Morbidity in primary care

Epidemiologic data from Family Medicine Network

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Preface

This book is about symptoms, diseases and treatments as they occur in primary care. It provides insight not only into the incidence and prevalence of many diagnoses, but also into the relationships between a patient's initial presentation of a problem ('Reason for Encounter' or 'RFE') and the final diagnosis. This will help students, GP trainees and the more experienced general practitioner (GP) to gain insight into the prognosis and likelihood of disease in patients with new complaints. The data is registered by the Dutch registration network 'Family Medicine Network' (FaMe-Net). We encourage readers to visit the freely accessible website, www.famenet.nl, where much more data can be found, also on referrals and the prescription of medication.

All the data has been collected during regular and out-of-hours patient contacts with GPs (in training), practice assistants and practice nurses (*praktijkondersteuner,* POH). The chapters were written by GPs from participating FaMe-Net practices. Many authors also hold ancillary positions at the Radboud University Medical Centre, as researchers, lecturers or GP trainers.

The data has been collected in the context of the Dutch healthcare system, where freely accessible healthcare is available to virtually every resident. All patients are listed with one GP practice. GPs are the first entry point into the Dutch healthcare system and function as gatekeepers to secondary care. Reassessment of patients when necessary is common and very possible. In general, GPs in the Netherlands are cost-conscious and advocate reserved management if possible. Their management is supported by the large evidence-based guideline programme of the Dutch College of General Practitioners (*Nederlands Huisartsen Genootschap,* NHG) which is harmonised with Dutch specialist guidelines. During GP training, skills are taught to embed professional practice in this context of a network of guidelines.

The book will be updated regularly. Future editions will expand the number of conditions described, as well as the size of the dataset on which the description is based. For this first edition, data is presented from 2014 to 2021. The registration itself took place over a period of more than five decades.

Instructions for using this book

This book is an interactive textbook that is preferably used digitally, so all data is available by following the links in the text. The data presented in this book is a selection of all the morbidity data accessible on www.famenet.nl, where users can apply their own selections when looking up epidemiological questions. With QR codes, the links can also be found using the printed version of this book. Please note that the QR codes and links always refer to the most recent data on the website. This book is closely linked to the website, but the data on the website may have been updated

after the publication of this edition of the book. The website is designed with Google Chrome and works best for users of this browser. Get the best experience by keeping the browser up to date.

The printed version and the digital version of this book are identical. Each chapter is illustrated with a few images, which are only part of the information available about this subject on the website, and which can be accessed by following the links (by clicking on them) or by opening the QR codes.

As a source of reference for the chapters, we used the complete guidelines of the Dutch College of General Practitioners (www.nhg.org/standaarden) as much as possible. Where applicable, we used other sources regularly, such as the Dutch College of General Practitioners guidelines for the treatment of smaller clinical topics (https://richtlijnen.nhg.org/#tab--nhgbehandelrichtlijnen) and chapters from the reference work UpToDate (www.uptodate.com). The Guidelines of the Dutch College of General Practitioners are available in Dutch only. In addition, pages from the Dutch patient education website, www.thuisarts.nl, are sometimes used as references. Some of these topics have been translated into English on www.GPinfo.nl.

Autumn 2023

The editors

Methods

Introduction to the FaMe-Net methods

This website provides primary care morbidity data from Family Medicine Network (FaMe-Net), a practice-based research network (PBRN) located in the Netherlands. FaMe-Net is the world's oldest and still functioning PBRN. The current network is a continuation of two well-known Dutch predecessor PBRNs from which it originated after their fusion in 2013: the Continuous Morbidity Registration Nijmegen (CMR) registering epidemiology since 1967, and the 'Transition Project', registering since 1985.[1]
FaMe-Net general practitioners (GPs) provide regular primary care to their listed patients. At the same time as providing primary care, registration for the PBRN takes place. Obviously, all this occurs within the context of the Dutch healthcare system. The PBRN registration is intended and used for research and educational purposes.

FaMe-Net registers 'complete' morbidity, i.e. all morbidity that patients present to their GP. Data are collected continuously and longitudinally.
The participating GPs record morbidity (and other items) in their Electronic Health Record (EHR) named TransHis, that was specially designed for the extensive data registration, facilitating education and research.

The data shown on the website are a selection of FaMe-Net's most essential data. Concepts and terminology will be explained below. Data are extracted and periodically updated. The FaMe-Net registration is innovative, with ongoing evolvement, and contains more items than those shown on the website in the current version. As parallel processes, this website is continuously in development, with periodical addition of latest collected data, and with planned addition of more collected variables. We showed the innovations and the expansion of the FaMe-Net registration from 2016 onwards and more details on the registration network as a whole in a peer-reviewed publication.[1]

For more information on the network FaMe-Net, its historic background, the Dutch healthcare system, participating practices, and scientific output, use this link.

Data from the FaMe-Net database have been available since 2005. Since then, all data within FaMe-Net have been uniformly classified according to ICPC-2. Data on the website and in the textbook chapters are presented from 2014 because the network and the registering practices have remained quite stable since then, which is important for the epidemiologic description of morbidity. The fusion in 2013 resulted in a significant expansion of the total study population. With more relatively young patients joining, the age distribution of the entire population changed, resulting in a smaller proportion of the 75^{+} group. Occasionally, individual registering practices may join or leave the network.

Currently, the data, coming from six practices (35 GPs) have been updated until December 31st, 2021. In these practices, more than 41.000 patients were registered at the end of

2021. The latest update of the website itself has been performed in October 2023.
FaMe-Net has shown to provide high quality data derived from an unselected population.
FaMe-Net systematically checks the quality of the stored data. Providing registration feedback to GPs is part of the quality control, e.g. in the registration of important episodes, such as malignancies and deaths. Uniformity in registration of diagnoses, RFEs and interventions is achieved through continuous training and quality control programs for GPs (in training), practice assistants and practice nurses (POHs).

Since 2016, FaMe-Net has started to collect contextual and personal characteristics of all the listed adult patients in a structured way. Addition to the website of some variables collected in this way is planned. For more information on registered data in FaMe-Net, click this link.

Concepts and Methods used in Fame-Net

Below we describe the most important concepts used in FaMe-Net and how they are applied.

Episode of Care

The core concept within FaMe-Net is the Episode of Care (EoC): all data in FaMe-Net are ordered into Episodes of Care. It can be defined as 'a health problem presented by an individual to a healthcare provider, from the first presentation until the last encounter'. EoCs have a title, the episode diagnosis, classified with ICPC-2. The episode diagnosis can be modified during the EoC. An example: an EoC is first labelled as fatigue, but the diagnosis (episode title) is changed to iron deficiency anaemia, and later on it appears to be caused by colorectal cancer, which will be the final diagnostic label. All contact elements related to this health problem are comprised in this EoC, including specialist reports to the GP.
Presented data from 'Episodes of Care' are abbreviated to 'Episodes' on the website and in this textbook.
The website features a short animation that provides insight into how registration in an episode of care works in practice.

Reason for Encounter (RFE)

Another essential concept used in FaMe-Net is the Reason for Encounter (RFE).
Patients normally start the consultation with a spontaneous statement on why they visit the doctor: the Reason For Encounter. This reflects the initial presentation of the illness. This statement precedes the interaction between patient and GP, and the GP's interpretation. RFEs are recorded regardless of the final diagnosis. FaMe-Net routinely and systematically registers all RFEs in all encounters during regular consultations, which takes GPs less than a minute of time.
The RFE(s) can be presented as a symptom (e.g. abdominal pain, a rash, cough), but also as a self-diagnosed disease ('I've got the flu'; 'I think I have migraine'; 'I hope it's not pneumonia again') or a request for a particular intervention ('I would like to have a blood test'). When multiple RFEs are presented, all are registered. RFE registration enables research studying associations between RFE and (final) diagnosis. RFEs in themselves have important prognostic value, for example in diagnosing cancer.[2, 3]

ICPC

All presented symptoms, complaints, diseases and problems in FaMe-Net are classified by the GP in accordance with the International Classification of Primary Care

(ICPC-2) at the highest level of accuracy and understanding. In addition to ICPC-2, diagnoses are also coded with the International Classification of Diseases and Related Health Problems (ICD-10).
Transfer to ICPC version 3 is planned, now that it has been released in December 2020. This will allow for additional recording of functioning (activities and participation) and personal preferences linked to morbidity.

Interventions

All interventions are also coded with ICPC-2. These include referral to primary or secondary care professionals, diagnostic imaging, laboratory testing, and therapeutic interventions such as medication, vaccination or surgical procedure.

Prescriptions and ATC classification

Prescriptions are coded according to the Anatomical Therapeutic Chemical (ATC) coding system maintained by the World Health Organization.[4]
Prescription data provide detail and are a particularisation of the intervention type 'medication' (ICPC-2 code *50).
Prescription data are shown by the first five characters of the ATC code by default. If desired this may be changed to a less detailed level with the first four characters of the ATC code so that prescriptions are studied in larger groups of medication. This can be changed in the report showing relations between a chosen episode (ICPC code) and its percentage with a prescription.

Referrals

FaMe-Net distinguishes referrals to primary care professionals and secondary (specialist) care, and the specialisms among these referral types (primary or secondary).
Referral data are a particularisation of the intervention type 'referral primary care' (ICPC-2 code *66) and 'referral secondary care' (ICPC-2 code *67).

