Sentinel Practices show this too: over the period 1976-2013 75% of the patients who asked for euthanasia or physician assisted suicide had cancer. In the higher age group this is also the most frequently occurring reason, but COPD, heart failure and Alzheimer disease are also frequently occurring reasons.

Data that have been collected over a longer period of time, on requests for euthanasia and physician assisted suicide, show a gradual change in reasons to ask the GP for euthanasia. Unbearable pain and physical suffering are becoming less important motives: hopelessness and loss of dignity due to the disease are now more important reasons to request euthanasia.[35-37] Loss of dignity turns out to be more often the motive for men than for women to request euthanasia.[36,37]
Alzheimer's disease is apparently no longer an absolute contra-indication for euthanasia, provided the request was done when the patient was coherent.

Until the early 1990s, hardly any possibilities existed to compare data collected in the Sentinel Practices concerning requests for euthanasia and physician assisted suicide with the findings of other data registration projects and research.[38] Since then, major studies have been carried out to determine the action taken by GPs and other doctors in the Netherlands with regard to euthanasia, physician assisted suicide and decisions concerning the end of life of patients.[39-43] The second national survey to evaluate the follow-up of the Euthanasia Act observes a gradual increase in reporting euthanasia to the Regional Assessment Committees and an increasing acceptance in physicians to perform euthanasia, 85% in 2012. In 2012 the 'End-of-Life clinic' emerged to perform euthanasia in patients whose physicians refused to do so.[44,45]

Substantial methodological differences exist between the above-mentioned studies and the registration of data by GPs participating in the Sentinel Practices. An extensive discussion of these differences is beyond the scope of this report. However, there is one difference that bears mentioning: unlike the recent studies mentioned above, the data of the Sentinel Practices are derived exclusively from GPs, and not only deal with applied cases of euthanasia, but also with discussions and deliberations about requests for euthanasia which in due course may be granted. Since 2011 a question was added concerning whether the euthanasia was finally applied, so we know the percentage of euthanasia requests carried out and whether the euthanasia was reported to the Regional Evaluation and Examination Committee for Euthanasia. In 2013 65% of the requests for euthanasia this requested intervention was applied, somewhat more frequently than in the previous year. All patients with applied euthanasia were also reported to the Regional Assessment Committee for Euthanasia.

Also the annual reports of the Regional Assessment Committee Euthanasia provide useful information. From the 2012 annual report we know that 4188 cases of executed euthanasia or physician assisted suicide are reported to the Committee.[45] In 2012 the number was higher than in previous years (3695, 3136, 2636, 2331 reported in respectively 2011, 2010, 2009 and 2008). Most likely the percentage of cases actually reported to the Assessment Committees has increased, but also the acceptance of physicians to apply euthanasia even in patients with dementia and psychiatric morbidity.[46] In most reported cases the physicians had strictly followed the rules required by law. Only in 10 instances this was not the case at a national level in 2012.[45] The increase noted by the Regional Assessment Committee is consistent with trends found in the Sentinel Practices; however, differences in study design should be taken into consideration as well as the possibility of co-incidental fluctuation in the Sentinel Practices due to small numbers. The percentage of living wills has increased during the past years; from 15% in 1984 to 82% in 2013. However, in 2009 it was 92%. Although a higher percentage can be considered as an indicator for the quality of care when discussing decisions at the end of life, the percentage could also decrease if these discussions occurred at an earlier stage in the illness, long before euthanasia is an actual issue. This appears to be a plausible explanation for the slightly decreasing percentage in the last years. Many of these requests were not yet actual issues, apparently. It is re-assuring that all patients who

underwent euthanasia in 2013 in the Sentinel Practices were reported to a Regional Assessment Committee for Euthanasia.

The study will be continued in 2014.

Publications based fully or partly on NIVEL Primary Care Database, Sentinel Practices

Donker GA and Alphen van JE (2011). *The Impact of the Dutch Euthanasia Act on the Number of Requests for Euthanasia and Physician Assisted Suicide* - A Cohort Study in General Practice between 1977 and 2007
In: Euthanasia - The "Good Death" Controversy in Humans and Animals, Josef Kuře (Ed.), ISBN: 978-953-307-260-9, InTech, Available from: http://www.intechopen.com/articles/show/title/the-impact-of-the-dutch-euthanasia-act-on-the-number-of-requests-for-euthanasia-and-physician-assist

Alphen van JE, Donker GA, Marquet RL. *Euthanasieverzoeken voor en na de euthanasiewet.* Huisarts en Wetenschap 2011;54(1):18-22

Alphen van Jojanneke E, Donker Gé A, Marquet Richard L. *Request for euthanasia in general practice before and after implementation of the Dutch Euthanasia Act*. British Journal of General Practice: 2010;60:263-267

Donker GA, Van Alphen JE, Marquet RL. *The impact of the Euthanasia Act on the number of requests for Euthanasia and Physician assisted suicide*. European Journal of Public Health 2009;19(S1):110 (Oral Presentation 2nd European Public Health Conference Lodz, November 2009)

Marquet RL, Bartelds A, Visser GJ, Spreeuwenberg P, Peters L. *Twenty five years of requests for euthanasia and physician assisted suicide in Dutch general practice: trend analysis.* BMJ 2003;327:201-2

