NIVEL Primary Care Database - Sentinel Practices

2014

Mrs. Dr. G.A. Donker

ISBN/EAN 9789461223791

http://www.nivel.nl
nivel@nivel.nl
Telephone 030 2 729 700
Fax 030 2 729 729

Contents

Foreword 5

1 Introduction 7
1.1 International cooperation 8

2 Counselling Committee 11

3 Sentinel Practices staff seminar in 2014 13

4 Methodological explanation of NIVEL Primary Cara Database – Sentinel Practices 15
4.1 Practices 16
4.2 Practice populations 18
4.3 Scale and continuity of reporting 22
4.4 Surveillance topics 27
4.5 Analyses 28
4.6 Extrapolation of observed frequencies to the Dutch population as a whole 30
4.7 Confidence intervals 31

5 Influenza(-like illness) 33

6 Pneumonia 49

7 Whooping cough 57

8 Acute gastro-enteritis 65

9 Sexually Transmitted Diseases (STD) 79

10 Urinary tract infections 89

11 Oak Processionary Larvae 97

12 End-of–Life research **105**

13 (Attempted) suicide **117**

14 Policy for symptoms mamma **123**

15 Requests for Euthanasia **131**

16 Palliative Sedation **145**

17 Eating disorders **159**

18 General comments **167**

19 Literature list **168**

20 Footnotes **175**
Appendix 1: participating doctors in 2014 181
Appendix 2: registered topics 1970-2015 (alphabetical) 183
Appendix 3: list of incidental studies 186
Appendix 4: age population of the Netherlands 187
Appendix 5: annual tables 189

Foreword

The year 2014 was characterized for the Dutch Sentinel Practices by the Integration with NIVEL Primary Care Database effective since 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 meets the latest requirements of privacy protection. The registration of most topics of previous years were continued, with the exception of 'cancer related gut feeling', for which the data collection had been completed in 2013.

The influenza epidemic of the season 2014-2015 was the longest lasting epidemic in the past 40 years and lasted 21 weeks. Of all via the sentinel practices identified influenza viruses this season 62% was influenza A(H3N2), 9% influenza A(H1N1)pdm09, 29% influenza B(Yamagata) and <1% influenza B (Victoria). The epidemic was initially dominated by influenzavirus A(H3N2), but influenza B Yamagata dominated during the second half of the epidemic. Unfortunately, both the circulating influenzaviruses A(H3N2) and B Yamagata lineage showed a mismatch with this seasons viruses in the influenza vaccine.

The year 2014 showed an unanticipated threefold increased incidence in the application of palliative sedation in the last phase of life. It is not clear whether this increase was partially caused by increased media attention for the subject and whether the increased incidence will sustain the coming years, but certainly this issue will be closely monitored via the sentinel practices in the near future. Our 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 and COPD compared to patients with cancer, and also less frequently in patients with a delirium and in the elderly. 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 other studies of which data collection has already been completed, like chickenpox, diabetes mellitus and unwanted pregnancy, generated several interesting publications in 2014 of which the information is available in this annual report.

In the third and last registration year of the surveillance of skin complaints caused by the oak processionary larvae more complaints were registered than in the two previous years, but less than anticipated before the registration started. 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 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.

The data in this annual report are this year again taken form the sentinel practices of NIVEL Primary Care Database 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 Practices and Surveillance

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 15-18). The GPs participating in the sentinel network, weekly assess and deliver data with regard to certain illnesses, events and procedures in general practice. Since the first of January 2014 the Sentinel Practices are integrated in NIVEL Primary Care Database. However, the for the Sentinel Practices characteristic type of data collection, which is not collected during routine EMD registration, is to be continued in the sentinel practices besides the routine data collection for NIVEL Primary Care Database.

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, but in 2014 preparations have been made to collect these data exclusively electronically as well starting from the first of January 2015. This annual report is based on data assembled electronically, either via the sentinel module from 39 practices or via the web application from only one practice. Additional materials from questionnaires and specimens are published in separate articles and reports.

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 28). 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, if a different registration system is collecting more or less the same information, when financial resources are lacking 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 183-186 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.

This also applies to the in 2011 started study in early diagnosis of abdominal tumors. The data collection in the sentinel practices for this study has been completed, but international cooperation in analyses and data interpretation is ongoing and intensive, coordinated by the University of Tromsö. Besides Dutch sentinel practices also GPs from Canada, Scotland, Belgium, Australia, Sweden, Denmark and Norway participate in this study. The study aims to identify prognostic symptoms preceeding abdominal tumors.

2 Counselling Committee

The sentinel practices and surveillance clusters are supported by a Counselling Committee, usually meeting twice a year.

The committee members in 2014 were:

Counselling Committee:	Mrs. Dr. Ir. B.H.B. van Benthem, staff member (RIVM)
	Drs. M.J.J.C. Poos, senior researcher (RIVM)
	Drs. S.M. Handgraaf, Sentinel GP
	Dr. M. Hooiveld, epidemiologist NIVEL
	Dr. ir. J.Korevaar, epidemiologist NIVEL
	Mrs. Dr. E.E. Stobberingh, MD PhD, microbiologist (RIVM)
	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 2014.
In close collaboration with NIVEL Primary Care Database, and other partners outside NIVEL, 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)
Contact	Mrs. E. Wentink(NIVEL)

3 Sentinel Practices staff seminar in 2014

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. In 2014 in Amersfoort the kick-off from NIVEL Primary Care Database was launched in March with a lunch symposium of the sentinel practices. This different set-up was planned due to the integration of three existing GP networks, including the sentinel practices, in NIVEL into NIVEL Primary Care Database per 1-1-2014. The special assignment of the sentinel practices of collecting extra data by questionnaires and specimens on certain topics will be maintained after the integration in NIVEL Primary Care database.

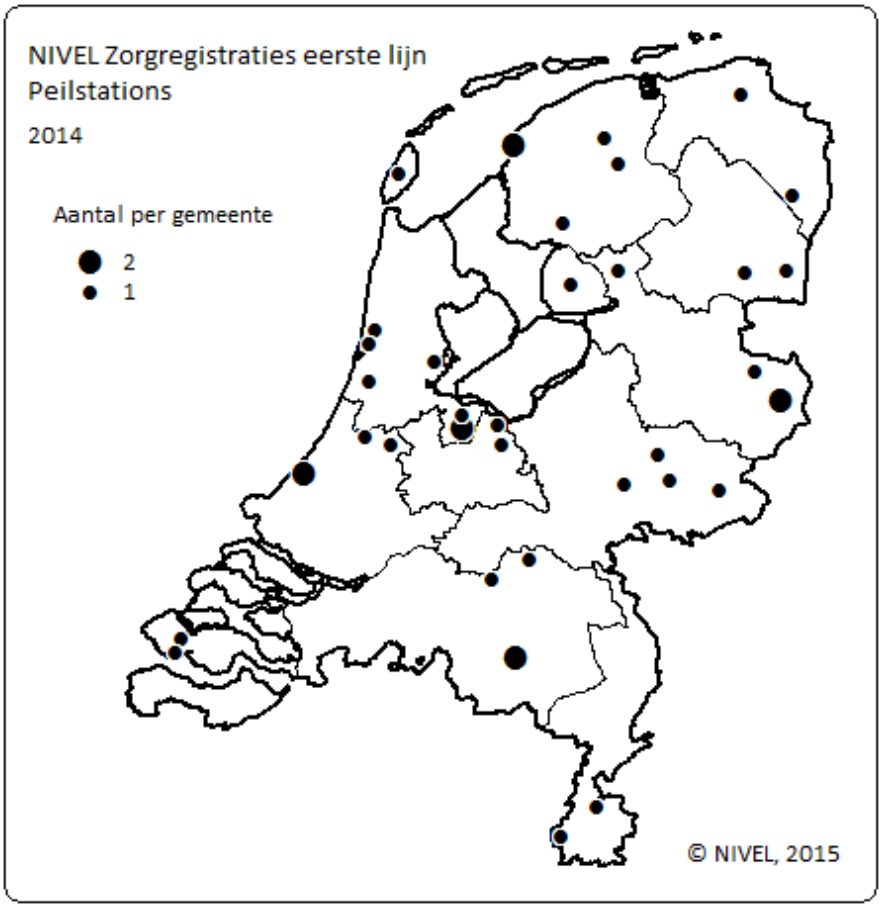
The programme of the lunch symposium included presentations on the following subjects:

- Welcome and introduction in data collection methods in the sentinel practices illustrated by a recent study in palliative sedation - Gé Donker.
- Impact of the introduction of the DSM-5: Eating disorders as a case study – Frederique Smink.
- Implementation of the new SOA guidelines in general practice – Ingrid van den Broek en Gé Donker.

4 Methodological explanation of NIVEL Primary Cara Database – Sentinel Practices

The distribution over The Netherlands of the in 2014 participating sentinel general practices is shown in Figure 4.1 and Table 4.1. In some communities two practices are participating, in most cases for practical reasons such as common holiday practice arrangements.

Figure 4.1



For location level practice see p. 181-182

4.1 Practices

There were 40 sentinel practices in the Netherlands in 2014. The number of participating GPs working in the sentinel practices was 58.

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 (pp181-182) contains a list of the GPs who participated in the sentinel practices in 2014. Two or more GPs cooperate at ten (25%) of the sentinel practices (two GPs cooperate in 5 practices, three in 2 practices, and four in three practices). The percentage of GPs working in a group practice nationwide in January 2014 was 71.6%; but 48.2% 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 27.5% of the total number of sentinel practices, 25.8% of the 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 2005-2014 period.

Table 4.1 Distribution of sentinel GPs and sentinel practices per province group in the 2005-2014 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
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
2014	9	9	12	9	24	14	13	8

Table 4.2 Distribution of sentinel GPs and sentinel practices per address density in the 2005-2014 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
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
2014	16	12	30	22	12	6	58	40

4.2 Practice populations

A census of most practice populations was held in 2014. The results of the census have been used in processing the Sentinel Practices data from 1 January 2014. 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, 2014

	population of the Netherlands**		population of sentinel practices* (with percentages)	
province group:				
N	1,718,033		20,943	(1.2)
E	3,559,282		25,058	(0.7)
W	7,572,073		49,291	(0.7)
S	3,979,901		28,717	(0.8)
gender:	8,334,385			
men	8,494,904		61,563	(0.7)
women			62,446	(0.7)
total (1-1-2014)	16,829,289	,	124,009	(0.7)

* Practices census 2014

** 1-1-2014 Netherlands Statistics *(Centraal Bureau voor de Statistiek)*.

The total practice population of all Sentinel Practices at the beginning of 2014 was 124,009 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 2014, 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 2014

	province group								Netherlands	
	N		E		W		S			
	m	f	m	f	m	f	m	f	m	f
0-4	1.2	1.2	0.6	0.7	0.6	0.6	0.7	0.7	0.7	0.7
5-9	1.3	1.2	0.8	0.8	0.6	0.6	0.7	0.6	0.7	0.7
10-14	1.1	1.3	0.8	0.8	0.7	0.6	0.7	0.6	0.7	0.8
15-19	1.3	1.2	0.7	0.7	0.7	0.7	0.7	0.6	0.8	0.7
20-24	1.1	1.0	0.6	0.6	0.6	0.6	0.8	0.8	0.7	0.7
25-29	1.1	1.2	0.5	0.5	0.6	0.6	1.0	0.9	0.7	0.7
30-34	1.1	1.1	0.6	0.6	0.6	0.6	0.9	0.9	0.7	0.7
35-39	1.2	1.1	0.7	0.7	0.6	0.6	0.9	0.8	0.7	0.7
40-44	1.2	1.2	0.8	0.8	0.6	0.7	0.8	0.7	0.8	0.8
45-49	1.3	1.2	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.7
50-54	1.2	1.3	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.7
55-59	1.3	1.2	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7
60-64	1.3	1.3	0.8	0.7	0.8	0.8	0.6	0.6	0.8	0.8
65-69	1.4	1.4	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.8
70-74	1.4	1.3	0.8	0.8	0.7	0.7	0.7	0.8	0.8	0.8
75-79	1.4	1.1	0.8	0.8	0.7	0.6	0.8	0.8	0.8	0.8
80-84	1.2	1.0	0.8	0.7	0.6	0.6	0.9	0.8	0.8	0.7
≥85	1.0	1.0	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8
total	1.2	1.2	0.7	0.7	0.6	0.7	0.7	0.7	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 2014 was 10,325: 52 weeks x 5 days x 39 sentinel practices; 1 sentinel practice registered only for 37 weeks due to illness.

In table 4.5 the absolute numbers and percentages are presented.

Table 4.5 Maximum number and actual number of reporting days per year (2005-2014)

year	maximum number of reporting days	actual number (absolute)	reporting day percentage
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%
2014	10,325	8,329	80.7%

The percentage of reporting days in 2014 is lower than in 2013.
The table below contains a breakdown by province group and address density.

Table 4.6 Reporting by province group and address density in 2014

province group		address density	
N	81.4%	1	78.0%
E	75.9%	2	81.0%
W	86.7%	3	84.9%
S	74.8%		

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 42 (the maximum number of registration days per week is 200).

Figure 4.2 Number of days in 2014 that data were recorded

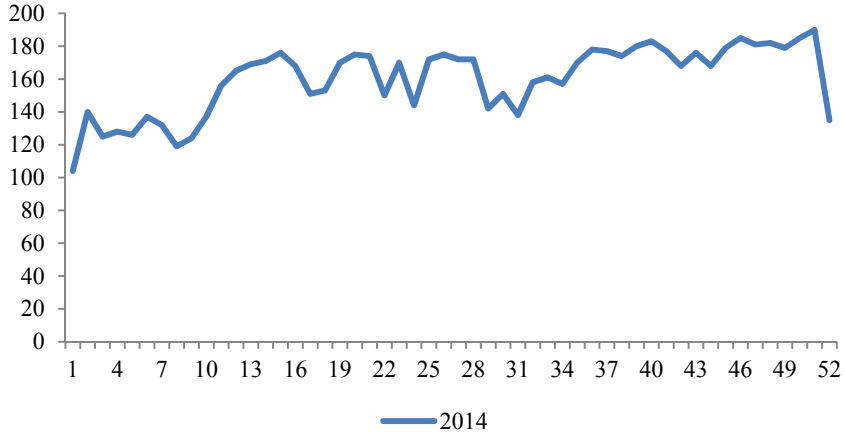


Table 4.7 shows the frequency distribution of the number of non-reporting days at each sentinel practice. The average number of non-reporting days per sentinel practice in 2014 was 55, which is more than in 2013 (19).
A breakdown into single and group practices reveals a significant difference, i.e. 64 and 28 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 (2005-2014)

number of non reporting days	number of sentinel stations									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
0	1	2	3	8	-	5	7	4	7	1
1-9	-	1	8	3	7	18	12	18	16	5
10-19	1	1	6	15	8	8	10	6	5	7
20-29	4	3	5	4	10	4	5	3	3	7
30-39	7	4	5	2	9	5	1	2	2	3
40-49	12	8	6	4	4	1	2	1	-	-
50-59	11	8	5	1	1	-	-	1	2	6
60-69	4	7	2	2	1	-	1	1	-	3
70-79	2	-	1	2	-	-	1	1	1	-
80-89	2	1	-	1	-	-	-	1	1	2
90-99	1	1	2	1	-	-	-	-	1	2
≥99	4	6	2	2	2	-	1	1	1	4
total number of sentinel practices	49	42	45	45	42	41	40	39	39	40
average	56	61	37	31	33	13	19	20	18	46
median	49	66	31	17	23	7	11	8	8	31

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 2014 in 19 practices (47.5%) compared to 15.4% in 2013. The eight practices that did not report in 2014 for more than 99 days did so for reasons of problems with the electronic registration, movement of the practice and illness.

4.4 Surveillance topics

In 2014 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 Acute gastro-enteritis (1996);
5 STD (2008);
6 Urinary tract infection
7 Oak Processionary Larvae (2012)
8 End-of-Life study (2005);
9 Suicide (and attempted suicide) (1979);
10 Policy for symptoms mamma (2012);
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 183), together with the years during which the data were registered.

4.5 Analyses

This report contains the results of registration of topics in 2014. 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 187) shows the age structure of the Dutch population on 1 January 2014, 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 was also applied in 2013 and differs a little from the years before, reason why retrospectively in 2013 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 189-194).

1 Cumulative, i.e. all sentinel practices in a standardised format, year 2014, weeks 01-52, pp 1-3.[4]
2 Province group standardised according to illness, year 2014, weeks 01-52 pp 1-3.[4]
3 Address density, standardised according to illness, year 2014, 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 17-19), 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 2014 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, 2005-2014 (CBS)*

year	men	women	total
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
2014	8,334	8,495	16,829

* 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 124,009 patients (1st column), the 95% confidence interval is 0.44 – 1.56 per 10,000 (2nd column). It then follows that the estimated absolute number in the Dutch population is 1683 (3rd column), and that the 95% confidence interval is between 746 and 2,620. 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	0.44-1.56	1683	746-2.620
10	8.24-11.76	16829	13.869-19.790
100	94.46-105.54	168293	158.973-177.613
1,000	983.30-1016.70	1682929	1.654.828-1.711.030

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)* (1970-2014)

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 where swabs are sent to the National Institute for Public Health and the Environment (RIVM).

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 and the Environment (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 2014/2015 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. The baseline is recalculated annually, but only adapted when the recalculation deviates >20%. 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 2014/2015 was characterized by a when considering intensity mild influenza epidemic from week 49 in 2014 to and including week 17 in 2015 (21 weeks). In week 8 of 2015 the peak of the mild epidemic was recorded with 16.2 per 10,000 population, higher than in the

previous four seasons. After this peak the incidence remained during nine weeks above the epidemic baseline and in the nose and throat swabs of patients with ILI a substantial percentage of influenzavirus was found during the whole epidemic period of 21 weeks. The cumulative ILI incidence was higher in 2014/2015 than in previous seasons (Figure 5.1). No striking regional differences in ILI incidence were observed. The highest ILI incidence was like in the previous season observed in the eastern part of the country in week 4: 24.5 per 10,000 (Figure 5.2). As usual the ILI incidence was the highest in the rural areas (Figure 5.3) and in the age group 0-4 years (Figure 5.4).

Between week 40 of 2014 through week 20 2015 632 ILI and 614 ARI swabs were sent to the RIVM by the sentinel GPs. In total influenzavirus was found in 390 ILI and ARI swabs of which 239 times (61%) A(H3N2), 35 times (9%) A(H1N1)pdm09 and 114 times (30%) type B of the B/Yamagata/16/88 fylogenetic lineage and 1 time type B of the B/Victoria/2/87 fylogenetic lineage. This season was dominated by type A influenza viruses, especially type A(H3N2). However, the last weeks of the epidemic influenzavirus type B/Yamagata was dominant.