Encounter

Synonym: contact, consultation.
An encounter is the professional interchange between a patient and a GP. Healthcare provided to patients by other team members of the general practice (practice assistants, practice nurses (Dutch: *POH's*), GPs and doctors (in training) are also recorded in encounters.
We distinguish different types of encounters (encounter types). Patients can have contact with their general practice in different ways. The majority concerns physical consultations in the practice. Other encounter types distinguished are home visits, telephone and email consultations (by the GP or the practice assistant), after-hours GP emergency care, repeat prescriptions and administrative contacts (specialist letters). They all contribute to the registered morbidity, ordered in EoCs.
One or more Episodes of Care may be dealt with during an encounter. When more than one episode is dealt with during an encounter, there are two or more sub-encounters.
Every (sub)encounter has at least one RFE. The only exemption are reports (letters) from other healthcare professionals, which do not have an RFE recorded.

Encounter diagnosis

Every encounter results in an (initial) diagnostic label, which is named Encounter diagnosis in FaMe-Net. This Encounter diagnosis may or may not be the final diagnosis (EoC). An Encounter diagnosis could be tiredness, changing later in the Episode to iron deficiency anaemia, and still later to colorectal cancer. In FaMe-Net's Episode registration, all these encounters contribute to the Episode

(EoC) colorectal cancer, but we are still able to review the (temporal / preliminary) Encounter diagnoses. In general practice, many Episodes of Care consist of only one encounter.

Epidemiologic concepts: Prevalence and incidence

Definition and methods

Prevalence

'Prevalence' expresses the proportion of a defined population with a specific health problem in a defined period of time. FaMe-Net uses periods of one calendar year and reports a 'contact prevalence proportion'. This figure represents the proportion of the population that had at least one interaction with the GP or the practice (e.g., consultation, prescription) for a selected episode (i.e. final diagnosis). This is calculated by dividing the number of persons contacting their GP for a specific health problem during the selected calendar year(s), by the total number of patients in these years. More precisely, the denominator '*patient years*' combines the number of listed patients in a practice with the length of their registration. This corrects for the dynamic population in a general practice in which patients are born, die and move in or out of the practice.

Thus, in the methods applied in FaMe-Net, some interaction with the GP (practice) during the calendar year is needed in order to be included in the prevalence ('contact prevalence proportion') or *incidence* figures (see below). This method makes these data particularly suitable for an assessment of the epidemiological representation of illness and conditions seen and / or treated by the GP. For diseases and conditions with a potentially but not necessarily chronic course, such as depression, gout or allergic rhinitis, this indicates whether the disease still requires medical attention. Consequently, medical problems that are not reported to the GP during the calendar year, e.g. minor problems for which professional medical help is not sought, are not included in these figures. A severe diseases that is exclusively handled by a specialist (e.g. HIV / AIDS) is also potentially underreported. This effect is probably limited as in most cases the GP receives (yearly) written reports on the situation, or is involved in prescribing medication or monitoring, for example by requesting lab tests.

An alternative method to the 'contact prevalence proportion' could be to count 'open episodes' using a standard formula estimating the date a patient 'recovered' from the condition. With this method, diseases classified as 'chronic' are automatically counted in the prevalence numbers every year, regardless of whether or not there was contact with the GP (practice) about this condition. The risk of missing chronic diseases in FaMe-Net due to the adopted method using *contact prevalence* is low because FaMe-Net considers all encounters in Episodes of Care, including repeat prescriptions and administrative contacts (such as reports from a specialist to the GP about a particular health problem). Instead, for diseases and conditions with a lengthy but variable course, we believe the use of 'contacts with the GP' is an accurate method to assess whether the disease is still relevant for this patient.

For assessment of prevalence, the episode label that was recorded at the end of the calendar year is used. For episodes evolving over a longer period of time, and in episodes in which the final diagnosis is harder to make, it should be noted that this might result in

some underestimation of the rate of these more severe diagnoses in the first year(s) that this condition is recorded.

Mean prevalence

Prevalence figures fluctuate over years. The extent of this year-to-year fluctuation depends on the specific condition. To make optimal use of the complete data collection, FaMe-Net calculates and displays prevalence numbers *over all calendar years* in the dataset. Prevalence numbers of single calendar years are summed up and divided by the number of calendar years to calculate the *mean prevalence* over the entire data period.
All age and sex groups are included in these figures.
The website user may adjust the calendar years if prevalence numbers are sought only for a selection of the entire period ('Apply a selection of calendar years').
Data from before 2014 are available upon request.

Trend chart of prevalence

In order to visualise the direction of changes in prevalence or *incidence* (see below) over time, trend charts are presented. Coincidental fluctuations are levelled by using a technique of 'rolling three years average', summing up the values for the actual year, its preceding year and its following year and then divide it by three. This emphasises the direction in which changes in prevalence or incidence stretch over years without underlining occasional outliers.

The trend chart always shows data for the entire calendar period included in the dataset and remains unchanged, even when a shorter selection of calendar years is applied by the user ('Apply a selection of calendar years'). The first and last year of the included dataset are not shown in the trend chart, because for these years the rolling average cannot be calculated as it requires data from the preceding and following year.

Incidence

'Incidence' expresses the rate of occurrence of new diagnoses of a specified health problem in a defined population during a defined time period. FaMe-Net uses periods of one calendar year and reports the 'incidence proportion'. This counts all newly occurring (starting) episodes of a certain condition during a calendar year and divides it by the total amount of *patient years*. Cases (new episodes) are counted and not persons with the diagnosis. It is up to the clinical judgment of the FaMe-Net GP whether the encounter is a continuation of an existing episode or the start of a new episode.
All patient years are counted in the denominator of the 'incidence proportion', not 'patient years *at risk*' (which would be used in an 'incidence rate').
For assessment of the incidence, the episode label that was recorded at the end of the calendar year is used. For episodes evolving over a longer period of time, and in episodes in which the final diagnosis is harder to make, it should be noted that this might result in some underestimation of the rate of more severe diagnoses.

Mean incidence

FaMe-Net calculates and displays incidence numbers *over all calendar years* in the dataset. Incidence numbers of single calendar years are summed up and divided by the number of calendar years to calculate the *mean incidence* over the entire data period.
All age and sex groups are included in these figures.
See also Trends in prevalence.

Trend chart of incidence

Trend charts visualise the direction of changes in incidence over multiple years, depicting 'rolling three years averages'. (See also Trend chart of prevalence)

Content and use of the website

The website www.famenet.nl/morbidity-data/ provides statistical and epidemiologic data from the FaMe-Net registration. Three datasheets offer different types of data.

'Distributions' provides information about episodes, RFEs and interventions, and their distribution among different age and sex categories. It can for example be used to look up the incidence and prevalence of a specific diagnosis or the occurrence of a specific RFE.

'Top lists' shows the most common diagnoses, RFEs, referrals, prescriptions and (other) interventions.

'Relations' shows relations between episodes, RFEs and interventions. Prescriptions and referrals can be shown in more detail (i.e. the medication type prescribed or the specialism that is referred to).

All data are extracted as datasets of entire calendar years and are periodically updated. Users of this website may choose to display data only from a subset of the calendar years presented. The trend charts on the 'Distributions' datasheet are always displayed for all calendar years included in the dataset.

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Varicella-zoster virus infection (chickenpox) (A72)

EVA SPIJKER

1 Clinical course of varicella-zoster virus infection (chickenpox)

Varicella-zoster virus infection (chickenpox) is a viral infection occurring in childhood. Almost all children in the Netherlands will get this infection at some point. People with chickenpox get red macules on the skin all over the body, including the scalp. The macules become papules within a few hours and then become the characteristic vesicles within 24 hours. First they contain bright fluid and then progress onto crusted papules. The crusts disappear after one to two weeks. Over the course of several days, new crops of vesicular rash appear and follow the same progression. The presence of different efflorescenses at the same moment is typical of this infection. The vesicles may also appear as painful ulcers in the mouth or throat and sometimes on the genitals. Chickenpox is often itchy and may also cause some pain. General illness and fever also occur. Fever, malaise and loss of appetite are common in the prodromal phase in the days before the rash appears and small, crater-like scars may remain after the healing of the skin lesions.

Chickenpox is caused by the varicella-zoster-virus (VZV), which is a herpesvirus. It is transmitted by aerosols in droplets of the nasopharyngeal secretions of an infected person or by direct cutaneous contact with fluid from the vesicles. It is a very contagious infection and the incubation period ranges from 10 to 21 days, but more typically lasts 14 to 16 days. Infected persons can infect others from two days before the first skin lesions appear until all vesicles have fully crusted over. This infectious period lasts approximately seven days in immunocompetent persons. Normally, a varicella-zoster virus infection occurs only once in a person.

The diagnosis is based on the typical clinical picture. In dubious cases, a PCR test of the vesicle fluid may be considered for confirmation. In general practice, testing is generally not necessary.

After healing, the virus withdraws through sensory nerve pathways to sensible ganglia, where it is suppressed by cellular immunity. The virus can become active again when cellular immunity is reduced. It then spreads through the sensible nerve pathway to the

corresponding dermatome, resulting in herpes zoster (shingles). This is usually a painful rash with vesicles in the supply area of a sensory nerve and occurs in all age groups, with the incidence increasing in higher age groups.