Appendix 1

Table 15.4 Requests made by patients for active euthanasia in 2013

age	gender	disease reported	reason for request
97	m	cardiac failure, epilepsy, COPD, artrosis anemia, kidney failure	immobility, depending on care
97	v	cachexia	exhausted, pain
90	m	immobility	completed life
89	v	terminal cardiac failure	dyspnea and and immobility
87	v	cardiac failure, grade IV	unbearable dyspnea, loss of dignity
84	m	mesothelioma	unbearable suffering
82	m	carcinoma head/neck	obstruction larynx, dyspnea
82	m	COPD Gold 4	immobility
82	v	pancreascarcinoma	prospectless suffering
81	m	COPD Gold IV, terminal	serious dyspnea, prospectless suffering
81	v	multiple myeloma, breast cancer and final stage M. Parkinson	immobility, bedridden
80	m	metastatic rectum carcinoma	terminal
80	v	colon carcinoma	prospectless suffering
79	m	metastatic gemetastaseerd lung carcinoma	prospectless suffering
79	m	esophagus carcinoma, metastatic	prospectless suffering, exhausted
78	m	cardiac failure	dyspnea
78	m	M. Kahler	unbearable suffering in end stage disease
78	v	ALS	dyspnea, immobility

Table 15.4 Requests made by patients for active euthanasia, 2013 (cont.)

age	gender	disease reported	reason for request
77	v	M. Parkinson	increasing dependence on care
75	v	metastatic bronchus carcinoma	unbearable suffering
75	v	primary lateral sclerosis	loss of dignity
74	m	bronchus carcinoma	pain, dyspnea, cachexia
74	v	bladder carcinoma, metastatic	prospectless suffering
74	v	PSMA	deterioration, dependancy
72	m	colon carcinoma	terminally ill, metastatic
73	v	decubitus, CVA	unbearable suffering
71	v	pancreatic carcinoma	prospectless unbearable suffering
70	m	metastatic lung carcinoma	pain, deterioration, bedridden
67	m	metastatic lung carcinoma	late diagnosis in advanced stage
66	m	hepatocellular carcinoma	dependancy
65	m	colon carcinoma	pain
65	v	colon carcinoma	unbearable suffering, pain, dependancy, loss of dignity
62	m	kidney malignancy	prospectless suffering, loss of dignity, bedridden, pruritus, exhausted
60	m	metastatic bladder carcinoma	pain, terminal illness
60	m	Non Hodgkin lymfoma	loss of function, dependancy
59	v	lung carcinoma	unbearable suffering
58	m	lung carcinoma	prospectless suffering
57	m	esophagus carcinoma, metastatic	unbearable suffering
57	m	melanoma	metastatic, unbearable suffering
52	m	gastric sarcoma, lung and liver metastases	deterioration
52	v	metastatic lung carcinoma	terminal phase
50	m	M. Huntington	prospectless suffering

Table 15.4 Requests made by patients for active euthanasia, 2013 (cont.)

age	gender	disease reported	reason for request
50	m	lung carcinoma	terminal phase, metastatic
48	v	metastatic bilateral mamma carcinoma	increasing pain and dyspnea
47	m	colon carcinoma	pain, complete dependancy
45	m	gastric carcinoma, metastatic	prospectless suffering
42	m	metastaic Grawitz carcinoma	prospectless suffering
41	m	gliobastoma grade 4	prospectless suffering

16 Palliative Sedation

Topic owner: Mrs. Dr. G.A. Donker, NIVEL (2005-2013)

Introduction

Even when palliative care is optimal at the terminal phase of a disease process, situations may arise in which treatment no longer provides sufficient alleviation of symptoms. Predominant features are for example severe agitation, dyspnea, pain, nausea, vomiting and fear. They leave a dreadful impression on all persons concerned in palliative care. The patient is suffering severely and may become desperate; family and friends are often hardly able to stand the situation, and doctors and caregivers feel they have failed.

In the past years severe suffering at the end of life is increasingly considered as unacceptable by patients and/or relatives. Caregivers are requested to alleviate this suffering, which is felt as meaningless. Doctors may then decide, on certain conditions, to apply deep sedation: decrease consciousness to a moderate or severe degree, short term or intermittantly, using sedative drugs (sleeping agents). The objective is to alleviate suffering, not to terminate life.

In 2002 palliative sedation was performed by Dutch GPs in 2.5% of all deaths and has found to be increasingly applied.[41] The end of life study of VU Medical Centre reports in its fifth national survey in 2012 that continuous deep sedation is applied in 12.3% of all deaths occurring at home, hospital or nursing home in home in 2010.[46,47]

The question has been raised whether the strict criteria formulated for a request for euthanasia, should also be followed for palliative sedation. When discussing this issue, fear has been expressed that in doing so palliative sedation will become an alternative for euthanasia, which is scrutinized by an external evaluation committee. It remains to be seen to what extent euthanasia and palliative sedation are complimentary in alleviating suffering

at the end-of-life. Investigations into the practice of palliative sedation by GPs may provide some answers to these questions.

Method

Sentinel GPs were requested to register each case of palliative sedation in their practice. At the end of each year they provide additional information by completing a questionnaire in which questions are being asked about the reason why palliative sedation was applied, the nature of the underlying disease, whether the patient also requested for euthanasia, and who was involved in the decision-making for palliative sedation. In 2007 it was asked for the first time which circumstance had been the predominant factor to decide for palliative sedation when a request for euthanasia has been posed as well.

Results

In 2013 37 sentinel practices reported 25 patients who were treated with palliative sedation, which is 4.9% of all reported deaths in 2013. This is comparable to the previous years. In 2013 the decision for sedation was taken in 12 men and 13 women. Of these 25 patients 19 had cancer, i.e. 76%. GPs reported that for 19 patients (76%) the presence of 2 or more refractory symptoms had prompted the decision to decrease the consciousness of the patient. For 5 patients only 1 refractory symptom was indicated (four times pain, one time anxiety) (see also appendix 1, table 16.5).