In A(H1N1)pdm09- and influenza B-viruses of the fylogenetic lineage B/Yamagata/16/88 no significant antigenic drift was observed when compared to the previous season 2013/2014. In A(H3N2)-viruses since the season 2011/2012 antigenic drift has occurred.
The viruses in this season's flu vaccine matched well to the circulating A(H1N1)pdm09-virus isolates, but like in the previous season differed substantially from the A(H3N2)- and matched also suboptimal with the circulating B/Yamagata/16/88-lineage virus isolates.
For the season 2015/2016 of the northern hemisphere the WHO recommended the following contents for the influenza vaccine:

- for A(H1N1)pdm09**:** again a A/California/7/2009-like virus
- for A(H3N2): a A/Switzerland/9715293/2013-like virus
- for B: a B/Phuket/3073/2013-like virus, of the B/Yamagata/16/88 lineage

Of 874 tested viruses of sentinel practices and nationwide laboratories spread only one, a A(H1N1)pdm09-virus isolate, showed a strongly decreased sensitivity to oseltamivir; a part of the viruses in this isolate contained the H275Y-amino acid substitution in the neuraminidase.

Figure 5.1 Number of incidental patients with influenza-like illness per week per 10,000 inhabitants, for the Netherlands in, 2012/2013, 2013/2014 and 2014/2015

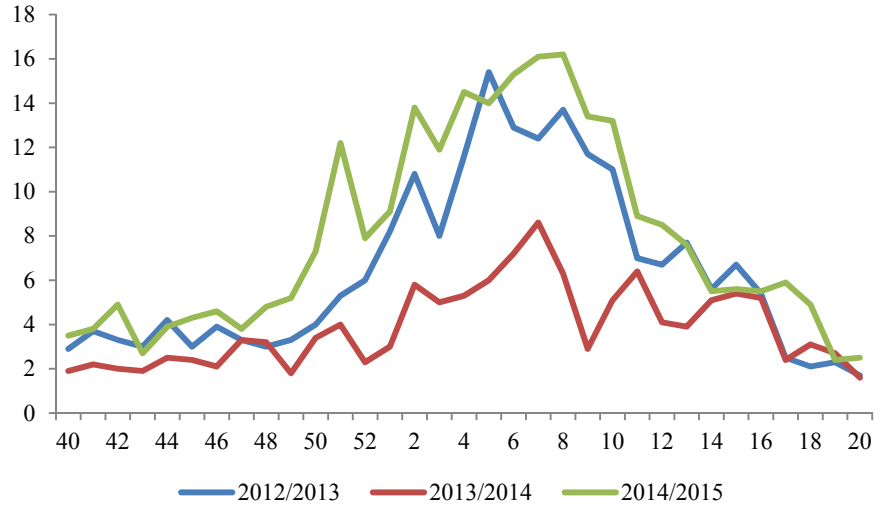


Figure 5.2 Number of incidental patients with influenza-like illness per week per 10,000 inhabitants, according to population density in 2014/2015

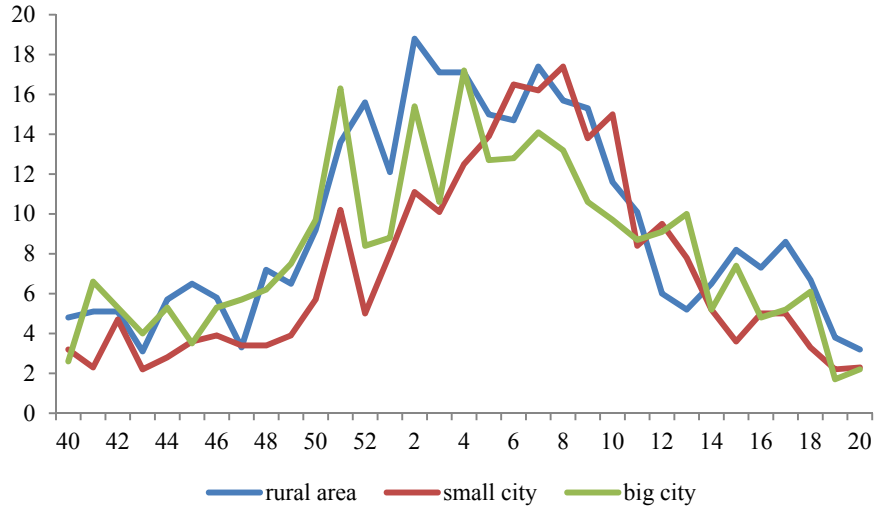


Figure 5.3 Number of incidental patients with influenza-like illness per week per 10,000 inhabitants, per province group in 2014/2015

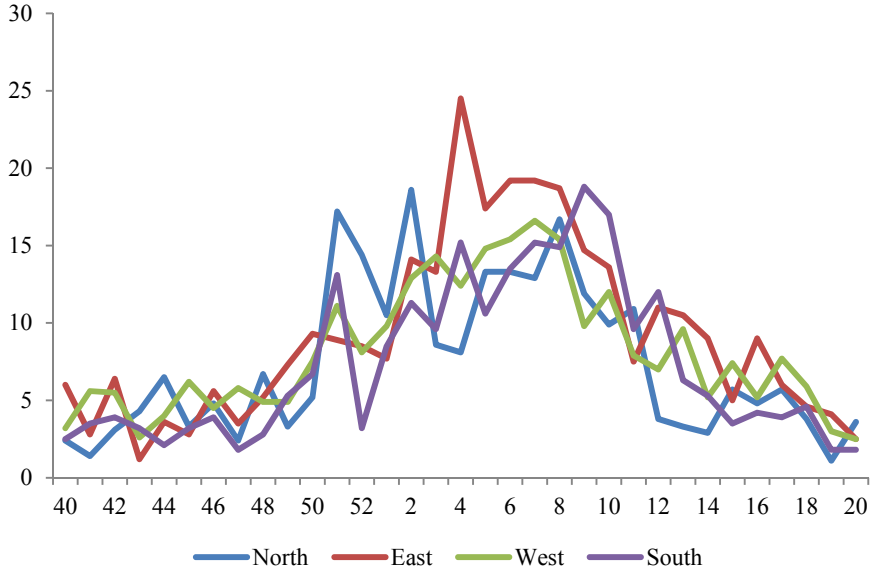


Figure 5.4 Number of incidental patients with influenza-like –illness, per 10,000 per age group, season 2014-2015

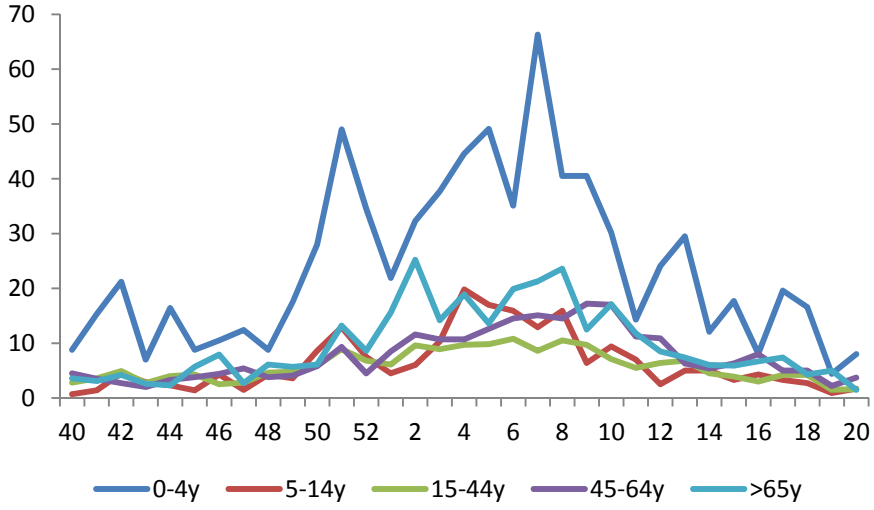


Table 5.1 Number of incidental patients with influenza(-like illness), per 10,000 inhabitants, 2005-2015

year	2005	2006	2007	2087	2009	2010	2011	2012	2013	2014	2015
total calendar year	208	109	141	168	309	130	171	170	256	256	230
highest weekly incidence per 'season'		14	8	7	15	19	11	8	15	9	16

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		
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
2014	230	387,000

* 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 2014/2015 was characterized by a when considering intensity mild, but very long lasting influenza epidemic of 21 weeks dominated by influenzavirus type A(H3N2). The epidemic started in week 49 of 2014 and

reached its peak in week 8 of 2015: 16.2 per 10,000 were reported that week by the GPs. Thereafter the incidence decreased very slowly. As usual the highest incidence did occur in the age group 0-4 years. The incidence among persons ≥65 years was relatively higher than in previous years. Analyses of viruses isolated in the Netherlands showed that the viruses of this season's influenza vaccine matched well with the circulating A(H1N1)pdm09-virus isolates, but like in previous seasons poorly with A(H3N2)- and suboptimal with B/Yamagata/16/88-lineage virus isolates. Vaccinated persons were therefore suboptimal protected.

This topic will be continued.

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

Jong de JC, Meijer A, Donker GA, Lange de MMA, Hoek van der W, Rimmelzwaan GF, Koopmans M. *Summary report of the influenza activity in the Netherlands in the 2015/2016 season, report of February 2016.* WHO report Feb 2016 the Netherlands

Backes D, Rinkel GJE, Algra A, Vaartjes I, Donker GA, Vergouwen MDI. *Increased incidence of subarachnoid hemorrhage during cold temperatures and influenza epidemics*. J Neurosurg, published on line January 29, 2016; DOI: 10.3171/2015.8.JNS151473

De Jong JC, Donker GA, Meijer A, Van der Hoek W, De Lange MMA, Rimmelzwaan GF,Koopmans MPG. *Het influenzaseizoen 2014/2015 in Nederland: een zeer langdurige epidemie*. Ned Tijdschr Med Microbiol 2015;23 (4):150-156

McDonald SA, Van Asten L, Van der Hoek W, Donker GA, Wallinga J *The impact of national vaccination policy changes on influenza incidence in the Netherlands*. Influenza Other Respiratory Viruses 2015 Dec 9. doi: 10.1111/irv.12366. [Epub ahead of print

Poelman R, Schuffenecker I, Van Leer-Buter C, Josset L, Niesters HGM, *Lina B, on behalf of the ESCV-ECDC EV-D68 study group. European surveillance for enterovirus D68 during the emergingNorth-American outbreak in 2014*. Journal of Clinical Virology 2015;71:1–9

Beauté J, Zucs P, Korsun N, Bragstad K, Enouf V, Kossyvakis A, Griškevičius A, Olinger CM, Meijer A, Guiomar R, Prosenc K, Staroňová E, Delgado C, Brytting M, Broberg E. *Age-specific differences in influenza virus type and subtype distribution in the 2012/2013 season in 12 European countries.* Epidemiol Infect. 2015 Feb 4:1-9

Jong de JC, Rimmelzwaan GF, Meijer A, Donker GA, Lange de MMA, Hoek van der W, Koopmans MPG. *Summary report of the influenza activity in the Netherlands in the 2014/2015 season, report of September 2015.* WHO-report, 2015

Teirlinck AC, Van Asten L, Brandsema PS, Dijkstra F, Donker GA, Euser SM, Van Gageldonk-Lafeber AB, Hooiveld M, De Lange MMA, Meijer A, Slump E, Van der Hoek W. *Annual report Surveillance of influenza and other respiratory infections in the Netherlands: winter 2014/2015*. RIVM report number: 2015-0042. www.rivm.nl/en

Broberg E, Snacken R, Adlhoch C, Beauté J, Galinska M, Preyaslov D, Brown C, Penttinen P. *Start of the 2014/2015 influenza season in Europe: drifted influenza A(H3N2) viruses circulate as dominant subtype.* http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=21023

Schurink-van 't Klooster TM, De Melker HE (Editors), Donker GA, Nielen M et al. *The National Immunisation Programme in the Netherlands. Surveillance and developments in 2013-2014*. RIVM report 151103001/2014. Bilthoven 2014

De Jong JC, Donker GA, Meijer A, De Lange, Van der Hoek W, Rimmelzwaan GF, Osterhaus ADME. *Summary report of the influenza activity in the Netherlands in the 2013/2014 season, report of September 2014*. WHO-report, Copenhagen, October 2014

De Jong JC, Meijer A, Donker GA, Van der Hoek W, De Lange MMA, Rimmelzwaan G, Osterhaus ADME. Het influenzaseizoen 2013/2014 in Nederland: lage influenza-activiteit. Ned Tijschr Med Micoobiol 2014;22(4):153-161.

Meijer A, Benschop KS, Donker GA, van der Avoort HG. *Continued seasonal circulation of enterovirus D68 in the Netherlands,* 2011–2014. Euro Surveill 2014;19(42):pii=20935. Available online: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20935

Hooiveld M, Donker GA, Meijer A, Zock JP, Schellevis FG. *Syndromic surveillance in the Netherlands. Real-time system using electronic medical records*. Poster presentation ESWI conference 2014, Riga

De Jong JC, Rimmelzwaan GF, Meijer A, Donker GA, De Lange MMA, Van der Hoek W, Osterhaus ADME. *Summary report of the influenza activity in the Netherlands in the 2013/14 season.* WHO-report February 2014

Brooke RJ, Van Lier A, Donker GA, Van der Hoek W, Kretzschmar MEE. *Comparing the impact of two concurrent infectious disease outbreaks on The Netherlands population*, 2009, using disability-adjusted life years. Epidemiol Infect 2014;doi:10.1017/S0950268813003531

Koetsier A, Van Asten L, Dijkstra F, Van der Hoek W, Snijders BE, Van den Wijngaard CC, Boshuizen HC, Donker GA, De Lange DW, De Keizer NF, Freek N. *Do intensive care data on respiratory infections reflect influenza epidemics?* Plos One 2013;8(12):e83854

De Jong JC, Donker GA, Meijer A, Van der Hoek W, De Lange MMA, Rimmelzwaan GF, Osterhaus ADME. *Het influenzaseizoen 2012/2013 in Nederland: een milde maar langdurige epidemie*. Ned Tijdschr Med Microbiol 2013;21(4):135-42

McDonald SA, Presanis AM, De Angelis D, van der Hoek W, Hooiveld M, Donker G, Kretzschmar ME. *An evidence synthesis approach to estimating the incidence of seasonal influenza in the Netherlands.* Influenza Other Respir Viruses 2013;Nov 10. Doi: 10.1111/inv.12201

De Lange MMA, Meijer A, Friesema IHM, Donker GA, Koppeschaar CE, Hooiveld M, Ruigrok N, Van der Hoek W. *Comparison of five influenza surveillance systems during the 2009 pandemic and their association with media attention.* BMC Public Health 2013;13:881. http://www.biomedcentral.com/1471-2458/13/881

Van der Hoek W, Dijkstra F,De Lange MM, Donker GA, Meijer A, Van der Sande MA. Letter to the editor*: Influenza vaccine effectiveness: heterogeneity in estimates for the 2012/13 season*. Euro Surveill. 2013;18(7):pii=20399. Available online: http://www.eurosurveillance.org/ViewArticleId=20399 . Published on 14 February 2013

De Jong JC, Donker GA, Rimmelzwaan GF, Meijer A, de Lange MMA, van der Hoek W, Osterhaus ADME. *Summary report of the influenza activity in the Netherlands in the 2012/13 season.* WHO-report, February 2013

De Jong JC, Meijer A, Donker GA, Van der Hoek W, Rimmelzwaan GF, Osterhaus ADME. *Het influenzaseizoen 2011/2012 in Nederland: een kleine epidemie gedomineerd door het A(H3N2)-virus*. Ned Tijdschr Med Microbiologie 2012;20(4)142-148

Van Gageldonk-Lafeber Arianne B, van der Sande Marianne AB, Meijer Adam, Friesema Ingrid HM, Donker Gé A, Reimerink Johan, Robert-Du Ry van Beest Holle Mirna, Prins Jan M, Isken Leslie, Schellevis Francios G, van de Lubben Mariken IM. *Utility of the first few 100 approach during the 2009 influenza A(H1N1) pandemic in the Netherlands.* Antimicrobial Resistance and Infection Control 2012;1:30

Ratmann O, Donker G, Meijer A, Fraser C, Koelle K. Phylodynamic *Inference and Model Assessment with Approximate Bayesian Computation: Influenza as a Case Study*. PLoS Comput Biol 2012;8(12): e1002835. doi:10.1371/journal.pcbi.1002835

JC de Jong, GA Donker, GF Rimmelzwaan, A Meijer, MA de Lange, W van der Hoek and ADME Osterhaus. *Summary report of the influenza activity in the Netherlands in the 2011/12 season.* WHO report of September 2012

Arianne B van Gageldonk-Lafeber, Maraianne B van der Sande, Adam Meijer, Ingrid HM Friesema, Gé A Donker, Johan Reimerink, Mirna Robert-Du Ry van Beest Holle, Jan M Prins, Leslie Isken, Francois G Schellevis, Mariken IM van der Lubben. *Utility of the first few100 approach during the 2009 influenza A(H1N1) pandemic in the Netherlands.* Antimicrobial Resistance and Infection Control 2012, 1:30. Doi:10.1186/2047-2994-1-30

Tomás Vega, Jose Eugenio Lozano, Tamara Meerhoff, René Snacken, Joshua Mott, Raul Ortiz de Lejarazu, Baltazar Nunes. *Influenza surveillance in Europe: establishing epidemic thresholds by the Moving Epidemic Method.* 2012;Doi:10.1111/j.1750-2659.2012.00422.x

Van den Wijngaard CC, Van Asten L, Koopmans MPG, Van Pelt W, Nagelkerke NJD, Wielders CCH, Van Lier A, Van der Hoek W, Meijer A, Donker GA, Dijkstra F, Harmsen C, Van der Sande MAB, Kretzschmar M. *Comparing Pandemic to Seasonal Influenza Mortality:/Moderate Impact Overall but High Mortality in Young Children.* PLoS ONE 2012;7(2):e31197

Ingrid.HM Friesema, Adam Meijer, Arianne B, van Gageldonk-Lafeber, Mariken van der Lubben, Janco van Beek, Gé A Donker, Jan M Prins. e.a. *Course of pandemic influenza A(H1N1) 2009 virus infection in Dutch patients.* Influenza and Other Respiratpry Viruses DOI: 10.1111/j.1750-2659.2012.000347.x