In healthy children, varicella-zoster virus infection has a mild and self-limiting course. Many cases of chickenpox are not presented to the GP. A secondary bacterial infection of the vesicles sometimes occurs (in 5% of cases) and is often caused by *S. pyogenes* or *S. aureus*. Other complications, such as neurologic complications (acute cerebellar ataxia and encephalitis), are rare. Primary varicella infection in children increases the risk of soft tissue infection with invasive group A streptococci. This may lead to serious complications, such as necrotising fasciitis and toxic shock syndrome.

In immunosuppressed hosts, varicella-zoster virus infection may run a more serious course because of reduced cellular immunity. This may be the case for patients receiving immunosuppressive therapy after a solid organ transplantation or those who are HIV positive.
New-borns infected intra-uterine via the mother having a varicella infection late in her pregnancy are also at high risk for severe complications of varicella.
A varicella-zoster virus infection generally runs a more serious course in immunocompetent hosts aged 12 years and older than in young children. Varicella pneumonia, a rare complication occurring mainly in adults, is difficult to treat.

Education about the disease and its mild course in healthy children is important. Treatment is focused on symptom relief, such as drying or cooling lotions. Bacterial superinfections of chickenpox can be treated with local antibiotics. In extensive or persistent impetiginisation, oral antibiotics can be considered.
Oral antiviral therapy is not indicated in uncomplicated varicella-zoster virus infections in immunocompetent children. It may be considered in immunocompetent patients aged 12 years and older within 24 hours after the onset of skin lesions to reduce the disease duration. Infected patients from other risk groups and infected patients with (serious) complications should be referred and receive intravenous antiviral therapy.

In the Netherlands and other parts of the world with a moderate climate, seroprevalence of varicella-zoster virus at the age of 12 is more than 95%. In countries with a warmer climate, seroprevalence is much lower. As a result, the occurrence of chickenpox among adults can be higher there and causes more severe morbidity.

Some countries have started a vaccination programme against varicella-zoster virus infection, reporting a decreased incidence and a milder course of infection in vaccinated children and a lower complication rate. The Netherlands has not yet started a national vaccination programme.

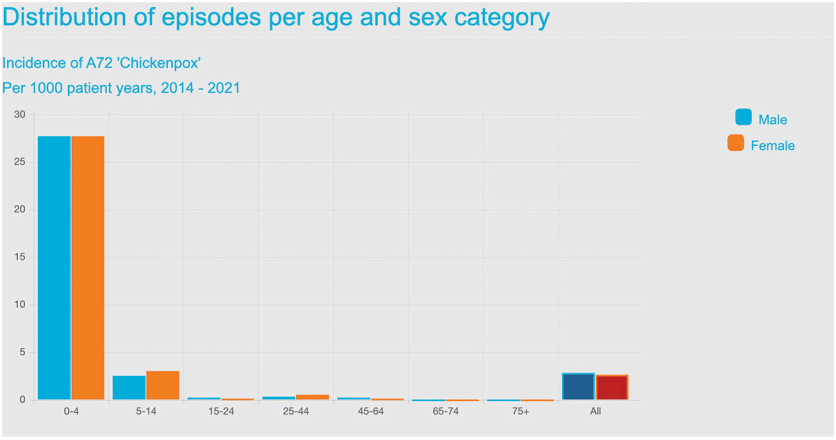
2 How is varicella-zoster virus infection (chickenpox) recorded in FaMe-Net?

Varicella-zoster virus infection (chickenpox) is recorded with the ICPC code A72.
Herpes zoster (shingles) has the code S70.
If the diagnosis of chickenpox cannot be made (for example, in a telephone consultation), a symptom diagnosis may be recorded.

The symptom diagnosis 'rash localised' has the code S06. 'Rash generalised' is coded S07 and 'lumps / swellings generalised' S05.
'Other viral exanthem' can be recorded as A76.

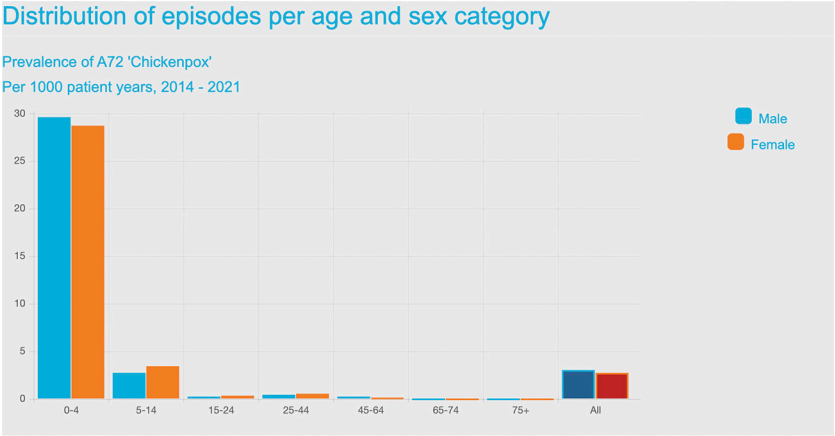
3 Epidemiology of varicella-zoster virus infection (chickenpox) in FaMe-Net

The overall incidence of chickenpox is 2.7 per 1000 patient years. It is a disease of childhood, with an incidence of 27.7 per 1000 patient years in the age group 0-4. This means that in a practice with 1000 patients aged 0-4, chickenpox is diagnosed almost 28 times a year in this young age group. In the age group 5-14, the incidence is 2.7 per 1000 patient years. In older age groups the diagnosis is rare. Link/Figure 1 The incidence between the different sexes is roughly equal.



Chickenpox is ranked number 18 of most common new diagnoses among children aged 0-4. Link/Table 2
The overall prevalence of chickenpox is 2.8 per 1000 patient years, with the highest prevalence in the age group 0-4 (29.2 per 1000 patient years in those aged 0-4). This means that among 1000 patients aged 0-4, 29 patients (parents) contact their GP during the year because of chickenpox. Link/Figure 3

The similar numbers of incidence and prevalence indicate that chickenpox is an acute (episodic) disorder. Occasionally, it demands repeated GP attention crossing the calendar year border.
The rolling three years average trend graphs show a decrease in chickenpox incidence and prevalence since 2019, which cannot be explained other than as an effect of the COVID-19 pandemic that started in 2020.



4 Which initial RFEs do patients with varicella-zoster virusinfection (chickenpox) present to their GP?

The most common RFE at the start of an episode of chickenpox is 'chickenpox' (A72), in 43% of all episodes, which means that chickenpox is easily recognised by many parents. This is followed by a request for advice (*45) as an initial RFE. Other common RFEs are various symptoms of chickenpox: localised rash (S06), generalised rash (S07) and fever (A03) (6%), followed by generalised lumps / swelling (S05) and pruritus (S02). A request to check the skin (*31), to prescribe medication (*50) or to write some sort of note or letter (*62) are other RFEs. Airlines repel infective persons with chickenpox, resulting in requests for fit-to-fly declarations. Link/Table 4

5 How do FaMe-Net GPs act?

The most common intervention in episodes of chickenpox is providing education / advice / observation (*45), recorded in 75% of episodes. Link/Table 5 The prescription of medication occurs in 14% of episodes and a referral to secondary care (the paediatrician) is needed in only 1% of episodes. Link/Table 6 Medication prescription involves topical antibiotics (e.g. fusidic acid, in 4% of episodes), zinc products (in 2%), other emollients and protective agents (in 2%) and local anaesthetics (amides, e.g. lidocaine, in 1%). Link/Table 7 In the rare case of chickenpox in patients aged 15 and older, the prescription of medication occurs more frequently, in 29% of episodes. Link/Table 8

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Table 5 Table 6 Table 7 Table 8

Gastrointestinal infection (D73)

ANNEMARIE UIJEN

1 Clinical course of gastrointestinal infection

A gastrointestinal infection or gastroenteritis is an infection of the stomach and / or intestines. Symptoms include nausea, vomiting, abdominal pain and watery diarrhoea. Fever may also occur. Symptoms can range from mild to severe. Dehydration is the most serious but rare complication.

Gastrointestinal infection usually has a viral cause, with norovirus being the most common pathogen. Other viral causatives are rotavirus and enteric adenovirus. Bacteria (*S. aureus*, *C. jejuni*, *Shigella* spp., *Salmonella* spp.), parasites (*Giardia*, *Cryptosporidium*) or bacterial toxins may also cause gastroenteritis.
The infection can be caught by eating contaminated food, drinking contaminated water or by close contact with an infected person (norovirus).

In uncomplicated cases, treatment is conservative. Faeces investigation to determine the causative agent is only advised in seriously ill patients (e.g. persistent fever), in immunocompromised patients, or when the risk of infecting others is increased (e.g. employees in the food industry or in healthcare).

Treatment involves getting enough fluids. For mild or moderate cases, this can be achieved by drinking fluids slowly, frequently and in small amounts, because drinking too much too fast can cause vomiting. Oral rehydration solution (ORS), a combination of water, salt and sugar, is used to treat moderate dehydration. It is also worth considering an interruption of diuretics and renin-angiotensin system blockers and to be attentive to hypoglycaemia in patients using blood glucose lowering medication. Dehydration may also cause increased serum levels of medication (lithium). Consider that medication absorption may be reduced. Extra attention for hygiene is recommended.