Untreatable pain (18 patients, 72%) was the most prominent reason to decide for palliative sedation in 2013, like in previous years. Also anxiety (9 patients, 36%), untreatable dyspnea (9 patients, 36%), delirium (6 patients, 24%), nausea (4 patients, 16%) and vomiting (2 patients, 8%) are prominent reasons to sedate and often occur in combination with pain.

From the 25 reported patients 5 (20%) also requested for euthanasia. The reasons to apply palliative sedation and not euthanasia in these 5 patients were, respectively: patient preferred palliative sedation after careful consideration (4 times) and sudden deterioration resulting in lack of time to start a euthanasia procedure due to severe symptoms (one patient).

Table 16.1 Absolute number of patients decreased after palliative sedation, per province group, address density and for the Netherlands in 2005-2013

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2005	4	4	15	3	7	17	2	26
2006	5	4	18	4	4	23	4	31
2007	4	2	18	6	5	24	1	30
2008	3	2	10	3	4	9	5	18
2009	7	10	9	5	7	21	3	31
2010	5	10	8	8	5	23	3	31
2011	4	1	8	2	4	6	5	15
2012	7	2	6	6	7	12	2	21
2013	3	4	12	6	7	17	1	25

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$2500/km^2

In 2013 the highest number of patients (per 10,000) are reported in the southern provinces. Sorted by address density most patients per 10,000 in 2013 were reported to live in middle large and small cities. (table 16.1 and 16.2)

Table 16.2 Number of patients per 10,000 deceased after palliative sedation, per province group, address density and for the Netherlands as a whole in 2005-2013

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2005	(1.8)	(1.5)	2.5	(1.2)	3.0	1.9	(0.9)	2.0
2006	3.0	(2.3)	4.0	(2.5)	(2.4)	4.2	(1.7)	3.3
2007	(1.6)	(0.9)	4.4	3.2	2.8	3.5	(0.5)	2.8
2008	(1.2)	(0.8)	2.9	(1.5)	(2.0)	1.4	3.1	1.7
2009	2.6	4.1	1.9	2.5	2.5	2.7	(1.1)	2.7
2010	1.9	3.8	1.9	2.5	1.9	3.0	(1.4)	2.5
2011	(3.8)	(0.4)	2.1	(0.7)	(2.3)	1.1	1.6	1.5
2012	4.2	(0.9)	1.4	2.3	2.8	2.2	(0.9)	2.1
2013	(2.1)	(2.6)	3.1	3.5	2.9	3.7	(0.5)	2.8

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$2500/km^2

The numbers between bracket are based on N<5

Age distribution

The age distribution is given in table 16.3.

Table 16.3 Absolute number of patients per age group treated with palliative sedation by their GP in 2005-2013

	≤54	55-64	65-74	75-84	≥85	total
2005*	3	9	3	8	2	26
2006	2	6	8	8	7	31
2007	1	5	10	8	6	30
2008	4	3	2	5	4	18
2009	7	4	7	7	6	21
2010	2	7	9	6	7	31
2011	3	2	4	4	2	15
2012	1	2	2	10	6	21
2013	2	5	5	7	6	25

*In 2005 the age of one patient was unknown.

Palliative sedation sometimes is applied at a relatively young age and does not seem to be related to age.

Summary of reported requests

Similarly as for the topic ‘requests for euthanasia’ (see chapter 15) five major disease groups were shown to obtain insight into the disorders underlying the use of palliative sedation.

Table 16.4 Disorders for which palliative sedation was applied in 2005-2013

	N	%
malignant tumors	168	74
cardio-vascular diseases	27	12
chronic obstructive pulmonary disease	7	3
symptoms and incompletely described diseases	9	4
other diseases	17	7
total	228	100

Discussion

Similarly as for requests of euthanasia (chapter 15), cancer is the most prominent disease leading to the decision for palliative sedation.
Mostly the presence of more than one refractory symptom is the reason to apply palliative sedation. Untreatable pain, dyspnea and anxiety play a major role. In 2013 palliative sedation was applied in 4.9% of the by the sentinel GPs reported deaths. This is considerably lower than the 12.8% mentioned in the fifth national survey concerning medical decisions at the end of life.[47] However, this latter study involves also deaths in hospitals, nursing homes and at home, and therefore is not comparable with our study in a general practice population, in which patients in nursing homes normally are not included. Probably palliative sedation is more frequently applied in nursing homes and hospitals than in general practice. Our study showed annual fluctuations, but no increasing trend in the period 2005-2011. This was an unexpected finding as literature reported an increasing trend of palliative sedation.[47-49]
In the five patients who had also asked for euthanasia there was no indication that palliative sedation had been applied to avoid euthanasia. The reasons for palliative sedation were clearly defined. These results indicate that requests for euthanasia and palliative sedation largely relate to different

motives, despite similarities in the nature of underlying diseases. The study does not support the notion that the boundary between euthanasia and palliative sedation is becoming indistinct. This is also supported by the thesis about palliative sedation by Jeroen Hasselaar in 2009.[50] The guideline on palliative sedation issued by the KNMG in 2005 (www.knmg.nl), undoubtedly has contributed to professionalize this intervention. The results of 2005 to and including 2011 were analysed and published in the British Journal of General Practice [51] in 2013. This study demonstrated that the patient is mostly involved in the decision preceding palliative sedation (87.4%). However patients with COPD and/or chronic cardiovascular disease were less frequently involved in these decisions than patients with cancer ($p<0.05$), resulting in the conclusion that timely discussion of end-of-life preferences deserves more attention in patients with respiratory and cardiovascular diseases and in patients with pending declining cognition.[49]

The topic will be continued in 2014.