Meijer A, Jonges M, Abbink F, Ang W, Van Beek J, Beersma M, Bloembergen P, Boucher C, Claas E, Donker G, Van Gageldonk-Lafeber R, Isken L, De Jong A, Kroes A, Leenders S, Van der Lubben M, Mascini E, Niesters B, Oosterheert JH, Osterhaus A, Riesmeijer R, Riezebos-Brilman A, Schutten M, Sebens F, Stelma F, Swaan C, Timen A, Van 't Veen A, Van der Vries E, Te Wierik M, Koopmans M. *Oseltamivir-resistant pandemic A(H1N1) 2009 influenza viruses detected through enhanced surveillance in the Netherlands, 2009–2010*. Antiviral Research 2011;92: 81-89

Jong JC, Donker GA, Meijer A, Hoek W van der, Rimmelzwaan GF, Osterhaus ADME. *Het influenzaseizoen 2010/2011 in Nederland: het nieuwe A(H1N1)-virus van 2009 blijft actief.* Nederlands Tijdschrift Medische Microbiologie 2011;19(4):21-27

De Jong JC, Rimmelzwaan GF, Donker GA, Meijer A, Van der Hoek W, Osterhaus ADME. *De Mexicaanse grieppandemie van 2009: een overzicht met een focus op Nederland*. Ned Tijdschr Med Microbiologie 2011;19(3):6-12

Van Gageldonk-Lafeber AB, Hooiveld M, Meijer A, Donker GA, Veldman-Ariesen, Van der Hoek W, Van der Sande AB. *The relative clinical impact of 2009 pandemic influenza A (H1N1) in the community compared to seasonal influenza in the Netherlands was most marked among 5-14 year olds. Influenza and Other Respiratory Viruses* 2011 DOI: 10.1111/j.1750-2659.2011.00260

Meijer A, Van der Sanden S, Snijders BEP, Jaramillo-Gutierrez G, Bont L, Van der Ent CK, Overduin P, Jenny SL, Jusic E, Van der Avoort HGAM, Smith GJD, Donker GA, Koopmans MPG. *Emergence and epidemic occurrence of enterovirus 68 respiratory infections in The Netherlands in 2010*. Virology 2011;doi:10.1016/j.virol.2011.11.021

Dijkstra F, Jonges M, Van Beek R, Donker GA, Schellevis FG, Koopmans M, Van der Sande MAB, Osterhaus ADME, Boucher CAB, Rimmelzwaan GF, Meijer A. *Influenza A(H1N1) Oseltamivir Resistant Viruses in the Netherlands During the Winter 2007/2008*. The Open Virology Journal 2011;5:154-62

Van den Wijngaard C, van Asten L, Meijer A, van Pelt W, Nagelkerke NJD, Donker GA, van der Sande MAN, Koopmans DVM. *Detection of Excess Influenza Severity: Associating Respiratory Hospitalization and Mortality Data With Reports of Influenza-Like Illness by Primary Care Physicians.* American Journal of Public Health 2010;100(11),2248-2254. DOI. 10.2105/AJPH.2009.168245

Donker GA. *Monitoring en surveillance: is de huidige situatie adequaat?* In: 'Outbreaks', Bijblijven 2010-7:68-75

Nielen MMJ, Spreeuwenberg P, Paget WJ, Donker GA, Meijer A, Schellevis FG. *The age-specific impact of influenza on hospital admissions and mortality in five countries in Europe*. Utrecht, NIVEL 2010, report

Wielders CCH, van Lier EA, van 't Klooster TM, van Gageldonk-Lafeber AB, van den Wijngaard CC, Haagsma JA, Donker GA, Meijer A, van der Hoek W, Lugner AN, Kretzschar MEE, van der Sande MAB. *The burden of 2009 pandemic influenza (AH1N1) in the Netherlands.* Eur J Pub Health 2010; Advanced access:Doi:10.1093/eurpub/ckq187

Wijngaard van den Cees C, van Asten L, Meijer A, van Peilt W, Nagelkerke NJD, Donker GA, van der Sande MAB, Koopmans MPG. *Detection of Excess Influenza Severity: Associating Respiratory Hospitalization and Mortality Data With Reports of Influenza-Like Illness by Primary Care Physicians.* American Journal of Public Health 2010;vol:100:no.11

Meijer A, Jonges M, Abbink F, Ang W, Beersma T, Bloembergen P, Boucher C, Claas E, Donker GA, Gooskens J, IskenL, Jong A de, Leenders S, Lubben M van der, Mascini E, Niesters B, Oosterheert JE, Osterhaus A, Riesmeijer R, Riezebos-Brilman A, Schutten M, Sebens F, Stelma F, Swaan C, Timen A, Veen A van 't, Vries E van der, Wierik M, Koopmans M. *Oseltamivir resistant Pandemic A(H1N1) 2009 Influenza Viruses in The Netherlands.* Poster presented at the "Options for the Control of Influenza meeting" in Hong Kong September 2010

Wijngaard van den C, Asten van L, Pelt van W, Doornbos G, Nagelkerke NJD, Donker GA, Hoek van der W, Koopmans MPG. *Syndromic surveillance for local outbreaks of lower-respiratory infections: Would it work?* Plos-one 2010;5(4): e10406. doi:10.1371/journal.pone0010406

Wijngaard van den CC, Dijkstra F, Pelt van W, Asten van L, Kretschmar M, Schimmer B, Nagelkerke NJD, Vellema P, Donker GA, Koopmans MPG. *In search of hidden Q-fever outbreaks: linking syndromic hospital cluster to infected goat farms.* Epidemiology and Infection 2010; 139(1):19-26. Epub 2010 May 18; doi:10.1017/S0950268810001032

Paget John W, Balderston C, Casas I, Donker G, Edelman L, Fleming D, e.a. *Assessing the burden of paediatric influenza in Europe: the European Paediatric Influenza Analysis (EPIA) project.* Eur J Pediatr. 2010:DOI 10.1007/s00431-010-1164-0

Friesema IHM, Koppeschaar CE, Donker GA, Dijkstra F, Noort van SP, Smallenburg R, Hoek van der W, Sande van der MAB. *Internet-based monitoring of influenza-like illness in the general population: Experience of five influenza seasons in the Netherlands.* Vaccine 2009;27:6353-6357

Kroes ACM. *Informatie over influenza.* .Editorial bij de bijdrage van Meijer A, Rimmelzwaan GF, Dijkstra F, Donker GA Tijdschrift voor infectieziekten 2009;4(5):174-5

Meijer A, Rimmelzwaan GF, Dijkstra F, Donker GA. *Actuele ontwikkelingen betreffende influenza; griepspotters in actie.* Tijdschrift voor infectieziekten 2009;4(5):176-84

Sande van der Marianne AB, Hoek van der Wim, Hooiveld Mariëtte, Donker GA, Steenbergen van Jim E, Boven van Michiel, Wallinga Jacco. *Bestrijding van de nieuwe influenza A(H1N1). 11.* Nederlands Tijdschrift voor Geneeskunde 2009;153:A770 en B420

Dijkstra F, Donker GA, Wilbrink B, Gageldonk-Lafeber van AB, Sande van der MAB. *Long time trends in influenza-like illness and associated determinants in The Netherlands.* Epidemiol Infect 2009;137(4):473-9

Donker G. *Hoge koorts & koude rillingen.* 10 vragen over griep. Libelle 2008;2;36-37

Gageldonk-Lafeber van Arianne B, Sande van der Marianne AB, Heijnen Marie-Louise A, Peeters Marcel F, Bartelds Aad IM, Wilbrink Berry. *Risk factors for acute respiratory tract infections in general practitioner patients in The Netherlands: a case-control study* BMC Infectious Diseases 2007;7:35(27 April 2007)

Gageldonk van R, Donker GA, Peeters M. *Voorspellen klachten een bacteriële bovensteluchtweginfectie?* Huisarts en Wetenschap 2007;50:85-86

Donker GA, Gravestein J. *De beste tijd voor griepvaccinatie*. Huisarts en Wetenschap 2007;50:41

6 Pneumonia

Topic owner: Mw. Dr. R. van Gageldonk, RIVM (2007-2010, 2014)

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. Nevertheless, it is asked whether a thorax X-ray has been made and whether sputum sample has been analyzed. The following questions are asked:
- Has a sputum 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 2014 the results are based on 40 reporting sentinel practices. All practices reported two or more cases in 2014, so no practice was excluded. The incidence is 91 per 10,000 registered patients, considerably higher than in previous years. The inclusion of all practices and the higher incidence co-inside with the implementation of the sentinel practices electronic data collection application in all but one practices during 2014 reducing underreporting.

Table 6.1 Number of patients with pneumonia per 10,000 inhabitants, per province group, address density and for the Netherlands, 2007-2010, 2012-2014

	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
2014	85	77	93	103	76	93	103	91

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

Seasonal influence

Comparison of the incidence per season during previous seasons shows that pneumonia occurs mostly in winter (first trimester). In 2014 this was not the case, however. The peak was in the fourth trimester (table 6.2). The influenza epidemic of the seasons 2013/2014 and 2014/2015 occurred in the first trimester of 2014 and 2015, respectively. It is exceptional that the peak incidence of influenza and pneumonia do not occur in the same trimester.

Table 6.2 Number of patients with pneumonia per 10,000 inhabitants per quarter, 2007-2010, 2012-2014

	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
2014	19	23	17	31

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: 531 per 10,000. In elderly persons ≥65 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 2014 the incidence in women in the age group 55-64 years was relatively high comparable to previous years (table 6.3).

Table 6.3 Number of male and female patients with pneumonia per 10,000; per age group and for the Netherlands, 2012-2014

	2012			2013			2014		
age group	m	f	t	m	f	t	m	f	t
≤1	185	(31)	109	-	(24)	(13)	(79)	(40)	59
1-4	79	69	74	(25)	38	31	135	113	124
5-9	28	(6)	17	23	24	23	57	84	70
10-14	(16)	(17)	16	21	(4)	13	36	16	26
15-19	(22)	(17)	20	(4)	26	15	30	(3)	17
20-24	-	(5)	(3)	(13)	21	17	22	32	27
25-29	(16)	35	26	(17)	25	21	38	19	28
30-34	(20)	(26)	23	(8)	22	15	32	36	34
35-39	(19)	14	17	(8)	41	24	54	44	49
40-44	43	26	35	44	30	37	55	64	59
45-49	35	44	39	44	45	45	52	49	51
50-54	(19)	34	27	44	35	40	70	74	72
55-59	59	71	65	39	91	66	58	110	84
60-64	59	75	67	58	93	75	114	139	126
65-69	76	105	91	74	112	93	158	123	141
70-74	94	106	100	94	74	86	198	175	186
75-79	98	67	81	142	81	109	259	184	219
80-84	206	60	116	186	109	141	558	258	382
≥ 85	(110)	249	209	270	265	266	579	484	513
total	43	48	46	43	54	49	91	90	91

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
2014	91	90	91	76,000	76,000	153,000

* 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 deviating seasonal trend in 2014 with the highest incidence in the fourth trimester while the influenza epidemic occurred in the first trimester of 2015. Only at the age ≥65 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 in 2014 is remarkably higher than in previous years, probably as a result of successful implementation of electronic tools for data collection. During 2014 in all but

one practices the electronic data collection application was implemented. This resulted in inclusion of all practices in the data analyses.

This topic will be continued in 2015.

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

Van Dijk CE, Garcia-Aymerich J, Carsin AE, Smit LAM, Borlée F, Heederik DJ, Donker GA, Yzermans CJ, Zock JP. *Risk of exacerbations in COPD and asthma patients living in the neighbourhood of livestock farms: Observational study using longitudinal data*. Int. J. Hyg. Environ. Health (2016), http://dx.doi.org/10.1016/j.ijheh.2016.01.002

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) (1998-2014)

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, including 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 2014 68 patients were reported with whooping cough amounting to 6 per 10,000 patients. This incidence indicates a small epidemic with less cases than in 2012 (see table 7.1). An epidemic occurs every three to four years. The present epidemic occurs earlier than expected. 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 acellular 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, 2005-2014

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
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
2014	13	4	4	7	9	6	3	6

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

In 2012 and 2014 relatively many cases were reported from the northern part of the country.

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, 2005-2014

age group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
≤1	(8)	(18)	(8)	9	(17)	(8)	(9)	(32)	(-)	(20)
1-4	30	17	17	8	18	(4)	11	12	17	18
5-9	18	(7)	10	9	7	(4)	(3)	15	(2)	19
10-14	10	10	17	24	7	12	(5)	30	(3)	18
15-19	(3)	(7)	14	6	7	(4)	(6)	16	(3)	(6)
20-24	-	-	(3)	(2)	(2)	(4)	(3)	13	(-)	(6)
25-29	-	-	0	(3)	-	(1)	-	(7)	(2)	(2)
30-34	5	(3)	(6)	(2)	(3)	(3)	(2)	(5)	(3)	7
35-39	4	(1)	(1)	(4)	-	-	(1)	(3)	(5)	(5)
40-44	(1)	-	(5)	6	(5)	(3)	(2)	10	(-)	(3)
45-49	6	-	6	(1)	(1)	(3)	(1)	9	(1)	(5)
50-54	(4)	-	0	(1)	(1)	(1)	(1)	(5)	(5)	(1)
55-59	(5)	-	(1)	(4)	(1)	(1)	-	(7)	(-)	(1)
60-64	(6)	-	(2)	(2)	-	(3)	(1)	(3)	(2)	(4)
65-69	-	-	0	-	-	(2)	(2)	(6)	(2)	(3)
≥70	(2)	-	-	-	(2)	(1)	-	4	(1)	(3)

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] However, in 2014 was highest in the age group 0-14 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		
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
2014	6	10,000

* 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 2014 showed an epidemic, although smaller than in 2012. This epidemic occurred earlier than expected. 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. However, during the epidemic in 2014 the peak incidence occurred in the age group 0-14 years. The mandatory notification showed a peak incidence in the same age group in 2014. In comparison to the epidemic in 2012 the peak incidence in the age group 6 months to 4 years was higher in 2014. During an epidemic the incidence of baby's with an incomplete vaccination status increases due to higher infection risk. A comparison between sentinel surveillance and mandatory notification during the epidemic in 2012 showed no marked differences between the two surveillance systems. In 2014 the comparison showed some regional differences between the two systems with a peak incidence in the northern part of the country in the sentinel surveillance and a peak incidence in the central and the eastern part of the Netherlands in the mandatory notification system. The Health Council is considering additional measures regarding whooping cough.

The topic will be continued in 2015.

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) (1996-2014)

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.[13]

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.[14]
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.[15]

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 acute 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, 2005-2014

		province group				address density			Netherlands
		N	E	W	S	1*	2*	3*	
2005	male	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
2014		96	56	92	119	78	81	140	92
2005	female	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
2014		133	60	87	158	87	100	142	105

* 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 2005-2014 (cont.)

		province group				address density			Netherlands
		N	E	W	S	1*	2*	3*	
2005	total	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
2014		114	58	89	138	83	91	141	99

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

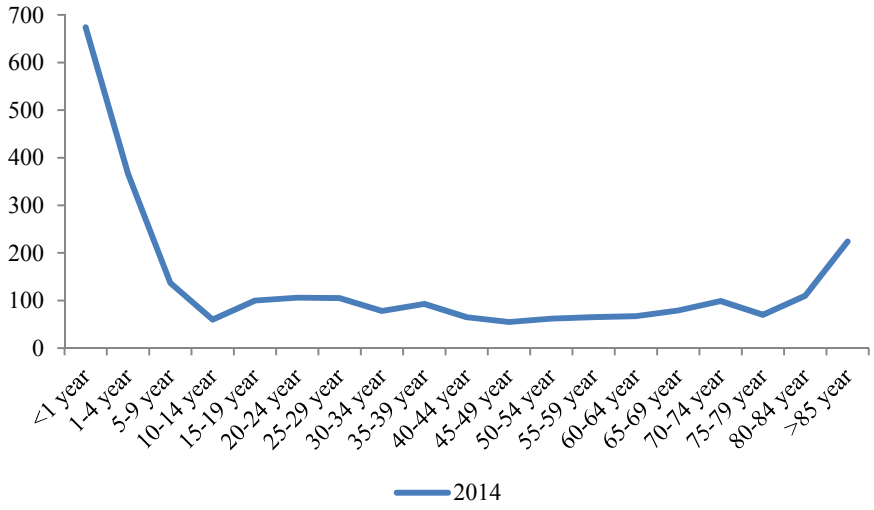
The highest incidence for men and women was seen in 2006.
In 2014 the incidence is comparable to the preceeding years. The highest incidence is found in 2014 in the big cities and the southern part of the country as was the case in preceeding years, too. The difference between men and women has been inconsistent over time, however in 2014 the incidence in women was higher than in men like in the preceeding six years.

Age distribution

Table 8.2 Numbers of patients with acute gastro-enteritis per 10,000 inhabitants, 2005-2014

	total									
age group (year)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
≤1	687	690	588	689	586	766	554	684	925	653
1-4	296	472	349	368	326	350	240	324	455	353
5-9	163	156	114	114	101	118	83	111	113	132
10-14	79	107	56	61	89	68	36	57	69	58
15-19	100	84	53	54	58	79	46	73	83	97
20-24	80	121	84	85	78	98	62	65	109	103
25-29	72	104	82	80	66	90	38	68	94	102
30-34	67	80	84	83	77	92	47	86	87	76
35-39	56	86	44	72	56	57	41	71	59	90
40-44	55	61	38	56	54	56	34	41	77	63
45-49	49	65	49	44	45	58	41	57	63	53
50-54	57	67	57	42	38	54	32	33	52	61
55-59	57	67	76	53	61	51	58	67	71	63
60-64	78	61	48	54	42	66	43	75	69	65
65-69	76	92	63	73	89	55	53	73	64	77
70-74	82	102	100	61	58	89	44	89	107	96
75-79	98	125	131	119	86	104	79	120	89	68
80-84	131	193	152	141	107	142	84	104	128	108
≥85	131	166	152	174	1242	226	216	249	193	217

Figure 8.1 Numbers of patients with acute gastro-enteritis in 2014, 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 2014 this occurred as well and comparable to the previous years a higher incidence was found for persons older than 80 years.

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 2005-2014, arranged per quarter

quarter	1 : weeks 1-13	2 : weeks 14-26	3 : weeks 27-39	4 : weeks 40-52
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
2014	27	23	23	25

Similarly as in most earlier years the highest incidence in 2014 is seen during winter time (first quarter).