Anti-diarrhoeal medication may be helpful to relieve symptoms.
Antibiotics should only be considered in case of serious illness (e.g. persistent or high fever, rectal bleeding) or in immunocompromised patients, in addition to ORS. In these cases, antibiotics are preferably prescribed based on the culture result or possibly after consultation with a microbiologist / infectiologist. Referral is needed in patients with serious general illness, severe dehydration (confusion, increased breathing effort, severe hypotension), increased risk of a severe course

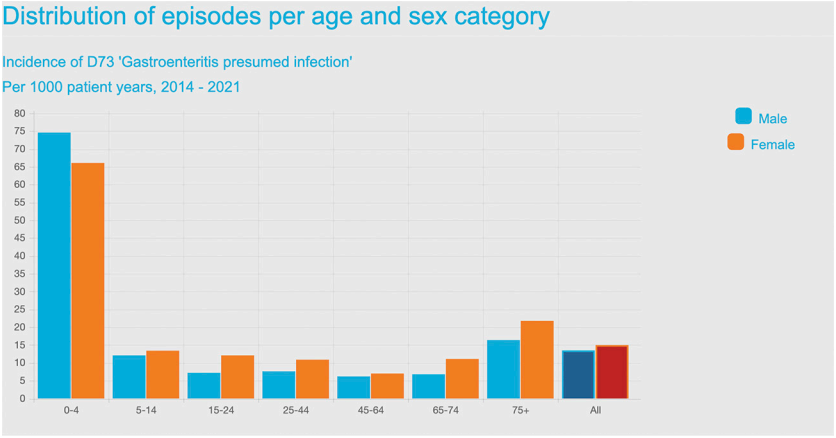
or in unsuccessful attempts for rehydration. Babies younger than three months with (suspected) dehydration should be referred.

2 How is gastrointestinal infection recorded in FaMe-Net?

Gastroenteritis of presumed infectious origin, without demonstration of a specific causative agent, is recorded with the ICPC code D73. A gastroenteritis caused by a demonstrated micro-organism (e.g. *Campylobacter, Giardia, Salmonella, Shigella*) is coded D70. The symptom diagnosis for diarrhoea (without an evident infectious cause) is coded D11 and for vomiting it is D10.

3 Epidemiology of gastrointestinal infection in FaMe-Net

Gastroenteritis as presumed infection (D73) has an incidence of 14.3 per 1000 patient years, which means the GP records 14 new diagnoses of gastroenteritis per 1000 patients per year. Incidence is highest in patients 0-4 years of age and there are more than 70 new diagnoses per 1000 patient years in this age group. Link/Figure 1

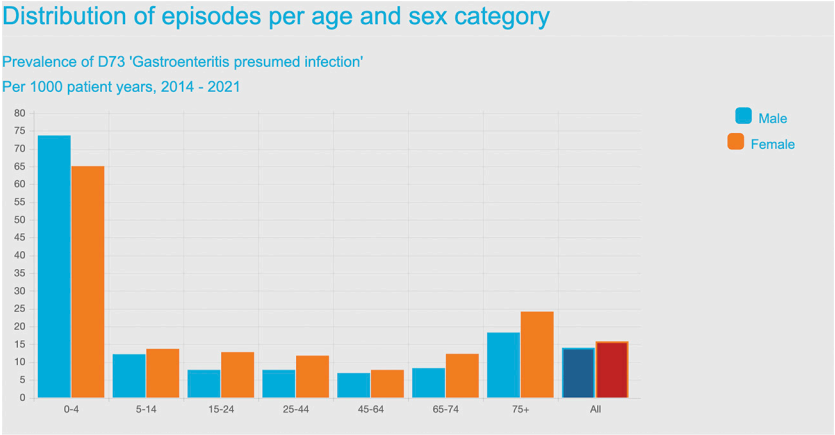


Except for with the youngest age group (0-4), women end up seeing their GP slightly more often for gastro-enteritis than men. Presumed gastrointestinal infection (D73) is one of the most common conditions for which parents of young children (0-4 years of age) seek medical help from their GP, after respiratory infection, otitis media, fever, impetigo and cough. Link/Table 2

A proven gastrointestinal infection (D70) has an incidence of 3.1 per 1000 patient years, with a quite similar distribution over age and sex groups. Link/Figure 3

Figure 1 Table 2 Figure 3 Figure 4

Prevalence of presumed gastrointestinal infection (D73) is 14.9 per 1000 patient years, meaning that among 1000 patients in a year almost 15 persons seek help from their GP for gastroenteritis. Link/Figure 4



Prevalence of proven gastrointestinal infection (D70) is 3.6 per 1000 patient years. The similar numbers of incidence and prevalence show that most episodes of gastrointestinal infection are dealt with in a short period of time.

4 Which initial RFEs do patients with gastrointestinal infection present to their GP?

The most common initial reason for encounter (RFE) for gastroenteritis is diarrhoea (D11), followed by vomiting (D10). The condition is easily self-diagnosed as the third most common RFE is gastroenteritis (D73). Link/Table 5

In the age group 0-4 years, fever (A03) is the third most common RFE, while this RFE is less commonly mentioned in older age groups. Link/Table 6

5 How do FaMe-Net GPs act?

In most episodes of gastrointestinal infection, a medical examination is performed by the GP, and health education / advice is provided. Medication is prescribed only in 14% of episodes. Link/Table 7 Referrals to secondary care (*67) are needed sporadically (in 5% of all episodes) and occur mainly in the youngest children (age 0-4: 7% referrals,

Table 5 Table 6 Table 7

Link/Table 8) and the elderly (75+: 6% referrals). Link/Table 9

The prescribed medication types are predominantly anti-emetics: propulsives (A03FA, e.g. metoclopramide, domperidone) and serotonin antagonists (A04AA, e.g. ondansetron). Other common prescriptions are proton pump inhibitors (A02BC) and antipropulsives (A07DA, e.g. loperamide). Antibiotics are seldomly prescribed. Link/Table 10 Note that only medication prescribed by the GP is recorded, not medication bought 'over the counter'.

Referrals to paediatrics, internal medicine and gastroenterology are recorded. Link/Table 11

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Colorectal cancer (D75)

JUUL HOUWEN

1 Clinical course of colorectal cancer

Colorectal cancer (CRC) can be diagnosed after the onset of symptoms or through screening. Symptoms from the local tumour may be rectal bleeding, abdominal pain and a change in bowel habits. Abdominal distension, nausea and vomiting may also be symptoms resulting from obstruction. An iron deficiency anaemia can be an indicator of colorectal cancer.

A screening programme for colorectal cancer in the Netherlands started in 2014, inviting all persons aged between 55 and 75 for an immunohistochemic fecal occult blood test (iFOBT) every two years.
After a positive iFOBT, participants receive the advice to undergo a colonoscopy. Patients with an increased risk of CRC have an indication for surveillance colonoscopy and do not participate in the screening programme. This includes patients with familiar CRC, a history of adenomas or CRC, or inflammatory bowel disease (IBD).

The diagnosis is based on the histologic confirmation of a biopsy that is obtained via a colonoscopy. The vast majority of colorectal cancer concerns carcinomas, originating from adenomas or from 'flat / invisible' dysplasia occurring in IBD. Other histologic types, such as neuroendocrine tumours or lymphomas, are rare. The Tumour, Node and Metastasis (TNM) staging system is the preferred staging system for colorectal cancer. For localised colon cancer, surgery is the only curative treatment. Treatment and prognosis depend on the local and distant extent of the disease. Other treatment options for colorectal cancer may include chemotherapy and radiotherapy.

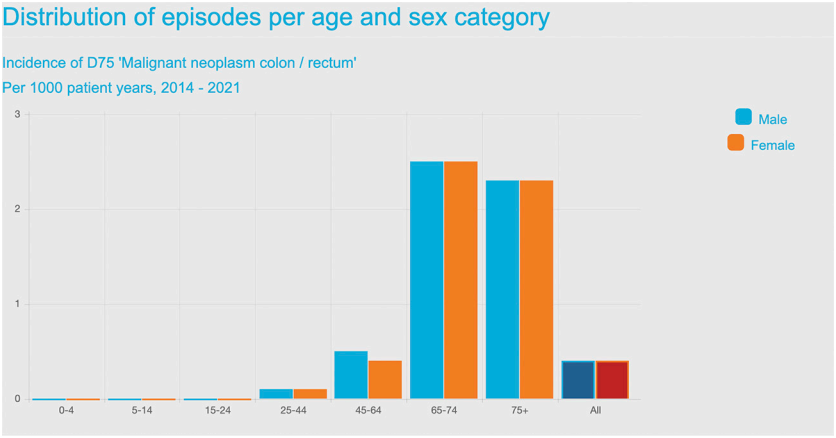
2 How is colorectal cancer recorded in FaMe-Net?

A malignancy of the colon is coded with ICPC code D75 and a malignancy of the rectum also has code D75. The distinction between colon cancer and rectal cancer cannot be made based on the ICPC-2 code. Other digestive system tumours are coded separately.
A benign or unspecified tumour of the digestive system is coded D78. Other malignancies are coded D74 (stomach cancer), D76 (pancreatic cancer) or D77 (oesophageal, gallbladder and liver cancer).