Publications based fully or partly on NIVEL Primary Care Database, Sentinel Practices

Donker GA, Van Dijk C. *Delier en palliatieve sedatie.* Huisarts & Wetenschap 2014;57(4):194

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Appendix 1

Table 16.5 Characteristics of patients treated with palliative sedation in 2013

age	gender	disease reported	reason for request
98	v	old age, status after femur fracture	pain
93	v	heart failure	dyspnea, anxiety
92	v	metastatic mamma carcinoma	pain, exhausted, prospectless suffering
90	m	prostate carcinoma	dyspnea, pain
88	v	M. Parkinson, suspicion colon carcinoma, anemia	anxiety, completed life
87	m	peritonitis carcinomatosa, unknown primary malignancy	dyspnea, fast deterioration, cachectic ascites, no food intake
83	v	esophagus carcinoma	
82	m	COPD Gold 4	dyspnea, anxiety
82	v	biliary carcinoma	delirium, dyspnea
78	m	idiopaticpulmonary fibrosis	dyspnea, nausea, anxiety
78	v	gastric carcinoma	delirium, pain, nausea, vomiting, anxiety
77	m	pancreatic carcinoma	pain, untreatable suffering(epileptic)
75	V	primary lateral sclerosis/ALS	
74	m	sarcoma	pain, anxiety
73	v	hyperparathyreoïdia and serious cardiac failure	pain
68	v	metastatic melanoma	dyspnea, pain, exhausted
67	m	metastatic prostate carcinoma	delirium, pain, anxiety

Table 16.5 Characteristics of patients treated with palliative sedation in 2013 (cont.)

age	gender	disease reported	reason for request
65	m	lu carcinoma	pain,
64	m	liver carcinoma	dyspnea, pain, nausea, vomiting
62	v	pancreatic carcinoma	pain, nausea
60	v	metastatic mamma carcinoma	delirium, pain
56	v	metastatic colon carcinoma	pain, exhausted, patient's request
55	m	metastatic kidney carcinoma, cerebral metastases	pain, anxiety, hick-up
52	m	metastatic biliary carcinoma	delirium, dyspnea, pain, nausea, anxiety
51	m	metastatic bronchus carcinoma	delirium, pain, exhausted

17 Eating disorders

Topic owner: Prof. H.W. Hoek, Parnassia Bavo group
(1985-1989 and 1995-2013)

Introduction

It is unclear whether the incidence rate of serious eating disorders such as anorexia nervosa and boulimia nervosa is increasing. Sentinel GPs registered both of these disorders between 1985 and 1989. By a renewal of registration from 1995 it is studied whether these disorders are increasing.
This chapter only provides an indication of trends in the number of patients with eating disorders in general practice. Results emerging from the questionnaires will be published separately.

Methods

The trend in the incidence of eating disorders from 1995 onward will be calculated per age group, province group and address density and will be compared with the period 1985-1989. These data are not corrected yet for double counts and contain figures about incidence as well as prevalence. The numbers should therefore be interpreted with caution. For that reason no extrapolation to a national level is presented.
The sentinel GPs have been asked to complete a questionnaire with additional information for each registered patient. Was the eating disorder newly diagnosed in 2013 and was the patient referred to a different care provider? In addition, information was gained about some demographic data of the patient, the physical aspects of the disease and referral by the GP. The results of this study are published elsewhere.

Results

In table 17.1 the distribution is shown of the number of patients diagnosed by the GP with an eating disorder, per 10,000 inhabitants, per province group and address density and for the Netherlands as a whole, from 1985-1989 and from 1995-2011. In 2013 eating disorders are diagnosed in 33 women and four men.

Table 17.1a Absolute numbers of patients for whom GPs diagnosed an eating disorder (boulimia and/or anorexia nervosa), per province group, address density and for the Netherlands as a whole, 1985-1989 and 1995-2013

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
absolute/year average:								
1985-1989	7	10	35	10	6	33	24	61
1995	11	11	26	16	5	49	10	64
1996	6	8	22	9	3	37	5	45
1997	12	10	11	9	8	29	4	42
1998	10	17	15	9	5	36	10	51
1999	4	14	12	13	1	38	4	43
2000	4	9	13	9	3	26	6	34
2001	5	6	6	7	4	19	1	24
2002	2	12	14	8	5	24	7	36
2003	1	14	24	4	2	29	12	43
2004	3	11	14	11	3	30	6	37
2005	4	8	15	1	10	16	2	28
2006	2	8	16	6	5	19	8	32
2007	4	8	19	9	5	27	8	40
2008	8	12	16	13	11	31	7	49
2009	5	8	22	9	5	26	13	44
2010	6	7	16	5	6	20	8	34
2011	1	9	12	7	6	16	7	29
2012	7	7	7	9	8	19	3	30
2013	2	6	22	3	6	21	6	33

* 1: ≤500/km^2 2: 500-2500/km^2 3: ≥2500/km^2

Table 17.1b Numbers of women for whom GPs diagnosed an eating disorder (boulimia and/or anorexia nervosa), per province group, address density and for the Netherlands as a whole, 1995-2013, per 10,000 women