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 2005-2014

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
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
2014	7	6	10	11	5	10	12	9

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

The number of requests for faeces tests in 2014 was slightly lower than in the previous two years. In 2014, the number of requests for a test was the highest in the big cities and in the southern 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 2005-2014

age group (year)	2005	%	2006	%	2007	%	2008	%	2009	%	2010	%
≤1	82	11	45	6	118	17	28	4	(50)	4	(15)	2
1-4	57	16	61	13	77	18	30	8	32	12	31	10
5-9	18	10	25	16	27	19	(6)	5	(7)	7	10	8
19-14	24	23	19	17	9	14	(3)	5	(3)	4	8	14
15-19	32	24	26	31	21	29	(8)	15	(1)	2	16	26
20-24	17	17	42	35	29	26	12	14	14	23	11	13
25-29	16	19	41	39	35	30	13	16	15	30	10	13
30-34	22	25	31	38	25	23	10	12	(6)	9	15	17
35-39	20	27	19	22	24	35	12	17	14	31	(5)	10
40-44	22	28	23	38	13	25	(9)	16	(8)	26	9	18
45-49	19	28	10	15	22	31	(9)	20	(5)	14	9	20
50-54	12	18	22	33	18	24	12	29	(4)	11	6	13
55-59	16	22	19	28	14	15	15	28	13	39	(5)	12
60-64	17	18	27	43	26	35	(8)	15	(4)	10	(5)	8
65-69	25	25	20	22	23	27	(9)	12	15	42	13	32
70-74	13	14	21	21	15	13	(5)	8	17	57	13	31
75-79	3	3	26	19	10	7	(9)	8	(3)	4	(5)	5
80-84	20	13	31	16	17	10	13	9	-	0	(7)	5
≥85	0	0	(7)	4	(12)	7	(2)	1	(15)	8	(4)	2

% = 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 2005-2014

age group (year)	2011	%	2012	%	2013	%	2014	%
≤1	28	7	53	9	52	6	(20)	3
1-4	25	10	37	14	40	9	37	10
5-9	8	10	15	16	(4)	4	9	7
19-14	(3)	(9)	10	23	10	14	(2)	3
15-19	-	-	13	26	17	20	(6)	6
20-24	(6)	(9)	11	17	17	16	9	9
25-29	(5)	(10)	10	23	15	16	(6)	6
30-34	(5)	(10)	13	20	12	14	10	13
35-39	9	21	16	33	(7)	12	11	12
40-44	(4)	(10)	7	24	20	26	6	10
45-49	(4)	(13)	(4)	9	10	16	6	11
50-54	(4)	(12)	(2)	(4)	10	19	8	13
55-59	9	18	12	23	8	11	7	11
60-64	(4)	(10)	(6)	10	(3)	4	10	15
65-69	(2)	(3)	(6)	(7)	10	16	12	16
70-74	(2)	(6)	15	22	12	11	(4)	4
75-79	(3)	(4)	(10)	(13)	(3)	3	(6)	9
80-84	(4)	(5)	9	16	(4)	3	(16)	15
≥85	(5)	(2)	(6)	(2)	(10)	5	(5)	2

% = 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 2014 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 in adults aged 30-70 years consulting their GP with symptoms of acute gastro-enteritis the GP will relatively more often request a faeces test in 2014.

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						
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
2014	92	105	99	77,000	89,000	167,000

* 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 2014 the incidence was comparable to previous years, but lower in 2006 and 2013 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.[16,17]

As part of regular health care GPs request a faeces test relatively more frequently in 2014 for adults in the age group 30-70 years. 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 too.[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).[16]

This topic is unchanged continued in 2015.

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

Poelman R, Schuffenecker I, Van Leer-Buter C, Josset L, Niesters HGM, Lina B, *on behalf of the ESCV-ECDC EV-D68 study group. European surveillance for enterovirus D68 during the emergingNorth-American outbreak in 2014.* Journal of Clinical Virology 2015;71:1–9

Enserink R, Ypma R, Donker GA, Smit HA, Van Pelt W. *Infectious disease burden related to child day care in The Netherlands.* The Pediatric Infectious Disease Journal 2013; 32(8):e334-e340 Apr 11: PMID:23584578

Pelt W van, Notermans D, Mevius DJ, Vennema H, Koopmans MPG, Duynhoven YTHP van. *Trends in gastro-enteritis van 1996 – 2006: Verdere toename van ziekenhuisopnames, maar stabiliserende sterfte.* Infectieziekten Bulletin 2008;19(1)

Pelt van W, Friesema I, Doorduyn Y, Jager de CM, Duynhoven YTHP. *Trends in gastro-enteritis in Nederland; notitie met betrekking tot 2007.* RIVM project V/210221/TS. RIVM, Bilthoven, December 2008

Pelt van W, Notermans D, Giessen AW, Mevius DJ, Vennema H, Koopmans M, Asten van L, Duynhoven van YTHP. *Trends in gastro-enteritis van 1996-2005; Toename van ziekenhuisopnames en sterfte: een toenemende rol van virale infecties?* Infectieziekten Bulletin 2006;10:364-70

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)(2008-2014)

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. 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.[18-20]

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 38 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 small and big cities. The number of STD-related consultations was in 2014 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 2008-2014

	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
2014	45	36	70	63	31	67	62	58

* 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 20 and 39 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, 2008-2014

	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, 2008-2014(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

Table 9.2 Number of new STD-related consultations per age group and per 10,000 inhabitants, 2008-2014(cont.)

	2014		
age group	m	f	t
10-14	-	(3)	(2)
15-19	51	127	88
20-24	163	305	233
25-29	172	200	186
30-34	144	107	126
35-39	117	103	110
40-44	58	69	63
45-49	52	35	44
50-54	25	36	30
55-59	22	25	24
60-64	15	(9)	12
65-69	(6)	(9)	8
70-74	(4)	(4)	(4)
75-79	(6)	(5)	(6)
80-84	-	-	-
≥85	(15)	-	(5)
total	52	63	58

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
2014	52	63	58	43,000	54,000	98,000

* 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 cities and the western part of the Netherlands, where most of the big cities are located, with an age peak between 19 and 39 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 2014 and data were presented at international conferences at several occasions.

This topic will be continued in 2015.

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

Joore IK, Reukers DFM, Donker GA, Van Sighem AI, Op de Coul ELM, Prins JM, Geerlings SE, Barth RE, Van Bergen JEAM, Van den Broek IV. *Missed opportunities to offer HIV tests to high-risk groups during general practitioners' STI-related consultations: an observational study.* BMJ Open 2016;6:e009194. doi:10.1136/bmjopen-2015- 009194

IKCW Joore, DFM Reukers, JEAM van Bergen, ELM Op de Coul, GA Donker, AI van Sighem, JM Prins, SE Geerlings, RE Barth, IV van den Broek. *HIV testing in high-risk groups during STI consultations in Dutch general practice.* Poster at NCHIV 2014, Amsterdam and IUSTI Conference 2015, Sitges and manuscript submitted

Van Oeffelen AAM, Van Aar F, Van den Broek IVF, Op de Coul ELM, Woestenberg PJ, Heijne JCM, Den Daas C, Hofstraat SHI, Van Sighem AI, Nielen MMJ, Van Benthem BHB. *Sexually transmitted infections, including HIV, in the Netherlands in 2014.* Bilthoven 2015, RIVM report number 2015-0041

Van Aar F, Koedijk FDH, Van den Broek IVF, Op de Coul ELM, Soetens LC, Woestenberg PJ, Heijne JCM, Van Sighem AI, Nielen MMJ, Van Benthem BHB. *Sexually transmitted infections including HIV, in the Netherlands in 2013.* Bilthoven, 2014, RIVM report number 150002005/2014

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

Donker G, Dorsman S, Spreeuwenberg P, Van den Broek I, Van Bergen J. A *moderate increase in HIV-related consultations in Dutch general practice: a dynamic cohort study*. Eur J Pub Health 2013;23(s1):223

Donker GA, Van den Broek IVF. *Seksuele anamnese cruciaal bij SOA-consult*. Huisarts & Wetenschap 2013;56(9):464

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

Dorsman S, Donker G, Van den Broek IVF, Van Bergen J. *Twenty-two years of HIV-related consultations in Dutch general practice Increasing testing rates by trend analyses. 2012* Submitted for publication

Dorsman S, Donker G, Van den Broek IVF, Van Bergen J. Angst voor HIV/AIDS. *Hulpvragen bij de huisarts in de periode van 1988 tot en met 2009.* Rapport NIVEL mei 2011

Van den Broek IVF, Verheij RA, van Dijk CE, Koedijk FDH, van der Sande MAB and van Bergen JEAM. *Trends in sexually transmitted infections in the Netherlands, combining surveillance data from general practices and sexually transmitted infection centers*. BMC Family Practice 2010;May 20:11:39

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 Urinary tract infections

Rubriekhouder: Mw. Dr. E.E. Stobberingh (RIVM)(2014)

Introduction

Urinary tract infections are frequently occurring infections in general practice. The incidence varies depending on the practice population between 40-60 per 1000 per year. The antibiotic treatment prescribed by the GP is usually empiric and not based on a bacteriological culture. Mostly the choice is based on the NHG guideline for urinary tract infection, sometimes considerations may lead to a different choice. Even after a first treatment failure guidelines will lead to the choice of a second option. A bacteriological culture will usually be applied after a second treatment failure. The empirical choice of antibiotics should be based on recent sensitivity analyses for antibiotics of the bacterial population to be treated, thus of unselected uropathogens. Sensitivity of these uropathogens is higher than of the uropathogens selected after failing treatment.
For an optimal choice up to date sensitivity analyses are required. The most recent data stem from 2009. In that period in the sentinel practices research was carried out in sensitivity to antibiotics of uropathogens in women 12-70 years attending their GP with symptoms of an uncomplicated urinary tract infection.
Because of the increasing incidence of (multi) resistance in hospitals(Nethmap 2010) and the increasing prevalence of so-called Extended Spectrum Beta-lactamases (ESBL) in the veterinarian sector (D. Mevius, personal communication) it is important to repeat the study in order to obtain actual data. It has also become clear that sensitivity data for urological pathogens isolated from men are scarce. In connection with the extramural antibiotic surveillance of SWAB a surveillance of antibiotic sensitivity for urological pathogens has been started in genera practices in 2009. The outcome has been published in Dutch and English literature and the resistence of uropathogens in Dutch general practice was low at that moment.[21]

The aim of this study is:
Determination of antibiotic sensitivity of uropathogens isolated in male and female general practice patients with symptoms indicative of a urinary tract infection. In 2014 the study scope was geared towards all patients attending a GP with a urinary tract infection.

Method

- All male and female patients with symptoms of a urinary tract infection should be included, independant of the applied therapy, including patients with a catheter.
- Incidence and prevalence are determined using ICPC-codes U71 (cystitis) and U70 (pyelitis). New infections within one month are considered as a recurrence of the same infection. The ICPC codes U71 and U70 may be used based on clinical symptoms indicative of urinary tract infection.
- The usual diagnosis and way of treatment in general practice is continued. This is not influenced by the current study.
- In the freshly produced urine a uricult is immersed, marked with the code of the GP and patient number, to be sent to the bacteriological laboratory of the Maastricht University Medical Centre (MUMC) up till July 2014 and to RIVM/Cib since July 2014.
- Isolation and determination of the uropathogens will be performed according to the standard microbiological methods of the EUCAST and SWAB guidelines.
- The GP receives the bacteriological results weekly.
- The project leader and SWAB are informed annually. The results are published in Nethmap every year.
- When many samples are received per day the GPs are requested to sent the first 2 samples of that day.

Results

Table 10.1 shows the number of reported episodes with a urinary tract infection stratified by region and address density, men, women and total. The incidences are based on analysis of episodes with the ICPC codes U70 (pyelitis) and U71 (cystitis). Underreporting is likely, because most of the activities were performed by GP assistants and the results were available only one day later. The reported incidences in 2014 are higher in women than in men, as usual.

Table 10.1 Number of episodes with a urinary tract infection per province group and address density in the Netherlands, per 10,000 men and 10,000 women in 2014

		province group				address density			Netherlands
		N	E	W	S	1*	2*	3*	
2014	m	420	231	213	236	286	263	208	258
2014	f	2028	1757	1470	1625	1767	1660	1512	1656
2014	t	1216	999	857	918	1014	969	870	961

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

** m=men f=female t=total

Age distribution

Table 10.2 Number of episodes with a urinary tract infection per age group and per 10,000 men, women and total in 2014

	2014		
age group	m	f	t
≤1	91	109	100
1-4	165	640	406
5-9	140	805	465
10-14	67	408	234
15-19	27	1471	718
20-24	69	1793	915
25-29	57	1587	820
30-34	114	1486	794
35-39	95	1154	628
40-44	91	1246	664
45-49	120	1222	660
50-54	196	1365	771
55-59	267	1595	926
60-64	278	1759	1021
65-69	452	2032	1245
70-74	663	2653	1687
75-79	1041	3398	2283
80-84	1533	3766	2841
≥85	2373	5857	4774
total	258	1656	961

Table 10.2 shows the incidence by age group for men and women. The incidence increases in men and women from the age of 65 years.

Extrapolation

Table 10.3 Extrapolation of the incidence rate of urinary tract infection to the Dutch population

	frequency incidence rate (per 10.000)*			Netherlands** (absolute number)		
topic	m	f	total	m	f	total
year			(m+f)			(m+f)
urinary tract infections						
2014	258	1656	961	215.000	1407.000	1617.000

* number urinary tract infection 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

Regular monitoring of antibiotic sensitivity to unselected urological pathogens is the basis for an evidence based empirical choice of antibiotic treatment of a urinary tract infection. The national increase of antibiotic resistance found in human and veterinarian isolates and the fact that the last surveillance took place 5 years ago were the main reasons to start a new surveillance in 2014. The results show that the incidence in women is much

higher than in men and that the incidence increases especially after the age of 65 years, both in men and women.

The study is continued in 2015 by testing urine samples of pregnant women, men and children, as in 2014 sufficient urine samples were obtained of non-pregnant women.

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

Den Heijer C, Van Dongen M, Donker G, Stobberingh E. *Diagnostiek van urineweginfecties bij mannen.* Huisarts & Wetenschap 2014;57(8):390-394

Den Heijer CDJ, Van Dongen MCJM, Donker GA, Stobberingh EE. *Diagnostic approach to urinary tract infections in male general practice patients: a national surveillance study.* Brit J Gen Pract 2012;DOI: 10.3399/bjgp12x658313

Den Heijer CDJ, Van Dongen MCJM, Donker GA, Stobberingh EE. *Diagnostic approach to urinary tract infections in male general practice patients.* Clinical Microbiology and Infection 2012; 18 (s3):428 (Poster presentation 22nd European Congress of Clinical Microbiology and Infectious Diseases. London. April 2012)

Den Heijer CDJ, Van Dongen MCJM, Donker GA, Stobberingh EE. *Male urinary tract infections in Dutch general practices.* Poster presentation at European Scientific Conference on Applied Infectious Disease Epidemiology. Stockholm. November 2011)

Den Heijer CDJ, Donker GA, Maes J, Stobberingh EE. *Antibiotica bij ongecompliceerde urineweginfecties: geen toename van resistentie in de afgelopen 5 jaar*. Ned Tijdschr Geneeskd 2011;155(3):102-106

Den Heijer CDJ, Donker GA, Maes J, Stobberingh EE. *Antibiotic susceptibility of unselected uropathogenetic Escherichia Coli from female Dutch general practice patients: a comparison of two surveys with a five year interval*. J Antimicrob Chemother 2010;65(10):2128-33. Epub 2010 Aug 3 doi:10.1093/jac/dkq286

Koeijers J, Verbon A, Kessels AGH, Bartelds A, Donker G, Nys S, Stobberingh EE. *Urinary tract infection in male general practice patients: uropathogens and antibiotic susceptibility*. Urology:2010;76(2):336-340

Knottnerus BJ, Nys S, Riet ter G, Donker G, Geerlings SE, Stobberingh E. *Fosfomycin tromethamine as second agent for the treatment of acute, uncomplicated urinary tract infections in adult female patients in The Netherlands?* Journal of Antimicrobial Chemotherapy 2008;62:356-359

Knottnerus BJ, Nys S, Riet ter G, Donker G, Geerlings SE, Stobberingh E. *Fosfomycine tromethamine als tweede keus bij de behandeling van ongecompliceerde urineweginfecties?* Huisarts en Wetenschap 2008;51:242-3 (Presentatie NHG-wetenschapsdag 2008-Rotterdam)

Nys S, Bartelds AIM, Donker GA, Stobberingh EE. *Urinary tract infections in a paediatric general practice population in the Netherlands: diagnostic performances and antimicrobial susceptibility of the isolated uropatogens.* Eur J Public Health 2007;17(S2):180 (Presentatie EUPHA-congres 2007 Helsinki)

Koeijers JJ, Kessels AG, Nys S, Bartelds A, Donker G, Stobberingh EE, Vernon A. *Evaluation of the nitrite and leukocyte esterase activity tests for the diagnosis of acute symptomatic urinary tract infection in men.* Clin Infect Dis 2007;5(7):894-6

Donker GA. *Antibioticaresistentie van uropathogenen bij vrouwen vanaf 70 jaar*. Huisarts en Wetenschap 2006;49:319 (Presentatie NHG-wetenschapsdag 2006-Groningen)

11 Oak Processionary Larvae

Topic owner: Ir. A.G. Zijlstra, GGD region Twente and GGD IJsselland, department Environment and Health (2012-2014)

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.[22,23] 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.[24,25] 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.[23] 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.[26]

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 focused 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 2014, comparable to both preceding seasons, only a few reports were registered of complaints caused by the oak processionary caterpillar (N=17,with the highest incidence in the eastern part of the country and the lowest number of reports in the western part of the Netherlands, comparable to the previous seasons. The incidence for the Netherlands is calculated, based on that number, at 15.9 per 100,000, higher than in the previous years. Because of the small number, the incidence per region and and population density should be interpreted with caution (Table 11.1 and 11.1a). In 2014 the incidence in the northern part of the Netherlands is higher than in previous years indicating migration of the oak processionary caterpillar to the north.

Table 11.1 Number of reported complaints caused by the oak processionary caterpillar in 2012-2014, 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
2014	5	8	1	4	9	7	1	17

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

Table 11.1 Number of reported per 100.000 complaints caused by the oak processionary caterpillar in 2012-2014, per region and population density

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
2012	12,9	31,7	2,6	3,9	19,2	11,8	-	10,8
2013	-	25,4	5,1	11,3	-	14,6	9,7	10,1
2014	26,9	40,0	2,3	12,4	36,3	11,5	4,7	15,9

Season influences, age, complaints and exposure

After 11 reported cases in 2012 and 10 cases in 2013 in 2014 17 cases were reported with 17 completed questionnaires. The first valid report in 2014 was received in the southern part of the country in week 18 and the last in week 38. The reported cases combined for all three years 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 in this period of three years reported 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 11.2 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 year	total (m+f)	total (m+f)
oak processionary caterpillar		
2012	10,7	1,800
2013	10,1	1,700
2014	15,9	2,700

* 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 2014 17 patients with complaints due to the oak processionary caterpillar have been registered, more than in the previous two seasons. The rising incidence was mainly observed in the northern part of the Netherlands. 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, 1,700 in 2013 and 2,700 in 2014 with a wide 95% confidence interval. 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.[23] 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.[22] 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.[27] The seasons 2012 and 2013 were mild: 2014 was a less mild season consistent with a higher incidence in the sentinel practices. 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 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 through 2014.