3 Epidemiology of colorectal cancer in FaMe-Net

The incidence of colorectal cancer is 0.4 episodes per 1000 patient years, meaning one new diagnosis of CRC in a practice with

1000 patients every two and a half years. A diagnosis before the age of 45 is rare. New diagnoses are sometimes made between 45 and 64 years of age. Incidence is highest in patients older than 65. Link/Figure 1



The FaMe-Net database does not show an increase in the incidence of CRC after the introduction of the screening programme in 2014. It should be noted that the absolute numbers are small.

The prevalence of CRC is 2.9 per 1000 patient years, meaning that among 1000 patients in a year, three seek help from their GP for CRC. Prevalence is somewhat higher among men than women (3.2 compared to 2.7 per 1000 patient years) and increases with age, especially over 65 years. Link/Figure 2

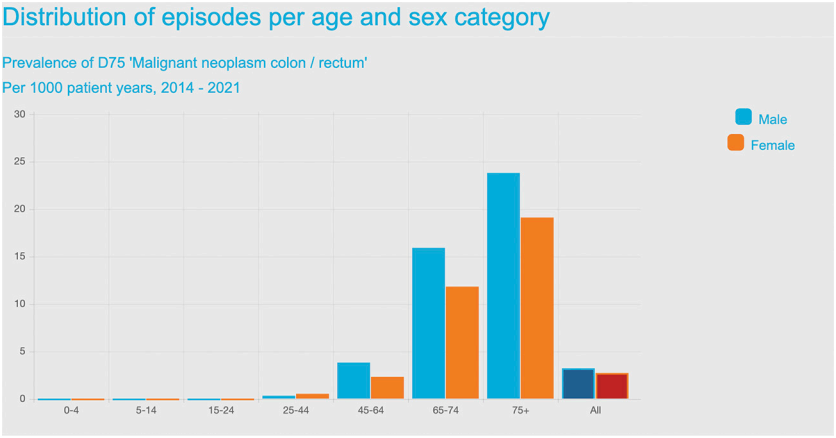


Figure 1 Figure 2 Table 3

The higher prevalence number compared to incidence reflects that CRC requires ongoing attention from the GP in the years after the initial diagnosis.

4 Which initial RFEs do patients with colorectal cancer present to their GP?

The most common initial reason for encounter (RFE) for colorectal cancer is rectal bleeding (D16, in 14% of new diagnoses), followed by an 'administrative procedure' (*62, in 11%). This means that the GP receives a letter from the specialist or from the screening programme reporting this new diagnosis or the first abnormal finding that later leads to this diagnosis. Other important initial RFEs are abdominal pain (D01 and D06, which make up 12% of the total). Link/Table 3

After the introduction of the CRC screening programme in 2014, the proportion of new diagnoses of CRC starting with the RFE 'administrative procedure' increased. Link/Table 4 Note once again that the absolute numbers are small.

5 How do FaMe-Net GPs act?

GPs prescribe medication (*50) in 43% of all episodes of colorectal cancer. Blood tests (*34) are performed by the GP in 15% and diagnostic imaging (*41) in 4%. Referral to a specialist (*67) occurs in 16% of the episodes (Link/Table 5), mostly to gastroenterology but also to internal medicine and surgery. Link/Table 6 These interventions take place partly before and partly after the final diagnosis. All percentages are calculated per episode of CRC *per year* and not per complete episode. The medication prescribed by the GP in episodes of CRC is most often osmotically acting laxatives. Link/Table 7

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Blepharitis / hordeolum / chalazion (F72)

HAN BEEKWILDER

1 Clinical course of blepharitis, hordeolum and chalazion

Blepharitis is an inflammation of the eyelid, usually localised on the inner part around the Meibomian glands (posterior blepharitis) or at the base of the eyelashes (anterior blepharitis). Meibomian glands (modified sebaceous glands) secrete the oily layer in the tear film which is essential for eye lubrication. Inflammation may be associated with changes in keratinisation in the glands, causing them to produce lipids with altered composition, resulting in toxic effects on the eye surface, a unstable tear film and an environment facilitating bacterial growth. In anterior blepharitis, *Staphylococci* and *Demodex* seem to play a role. Chronic skin diseases such as rosacea, seborrhoeic dermatitis, eczema and psoriasis may predispose one to blepharitis. (Contact) allergens and cigarette smoking may trigger or exacerbate it. Blepharitis occurs mostly bilaterally, sometimes asymmetrical. It is a clinical diagnosis. Blepharitis tends to recur.

Symptoms are red or pink swollen eyelids with a scaling of the skin and crusts around the eyelashes. Burning or itchy sensations and excessive tearing may occur.

Eyelid hygiene is the most important aspect in the treatment of blepharitis. Irritants and allergens (e.g. cosmetics and contact lenses) should be avoided. Artificial tear eye drops are often needed for associated symptoms of dry eyes. Topical antibiotics are advised when initial treatment fails after a few weeks. Referral to an ophthalmologist is needed only in severe cases.
Blepharitis should be distinguished from conjunctivitis, in which there is erythema of the eye instead of the eyelid. However, the two conditions can occur together.

Hordeolum and chalazion are unilateral nodular lesions of the eyelid. Both are diagnosed based on the typical clinical picture.

A hordeolum (stye) is an acute inflammation of a gland in the internal or external surface of the upper or lower eyelid, often caused by bacteria (mostly *Staphylococcus aureus*). It presents as a tender, swollen, erythematous nodulus, which may be purulent. Often spontaneous improvement occurs within two weeks but warm compresses may help to accelerate perforation, resulting in pain relief. (Topical) antibiotics are usually not necessary but preseptal (preorbital) cellulitis is a rela-

tively rare but serious infection and requires oral antibiotics.

A chalazion is a sterile lipogranuloma caused by an obstructed Meibomian gland. It presents as a subcutaneous swelling in the eyelid, most commonly the upper eyelid. The swelling is painless, firm and often small in size. Typically, spontaneous improvement occurs after several months. Warm compresses and massage can facilitate drainage of the obstructed gland. Therapeutic options for chalazia that do not improve spontaneously are intralesional corticosteroid injection or surgical removal. These can be performed by a GP with sufficient expertise or by the ophthalmologist after referral.

2 How is blepharitis, hordeolum and chalazion recorded in FaMe-Net?

The ICPC-2 classification uses the code F72 for all three eyelid conditions. Therefore, based on the ICPC code, it cannot be distinguished which specific eyelid condition has been diagnosed. In FaMe-Net, additional coding with ICD-10 does specify blepharitis, hordeolum or chalazion so that the distinction is possible in additional data extraction.
Eyelid conditions should be distinguished from conjunctivitis. Infectious conjunctivitis is coded F70. Allergic conjunctivitis is coded F71. Conjunctivitis with toxic cause is coded with F79 (other eye injury).

3 Epidemiology of blepharitis, hordeolum and chalazion in FaMe-Net

Blepharitis, hordeolum and chalazion (F72 together) have an incidence of 13.0 per 1000 patient years (13 new diagnoses per 1000 patients per year), with a higher incidence over 45 years of age. Link/Figure 1

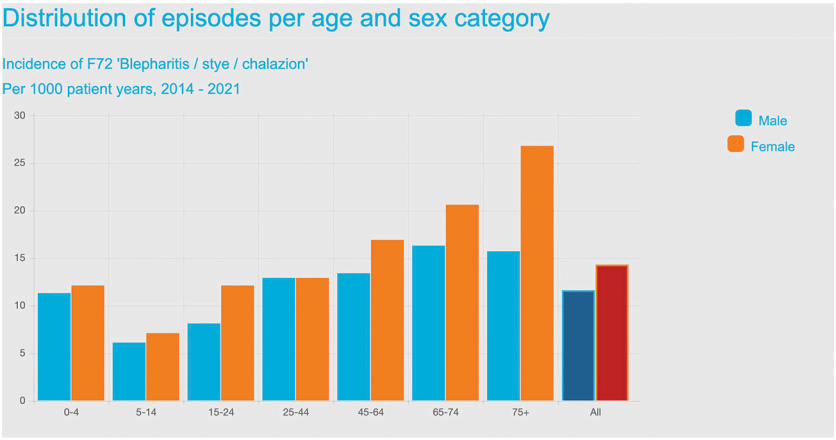
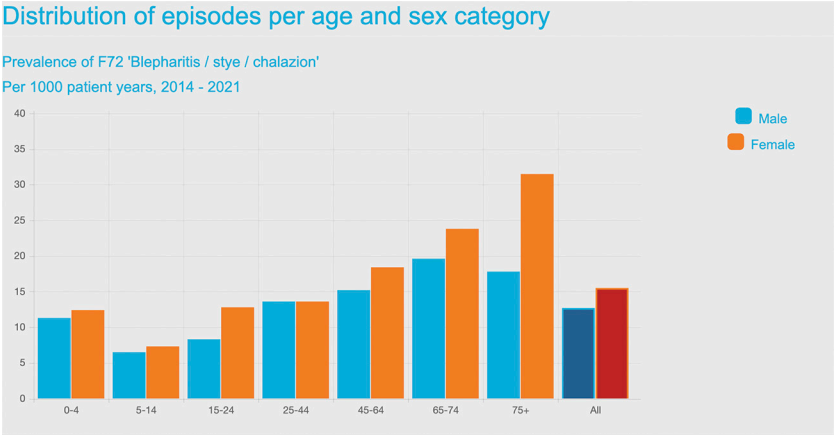


Figure 1

Prevalence of blepharitis, hordeolum and chalazion is 14.1 per 1000 patient years, meaning that among 1000 patients in a year, 14 persons seek help from their GP for these conditions. Link/Figure 2

Incidence and prevalence numbers are close together, suggesting that only a few episodes of eyelid conditions require repeated GP involvement and that most episodes are handled within a short time interval.