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
per 10,000 women								
1995	8.9	6.4	8.1	9.1	5.2	10.5	6.9	8.1
1996	4.7	4.7	8.9	4.8	3.0	8.9	3.3	6.2
1997	7.8	5.5	4.2	4.8	6.5	5.3	4.3	5.3
1998	7.2	9.1	6.7	5.6	8.6	7.1	11	7.1
1999	(3.3)	8.5	5.4	8.4	(1.1)	7.9	4.4	5.2
2000	(3.2)	4.6	3.9	6.1	(2.3)	4.9	3.8	4.2
2001	3.4	4.0	2.5	4.6	(4.4)	4.0	0.9	3.6
2002	(1.5)	7.3	5.4	3.5	4.9	4.5	4.5	4.6
2003	(0.8)	11.6	7.8	(2.3)	(1.8)	5.9	9.0	6.0
2004	(1.3)	7.0	2.6	2.9	(2.9)	3.5	2.3	3.0
2005	(3.3)	5.4	4.1	(0.6)	8.2	4.9	(1.2)	3.5
2006	(2.4)	9.2	6.6	7.5	6.0	6.6	6.5	6.4
2007	(3.2)	7.3	9.1	9.5	(5.5)	7.1	8.0	7.0
2008	6.0	8.8	8.7	12.4	10.5	8.3	8.4	8.7
2009	3.7	6.3	9.8	9.8	5.2	7.4	5.2	7.6
2010	4.5	4.5	8.0	4.9	3.1	6.2	7.5	5.8
2011	1.3	7.9	6.4	5.0	6.4	5.8	4.8	5.5
2012	8.8	5.7	3.1	7.5	5.8	6.4	3.6	5.7
2013	3.0	6.6	11.0	2.1	5.1	8.4	5.7	7.0

* 1: $\leq$500/km^2 2: 500-2500/km^2 3: $\geq$2500/km^2

The absolute and relative number of reports in 2013 is comparable to previous years. No consistent differences were found by region and address density.

Age distribution

Table 17.2 shows the distribution of reported eating disorders by age group.

Table 17.2 Absolute numbers of patients for whom GPs reported an eating disorder (boulimia and/or anorexia nervosa), by age, 1985-1989 and 1995-2013

women	1985-1989	1995	1996	1997	1998	1999	2000	2001	2002
1-4	-	-	-	1	-	-	-	-	-
5-9	-	-	-	1	-	-	-	1	-
10-14	1	1	1	0	2	-	1	1	1
15-19	8	13	15	10	9	7	9	6	5
20-24	12	14	9	11	14	74	5	2	3
25-29	14	10	7	7	5	6	9	4	8
30-34	6	9	4	3	4	6	4	5	2
35-39	7	8	6	3	11	91	3	3	5
40-44	4	2	2	4	4	6	1	-	4
45-49	1	4	1	1	1	-	1	-	2
50-54	1	2	-	-	-	-	1	1	2
55-59	1	-	-	-	1	1	-	-	-
60-64	-	-	-	-	-	-	-	-	-
65-69	-	-	-	-	-	-	-	-	-
70-74	-	-	-	-	-	-	-	-	-

Table 17.2 Absolute numbers of patients for whom GPs reported an eating disorder (boulimia and/or anorexia nervosa), by age, 1985-1989 and 1995-2013 (cont.)

women	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1-4	-	-	-	-	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-
10-14	-	1	1	-	3	1	2	2	4	2	4
15-19	5	5	9	5	6	12	7	11	5	5	8
20-24	7	10	2	9	7	2	9	7	5	4	6
25-29	7	8	2	4	4	5	7	3	6	4	4
30-34	5	-	6	3	5	7	4	1	2	4	3
35-39	5	2	1	6	3	7	5	2	-	4	2
40-44	6	5	6	1	3	3	3	3	1	3	3
45-49	5	4	-	1	5	6	4	-	1	-	1
50-54	2	-	-	1	1	3	-	2	1	2	2
55-59	-	-	-	-	-	1	3	1	1	-	-
60-64	1	-	1	1	1	-	-	1	1	2	-
65-69	-	-	-	-	-	-	-	1	-	-	-
70-74	-	-	-	1	-	-	-	-	-	-	-
75-79	-	-	-	-	-	-	-	-	-	-	-
80-84	-	-	-	-	1	-	-	-	-	-	-

The peak incidence in 2013 lies in the age group 15-19 years like in the preceeding year. Also, it is remarkable that eating disorders sometimes still occur at old age.

Discussion

In 2013 the number of patients reported with eating disorders is comparable to previous years. Previous studies have shown that living in big cities is a risk factor for boulimia nervosa.[52,53]

The study will be continued in 2014.

Publications based fully or partly on NIVEL Primary Care Database, Sentinel Practices

Smink FR, van Hoeken D, Hoek HW. *Epidemiology of eating disorders: incidence, prevalence and mortality rates.* Curr Psychiatry Rep. 2012 Aug;14(4):406-14. doi: 10.1007/s11920-012-0282-y

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18 General comments

1 The Counselling Committee has decided to include the following topics on the weekly returns in 2014.

   a Influenza and influenza-like illnesses
   b Research on end-of-live decisions
   c Suicide and attempted suicide
   d STD
   e Gastro-enteritis
   f Whooping cough
   g Pneumonia
   h Oak Processionary larvae
   i Screening breast cancer ≥25 years
   j Request for euthanasia
   k Eating disorders
   l Palliative sedation
   m. urinary tract infection

2 The Counselling Committee welcomes suggestions concerning new topics and adjustments of existing topics.

3 Data contained in this report may be reproduced provided that the source is acknowledged.

4 A translation into English will be published on the web-site of NIVEL.

19 Literature list

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   b The infection must be accompanied by a rectal temperature increase of at least 38º C.
   c At least one of the following symptoms must be present: cough, coryza, sore throat, frontal headache, retrosternal pain, myalgins.
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Appendix 1: participating doctors in 2013