The topic will not be continued in 2015.

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

Zijlstra AG, Donker G, Krol W, De Wolf J. *Landelijke registratie gezondheidsklachten eikenprocessierups (EPR) bij huisartspraktijken.* Eindrapportage. Zwolle, 2015, Academische werkplaats Milieu en Gezondheid.

Zijlstra AG, Donker G, Krol W, De Wolf J. *Registratie klachten door eikenprocessierups bij huisartsen*. Factsheet. Zwolle, 2015, Academische werkplaats Milieu en Gezondheid.

12 End-of–Life research

Topic owner: Dr. B.D. Onwuteaka-Philipsen, VUmc Amsterdam. EMGO-instituut, afdeling Sociale Geneeskunde (2005-2014)

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 12.1, per province group and by address density and for the Netherlands from 2005 to and including 2014. The numbers are based on 40 sentinel practices with ≥1 registration in 2014. No practice were excluded in 2014. 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 12.1 Number of reported End-of-Life study per 10,000 inhabitants, per province group, by address density and for the Netherlands, 2005-2014

	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
2014	72	63	41	47	62	50	45	52

* 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 12.2.

Table 12.2 Numbers of reported End-of-Life study by quarter, per 10,000 inhabitants, 2005-2014

	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
2014	14	13	13	12

In 2014 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 2014 is presented in table 12.3.

Table 12.3 Numbers of reports End-of-Life-study, per 10,000 inhabitants, by age group, 2005-2014

age group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
≤1	(26)	(21)	(20)	(22)	-	-	(30)	-	(11)	-
1-4	(0)	(0)	(10)	(2)	-	(4)	-	-	(5)	(2)
5-9	-	(0)	(0)	0	-	-	(2)	-	-	-
10-14	(3)	(0)	(0)	0	(2)	-	-	-	-	-
15-19	(3)	0	(0)	0	(2)	(3)	-	(2)	(7)	(3)
20-24	0	(2)	10	(4)	(3)	(1)	-	4	-	-
25-29	(1)	(2)	(2)	0	(3)	(1)	(2)	-	(2)	(2)
30-34	0	(2)	(2)	(6)	2	(3)	(2)	9	-	-
35-39	7	(2)	(5)	(6)	(3)	(4)	(2)	9	(5)	(6)
40-44	10	(6)	(4)	(6)	8	8	(3)	(2)	15	(3)
45-49	10	13	14	11	15	9	8	15	21	11
50-54	20	19	24	32	36	26	19	21	22	20
55-59	38	21	27	40	33	40	18	34	36	32
60-64	68	87	62	62	47	58	43	52	50	54
65-69	85	80	120	64	79	90	75	86	84	66
70-74	131	173	138	137	178	145	88	133	137	142
75-79	268	282	248	201	229	231	174	238	195	222
80-84	402	426	413	308	362	370	266	407	354	334
≥85	1106	915	918	761	809	840	627	774	806	886

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 12.4 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
2014			52			88,000

* 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 139,223 in 2014, 8.3 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.
The highest incidence was reported from the northern part of the country and from rural areas. Possibly in cities more often patients opt for staying in a nursing home or hospice in the last phase of life which is not under the care of a GP. Also other Dutch and international literature indicates that patients in rural areas more often die at home.[28]
According to the second Dutch National Survey of General Practice the mortality rate reported in general practice is 41 per 10,000.[29] This lower rate may be due to underreporting. In the sentinel practices, with a rate of 52 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 or fast archiving after death resulting in missing cases in data collection. 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 2015 and some subjects in the questionnaire have been changed.

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

Pivodic L, Pardon K, Miccinesi G, Alonso TV, Moreels S, Donker GA, Arrieta E, Onwuteaka-Philipsen BD, Deliens L, Van den Block L. *Hospitalisations at the end of life in four European countries: a population-based study via epidemiological surveillance networks.* J epidemiol Community Health 2015;0:1-7. doi: 10, 1136/jech-2015-206073

Penders YW, Van den Block L, Donker GA, Deliens L, Onwuteaka-Philipsen B; EURO IMPACT. *Comparison of end-of-life care for older people living at home and in residential homes: a mortality follow-back study among GPs in the Netherlands*. Br J Gen Pract 2015 Nov;65(640):e724-30. doi: 0.3399/bjgp15X687349

Van der Plas AGM, Vissers KC, Francke AL, Donker GA, Jansen WJJ, Deliens L, Onwuteaka-Philipsen BD. *Involvement of a Case Manager in Palliative Care Reduces Hospitalisations at the End of Life in Cancer Patients; A Mortality Follow-Back Study in Primary Care.* PLoS ONE 2015;10(7): e0133197. doi:10.1371/ journal.pone.0133197

Van den Block L, Pivodic L, Pardon K, Donker G, Miccinesi G, Moreels S, Vega Alonso T, Deliens L, Onwuteaka-Philipsen B. *Transitions between health care settings in the final three months of life in four EU countries.* The European Journal of Public Health 2015; doi:10.1093/eurpub/ckv039

Ko W, Deliens L, Miccinesi G, Giusti F, Moreels S, Donker GA, Onwuteaka-Philipsen B, Zurriaga O, López-Maside A, Van den Block L. *Care provided and care setting transitions in the last three months of life of cancer patients: a nationwide monitoring study in four European countries*. BMC Cancer 2014;14:960 doi:10.1186/1471-2407-14-960

Evans N, Pasman HRW, Donker GA, Deliens L, Van den Block L, Onwuteaka-Philipsen B; on behalf of EUROIMPACT. *End-of-life care in general practice: A cross-sectional, retrospective survey of 'cancer', 'organ failure' and 'old age/dementia' patients*. Palliative Medicine 2014;28(7):965-75. DOI:10.1177/0269216314526271

Ko W, Miccinesi G, Beccaro M, Moreels S, Donker GA, Onwuteaka-Philipsen B, Alonso TV, Deliens L, Van den Block L, on behalf of EURO IMPACT. *Factors Associated with Fulfilling the Preference for Dying at Home among Cancer Patients: The role of general practitioners*. J of Palliative Care 2014;30(3):141-150

De Roo ML, Miccinesi G, Onwuteaka-Philipsen B, Van den Noortgate N, Van den Block L, Bonacchi a, Donker GA, Lozano Alonso JE, Moreels S, Deliens L, Francke A, and on behalf of EURO IMPACT. *Actual and Preferred Place of Death of Home-Dwelling Patients in Four European Countries: Making Sense of Quality Indicators.* PlosOne 2014;April 8:DOI: 10.1371/journal.pone.0093762

Pivodic L, Van den Block L, Pardon K, Miccinesi G, Vega Alonso T, Boffin N, Donker GA, Cancian M, Lo´ pez-Maside A, Onwuteaka-Philipsen BD, Deliens L, on behalf of EURO IMPACT. *Burden on family carers and care-related Financial strain at the end of life: a cross-national population-based study*. Eur J Pub Health 2014; doi:10.1093/eurpub/cku026

Evans N, Costantini M, Pasman HR, Van den Block L, Donker GA, Miccinesi G, Bertolissi S, Gil M, Boffin N, Zurriaga O, Deliens L, Onwuteaka-Philipsen B. *End-of-life Communication: A Retrospective Survey of Representative General Practitioner Networks in Four Countries.* Journal of Pain and Symptom Management 2013;46: August 7. Available on line: http://dx.doi.org/10.1016/j.jpainsymman.2013.04.008

Claessen SJJ, Francke AL, Echteld MA, Schweitzer BPM, Donker GA, Deliens L. *GP's recognition of death in the foreseeable future and diagnosis of a fatal condition: a national survey.* BMC Family Practice 2013;14(1):104. DOI: 10.1186/1471-2296-14-104

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

Ko W, Beccaro M, Miccinesi G, Van Casteren V, Donker GA, Onwuteaka-Philipsen B, Miralles Espi MT, Deliens L, Costantini M, Van den Block L. *Awareness of General Practitioners concerning cancer patients' preferences for place of death: Evidence from four European countries.* Eur J Cancer 2013;published on line 18 February 2013. doi:10.1016/j.ejca.2013.01.006

Meeussen K, Van den Block L, Echteld MA, Boffin N, Bilsen J, Van Casteren V, Abarshi E, Donker G, Onwuteaka-Philipsen B, Deliens L. *End-of-life care and circumstances of death in patients dying as a result of cancer in Belgium and the Netherlands: a retrospective comparative study*. J Clin Oncol. 2011 Nov 10;29(32):4327-34. Epub 2011 Oct 11

Claessen SJJ, Echteld MA, Francke AL, Van den Block L, GA Donker, L Deliens. *Important treatment aims at the end of life: a nationwide study among GPs.* Br J Gen Pract 2012;62:86-7. DOI: 10.3399/bjgp12X625184

Abarshi E. *Care in the last months of life. End-of-life Care registration in the Netherlands by a network of General Practitioners.* Dissertatie 2011 VU Amsterdam

Meeussen K, Van den Block L, Echteld M, Bossuyt N, Bilsen J, Van Casteren V, Abarshi E, Donker G, Onwuteaka-Philipsen B, Deliens L. *Advance Care planning in Belgium and The Netherlands: a nationwide retrospective study via sentinel networks of general practitioners.* J Pain Symptom Manage 2011;42(4):565-77 Apr 27 [Epub ahead of print]

Abarshi E, Echteld MA, Van den Block L, Donker G, Deliens L, Onwuteaka-Philipsen B. *The oldest old and GP end-of-life care in the Dutch community: a nationwide study. Age and Ageing* 2010; 39(6):716-22. Epub 2010 Sep 4. Doi: 10.1093/ageing/afq097

Abarshi E, Echteld M, van den Block L, Donker G, Deliens L, Onwuteaka-Philipsen B. *Recognising patients who will die in the near future: A nationwide study via Dutch GPs.* Brit J Gen Practice 2010;61(587):371-8

Abarshi E, Echteld M, Donker GA, van den Block L, Onwuteake-Philipsen B, Deliens L. *Discussing end-of-life issues in the last months of life :a nationwide study among General Practitioners.* J Palliat Med. 2011 Jan 21. [Epub ahead of print] doi 21254811

Abarshi E, Echteld M, Block van den L, Donker G, Bossuyt N, Meeussen K, Bilsen J, Onwuteaka-Philipsen B, Deliens L. *Use of palliative care services and end-of-life GP visits in the Netherlands and Belgium.* Journal of Pain and Symptom Management 2010; 41(2):Epub2010;Sep15.doi10.1016/j.painsymman;2010.04.16

Donker Gé, Abarshi Ebun. *Gewenste plaats van overlijden tijdig bespreken.* Huisarts en Wetenschap:2010;53(5):247

Abarshi E, Echteld M, Van den Block L, Donker G, Deliens L, Onwuteaka-Philipsen B. *Transitions between care settings at the end of life in the Netherlands: results of a nationwide study*. European Journal of Public Health 2009;19(S1):55 (Oral Presentation 2nd European Public Health Conference Lodz, November 2009)

Abarshi E, Onwuteaka-Philipsen B, Donker G, Echteld M, Van den Block L, Deliens L. *GP awareness of preferred place of death and correlates of dying in a preferred place: a nationwide mortality follow-back study in the Netherlands.* Suiss Medical Weekly 2009;S175:43S (Oral Presentation 110 15th WONCA-conference Basel, September 2009)

Abarshi E, Onwuteaka-Philipsen B, Donker G, Echteld M, Block van den L, Deliens L. *GP awareness of preferred place of death and correlates of dying in a preferred place: a nationwide mortality follow-back study in the Netherlands.* Journal of Pain of Symptoms management 2009;38:568-77

Abarshi Ebun, Echteld Michael, Block van den Lieve, Donker Gé, Deliens Luc, Onwuteaka-Philipsen Bregje. *Transitions between care settings at the end of life in The Netherlands: results from a nationwide study.* Palliative Medicine:2009;24(2):166-74 doi:10.1177/0269216309351381

Echteld MA, Abarshi E, Block van den L, Deliens L, Donker GA, Onwuteaka-Philipsen B. *Factors associated with well-being at the end of life and good death.* Presentation at the EAPC conference in Vienna 2008

Donker GA, Abarshi E, Echteld M, Block van den L, Deliens L, Onwuteaka-Philipsen B. *GP awareness of patients' preferred place of death and predictors of dying in a preferred place: a nationwide general practice study in The Netherlands.* Presentation at the 14th WONCA Europe Conference in Istanbul, September 2008

Abarshi E, Echteld M, Block van den L, Donker G, Onwuteaka-Philipsen B. *Care setting transitions at the end of life in The Netherlands.* 9th Public Health Symposium: Public Health at the end of life, Jette, Belgium, 14 December 2007. In: Archives of Public Health 2007

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

Block van den L, Bossuyt N, Meeussen K, Abarshi E, Deliens L. *Monitoring end-of-life care via general practice in Europe: a study with the Sentinel Surveillance Networks of General Practitioners.* Workshop at the 13th WONCA Europe Conference in Paris, October 2007

13 (Attempted) suicide

Topic owner: Mrs. Dr. G.A. Donker (NIVEL) (1979-2014)

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 2005-2014 were, 71, 24, 49, 28, 40, 46, 33, 39 67 and 81 respectively.

The number of attempts per province group and by address density per 10,000 inhabitants is shown in Table 13.1. 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 and in 2014 the highest number. Analyses by gender (not shown here) demonstrate that the rise of the past years is mainly caused by a rise of the incidence in men. 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 2014 the incidence was the highest in the northern region.

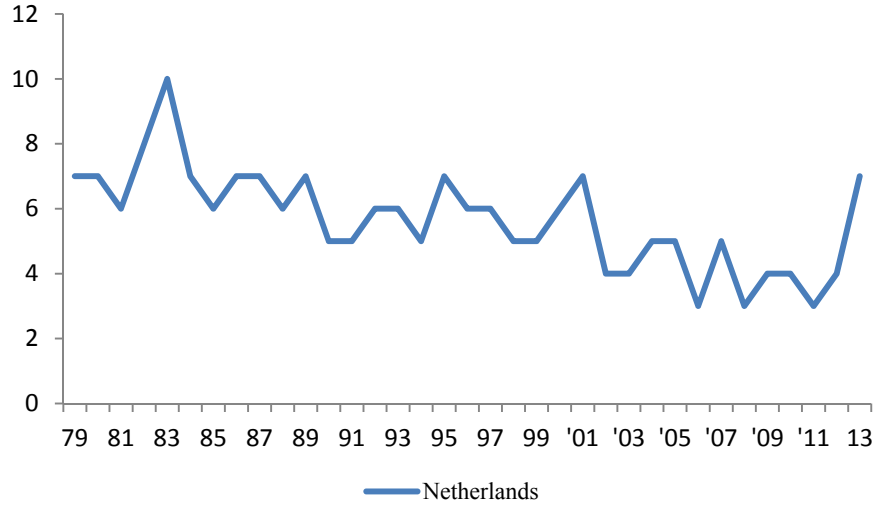
Table 13.1 Number of (attempted) suicides reported per 10,000 inhabitants, per province group, by address density and for the Netherlands as a whole, 2005-2014

	province group				address density			Netherlands
	N	E	W	S	1*	2*	3*	
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
2014	11	3	8	7	4	8	11	8

* 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. From 2003 through 2012 the incidence was stabile with small fluctuations. In 2013 the incidence increased and in 2014 the incidence was the highest of the past 10 years.

Figure 13.1 Number of (attempted) suicides reported per 10,000 inhabitants for the Netherlands as a whole, 1979-2014



Age distribution

In 2014 the number of suicide attempts peaked in the age group 35-54 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 2014.

Table 13.1 shows the frequency of suicide and attempted suicide per 10,000 inhabitants, by age group in the last 10 years.

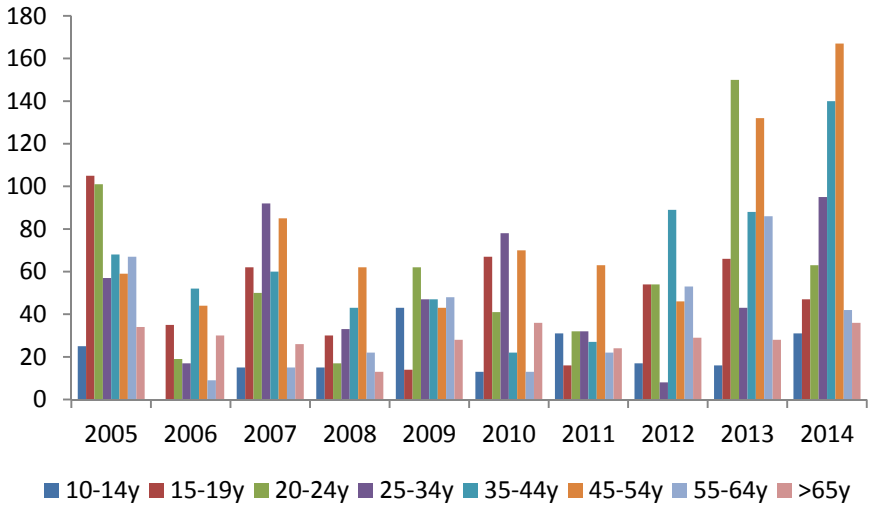
Table 13.2 shows the frequency per 100,000 inhabitants by age group in the last 10 years.

Table 13.2 Number of (attempted) suicides reported per 100,000 inhabitants, by age group, 2005-2014

age group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
10-14	(25)	-	(15)	(15)	(43)	(13)	(31)	(17)	(16)	(31)
15-19	105	(35)	(62)	(30)	(14)	67	(16)	(54)	(66)	(47)
20-24	101	(19)	(50)	(17)	(62)	(41)	(32)	(54)	150	(63)
25-34	57	(17)	92	33	47	78	(32)	(8)	43	95
35-44	68	52	60	43	47	(22)	(27)	89	88	140
45-54	59	44	85	62	43	70	63	46	132	167
55-64	67	(9)	(15)	(22)	48	(13)	(22)	53	86	42
≥65	34	(30)	(26)	(13)	28	36	(24)	29	28	36

The numbers between brackets are based on N<5

Figure 13.2 Number of (attempted) suicides reported per 100,000 inhabitants by age group, 2005-2014



Extrapolation

Table 13.3 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		
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
2014	8	13,000

* 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 2014 are the highest in the past 10 years. Also the year 2013 showed an increase, but in the preceeding ten years the numbers were stable preceeded by a declining trend. The increasing trend of the past years is mainly observed in men.
In 2014 the highest numbers were seen in the age groups 35-54 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 2015.