Incidence and prevalence are higher in women than in men. The sex difference is most pronounced in the oldest age group (75+) where the incidence and prevalence numbers for women are almost double those for men. The time trend graph suggests that sex difference has grown in recent years: incidence and prevalence in men remained quite stable from 2014-2021 but in women an increase appeared from around 2014-2015. We do not have an obvious explanation for this observation.

Blepharitis, hordeolum and chalazion (coded together as F72) are relatively common conditions, at position 37 in the list of most common incident diagnoses. For patients aged 45-64 years, the condition is ranked 24. Link/Table 3

4 Which initial RFEs do patients with blepharitis, hordeolum and chalazion present to their GP?

The most common initial reason for encounter (RFE) for blepharitis, hordeolum and chalazion are eyelid symptoms (F16), in 27% of all episodes. The second most common RFE is a self-diagnosed eyelid condition (F72), in 20% of episodes. Other important RFEs are a red eye (F02), a painful eye (F01) or an abnormal appearance of the eye (F15). Link/Table 4 In older patients, eye discharge (F03) is another common RFE. Link/Table 5

Figure 2 Table 3 Table 4 Table 5

5 How do FaMe-Net GPs act?

Apart from health education, the most common intervention for eyelid abnormalities presented to the GP is a prescription (*50), which occurs in 57% of episodes. Only 1% of cases result in incision / drainage (*51), excision (*52) or local infiltration (*55) by the GP. Referrals (*67) occur in 7% of episodes. Link/Table 6 These involve referrals to the ophthalmologist and, in rare cases, to the dermatologist. Link/Table 7

Prescriptions mostly concern topical antibiotics (e.g. chloramphenicol or fusidic acid), in 48% of the episodes. 'Other ophtalmological' prescriptions (S01XA) include artificial tears and are prescribed in 4% of instances. Combination eye drops of corticosteroids and antibiotics are prescribed in 2% and antiallergic eye drops in 1%. Link/Table 8

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Table 6 Table 7 Table 8

External otitis (H70)

MERIJN KEMPER

1 Clinical course of external otitis

External otitis is a diffuse inflammation of the skin of the ear canal causing pain, itching, discharge, scaling, redness or swelling and may be accompanied by hearing loss. The aetiology and pathophysiology are not entirely clear, but it appears that a disrupted acidic environment of the ear canal alters the local microbial flora and leads to inflammation. Normally, the lipidic and acidic characteristics of cerumen have a protective and bactericidal effect in the ear canal.
Acute external otitis is most common in summer. Swimming and other forms of water exposure are well-known risk factors. Other external factors are soap and shampoo, altering the pH of the ear canal. Furthermore, occlusion of the ear – for example, through the use of earplugs, hearing aids or earphones – increases ear canal moisture and irritation. It is assumed that picking at the ear and ear cleaning can lead to external otitis by removing cerumen and causing skin abrasions. A narrow ear canal is considered a further predisposing factor.

P. aeruginosa is the most common pathogenic micro-organism causing external otitis. This bacterium is sensitive to acidifying therapy. In <10% of patients with otitis externa, ear culture samples show the presence of a fungus, like *Aspergillus* or *Candida albicans*. This is more common in patients using hearing aids. In the absence of a causative micro-organism, a contact allergy, psoriasis or eczema may have contributed to the development of external otitis.

Diagnosis is based on history and physical examination. The distinction from acute otitis media with tympanic membrane rupture can sometimes be difficult.
Treatment consists of cleansing the ear canal from debris in the first place. This promotes healing in itself and is necessary for medication therapy to be effective. Cleansing is followed by the prescription of acid ear drops containing corticosteroids. If the tympanic membrane is not intact, aluminium acetotartrate ear drops should be prescribed. An ear wick drenched in ear drops can help decongest a swollen ear canal. Cleansing again and continued treatment are indicated if improvement does not occur after one (or two) weeks. A bacterial culture with resistance determination is advised when treatment fails after three weeks. Patients should be educated about external factors that may elicit external otitis. Systemic antibiotics are only indicated in case of fever and general illness. Analgesics can be used if necessary.

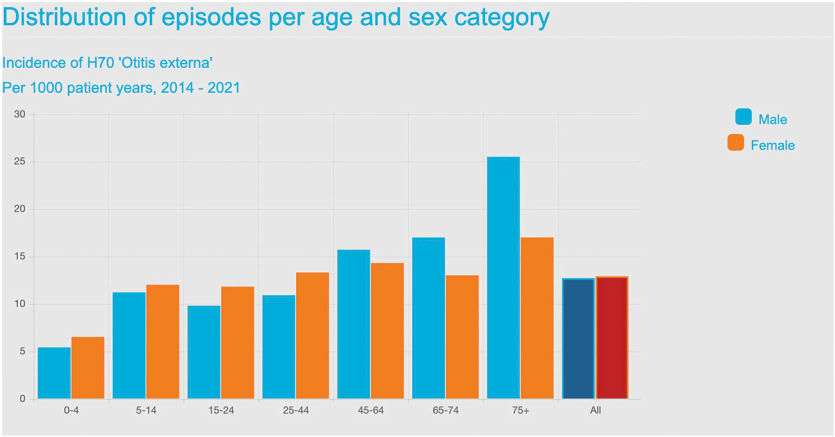
The prognosis of acute external otitis is good: more than 75% of patients are free of symptoms after three weeks of treatment.

2 How is external otitis recorded in FaMe-Net?

In ICPC-2, external otitis is coded H70. Acute otitis media is coded H71.

3 Epidemiology of external otitis in FaMe-Net

External otitis has an incidence of 12.8 per 1000 patient years, meaning 13 new diagnoses among 1000 patients in a year. External otitis occurs in all age groups, but the incidence is lowest in the 0-4 age group, rising slowly in the older age groups. Link/Figure 1

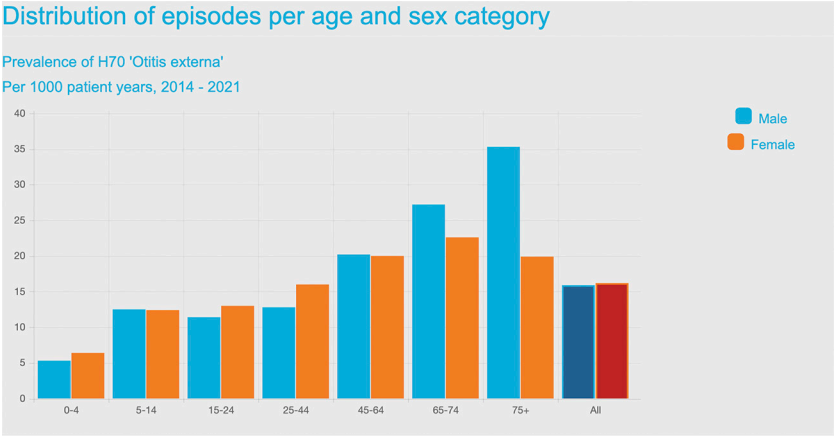


In the age group 75⁺ the incidence is 25.5 per 1000 patient years in men and 17.0 in women.

Prevalence of external otitis is 16 per 1000 patient years, meaning that among 1000 patients in a year, 16 persons seek help from their GP for external otitis. The higher prevalence number compared to the incidence number implies that external otitis sometimes requires the prolonged attention of the GP. In men, the prevalence is highest in the age group 75⁺ (35.3 per 1000 patient years); in women, the prevalence is highest in the age group 65-74 (22.6 per 1000 patient years). Link/Figure 2

Figure 1

Figure 2



4 Which initial RFEs do patients with external otitis present to their GP?

By far, the most common initial reason for encounter (RFE) for external otitis is 'ear pain' (H01), accounting for 43% of all RFEs. Other common reasons for encounter are external otitis (H70), a 'plugged feeling' in the ear (H13), ear discharge (H04) and a request for an otoscopy (*31) or for medication (*50). Link/Figure 3

5 How do FaMe-Net GPs act?

The most coded intervention for external otitis is the prescription of medication (*50), in 92% of episodes. Ear flushing (*51) is recorded in only 6% of all episodes. Referrals to a medical specialist (*67) and microbiological tests (*33) occur occasionally, in 4% and 2% of episodes, respectively. Link/Figure 4

Most prescribed medication types are ear drops containing a combination of corticosteroids and other (anti-infective) medication (S02C), in 76% of all episodes. This concerns acid ear drops with hydrocortisone or with triamcinolone acetonide. This is followed by ear drops with (single) anti-infective medication (S02A), including aluminium acetotartrate and acetic acid, in 10% of episodes. Penicillins (J01C) are prescribed in 4%. Link/Figure 5

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Figure 3 Figure 4 Figure 5

Acute otitis media (AOM) (H71)

LARS AVERINK

1 Clinical course of acute otitis media

Acute otitis media (AOM) is an infection of the middle ear. It is also known as purulent otitis media or suppurative otitis media. It is a common disease in children.
A viral upper airway infection, leading to oedema in the mucosa of the nose, nasopharynx and Eustachian tube, usually precedes AOM. Obstruction causes poor ventilation of the middle ear with the accumulation of secretions. Colonising bacteria and viruses can lead to suppuration. A building pressure in the middle ear causes pain, hearing loss, and may eventually cause the tympanic membrane to rupture, resulting in otorrhea. The most common bacterial pathogens causing AOM are *Streptococcus pneumoniae* and *Haemophilus influenzae.* In the large majority of cases, acute signs and symptoms resolve without active treatment within three days. Complications such as mastoiditis and facial nerve palsy occur seldomly.