Name:	Location:	Province:
J. Mulder*	't Zand	Groningen
J.P.de Kroon*(from 04.11.2013)	Onstwedde	Groningen
P.S. Wiersema*	Oostermeer	Friesland
W.J.M. Brunninkhuis	Drachten	Friesland
H.J. Dijkstra*	Bakhuizen	Friesland
Mw. F.B. van Heest*	Schoonoord	Drenthe
S.M. Handgraaf	Nieuw Weerdinge	Drenthe
J.H. Vaartjes(to 30.06.2013)	Emmen	Drenthe
J.F.E. Borm*	Albergen	Overijssel
Dr. R.A. de Groot/Mw. J.T. Bos		
Mw. E.J.A. Idema *	Oldemarkt	Overijssel
P.J. van Beek	Oldenzaal	Overijssel
M.T.W. van der Velden	Dieren	Gelderland
J.H.M. van der Holst	Groenlo	Gelderland
L.B.P.M. Hendrikx*	Steenderen	Gelderland
R.J.M. Kimmenaede	Zutphen	Gelderland
J.A. Nielen	Emmeloord	Flevoland
Mw. M.G.C.L. Smit, Mw. E.M. Koopman		
L.J.A.L. Kroft, L.A. Boom	Amersfoort	Utrecht
A. van Beelen(from 17.06.2013)	Bunschoten	Utrecht
S. Tedjoe	Broek in Waterland	Noord-Holland
Mw. S. Sluis	Hilversum	Noord-Holland
Mw. M.H. Brooks	Hilversum	Noord-Holland
A. Leemhuis/W. van der Maarel	Castricum	Noord-Holland
C. Zwart	Haarlem	Noord-Holland
C. Noordzij	Heemskerk	Noord-Holland
M. Voerknecht	Bussum	Noord-Holland

Appendix 1: participating doctors in 2013 (continued)

A.M. van Meurs(to 01.04.2013)	Den Haag	Zuid-Holland
J.C.B.M. Rensing/Mw. A. Rensing-van Dijk	Den Haag	Zuid-Holland
Mw. D. Nijman*	Nieuwveen	Zuid-Holland
Mw. M. Heijmans, Mw. K. Jonker,		
Mw. C. Douma en G. Agterberg(from 04.02.2013)	Den Haag	Zuid-Holland
W.H. van der Linden/Mw. E.A.A. van Rosmalen*	Leimuiden	Zuid-Holland
R.R. Lankhorst	Middelburg	Zeeland
P.B.A. Crama	Vlissingen	Zeeland
M.G.A.M. de Gouw	Rosmalen	Noord-Brabant
J.J.J. Meulenberg/J.D.M. schelfhout		
Mw. A. van Hintum	Eindhoven	Noord-Brabant
R.J.P. de Gardeyn	Sleeuwijk	Noord-Brabant
P. Meulesteen	Eindhoven	Noord-Brabant
P.B.G. Gyselink(to 01.04.2013)	Berkel-Enschot	Noord-Brabant
S. Schouten/Mw. H.J.C.M. Schouten-van den Oever	Oss	Noord-Brabant
M.J.F.M. Klaassen*	Oirsbeek	Limburg
P.H.M. Vaissier)	Maastricht	Limburg

*) With dispensary

Appendix 2: registered topics 1970-2014 (alphabetical)

abortion, spontaneous	1982-1983
abortion, induced	1971-1979
abortion requests	1970-1975
accidents	1971
accidents in a private setting	1981-1983
acute atypical headache	1988-1992
acute otitis media	1971 and 1986
acute respiratory infection	2001-2004
addiction to smoking (consultation)	1974 and 2003-2006
AIDS (fear of)	1988-2007
alcoholism	1975
anti-hypertensives and/or diuretics (prescription of)	1976
bee or wasp stings	1992-1993
bites by household pets	1986
burns	1988-1989
cerebrovascular accident	1986-1987
cervical smear	1976-1998
chickenpox	2000-2010
childbirth (at □ 28 weeks)	1982-1983
child abuse (suspicion of)	1973-1974
chronic benign pain disturbance	1995-1996
dementia	1987-1988
depression	1983-1985 and 2000-2002
diabetes mellitus	1980-1983 and 1990-1994 and 2000-2002
diarrhoea of unknown origin (acute)	1970
dog bite	1987 and 1998-1999
drug use (consultation)	1972-1973 and 1979-1981
dwelling (certificate issued for another)	1975

Appendix 2: registered topics 1970-2014 (alphabetical) (cont.)

echography requests	1988
environment-related health complaints	2003
exanthema of unknown origin	1970
family planning (advice)	1970-1976
gastro-enteritis	1992-1993 and 1996-2014
hay fever	1978-1982
hepatitis	1994
herpes zoster	1997-2001
gut feeling related to cancer	2010-2013
infectious mononucleosis	1977-1979 and 1991
influenza and influenza-like illnesses	1970-2014
injuries to the skeletal and locomotor systems	1984-1985
liver, gall bladder and pancreas diseases	1995-1997
malignancies	1984-1985
mammography (outpatient)	1988-2000
measles	1975-1979
measles/mumps	1990
medical aids	1999-2002
mental health care (referral)	2001-2003
morning-after pill, prescription of	1972-1991
myocardial infarction	1978 and 1983-1985 and 1991-1994
neuraminidase inhibitor (prescription)	2003-2004
oestrogen, prescription of	1994-1998
Parkinson's disease	1980-1985
penicillin, prescriptions and side effects	1982-1983
peptic ulcer (first time/relapse)	1985-1986
physical violence	1996-1999
p.i.d. (pelvic inflammatory disease)	1994-1998
pneumonia	2008-2010 2012-2014
pregnancy (despite contraception)	1987-1991
premature birth	1982-1983