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

Beurs D de, Hooiveld M, Donker G. *Suïcidepreventie.* Huisarts en Wetenschap 2016;59(2)

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)

Donker GA, Wolters I, Schellevis F. *Trends and determinants in attempting or committing suicide in Dutch general practice and the role of the general practitioner in 1983-2009.* Oral Presentation 16th WONCA-conference Malaga, October 2010

Marguet RL, Donker G, *Praten over suicidegedachten.* Huisarts en Wetenschap 2009;52(6):267

14 Policy for symptoms mamma

Topic owner: Mrs. Dr. M. Hooiveld, NIVEL (2012-2014) in cooperation with Mrs. Dr. E. Paap, LRCB

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 (Table 14.1). 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 14.1 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, 2012-2014

	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
2014	372	298	282	323	301	308	315	308

* 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. In 2014 the number in the age group 35-50 years is higher than in the age group 50-75 years which is screened for breast cancer every two years.

Table 14.2 Number of women per 10,000 per age group ≥25 years who consulted the GP with complaints of the breasts, 2012-2014

age group	2012	2013	2014
25-29	220	205	207
30-34	238	226	288
35-39	216	340	377
40-44	222	310	420
45-49	270	281	417
50-54	260	307	358
55-59	151	236	271
60-64	190	249	260
65-69	200	293	267
70-74	169	207	271
75-79	163	171	264
80-84	47	183	159
≥85	95	159	248
total	203	257	308

Numbers between brackets are based on N<5

Extrapolation

Table 14.3 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
2014	308	262,000

* 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. In 2014 the number in the age group 35-50 years is higher than in the age group 50-75 years which is screened for breast cancer every two years.

This topic will be not continued in 2015.

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

Hooiveld M, Ebrahimi H, Donker GA, Broeders M, Schellevis F. *Beleid van huisartsen bij klachten van de mamma.* Presentatie NHG Wetenschapsdag, Leiden, 2013

15 Requests for Euthanasia

Topic owner: Dr. G.A. Donker, (NIVEL) (1976-2014)

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.[30] 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 2014. In 2014 the number of requests is 55 (30 men and 25 women) from 40 reporting practices. This amounts to 5.1 per 10,000 in general practices registered patients, slightly higher than in the previous five years (4.8, 4.6, 3.5, 4.5 and 3.4 per 10,000 in 2013, 2012, 2011, 2010 and 2009 respectively). Of the patients who requested euthanasia in 2014 60% had a malignancy, which is a lower proportion than in previous years (76% in the period 1976-2013). Most patients with a euthanasia request in the sentinel practices were tended

at home or a care home for the elderly, two patients in a hospice, two in a nursing home, one in a hospital and one in a rehabilitation centre. In 42 out of 55 requests (76%) the request is supported by a living will. Forty one patients asked for euthanasia. Six patients requested physician assisted suicide and eight patients had not chosen between the two methods yet. In 58% of the cases the SCEN-doctor (Support and Consultation in Euthanasia in the Netherlands) was called in and 24 out of 55 (44%) 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 2005-2014

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, 2005-2014

			province group				address density			Netherlands
absolute	m	f	N	E	W	S	1*	2*	3*	
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
2014	30	25	4	10	28	13	6	34	15	55

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

The data per 10,000 inhabitants (not shown because of small numbers) indicate that in 2014 the number of requests in the big cities (7.0 per 10,000) is higher than in the previous four years and lowest was in the rural areas (2.4 per 10,000).

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, 2005-2014

	≤54	55-64	65-74	75-84	≥85	total
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
2014	3	6	12	14	20	55

Overview of reported requests

Since 1976 the sentinel general practice network has collected data on 1423 requests for euthanasia or physician assisted suicide, 737 (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 very old aged are included with motivation "completed life", "tired of life", without described disease 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 2014 the distribution is comparable to previous years.

Table 15.3 Diseases leading to euthanasia requests, 1976-2014

	N	%
malignant neoplasms	1065	75
cardiovascular diseases	87	6
chronic obstructive pulmonary diseases	62	4
symptoms and insufficiently defined diseases	74	5
other diseases	135	10
total	1423	100

Over the years, the reported percentage of living wills has increased from 15% in 1984 to 76% in 2014. 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 1976-2014. In the published 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 1976-2014 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.[31-33] Loss of dignity turns out to be more often the motive for men than for women to request euthanasia.[32,33]
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.[34] 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.[35-39] 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[40]. In 2012 the 'End-of-Life clinic' emerged to perform euthanasia in patients whose physicians refused to do so.[40,41]

In Hoogeveen GPs committed themselves to cooperate in treating patients with a euthanasia request in case patient's GP has moral problems with executing euthanasia.[42] This example is also followed elsewhere in the country resulting in decreasing barriers in executing euthanasia within the frame of the Dutch Euthanasia Act.

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 2014 44% of the requests for euthanasia this requested intervention was applied, somewhat less frequently than in the previous year (65%). 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 2014 annual report we know that 5306 cases of executed euthanasia or physician assisted suicide are reported to the Committee.[43] In 2014 the number was higher than in previous years (4829, 4188, 3695, 3136, 2636, 2331 reported in respectively 2013, 2012, 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.[43] In most reported cases the physicians had strictly followed the rules required by law. Only in 4 interventions this was not the case at a national level in 2014.[43] 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. In the Sentinel Practices we recorded euthanasia requests of which in 2014 only 44% were executed. The

percentage of living wills has increased during the past years; from 15% in 1984 to 76% in 2014. 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 2014 in the Sentinel Practices were reported to a Regional Assessment Committee for Euthanasia.

The study will be continued in 2015.

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 2014

age	gender	disease reported	reason for request
96	v	mamma carcinoma	pain, completed life, refused to experience deterioration of health
95	v	bladder carcinoma	loss of future perspective
94	v	multimorbidity diabetes mellitus, heart failure, kidney failure, osteoporosis	completed life, independant with many care takers
94	v	completed life	
93	v	Diabetes mellitus, kidney failure, hypothyroïdia, artrosis, heart failure, senilitas	pain, itching
93	v	rectum carcinoma	does not want to be dependant, wishes to die
91	m	general deterioration	admitted in nursing home
91	v	terminal kidney failure, pancreas carcinoma, stenosis duodenum	
90	m	multiple vessel problems, AP, amputation, artrosis	suffering, nauseated, tired
89	m	COPD IV	dyspnoea
89	v	terminal kidney failure	untreatable itching
89	v	status after CVA, instable angina pectoris	heart failure, extremely tired
88	v	metastatic mamma carcinoma	not able to swallow, inoperable
88	v	mamma carcinoma, blind	no wish to live
87	v	heart failure	bleeding CVA
87	v	oesophagus carcinoma	unbearable suffering

Table 15.4 Requests made by patients for active euthanasia, 2014 (cont.)

age	gender	disease reported	reason for request
87	v	aorta valve problem, stenosis, inoperable, kidney failure	terminal heart failure
86	v	heart failure	sister died
86	v	M. Parkinson	depression, lack of futureperspective
86	v	old age	tired of life
84	v	terminal COPD	dyspnea, anxiety for choking
82	m	old age	partner died
81	m	oropharynx carcinoma	increase of pain
80	m	metastatic prostate carcinoma, anaemia gravis	extremely tired, psychological deterioration
80	m	CMML	lack of energy due to untreatable blood loss
78	m	COPD	dyspnea, serious deterioration
78	m	prostate carcinoma	serious deterioration
78	m	prostate carcinoma	unbearable suffering, nausea, tired
78	v	pain due to multiple sclerosis	unbearable pain
78	v	metastatic bronchus carcinoma	unbearable suffering, loss of future perspective
77	v	metastatic adenocarcinoma lung, mamma carcinoma	terminal disease
76	m	duodenum carcinoma	unbearable suffering
75	m	metastatic prostate carcinoma	anxiety for unbearable suffering
75	m	colon carcinoma	metastatic, no treatment options
74	m	terminal lung carcinoma	dyspnea
73	m	metastatic sarcoma	pain, dyspnea
73	m	heart failure	tiredness

Table 15.4 Requests made by patients for active euthanasia, 2014 (cont.)

age	gender	disease reported	reason for request
73	m	lung carcinoma	dyspnea, anxiety
72	v	kidney cell carcinoma	deterioration
70	m	COPD and heart failure	exacerbation
68	m	prostate carcinoma	terminal
67	m	metastatic colon carcinoma	exhausted
67	v	metastatic breast carcinoma	no treatment options, progression of metastatic cancer
66	m	Lewy body disease	LBD, threatening admission in nursing home
65	m	M. Parkinson	endless serious suffering
65	m	esophagus carcinoma	poor quality of life and no treatment options
63	m	metastatic lung carcinoma	in hospital discussed, read about all options
62	m	lung carcinoma	terminal disease
61	v	metastatic lung carcinoma	no further treatment options for dyspnea and pain, does not want to be bedridden completely
60	m	metastatic colon carcinoma	unbearable suffering, no future perspective
58	m	metastatic lung carcinoma, hemiplegia	
56	m	lung carcinoma	dyspnea
53	m	Non hodgkin lymfoma	poor prognosis

Table 15.4 Requests made by patients for active euthanasia, 2014 (cont.)

age	gender	disease reported	reason for request
52	m	manic depression	unbearable suffering, percistent wish to die
52	v	lung carcinoma	general deterioration

16 Palliative Sedation

Topic owner: Mrs. Dr. G.A. Donker, NIVEL (2005-2014)

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 in the years thereafter.[44] 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 2010.[44,45]

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. When completing the end-of-life registration in the sentinel module additional questions are asked whether palliative sedation was applied or euthanasia or whether the patient committed suicide. When palliative sedation was applied an additional questionnaire is completed 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 2014 all 40 sentinel practices responded whether they had applied palliative sedation or not. Six practices did not apply palliative sedation in 2014. In 2014 78 cases of palliative sedation were reported, 14% of all deaths in the 40 reporting sentinel practices and a steep rise compared to previous years. Palliative sedation was applied in 39 men and 39 women in 2014 and 71% of these patients suffered from cancer as underlying disease. In 65 of these 78 patients (83%) two or more refractory symptoms were the reason to apply palliative sedation. In eleven patients only one refractory symptom is was indicated (five times delirium, dyspnea, anxiety and pain each two times (see also appendix 1, table 16.5).

Untreatable pain (43 patients, 55%) was the most prominent reason to decide for palliative sedation in 2014, like in previous years. Also dyspnea (38 patients, 49%), delirium (27 patients, 35%), anxiety (22 patients, 28%), nausea (21 patients, 27%) and vomiting (19 patients, 24%) are prominent reasons to sedate and often occur in combination with pain.

From the 78 reported patients 9 (12%) also requested for euthanasia. The reasons to apply palliative sedation and not euthanasia in these 9 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 (five times).

Table 16.1 Absolute number of patients decreased after palliative sedation, per province group, address density and for the Netherlands in 2005-2014

	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
2014	17	16	27	18	23	47	8	78

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

In 2014 the highest number of patients (per 10,000) are reported in the northern provinces. Sorted by address density most patients per 10,000 in 2014 were reported to live in rural areas. (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 2005-2014

	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
2014	9,1	8,0	6,1	7,4	9,3	7,7	3,7	7,3

* 1: ≤500/km^2 2: 500-2500/km^2 3: ≥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 2005-2014

	≤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
2014	5	8	20	17	28	78

*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 2005-2014

	N	%
malignant tumors	223	73
cardio-vascular diseases	38	12
chronic obstructive pulmonary disease	9	3
symptoms and incompletely described diseases	11	4
other diseases	25	8
total	306	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, delirium and anxiety play a major role. In 2014 palliative sedation was applied in 14% of the by the sentinel GPs reported deaths. This is considerably higher than the previous years also somewhat higher than the 12.3% mentioned in the fifth national survey concerning medical decisions at the end of life.[41] Of all cases reported in that study 43% was carried out by GPs, 38% by medical specialists and 19% by specialists in the elderly. Thus, this 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 2005-2014. However, in 2014 the number is significantly higher when the year 2014 is compared to the period 2005 through 2013. Possibly this is caused by a lot of media attention after the so called ‘Tuitjenhorn affair’ and it may also be enhanced by the regionally organized, but

nationally available, specialistic palliative care teams assisting GPs in the application of IV-drips and subcutaneous pumps which may be necessary for applying palliative sedation.[46] In these cases the GPs remain responsible for the prescription of medication, the dosage and for accompanying the process, but are able to delegate technical procedures to palliative specialistic care teams. In the nine 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.[47] The guideline on palliative sedation issued by the KNMG in 2005 and updated in 2009 (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 [48] 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 results of the increased application of palliative sedation in 2014 were presented in 2015 at the Ca-PRI-congress in Arhus and the annual conference of the European Public Health Association in Milano.[50]

The topic will be continued in 2015.

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

Donker GA, Van Dijk CE. *Increase in palliative sedation and reasons in cancer patients in Dutch general practice 2005–2014*. Eur J Pub Health 2015;25(3):244. Oral Presentation EUPHA, Milan, October 17, 2015

Donker GA en Van Dijk CE. *Trends and reasons of palliative sedation in cancer patients with and without pending requests of euthanasia in Dutch general practice*. Oral and poster presentation Ca-PRI Conference Arhus 20-22 May 2015. Eur. J of Cancer Care 2015;24 (Suppl. 2):Abstract P-44:47. http://onlinelibrary.wiley.com/doi/10.1111/ecc.12374/epdf

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

Donker GA, Slotman FG, Spreeuwenberg P, Francke AL. *Palliatieve sedatie in Nederlandse huisartspraktijken. Dynamische cohortstudie van trends en redenen in de periode 2005-2011.* Ned Tijdschr Geneeskd 2014;158:A7213

Donker GA, Slotman FG, Spreeuwenberg P, Francke AL. *Palliative sedation in Dutch general practice from 2005 to 2011: a dynamic cohort study of trends and reasons*. Brit J Gen Pract 2013; DOI: 10.3399/bjgp13X673676

Appendix 1

Table 16.5 Characteristics of patients treated with palliative sedation in 2014

age	gender	disease reported	reason for request
98	v	collum# inoperabel mamma carcinoma, terminal kidney insufficiency	pain, endless suffering
97	m	pneumonia	delirium, pain, tiredness, exhausted
97	v	ileus	delirium, pain, nausea, vomiting
96	v	CVA, metastatic pancreas carcinoma	pain
96	v	hip fracture	pain, tiredness, exhausted
95	v	old age	dyspnea
95	v	old age	tiredness, exhausted
94	m	lipo sarcoma	delirium, pain, tiredness, exhausted
94	v	carcinoma of unknown origin	dyspnea, pain, nausea, vomiting, anxiety
94	v	dementia	delirium
93	v	decompensatio cordis, diabetes, hypothyreoidia poly-artrosis, itching, decubitus	pain, itching
92	m	heart failure, kidney failure	delirium, dyspnea
92	v	mamma carcinoma	dyspnea, pain, nausea, anxiety
91	m	CVA	aspiration of food, pneumonia
91	v	colon carcinoma	pain, nausea, anxiety, tiredness, exhausted, ileus, fecal vomiting
91	v	decompensatio cordis	dyspnea, vomiting, anxiety

Table 16.5 Characteristics of patients treated with palliative sedation in 2014 (cont.)

age	gender	disease reported	reason for request
90	v	mamma carcinoma	deliriumr, pain, nausea, vomiting, ileus
89	v	malignancy of unknown abdominal origine	delirium, dyspnea, pain, tiredness, exhausted
89	v	dementia, heart failure	delirium, dyspnea, pain
89	v	diabetic foot	anxiety
89	v	terminal kidney insufficiency	general tarnishing
88	v	terminal heart failure	dyspnea, pain
87	m	colon carcinoma	delirium,
87	v	malignancy of unknown origine	dyspnea, anxiety
86	m	heart failure	dyspnea, tiredness, exhausted
86	v	serious periferic atherosclerosis	pain, nausea, vomiting, anxiety
85	m	COPD	delirium, dyspnea, pain
85	v	lung carcinoma	delirium, pain, nausea, tiredness, exhausted
84	m	colon carcinoma	delirium, dyspnea
83	m	M. Parkinson	pain, restlessness
83	v	pancreas,carcinoma	nausea, vomiting, tiredness, exhausted, ileus, fecal vomiting
83	v	pancreas carcinoma	delirium, nausea, tiredness, exhausted
81	m	pancreas carcinoma	pain, tiredness, exhausted
80	m	metastatic sigmoid carcinoma	delirium, pain
80	v	ovarium carcinoma	delirium

Table 16.5 Characteristics of patients treated with palliative sedation in 2014 (cont.)

age	gender	disease reported	reason for request
78	v	colon carcinoma	dyspnea, nausea, tiredness, exhaustion
77	m	M. Kahler + kidney insufficiency	dyspnea, serious trombopenia, spontaneous bleeding from nose, penis, anus
77	m	neuro-endorine tumor bowel	delirium, pain, tiredness, exhaustion
77	v	sigmoid carcinoma	delirium, dyspnea, tiredness, exhaustion
76	m	colon carcinoma	pain, nausea, vomiting, tiredness, exhausted
76	m	lung carcinoma	dyspnea, pain, tiredness, exhausted
76	m	Grawitz tumor	pain, nausea, vomiting, anxiety
75	m	Non-Hodgkin lymfoma with lung metastases	dyspnea, anxiety, tiredness, exhausted
75	m	pancreas carcinoma	delirium, anxiety
75	m	lung carcinoma, CVA	delirium, dyspnea, pain
74	m	terminal COPD	dyspnea, tiredness, exhausted
74	m	lung carcinoma	dyspnea, pain, nausea, vomiting, tiredness, exhausted
74	v	gallbladder carcinoma	delirium
73	m	rectum carcinoma with liver- and lung metastases	delirium, dyspnea, pain, tiredness, exhausted
73	v	liver, gallbladder carcinoma	dyspnoe, pijn, misselijk, braken, angst

Table 16.5 Characteristics of patients treated with palliative sedation in 2014 (cont.)

age	gender	disease reported	reason for request
73	v	metastatic bronchial carcinoma	dyspnea, tiredness, exhausted
73	v	metastatic ovarium carcinoma	dyspnea, pain, nausea, vomiting, anxiety
72	m	thyroid carcinoma	dyspnea, vomiting, anxiety
72	m	terminal heart failure and ischaemic cardiomyopathy	dyspnea,anxiety, tiredness, exhausted
72	m	colon rectal carcinoma with multiple metastases	dyspnea, unable to eat, drink and talk
71	m	bipolar disorder, DM and myelum carcinoma	delirium, dyspnea, tiredness, exhausted
70	m	leucaemia	delirium, dyspnea, painnausea, vomiting
70	m	liver metastasea of unknown primary tumor	vomiting, tiredness, exhausted
69	m	metastatic lung carcinoma	pain, tiredness, exhausted
69	m	bronchus carcinoma st. IV right	dyspnea, anxiety
68	v	metastatic gastric carcinoma	dyspnea, pain, nausea, vomiting, tiredness, exhausted
68	m	metastatic melanoma	anxiety
68	v	DLBCL-lymfoma	nausea, vomiting, anxiety, ileus
67	m	metastatic colon carcinoma	delirium, nausea, anxiety
65	m	metastatic lung carcinoma	delirium, tiredness, exhausted
64	m	lung carcinoma	dyspnea, anxiety
62	m	metastatic esophagus carcinoma	pain, tiredness, exhausted