In young children, especially those under one year old, AOM may present aspecifically, with fever, general irritability or disturbed sleep and feeding. AOM is often accompanied with symptoms of an upper airway infection. Acute otorrhoea in children with tympanic tubes is also considered an AOM.

Physical examination includes otoscopy, showing a bulging and / or erythematous tympanic membrane. Fluid in the middle ear results in an opaque tympanic membrane. A perforation or purulent material may be visible in a membrane rupture.

The diagnosis can be made if there is acute ear pain and / or illness (e.g. fever) in combination with (1) a red, bulging, and / or opaque tympanic membrane, or (2) a marked left-right difference in redness of the tympanic membrane, or (3) briefly existing otorrhoea.

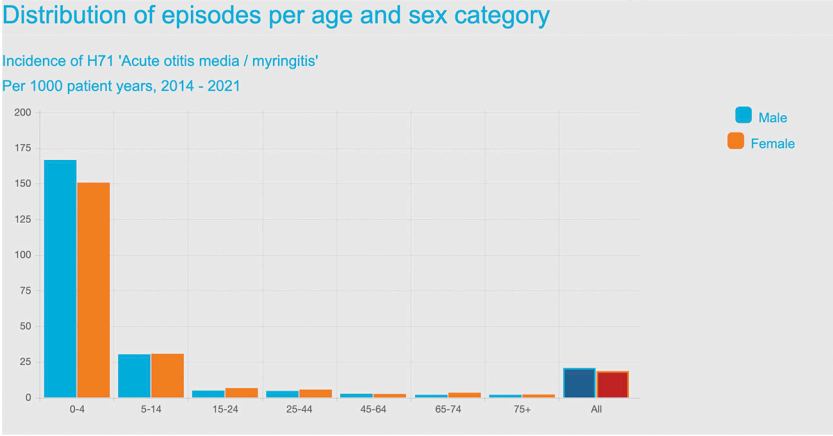
Because of the generally favourable course of AOM, treatment in the Netherlands is focused on symptom relief with analgesics. Antibiotics are advised only for severely ill children and, for children at a higher risk of complications, such as those under six months old, immunocompromised children and children with craniofacial anatomic abnormalities.

2 How is acute otitis media recorded in FaMe-Net?

In ICPC-2, acute otitis media is coded H71. The symptom diagnoses 'ear ache / pain in the ear' (H01) and 'otorrhea' (H04) may be recorded when these symptoms are present but the diagnosis AOM cannot be made. Upper respiratory tract infection (R74) may show some overlap with AOM and will be recorded if the clinical picture fits best to that diagnosis. If, along with a (mild) upper respiratory infection, an evident AOM is present and requiring treatment, GPs will likely classify it as AOM (H71). This is a clinical assessment.

3 Epidemiology of acute otitis media in FaMe-Net

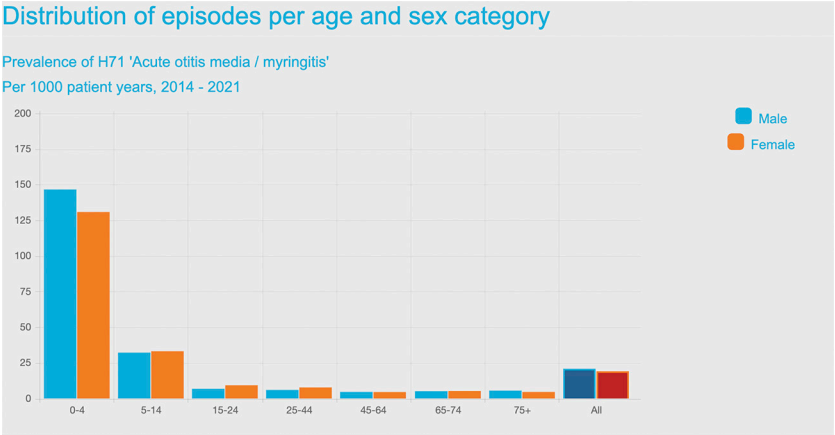
AOM is a common condition among children. In the age group 0-4 it is in the second place of frequently made diagnoses, following acute upper respiratory infection (R74). Link/Table 1 AOM is less common in older patients. The incidence of acute otitis media is 19.6 per 1000 patient years across all age groups. Incidence is highest in the age group 0-4 (more than 150 new diagnoses per 1000 patient years), followed by the group 5-14 years (30 new diagnoses per 1000 patient years). Link/Figure 2



Prevalence of AOM is 18.8 per 1000 patient years, which means that among 1000 patients, 19 individual patients seek help from their GP for AOM every year. The comparability of the prevalence and incidence numbers suits the short episodic nature of the condition AOM. The slightly higher number for incidence (new diagnoses) compared with the number for prevalence (affected persons) shows that AOM is a condition that can recur in the same person within a calendar year.

Like the incidence, the prevalence is highest in the 0-4 age group, followed by the 5-14 group. Link/Figure 3 In the age group 0-4, incidence and prevalence are slightly higher for boys compared to girls.

Table 1 Figure 2 Figure 3



The incidence and prevalence of AOM has decreased since 2019. This shows the effect of the COVID-19 pandemic that started in 2020, where the number of cases of AOM dropped dramatically as a result of missed presentation to the GP and decreased upper airway infection pressure as a result of the covid measures (Schers *et al.*, 2021). The decline in the trend graph starts in 2019 by calculating the 'rolling three years average', resulting in a smoothened curve that indicates the direction of changes over time without emphasising occasional outliers.

4 Which initial RFEs do patients with acute otitis media present to their GP?

The most common initial reasons for encounter (RFEs) for acute otitis media are pain in the ear (H01) and fever (A03), in 34% and 24% of all episodes, respectively. Another frequently recorded RFE is 'ear discharge' (H04). 'AOM' (H71) itself is the RFE in 5% of all new episodes of AOM, meaning that some patients or parents already state to believe the diagnosis is AOM right when the consultation first begins. Link/Table 4 Fever (A03) as an RFE decreases in patients with AOM as age increases age, while the percentage with 'self-suspected AOM' as an RFE (H71) increases with increasing age. Link/Table 5

5 How do FaMe-Net GPs act?

After performing a physical examination (otoscopy), the most common GP intervention is the prescription of medication, occurring in 63% of all episodes Link/Table 6 The main group of prescribed drugs is penicillin with an extended spectrum (J01CA, e.g. amoxicillin), in 41%. This is followed by locally administered medication (ear drops) combining corticosteroids and anti-infectives (S02CA), in 11% of episodes and by NSAIDs (M01AE, e.g. ibuprofen) in 2%. Link/Table 7 A referral to a medical specialist is recorded in only 6% of the episodes of AOM per year. This concerns

Table 4 Table 5 Table 6 Table 7

referrals to otorhinolaryngology or to paediatrics. Link/Table 8 Among older patients with AOM (aged 45-74), the percentage that is referred to secondary care increases (to 13% of all episodes) compared with younger patients. Link/Table 9 The rate of prescribed antibiotics is lower among adults over 25 years with AOM (33% penicillin with extended spectrum). Link/Table 10

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Ischaemic heart disease (K74, K75, K76)

JUUL HOUWEN, MARK VAN DER WEL

1 Clinical course of ischaemic heart disease

Ischaemic heart disease may manifest as asymptomatic coronary atherosclerosis, as (stable) angina pectoris and / or as acute coronary syndrome (ACS). ACS comprises instable angina pectoris (IAP) or acute myocardial infarction (AMI).

Angina pectoris (AP) refers to chest symptoms from myocardial ischaemia. Stable AP is characterised by chest tightness or pain, is provoked by physical exercise, emotions or cold, and disappears at rest or with sublingual nitrates within 15 minutes.

In ACS, symptoms are generally more severe and rest or nitrates do not completely resolve the symptoms. In IAP, myocardial ischaemia occurs progressively at rest or at minimal physical exertion.

In AMI, myocardial necrosis occurs, resulting in biochemical markers of myocardial damage. At least one of the following items is also present: clinical signs of AMI (sudden chest pain or tightness), corresponding abnormalities on the electrocardiogram or at coronary imaging or an identified thrombus in coronary angiography or autopsy.

The most common symptom of ischaemic heart disease in both men and women is chest pain. The pain sometimes radiates to the left arm or shoulder. Other common symptoms are dyspnoea or difficulty breathing. Transpiration, pallor and nausea or vomiting may also occur, especially in ACS. Less common symptoms are interscapular pain, dizziness, neck pain, palpitations, pain in the right arm, shoulder or jaw, dyspepsia, epigastric pain and fatigue. Patients may be anxious or agitated. There is a large variety in the presentation of signs and symptoms, making clinical diagnosis challenging.