Appendix 2: registered topics 1970-2014 (alphabetical) (cont.)

prostate complaints	1997-2002
psoriasis	1976-1977
psychiatric patients	
- discharged	1986-1988
- admitted	1988
referrals to a specialist	1984
referrals to a speech-language pathologist	1988-1989
referral/authorization for physiotherapy	1985
referral for psychosocial problems	1986-1987
research on end-of-live decisions	2005-2014
rohypnol prescriptions	1987-1988
rubella and rubella-like illnesses	1971
screening breast cancer >25 years	2012-2014
sexual problems and sexual violence	2003-2008
side-effects of cosmetics (suspected)	1992-1993 and 2009-2011
sports injuries	1979-1983 and 2005 2007
skull traumas in traffic accidents	1975-1977
sterilization of men (performed)	1972-1999
sterilization of women (performed)	1974-1999
sexually transmitted diseases (STD)	2008-2014
suicide and attempted suicide	1970-1972 and 1979-2014
Tree pest	2013-2014
tonsillectomy or adenotomy	1971
tranquillizer prescribed	1972-1974
unwanted pregnancy	2003-2011
urethritis in men	1992-2007
urinary tract infection (medicine prescribed)	1977
urinary tract infection	2003-2004 and 2009-2011 and 2014
ventricular/duodenal ulcer	1975
whooping cough	1998-2014
zanamivir (Relenza)	2000-2002

Appendix 3: list of incidental studies

Incidental studies and other additional studies 1977-2014 (alphabetical)

acute intoxication at work	1994-1995
aggression against GP and practice staff	1997-2000
alternative treatments (registration possible?)	1980
anorexia nervosa and boulimia	1985-1989 and 1995-2014
antibiotic resistance of Staphylococcus in general practice	2005-2006
diabetes mellitus (prevalent cases)	2000 and 2007-2012
euthanasia (request for)	1976-2014
incest	1988
lyme disease	1991-1994
malignancies	1982-1983
multiple sclerosis	1977-1982
puerperal mastitis	1982
regret after sterilization	1980-1984
serum collection	1980 and 1985
palliative sedation	2005-2014
vaccination against influenza	1992

Appendix 4: age population of the Netherlands

Age distribution of the population of the Netherlands, by gender, in thousands, 1 January 2013 (CBS)

age	men	women	total
0-4	467	445	912
5-9	486	464	950
10-14	519	496	1015
15-19	508	485	993
20-24	534	523	1057
25-29	516	508	1024
30-34	505	504	1009
35-39	514	517	1031
40-44	637	633	1270
45-49	652	640	1292
50-54	620	615	1235
55-59	558	557	1115
60-64	527	525	1052
65-69	467	475	942
70-74	320	347	667
75-79	229	283	512
80-84	150	228	378
≥85	98	227	325
total	8,307	8,472	16,779

Appendix 5: annual tables

NIVEL Primary Care Database - Sentinel Practices

Age group by topic

year 2013 weeks 1 t/m 52

all practices age group	population			Influenza	STD*			Whooping-cough	Pneumonia*		
	M	F	M+F	M+F	M	F	M+F	M+F	M	F	M+F
≤1	459	503	962	936	0	0	0	0	0	24	13
1-4	2012	2013	4025	626	5	0	3	17	25	38	31
5-9	2815	2639	5454	268	0	0	0	2	23	24	23
10-14	3139	2976	6116	173	0	11	5	3	21	4	13
15-19	3103	2936	6039	185	51	201	124	3	4	26	15
20-24	3004	2973	5977	154	231	285	258	0	13	21	17
25-29	2874	2981	5855	169	165	259	213	2	17	25	21
30-34	2899	2872	5770	243	75	158	117	3	8	22	15
35-39	3075	3031	6107	247	84	78	81	5	8	41	24
40-44	3768	3770	7537	228	42	84	63	0	44	30	37
45-49	3998	3840	7839	246	43	61	51	1	44	46	45
50-54	3783	3546	7329	244	28	27	28	5	44	35	40
55-59	3195	3262	6458	257	30	30	30	0	39	91	66
60-64	3241	3131	6372	251	20	10	15	2	58	93	75
65-69	2820	2932	5752	252	4	0	2	2	74	112	93
70-74	2042	2175	4217	270	5	5	5	0	94	77	85
75-79	1492	1752	3244	265	0	6	3	3	142	81	109
80-84	966	1364	2330	266	0	0	0	0	186	109	141
≥84	638	1383	2021	381	0	0	0	0	270	265	266
total	49323	50079	99404	256	49	74	62	3	43	54	49