Table 16.5 Characteristics of patients treated with palliative sedation in 2014 (cont.)

age	gender	disease reported	reason for request
61	v	Creutzfeld-Jacob disease	dyspnea, swallow disorder, loss of vital functions
60	m	kidney carcinoma	delirium
58	m	larynx carcinoma	tiredness, exhausted, oedema
57	m	locked in syndrome due to brain ischaemia	exhausted
56	v	lung carcinoma	dyspnea, pain, tiredness, exhausted
55	v	colon carcinoma	pain, vomiting, uneasiness
54	m	metastatic lung carcinoma	dyspnea, pain
54	v	lung carcinoma	dyspnea, pain, anxiety
51	v	mamma carcinoma with liver, lung, bone metastases	delirium, dyspnea, anxiety
45	v	melanoma	nausea, vomiting
42	v	ovarium carcinoma with liver and bone metastases	pain

17 Eating disorders

Topic owner: Prof. H.W. Hoek, Parnassia group and UMCG(1985-1989 and 1995-2014)

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 2014 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 1995-2014. In 2014 eating disorders are diagnosed in 41 women and 5 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 1995-2014

	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
2014	6	6	21	8	5	32	4	41

* 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, 1995-2014, 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
2014	6,5	6,0	9,3	6,7	4,1	10,4	3,7	7,6

* 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 1995-2014

women	1985-1989	1995	1996	1997	1998	1999	2000	2001	2002	2003
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	5
20-24	12	14	9	11	14	74	5	2	3	7
25-29	14	10	7	7	5	6	9	4	8	7
30-34	6	9	4	3	4	6	4	5	2	5
35-39	7	8	6	3	11	91	3	3	5	5
40-44	4	2	2	4	4	6	1	-	4	6
45-49	1	4	1	1	1	-	1	-	2	5
50-54	1	2	-	-	-	-	1	1	2	2
55-59	1	-	-	-	1	1	-	-	-	-
60-64	-	-	-	-	-	-	-	-	-	1
65-69	-	-	-	-	-	-	-	-	-	-
70-74	-	-	-	-	-	-	-	-	-	-
75-79										-
80-84										-

Table 17.2 Absolute numbers of patients for whom GPs reported an eating disorder (boulimia and/or anorexia nervosa), by age, 1985-1989 and 1995-2014 (cont.)

women	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1-4	-	-	-	-	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-
10-14	1	1	-	3	1	2	2	4	2	4	1
15-19	5	9	5	6	12	7	11	5	5	8	11
20-24	10	2	9	7	2	9	7	5	4	6	10
25-29	8	2	4	4	5	7	3	6	4	4	4
30-34	-	6	3	5	7	4	1	2	4	3	3
35-39	2	1	6	3	7	5	2	-	4	2	2
40-44	5	6	1	3	3	3	3	1	3	3	1
45-49	4	-	1	5	6	4	-	1	-	1	2
50-54	-	-	1	1	3	-	2	1	2	2	2
55-59	-	-	-	-	1	3	1	1	-	-	3
60-64	-	1	1	1	-	-	1	1	2	-	1
65-69	-	-	-	-	-	-	1	-	-	-	1
70-74	-	-	1	-	-	-	-	-	-	-	-
75-79	-	-	-	-	-	-	-	-	-	-	-
80-84	-	-	-	1	-	-	-	-	-	-	-

The peak incidence in 2014 lies in the age group 15-19 years like in the preceeding two years. Also, it is remarkable that eating disorders sometimes still occur at old age.

Discussion

In 2014 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.[51,52]

The study will be continued in 2015.

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

Smink FRE, Van Hoeken D, Donker GA, Susser ES, Oldehinkel AJ, Hoek HW. Three decades of eating disorders in Dutch primary care: decreasing incidence of bulimia nervosa but not of anorexia nervosa. Psychological Medicine 2015; December. DOI: 10.1017/S003329171500272X

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

Son van GE. *Eating disorders in a primary care based cohort*. Dissertation 2010

Son van Gabriëlle E, Hoeken van Daphne, Furth van Eric F, Donker Gé A, Hoek Hans W. *Course and Outcome of Eating Disorders in a Primary Care-Based Cohort*. International Journal of Eating Disorders 2010;43(2):130-8

Son van Gabriëlle, Donker Gé, Hoek Hans Wijbrand. *Eetstoornissen: trend en samenhang met verstedelijking.* Huisarts en Wetenschap 2009;52(3):121

Son van GE, Hoeken van D, Furth van EF, Donker GA, Hoek HW. *Outcome of Eating Disorders in a Primary Care-Based Study.* Oral presentation. International Conference on Eating Disorders, Baltimore, 2-5 Mei, 2007

Son van GE, Hoeken van D, Bartelds AIM, Furth van EF, Hoek HW. *Urbanisation and the incidence of eating disorders.* Brit J Psychiatry 2006;189:562-563

Son van GE, Hoeken van D, Bartelds AIM, Furth van EF, Hoek H.W. *Time trends in the incidence of eating disorders: A primary care study in the Netherlands* Int Eat Disord 2006;39:565-569

18 General comments

1 The Counselling Committee has decided to include the following topics on the weekly returns in 2015.

   a Influenza and influenza-like illnesses
   b Research on end-of-live decisions
   c Suicide and attempted suicide
   d STD
   e Acute gastro-enteritis
   f Whooping cough
   g Pneumonia
   h Request for euthanasia
   i Eating disorders
   j Palliative sedation
   k 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

List of other publications based fully or partly on the data from NIVEL Primary Care Database, Sentinel Practices from 2000

General

Dorn T, Ceelen M, Buster M, Stirbu I, Donker G, Das K.. *Mental health and health-care use of detainees in police custody.* Journal of Forensic and Legal Medicine (2014). doi.org/10.1016/j.jflm.2014.06.005

Ceelen M, Dorn T, Buster M, Stirbu I, Donker G, Das K. *Health-care issues and health-care use among detainees in police custody.* Journal of Forensic and Legal Medicine (2012). doi:10.1016/j.jflm.2012.02.012

Santing L, Van der Eijk R, Donker GA. *Cholesteatoom: een wolf in schaapskleren.* Huisarts en Wetenschap 2012;55(2):78-81

Van den Wijngaard CC, Dijkstra F, Van Pelt W, Van Asten L, Kretzschmar M, Schimmer B, Nagelkerke NJD, Vellema P, Donker GA, Koopmans MPG. *In search of hidden Q-fever outbreaks: linking syndromic hospital clusters to infected goat farms.* Epidemiol Infect 2011;Jan:139(1):19-26

Santing-Winter L, Van der Eijk R, Donker GA. *Even een trommelvlies beoordelen: meerdere valkuilen.* Bijblijven 2011;2:20-24

Donker GA, Pruys T. *ICT – vooruitgang met valkuilen.* Bijblijven 2011;2:47-50

Donker GA. *Monitoring en surveillance: is de huidige situatie adequaat*? In: 'Outbreaks', Bijblijven 2010-7:68-75

Donker GA. *Peilstations-meten trends in de huisartsenpraktijk.* Huisarts in de praktijk 2007;18(12):10-12

Antibioticaresistentie

Donker Gé, Stobberingh Ellen. *Antibioticagevoeligheid van streptokokken*. Huisarts & Wetenschap 2015;58(8):430.

Van der Donk CF, Rijnders MI, Donker GA, De Neeling AJ, Nys S, Stobberingh EE. *Is living in a border region a risk for a high prevalence of resistance?* Eur J Clin Microbiol Infect Dis. 2013 Feb 10. [Epub ahead of print]

Den Heijer CDJ, Van Dongen MCJM, Donker GA, Stobberingh EE. *Diagnostic approach to urinary tract infections in male general practice patients: a national surveillance study*. Brit J Gen Pract 2012;DOI: 10.3399/bjgp12X658313

Donker GA, Deurenberg RH, Driessen C, Sebastian S, Nys S, Stobberingh EE. *The population structure of Staphylococcus aureus among general practice patients from The Netherlands.* Clin Microbiol Infect 2009;15(2):137-43

Donker G, Stobberingh E. *Ligt MRSA overal op de loer?* Huisarts & Wetenschap 2008;51:113

Donker GA, Nys S, Driessen C, Deurenberg RH, Stobberingh EE. *Prevalence of antibiotic-resistant S. aureus among general practice patients.* Eur J Public Health 2006;16(1S):186

ARI-EL study

Gageldonk van Rianne, Donker Gé, Peeters Marcel. *Voorspellen klachten een bacteriële bovensteluchtweginfectie?* Huisarts en Wetenschap 2007,50(3)85

Bartelds Aad, Gageldonk-Lafeber van Rianne, Heijnen Marie-Louise, Peeters Marcel, Plas van der Simone, Wilbrink Berry. *ARI-EL: case-controle onderzoek naar Acute Respiratoire Infecties in de Eerste Lijn.* Huisarts en Wetenschap 2006,49(5) 244-247

Gageldonk-Lafeber van AB, Heijnen MLA, Bartelds AIM, Peters MF, Plas van der SM, Wilbrink B. *A case-control study on acute respiratory tract in general practitioner patients in The Netherlands.* CID 2005:41:490-497

Nys S, Tjhie JHT, Bartelds AIM, Heijnen MLA, Peeters MF, Stobberingh EE. *Erythromycin resistance in the commensal throat flora of patients visiting the general practitioner: a reservoir for resistance genes for potential pathogenic bacteria.* Int J Antimicrob Agents. 2005 Aug; 26(2): 133-7

Chickenpox

Van Lier A, Van Erp J, Donker GA, Van der Maas NAT, Sturkenboom MCJM, De Melker HE. *Low varicella-related consultation rate in the Netherlands in primary care data. Vaccine* 2014; JVAC-15315

Van Lier EA, Kemmeren JM, Suikerbuik AWM, Luytjes W, Donker GA, Stirbu-Wagner I, Jochemsen P, De Melker HE. Varicella Zoster virus (VZV) infection. In: Schurink-van 't Klooster TM, De Melker HE, editors. *The National Immunisation Programme in the Netherlands – developments in 2013.* Bilthoven 2014, RIVM report 150202002/2013:92-99

Donker Gé, Haar van der Ella. *Waterpokken: vaccinatie invoeren of niet?* Huisarts en Wetenschap 2009;52(4):165

Boot HJ, Melker de HE, Stolk EA, Wit de GA, Kimman TG, *Assessing the introduction of universal varicella vaccination in the Netherlands.* Vaccine 2006;24(37-39):6288-99

Melker de HE, Berbers G, Hahné S, Rümke S, Hof van den S, Wit de A, Root H. *The epidemiology of varicella and Herpes Zoster in The Netherlands: implications for varicella zoster virus vaccination.* Vaccine 2006;24(18):3946-52

Consultation for smoking addiction

Jacobs-van der Bruggen Monique, Donker Gé, Verkleij Harry, Baan Caroline. *Stoppen met roken: hoe pakken wij dat aan?* Huisarts & Wetenschap 2007;50:198-202

Jacobs-van de Bruggen M, Baan C, Verkleij H, Donker G. *Stoppen met roken advies huisartsen in 2005: 478 consulten onderzocht.* Bilthoven 2006, RIVM rapport 260702/01

Bladeren F. van, Jacobs M. *Behandeling van tabaksverslaving.* Medisch Contact 2006;61(13):450

COPD

Van Dijk CE, Garcia-Aymerich J, Carsin AE, Smit LAM, Borlée F, Heederik DJ, Donker GA, Yzermans CJ, Zock JP. *Risk of exacerbations in COPD and asthma patients living in the neighbourhood of livestock farms: Observational study using longitudinal data*. Int. J. Hyg. Environ. Health (2016), http://dx.doi.org/10.1016/j.ijheh.2016.01.002

Diabetes Mellitus

Van der Heijden AAWA, De Bruijne MC, Feenstra TL, Dekker JM, Baan CA, Bosmans JE, Bot SCM, Donker GA, Nijpels G. *Resource use and costs of type 2 diabetes patients receiving managed or protocolized primary care: a controlled clinical trial.* BMC Health Services Research 2014;14: 280. http://www.biomedcentral.com/1472-6963/14/280

Donker GA, Fleming DM, Schellevis FG, Spreeuwenberg P. *Differences in treatment regimes, consultation frequency and referral patterns of diabetes mellitus in general practice in five European countries.* Family Practice 2004;21:364-69

Gut feeling related to cancer

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

Herpes Zoster

Fleming DM, Bartelds A, Chapman SR, Cross KW. *The consistency of shingles and its significance for health monitoring.* European Journal of Epidemiology 2004;19:1113-1118

Oncology

Heins MJ, Korevaar JC, Hopman PEPC, Donker GA, Schellevis FG, Rijken MPM. *Health-Related Quality of Life and Health Care Use in Cancer Survivors Compared With Patients With Chronic Diseases*. Cancer 2016, Jan 7. DOI: 10.1002/cncr.29853

Marianne Heins, Mieke Rijken, Gé Donker, Joke Korevaar. *Invloed van kanker op het zorggebruik van partners.* Huisarts & Wetenschap 2015; 58(10):541

Heins MJ, Korevaar JC, Donker GA, Rijken PM, Schellevis FG. *The combined effect of cancer and chronic diseases on general practitioner consultation rates*. Cancer Epidemiol 2015 Feb;39(1):109-14. doi: 10.1016/j.canep.2014.12.002. Epub 2015 Jan 2

Heins MJ, Hopman EPC, Korevaar JC, Schellevis FG, Donker GA, Rijken PM. *Effect of the partner's health and support on cancer patients'use of general practitioner care*. Psycho-Oncology 2015; Published online in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/pon.3963

Marianne Heins, Francios Schellevis, Mieke Rijken, Gé Donker, Lucas van de Hoek, Joke Korevaar. *Partners of cancer patients consults their GPs significantly more often with both somatic and psychosocial problems.* Scandinavian Journal of Primary Health Care 2013; 31: 203-208. DOI: 10.3109/02813432.2013.861153

Physical violence

Marquet R, Donker G. *Niet alleen blauwe plekken. De rol van de huisarts bij consultatie voor fysiek geweld.* Huisarts en Wetenschap 2008;51(1):5

Marquet Richard, Schellevis Francios, Donker Gé. *Slachtoffers van geweld zijn grootgebruikers van de huisartsenzorg.* Huisarts en Wetenschap 2006;49(10):489

Prostate complaints

Otto Suzie J, Cruijsen van der Ingrid W, Liem Michael K, e.a. *Effective PSA contamination in the Rotterdam section of the European randomized study of screening for prostate cancer.* Int J Cancer 2003;105:394-399

Sexsual problems and sexual violence

Kedde Harald, Donker Gé, Leusink Peter. *Incidentie van seksuele functieproblemen.* Huisarts en Wetenschap 2013;56(2)

Kedde H, Donker G, Leusink P, Kruijer H. *The incidence of sexual dysfunction in patients attending Dutch general practitioners*. Int J Sexual Health 2011;23(4):269-277. On line: http://dx.doi.org/10.1080/19317611.2011.620686

Kedde H, Donker GA. Het huisartsgeneeskundig handelen bij erectieproblemen – gegevens *uit de Continue Morbiditeitsregistratie Peilstations Nederland*. Huisarts en Wetenschap 2006; 49:410-4

Kedde Harald, Vroege Jos, Vanwesenbeeck Ine, Bartelds Aad. *De incidentie van seksuele problemen in de huisartspraktijk gegevens uit de Continue Morbiditeits Registratie Peilstations Nederland.* Tijdschr. voor Seksuologie 2005; 29:143-9

Sports injuriess

Valkenberg H, Donker GA, Schoots W, Vriend H.*Sportblessures bij de huisarts: registratie, behandeling en verwijsbeleid.* Sport en Geneeskunde 2010;2:6-14

Unwanted pregnancy

Goenee M, Donker G, Wijsen C. *Anticonceptie voor en na ongewenste zwangerschap*. Huisarts & Wetenschap 2015; 58(11):599

Goenee MS, Donker GA, Picavet C, Wijsen C. *Decision-making concerning unwanted pregnancy in general practice.* Fam Pract 2014;doi:10.1093/fampra/cmu033.

Goenee MS, Donker GA, Picavet C, Wijsen S. *Beslissen over een ongewenste zwangerschap. Wat is de rol van de huisarts?* Ned. Tijschr Geneeskd 2014;158:A8243.

Donker Gé, Goenee Maaike. *Besluiten bij ongewenste zwangerschap.* Huisarts en Wetenschap 2012;55(2):86

Unwanted side effects of cosmetics

Salverda JGW, Bragt PJC, de Wit-Bos L, Rustemeyer T, Coenraads PJ, Tupker RA, Kunkeler LCM, Laheij–de Boer AM, Stenveld HJ, van Ginkel KJW, Kooi MW, Bourgeois FC, van Gorcum TF, van Engelen JGM, van Dijk R, de Graaf J, Donker GA, de Heer C, Bruynzeel D. *Undesirable effects attributed to cosmetic products. Results of a cosmetovigilance survey in the Netherlands.* Contact Dermatitis 2013;68:139-148

De Wit-Bos L, Salverda-Nijhof JGW, Kooi MW, Bourgeois FC, Van Gorcum TF, Van Engelen JGM, Donker GA. *Cosmetovigilance in The Netherlands*. Trend report 2011-2012. Bilthoven, RIVM Report 320113005/2012

Salverda-Nijhof JGW, Kooi MW, De Wit-Bos L, Bourgeois FC, Van Gorcum TF, Colijn JJ, Van Engelen JGM, Donker GA. *Huidklachten door cosmetische producten.* Eindrapportage CESES. RIVM Rapport 320113004/2011

Use of benzodiazepines

Kollen BJ, Van van der Veen WJ, Groenhof F, Donker GA, Van der Meer K. *Discontinuation of reimbursement of benzodiazepines in the Netherlands: does it make a difference?* BMC Family Practice 2012, 13:111

20 Footnotes

1 Dulk CJ den, Stadt H van der, Vliegen JM. Een nieuwe maatstaf voor stedelijkheid: de omgevingsadressendichtheid. Mnd. Stat. Bevolk, (CBS) 92/7.