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Age group by topic

year 2013 weeks 1 t/m 52

all practices age group	population			Gastro-enteritis no feces test			Gastro-enteritis feces test			Gut feeling related to cancer		
	M	F	M+F	M	F	M+F	M	F	M+F	M	F	M+F
≤1	459	503	962	806	1034	925	65	40	52	0	0	0
1-4	2012	2013	4025	383	527	455	50	30	40	0	0	0
5-9	2815	2639	5454	149	129	140	7	0	4	0	0	0
10-14	3139	2976	6116	92	44	69	13	7	10	0	0	0
15-19	3103	2936	6039	58	109	83	16	17	17	3	3	3
20-24	3004	2973	5977	83	135	109	17	17	17	3	0	2
25-29	2874	2981	5855	80	107	94	10	20	15	0	0	0
30-34	2899	2872	5770	59	115	87	10	14	12	0	0	0
35-39	3075	3031	6107	49	69	59	0	13	7	3	0	2
40-44	3768	3770	7537	74	80	77	19	21	20	0	3	1
45-49	3998	3840	7839	48	78	63	5	16	10	8	5	6
50-54	3783	3546	7329	42	62	52	0	20	10	5	3	4
55-59	3195	3262	6458	50	92	71	6	9	8	3	12	8
60-64	3241	3131	6372	74	64	69	3	3	3	15	19	17
65-69	2820	2932	5752	39	89	64	4	17	10	18	24	21
70-74	2042	2175	4217	88	124	107	15	9	12	20	23	21
75-79	1492	1752	3244	94	86	89	7	0	3	60	11	34
80-84	966	1364	2330	135	125	129	10	0	4	62	22	39
≥84	638	1383	2021	94	239	193	16	7	10	31	14	20
total	49323	50079	99404	91	122	107	11	13	12	8	7	7

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Age group by topic

year 2013 weeks 1 t/m 52

all practices

age group	population			Policy for symp-toms mamma	End-of-life* study	Suicide
	M	F	M+F	F	M+F	M+F
≤1	459	503	962	0	11	0
1-4	2012	2013	4025	0	5	0
5-9	2815	2639	5454	0	0	0
10-14	3139	2976	6116	0	0	2
15-19	3103	2936	6039	0	7	7
20-24	3004	2973	5977	0	0	15
25-29	2874	2981	5855	205	2	7
30-34	2899	2872	5770	226	0	2
35-39	3075	3031	6107	340	5	13
40-44	3768	3770	7537	310	15	5
45-49	3998	3840	7839	281	21	9
50-54	3783	3546	7329	307	22	18
55-59	3195	3262	6458	236	36	8
60-64	3241	3131	6372	249	50	9
65-69	2820	2932	5752	293	84	3
70-74	2042	2175	4217	207	137	0
75-79	1492	1752	3244	171	195	9
80-84	966	1364	2330	183	354	0
≥84	638	1383	2021	159	806	0
total	49323	50079	99404	257	53	7

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Province group by topic

year 2013 weeks 1 t/m 52

all practices province group	population			Influenza	STD*			Whooping-cough	Pneumonia*		
	M	F	M+F	M+F	M	F	M+F	M+F	M	F	M+F
GR+FR+DR	7212	7128	14340	281	38	45	42	3	24	24	24
OV+GLD+FLE	9839	9864	19703	237	33	46	39	1	21	44	33
UTR+NH+ZH	18823	20024	38847	265	54	104	80	2	58	71	65
ZLD+NB+LIM	13450	13064	26514	243	60	68	64	5	42	46	44
total	49323	50079	99404	256	49	74	62	3	43	54	49

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Province group by topic

year 2013 weeks 1 t/m 52

all practices province group	population			Gastro-enteritis no feces test			Gastro-enteritis Feces test			Gut feeling retated to cancer		
	M	F	M+F	M	F	M+F	M	F	M+F	M	F	M+F
GR+FR+DR	7212	7128	14340	57	69	63	7	3	5	14	7	11
OV+GLD+FLE	9839	9864	19703	80	97	89	12	6	9	12	14	13
UTR+NH+ZH	18823	20024	38847	77	116	97	11	18	15	4	5	4
ZLD+NB+LIM	13450	13064	26514	138	181	158	13	17	15	8	4	6
total	49323	50079	99404	91	122	107	11	13	12	8	7	7

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Province group by topic

year 2013 weeks 1 t/m 52

all practices province group	population			Policy for symptoms mamma	End-of-life research*	Suicide
	M	F	M+F	F	M+F	M+F
GR+FR+DR	7212	7128	14340	306	73	7
OV+GLD+FLE	9839	9864	19703	318	60	4
UTR+NH+ZH	18823	20024	38847	169	34	7
ZLD+NB+LIM	13450	23064	26514	320	64	9
total	49323	50079	99404	257	53	7

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Address density by topic

year 2013 weeks 1 t/m 52

all practices address density	population			Influenza	STD*			Whooping-dough	Pneumonia*		
	M	F	M+F	M+F	M	F	M+F	M+F	M	F	M+F
<500/KM2	12187	11794	23981	161	21	46	33	2	12	25	18
500-2500/KM2	27047	27719	54766	145	55	76	66	3	67	80	73
>2500/KM2	10090	10568	20659	136	68	105	87	2	26	32	29
total	49323	50079	99404	147	49	74	62	3	43	54	49

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Address density by topic

year 2013 weeks 1 t/m 52

all pratices Address density	population			Gastro-enteritis no feces test			Gastro-enteritis Feces test			Gut feeling related to cancer		
	M	F	M+F	M	F	M+F	M	F	M+F	M	F	M+F
<500/KM2	12187	11794	23981	58	82	70	9	3	6	10	7	8
500-2500/KM2	27047	27719	54766	90	119	105	11	13	12	9	7	8
>2500/KM2	10090	10568	20659	132	175	154	14	25	19	3	7	5
total	49323	50079	99404	91	122	107	11	13	12	8	7	7

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Address density by topic

year 2013 weeks 1 t/m 52

All practices Address density	population			Policy for symtoms mamma	End-of-life research*	Suicide
	M	F	M+F	F	M+F	M+F
<500/KM2	12187	11794	23981	289	63	5
500-2500/KM2	27047	27719	54766	231	53	7
>2500/KM2	10090	10568	20659	289	41	8
total	49323	50079	99404	257	53	7

* not all GPs were included