2 Occupations in Extramural Healthcare as of 1 January 2014. Nivel, Utrecht.

3 The tables indicated by figures only are tables containing text.

4 In these tables and the text tables derived from them the frequencies are always per 10,000 men, women or inhabitants, unless otherwise indicated.

5 Diekstra RFW and Egmond M van. Suicide and attempted suicide in general practice. In the Dutch Sentinel Practice Networks; relevance for public health policy, p. 202. NIVEL, Utrecht. 1989.

6 This must meet the following criteria (Pel, 1965):
   a An acute beginning, therefore a prodromal phase of not more than three to four days (including pre-existing airway infections at a non-pathogenic level).
   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.
   (Pel, J.Z.S. (1965) Proefonderzoek naar de frequentie en de aetiologie van griepachtige ziekten in de winter 1963-1964. (Huisarts en Wetenschap 8, 321).

7 Dijkstra F, Donker GA, Wilbrink B, VAN Gageldonk-Lafeber AB, Van der Sande MAB. Long time trends in influenza-like illness and associated determinants in The Netherlands. Epidemiology and Infection 2009 Apr;137(4):473-9. 2008 Sep 15:1-7 [Epub ahead of print].

8 Van Gageldonk et al. Time trends in primary-care morbidity, hospitalization and mortality due to pneumonia Epidemiology and Infection 2009; 137:1472-78).

9 Melker HE de, Conyn-van Spaendonck MA, Schellekens JFP. Pertussis surveillance 1989-1995, RIVM. 1996

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

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

12 Havelaar Arie H, Haagsma Juanita A, Mangen Marie-Josée J, Kemmeren Jeanet M, Verhoef Linda PB, Vijgen Sylvia MC, Wilson Margaret, Friesema Ingrid HM, Kortbeek Laetitia M, van Duynhoven Yvonne THP, van Pelt Wilfrid. Disease burden of foodborne pathogens in the Netherlands. 2009. International journal of food microbiology 2012;156(3):231-8

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

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

15 Enserink R, Ypma R, Donker GA, Smit HA, Van Pelt W. Infectious disease burden related to child day care in The Netherlands. The Pediatric Infectious Disease Journal 2013;Apr 11: PMID:2358457.

16 Lopman B, Vennema H, Kohli E. e.a. Increase in viral gastroenteritis outbreaks in Europe and epidemic spread of a new norovirus variant. Lancet 2004;363:682-88

17 Pelt W van, Notermans D, Giessen AW van de, Mevius DJ, Vennema H, Koopmans M, Asten L, Duynhoven YTHP van. Trends in gastro-enteritis van 1996-2005; Toename van ziekenhuisopnames en sterfte: een toenemende rol van virale infecties? Infectieziekten Bulletin 2006;10:364-70

18 Van Oeffelen AAM, Van Aar F, Van den Broek IVF, Op de Coul ELM, Woestenberg PJ, Heijne JCM, Den Daas C, Hofstraat SHI, Van Sighem AI, Nielen MMJ, Van Benthem BHB. Sexually transmitted infections, including HIV, in the Netherlands in 2014. Bilthoven 2015, RIVM report number 2015-0041

19 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

20 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

21 Den Heijer CDJ, Donker GA, Maes J, Stobberingh EE. Antibiotica bij ongecompliceerde urineweginfecties: geen toename van resistentie in de afgelopen 5 jaar. Ned Tijdschr Geneeskd 2011;155(3):102-106

22 Van Ass M. et al. GGD-Richtlijn medische milieukunde: eikenprocessierups en gezondheid. 2008

23 Jans. H.W.A. en Franssen, A.E.M (2008b). De brandharen van de eikenprocessie rups. (Thaumetopoea processionea L.) een reëel probleem voor de huisarts. Huisarts en Wetenschap; 51(8): 1-4

24 Stigter H. Geraedts WHJM, Spijkers HCP. Thaumetopoea processionea in the Netherlands: present status and management perspectives (Lepidoptera: Notodontidae). Prox Exper Appl Entomol 1997;8

25 Moraal LG. Insectenplagen op bomen en klimaatverandering. De Levende Natuur. 2003;104:90-3

26 Schellart M en Jans H.W.A. Eikenprocessierups, gezondheidsklachten en-vragen. Een inventarisatie van omvang, ernst en aard van gezondheidsklachten naar aanleiding van de overlast van de eikenprocessierups in de provincies Noord-Brabant en Limburg inde lente- en zomerperiode van 1996. Rapport Provinciaal Bureau Medische Milieukunde GGD's in Brabant en Zeeland. 1996

27 Rots-de Vries MC en Jans H.W.A. (2000). Eikenprocessierupsen in Nederland en België. Verloop van een epidemie en evaluatie van een voorlichtingscampagne. Tijdschr Gezondheidswet 2000; 78:28-34)

28 J Cohen,, L Pivodic G Miccinesi2 B D Onwuteaka-Philipsen, et al International study of the place of death of people with cancer: a population-level comparison of 14 countries across 4 continents using death certificate data British Journal of Cancer (2015) 113, 1397–1404

29 Linden MW vd, Westert GP, Bakker DHd, Schellevis FG. Klachten en aandoeningen in de bevolking en in de huisartsenpraktijk. De tweede Nationale Studie naar ziekten en verrichtingen in de huisartspraktijk. Utrecht: NIVEL, 2004

30 Een euthanasieverklaring is een schriftelijk verzoek tot euthanasie onder bepaalde voorwaarden

31 Marquet RL, Bartelds A, Visser GJ, Spreeuwenberg P and Peters L. Twenty-five years requests for euthanasia and physicians-assisted suicide in Dutch general practice. BMJ 2003;327:201-202

32 Alphen van Jojanneke E, Donker Gé A, Marquet Richard L. Requests for euthanasia in general practice before and after implementation of the Dutch Euthanasia Act. British Journal of General Practice: 2010;60:263-26.

33 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.

34 Bartelds AIM. Request for application of euthanasia. In: Bartelds AIM, Fracheboud J, van der Zee J. (eds). The Dutch Sentinel Practice Networks; relevance for public health policy. Utrecht, NIVEL, 1989

35 Maas PJ van der, Delden JJM van, Pijnenborg L, Looman CWN. Euthanasia and other medical decisions concerning the end of life. The Lancet 1991; 338:669-74

36 Pijnenborg L, Delden van JJM, Kardaun JWPF, Glerum JJ, Maas PJ van der. Nationwide study of decisions concerning the end of life practice in the Netherlands. BMJ 1994; 309:1209-9

37 Wal G van der, Dillmann RLM. Euthanasia in the Netherlands. BMJ 1994;308:1346-9

38 Maas PJ van der, Wal G van der. e.a. Euthanasia. physician-assisted suicide, and other medical practices involving the end of life in the Netherlands. 1990-1995. Special report from the Netherlands. New Engl J of Med 1996;335(22):1699-705

39 Wal G van der, Heide A van der. Medische besluitvorming aan het einde van het leven. De Tijdstroom, Utrecht, 2003

40 Van der Heide A, Legemaate J, Onwuteaka-Philipsen B, Bolt E, Bolt I, Van Delden H, Geijteman H, Snijdewind M, Van Tol M, Willems D. Tweede evaluatie Wet toetsing levensbeëindiging op verzoek en hulp bij Zelfdoding. Den Haag 2012, rapport

41 Regionale toetsingscommissie euthanasie. Jaarverslag 2014. Den Haag 2013

42 Visser J. Euthanasie per toerbeurt. Medisch Contact 2012;67(11):637

43 Regionale toetsingscommissie euthanasie. Jaarverslag 2014. Den Haag 2015

44 Van der Heide A, Onwuteaka-Philipsen BD, Rurup ML, et al. Endof-life practices in the Netherlands under the Euthanasia Act. N Engl J Med 2007; **356(19):** 1957–1965

45 Onwuteaka-Philipsen BD, Brinkman-Stoppelenburg A, Penning C, et al. Trends in end-of-life practices before and after the enactment of the euthanasia law in the Netherlands from 1990 to 2010: a repeated crosssectional survey. Lancet. 2012;380:908-15

46 Inspectie voor de Gezondheidszorg. Rapport over een calamiteit bij de zorgverlening rond het levenseinde van een patiënt. Den Haag, 2014, Documentnummer20 14-1036346 M 65048

47 Hasselaar J. Medical and ethical aspects of palliative sedation practice in the Netherlands. From controversy to guideline and beyond. Radboud University Nijmegen 2009. Dissertation

48 Donker GA, Slotman FG, Spreeuwenberg P, Francke AL. Palliative sedation in Dutch general practice from 2005 to 2011: a dynamic cohort study of trends and reasons. Brit J Gen Pract 2013; DOI: 10.3399/bjgp13X673676

49 Donker GA en Van Dijk CE. Trends and reasons of palliative sedation in cancer patients with and without pending requests of euthanasia in Dutch general practice. Oral and poster presentation Ca-PRI Conference Arhus 20-22 May 2015. Eur. J of Cancer Care 2015;24 (Suppl. 2):Abstract P-44:47. http://onlinelibrary.wiley.com/doi/10.1111/ecc.12374/epdf

50 Donker GA, Van Dijk CE. Increase in palliative sedation and reasons in cancer patients in Dutch general practice 2005–2014. Eur J Pub Health 2015;25(3):244. Oral Presentation EUPHA, Milan, October 17, 2015

51 Son GE van, Hoeken D van, Bartelds AIM, Furth EF van, Hoek HW. Urbanisation and the incidence of eating disorders. Brit J Psychiatry 2006;189:562-563

52 Son G van, Donker G, Hoek HW. Eetstoornissen: trend en samenhang met verstedelijking. Huisarts en Wetenschap 2009;52(3):121

Appendix 1: participating doctors in 2014

Name:	Location:	Province:
J. Mulder*	't Zand	Groningen
J.P.de Kroon*	Onstwedde	Groningen
P.S. Wiersema*	Oostermeer	Friesland
W.J.M. Brunninkhuis	Drachten	Friesland
H.J. Dijkstra*	Bakhuizen	Friesland
M.L. Treub	Harlingen	Friesland
T.E. Wesselius	Harlingen	Friesland
Mw. F.B. van Heest*	Schoonoord	Drenthe
S.M. Handgraaf	Nieuw Weerdinge	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
E. Beissel	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	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

Appendix 1: participating doctors in 2014 (continued)

M. Voerknecht	Bussum	Noord-Holland
Mw. J. Dros/Hoekstra	Den Burg	Noord-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	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
P. Meulesteen	Eindhoven	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 1970-2015 (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 1970-2015 (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 1996-2015
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	1970-2015
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 2012-2015
pregnancy (despite contraception)	1987-1991
premature birth	1982-1983

Appendix 2: registered topics 1970-2015 (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	2005-2015
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)	2008-2015
suicide and attempted suicide	1970-1972 and 1979-2015
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 2015
ventricular/duodenal ulcer	1975
whooping cough	1998-2015
zanamivir (Relenza)	2000-2002

Appendix 3: list of incidental studies

Incidental studies and other additional studies 1977-2015 (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 1995-2015
antibiotic resistance of Staphylococcus in general practice	2005-2006
diabetes mellitus (prevalent cases)	2000 and 2007-2012
euthanasia (request for)	1976-2015
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	2005-2015
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 2014 (CBS)

age	men	women	total
0-4	460	438	898
5-9	479	457	936
10-14	520	497	1.017
15-19	509	487	996
20-24	538	525	1.063
25-29	522	514	1.036
30-34	505	502	1.007
35-39	505	507	1.012
40-44	616	616	1.232
45-49	648	637	1.285
50-54	629	624	1.253
55-59	566	565	1.131
60-64	522	522	1.044
65-69	489	497	986
70-74	332	357	689
75-79	238	289	527
80-84	154	229	383
≥85	102	232	334
total	8,334	8,495	16,829

Appendix 5: annual tables

NIVEL Primary Care Database - Sentinel Practices

Age group by topic

year 2014 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	491	487	979	1158	0	0	0	20	79	40	59
1-4	2078	2131	4209	688	0	0	0	18	135	113	124
5-9	2886	2749	5635	245	0	0	0	19	57	84	70
10-14	3236	3093	6329	115	0	3	2	18	36	16	26
15-19	3228	2968	6196	125	51	127	88	6	30	3	17
20-24	3168	3065	6233	153	163	305	233	6	22	32	27
25-29	3115	3093	6207	170	172	200	186	2	38	19	28
30-34	3042	2981	6023	219	144	107	126	7	32	36	34
35-39	3068	3074	6143	217	117	103	110	5	54	44	49
40-44	3857	3787	7644	181	58	69	63	3	55	64	59
45-49	4082	3912	7994	194	52	35	44	5	52	49	51
50-54	3914	3784	7698	189	25	36	30	1	70	74	72
55-59	3503	3449	6953	210	22	25	24	1	58	110	84
60-64	3334	3376	6710	199	15	9	12	4	114	139	126
65-69	3232	3254	6486	233	6	9	8	3	158	123	141
70-74	2267	2385	4652	232	4	4	4	4	198	175	186
75-79	1617	1805	3422	219	6	5	6	3	259	184	219
80-84	1017	1427	2445	386	0	0	0	4	558	258	382
≥84	638	1416	2054	419	15	0	5	0	579	484	513
total	51773	52236	104012	230	52	63	58	3	91	90	91

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Age group by topic

year 2014 weeks 1 t/m 52

all practices age group	population			Gastro-enteritis no feces test			Gastro-enteritis feces test			Urinary tract infections		
	M	F	M+F	M	F	M+F	M	F	M+F	M	F	M+F
≤1	491	487	979	748	558	653	0	40	20	91	109	100
1-4	2078	2131	4209	432	276	353	47	27	37	165	640	406
5-9	2886	2749	5635	147	116	132	10	7	9	140	805	465
10-14	3236	3093	6329	63	53	58	3	0	2	67	408	234
15-19	3228	2968	6196	72	124	97	3	10	6	27	1471	718
20-24	3168	3065	6233	89	118	103	12	6	9	69	1793	915
25-29	3115	3093	6207	81	122	101	6	6	6	57	1587	820
30-34	3042	2981	6023	61	91	76	6	13	10	114	1486	794
35-39	3068	3074	6143	79	100	90	9	13	11	95	1154	628
40-44	3857	3787	7644	65	61	63	8	5	6	91	1246	664
45-49	4082	3912	7994	43	64	53	7	5	6	120	1222	660
50-54	3914	3784	7698	60	62	61	7	8	8	196	1365	771
55-59	3503	3449	6953	67	59	63	6	8	7	267	1595	926
60-64	3334	3376	6710	58	72	65	9	12	10	278	1759	1021
65-69	3232	3254	6486	46	108	77	6	18	12	452	2032	1245
70-74	2267	2385	4652	60	130	96	0	8	4	663	2653	1687
75-79	1617	1805	3422	54	81	68	12	0	6	1041	3398	2283
80-84	1017	1427	2445	87	122	108	0	27	16	1533	3766	2841
≥84	638	1416	2054	183	232	217	0	7	5	2373	5857	4774
total	51773	52236	104012	92	105	99	8	10	9	258	1656	961

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Age group by topic

year 2014 weeks 1 t/m 52

all practices

age group	population			Policy for symptoms mamma	End-of-life* study	Suicide
	M	F	M+F	F	M+F	M+F
≤1	491	487	979	0	0	0
1-4	2078	2131	4209	0	2	0
5-9	2886	2749	5635	0	0	0
10-14	3236	3093	6329	0	0	3
15-19	3228	2968	6196	0	3	5
20-24	3168	3065	6233	0	0	6
25-29	3115	3093	6207	207	2	2
30-34	3042	2981	6023	288	0	18
35-39	3068	3074	6143	377	6	13
40-44	3857	3787	7644	420	3	15
45-49	4082	3912	7994	417	11	13
50-54	3914	3784	7698	358	20	20
55-59	3503	3449	6953	271	32	7
60-64	3334	3376	6710	260	54	1
65-69	3232	3254	6486	267	66	5
70-74	2267	2385	4652	271	142	2
75-79	1617	1805	3422	264	222	3
80-84	1017	1427	2445	159	334	8
≥84	638	1416	2054	248	886	0
total	51773	52236	104012	308	52	8

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Province group by topic

year 2014 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	9168	9035	18204	237	47	43	45	13	85	85	85
OV+GLD+FLE	9819	9916	19735	273	28	43	36	4	91	64	77
UTR+NH+ZH	20538	21433	41971	225	59	81	70	4	78	92	85
ZLD+NB+LIM	12249	11853	24102	197	65	60	63	7	121	113	117
total	51774	52237	104012	230	53	63	58	6	91	90	91

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Province group by topic

year 2014 weeks 1 t/m 52

all practices province group	population			Gastro-enteritis no feces test			Gastro-enteritis Feces test			Urinary tract infections		
	M	F	M+F	M	F	M+F	M	F	M+F	M	F	M+F
GR+FR+DR	9168	9035	18204	96	133	114	5	9	7	420	2028	1216
OV+GLD+FLE	9819	9916	19735	56	60	158	4	7	6	231	1757	999
UTR+NH+ZH	20538	21433	41971	92	87	89	11	10	10	213	1470	857
ZLD+NB+LIM	12249	11853	24102	119	158	137	9	13	11	236	1625	918
total	51774	52237	104012	92	105	99	8	10	9	258	1656	961

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Province group by topic

year 2014 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	9168	9035	18204	372	72	11
OV+GLD+FLE	9819	9916	19735	298	63	3
UTR+NH+ZH	20538	21433	41971	282	41	8
ZLD+NB+LIM	12249	11853	24102	323	47	7
total	51774	52237	104012	308	52	8

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Address density by topic

year 2014 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	12332	11944	24276	298	33	30	31	9	73	80	76
500-2500/KM2	29045	29513	58558	206	60	74	67	6	96	90	93
>2500/KM2	10398	10780	21177	221	56	67	62	3	101	104	103
total	51775	52237	104011	230	53	63	58	6	91	90	91

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Address density by topic

year 2014 weeks 1 t/m 52

all pratices Address density	population			Gastro-enteritis no feces test			Gastro-enteritis Feces test			Urinary tract infections		
	M	F	M+F	M	F	M+F	M	F	M+F	M	F	M+F
<500/KM2	12332	11944	24276	78	86	83	2	7	5	286	1767	1014
500-2500/KM2	29045	29513	58558	81	100	91	9	11	10	263	1660	969
>2500/KM2	10398	10780	21177	140	142	141	14	9	12	208	1512	870
total	51775	52237	104011	92	105	99	8	10	9	258	1656	961

* not all GPs were included

NIVEL Primary Care Database - Sentinel Practices

Address density by topic

year 2014 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	12332	11944	24276	301	62	4
500-2500/KM2	29045	29513	58558	308	50	7
>2500/KM2	10398	10780	21177	315	45	11
total	51775	52237	104011	308	52	7

* not all GPs were included