If stable AP is suspected, cardiovascular risk factors should be assessed and the patient should be referred to the cardiologist to confirm or reject the diagnosis. Treatment consists of symptom control (nitrates, beta-blockers) and secondary cardiovascular prevention (lifestyle, platelet aggregation inhibitors, statins, blood pressure management).

In patients suspected of having ACS, an urgent referral with ambulance transport is indicated. While waiting for emergency transport, nitrates, fentanyl or morphine may be administered, along with oxygen and platelet aggregation inhibitors.

In hospital, treatment is started to restore oxygen supply to the heart (e.g. percutane-

ous coronary intervention). Cardiovascular risk management is then initiated.

2 How is ischaemic heart disease recorded in FaMe-Net?

Three ICPC-codes are used: K74 for episodes relating to ischaemic heart disease with angina pectoris (i.e. symptomatic ischaemia); K75 for myocardial infarction; K76 for ischaemic heart disease without angina (asymptomatic). Based on the ICPC-classification, it is not possible to differentiate between IAP and AP. It has been agreed in FaMe-Net to additionally record K74 or K76 in patients who have had a myocardial infarction (depending on the presence / absence of angina). This means that care related to the treatment and immediate aftermath of an AMI is coded under K75, and subsequent CVRM actions are coded under K74 or K76.
On this website, it is not possible to determine the co-occurrence of several ICPC codes within the same person. This would be possible with additional data extractions (upon request).

Different symptom diagnoses are used to code symptoms in cases when ischaemic heart disease cannot be diagnosed but symptoms that could fit it occur. Heart pain (pain attributed to the heart) is coded K01. Pressure / tightness attributed to the heart is coded K02.
Chest pain 'not otherwise specified' is coded A11.
Chest symptoms / complaints (attributed to the musculoskeletal system) are coded L04.

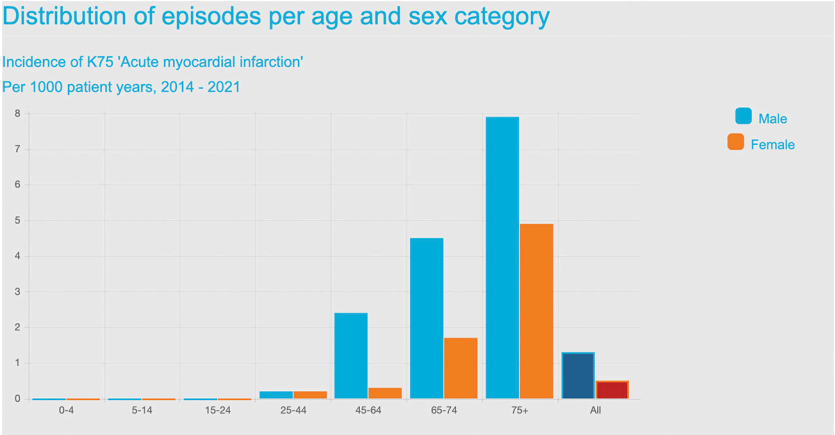
3 Epidemiology of ischaemic heart disease in FaMe-Net

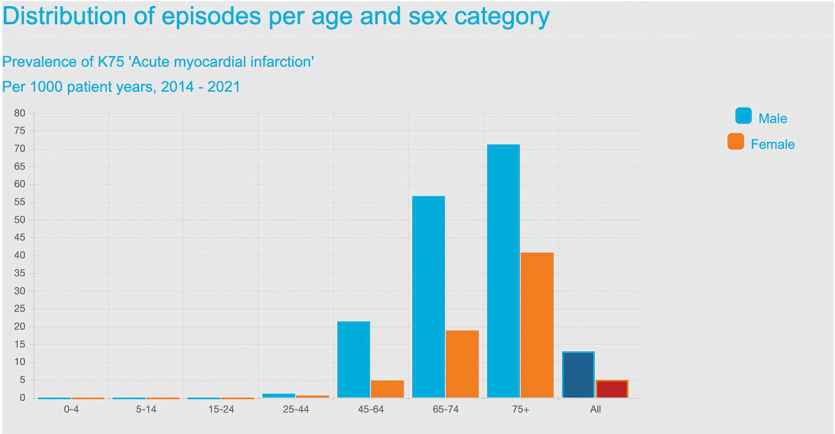
Acute myocardial infarction has an incidence of 0.9 per 1000 patient years, meaning one new diagnosis of AMI among 1000 patients in a year. The incidence among men (1.3) is two to three times higher than that among women (0.5 per 1000 patient years). There is a marked increase in incidence with age, which starts earlier in men than in women. At older ages, the sex difference in incidence decreases. This is a well-described phenomenon. Link/Figure 1

The incidence of ischaemic heart disease with angina (K74) is 0.8 per 1000 patient years. Link/Figure 2 Some (not all) of these new diagnoses of ischaemic heart disease with angina involve acute coronary syndrome, but it is not possible to determine exactly which part this is, as the code K74 is used not only for acute (ACS) but also for non-acute ischaemia (stable AP), as well as for CVRM registration.
The incidence of ischaemic heart disease without angina (K76) is 0.9 per 1000 patient years Link/Figure 3

The prevalence of ischaemic heart disease with angina (K74) is 12.8 per 1000 patient years, meaning that out of 1000 patients in a year, 13 contact their GP for care registered with K74 (i.e. either with clinical signs / symptoms of ischaemic heart disease with angina or for CVRM). Link/Figure 4
The prevalence of AMI (K75) is 8.9 per 1000 patient years. Link/Figure 5

Figure 1 Figure 2 Figure 3 Figure 4





The prevalence of ischaemic heart disease without angina (K76) is 8.1 per 1000 patient years. Link/Figure 6

The symptom diagnoses heart pain (K01) and pressure / tightness of heart (K02) have an incidence of 2.2 and 1.5 per 1000 patient years, respectively. Link/Figure 7, Link/Figure 8 Chest pain NOS (A11) and (musculoskeletal) chest symptoms (L14) have an incidence of 3.8 and 18.7 per 1000 patient years, respectively. Link/Figure 9, Link/Figure 10

Figure 5 Figure 6 Figure 7 Figure 8

The prevalence of heart pain (K01) and of pressure / tightness of heart (K02) is 3.7 and 2.8 per 1000 patient years, respectively. Link/Figure 11, Link/Figure 12
The prevalence of chest pain NOS (A11) and of (musculoskeletal) chest symptoms (L04) is 5.1 and 21.9 per 1000 patient years, respectively. Link/Figure 13, Link/Figure 14

4 Which initial RFEs do patients with ischaemic heart disease present to their GP?

The most common initial reason for encounter (RFE) for acute myocardial infarction (K75) is an administrative procedure (*62), which occurs in 22% of all episodes, meaning that the diagnosis is reported to the GP in a (specialist) letter. This implies that the GP had no role in diagnosis and initial management (e.g. because an ambulance was called immediately or the patient was already in hospital).

Importantly, a substantial number of episodes of AMI (K75) lack an initial RFE. A manual search shows that episodes without an initial RFE started with a letter (without registration of RFE *62). This means that the proportion of episodes of AMI starting without GP involvement is much higher. The dataset contains n=234 new episodes of AMI, while only n=158 initial RFEs were recorded. Missing RFEs (at least n=76) account for 32% of all episodes. Presented RFEs are calculated as percentages of the *registered* RFEs (n=158).

The RFE 'initiated by healthcare provider' (*64, in 8%) indicates that the GP heard of the AMI through a specialist letter, family, or otherwise, and then contacted the patient.
The most common symptom presented to the GP is heart pain (K01), recorded in 13%, followed by pressure / tightness of heart (K02) in 8% of episodes and shortness of breath (R02) in 7%. In 6% of all episodes of AMI, the patient stated in the beginning of the consultation that they thought they were having a myocardial infarction (K75). Link/Table 15

Pressure / tightness of heart (K02) is more common in the oldest (75+) patients with AMI than in younger patients, and is the most common initial symptom in this age group. Link/Table 16 It is also a more common symptom in women (13%) than in men (6%) with AMI. Link/Table 17, Link/Table 18
Although caution is needed because of the very small absolute numbers, it is interesting to note that of all episodes starting with RFE AMI (K75), i.e. episodes in which the patient starts by saying he thinks he has an infarction, in 71% of cases the final diagnosis indeed turned out to be an AMI. Link/Table 19

The three most common RFEs for episodes of ischaemic heart disease with angina (K74) are similar to those for episodes of AMI (K75):


Figure 9


Figure 10


Figure 11


Figure 12


Figure 13


Figure 14


Table 15


Table 16

administrative procedure (*62), heart pain (K01) and pressure / tightness of heart (K02). Link/Table 20

Episodes of ischaemic heart disease without angina (K76) usually do not start with symptoms but with an administrative procedure (*62), as a 'check' (*31) or when 'initiated by GP' (*64). This reflects that these episodes are used for registration of cardiovascular risk management after an ischaemic event, or as an abnormal finding in investigations of individuals without typical AP symptoms. Link/Table 21

5 How do FaMe-Net GPs act?

The most common GP intervention coded for AMI (K75) is prescription of medication which occurs in 80% of episodes per year. Blood tests occur in 16%. Link/Table 22 In only 6% of episodes that turned out to be AMI (K75) the GP refers to a medical specialist, usually (in 5%) the cardiologist. Link/Table 23 This percentage seems very low, but note that all percentages are calculated *per calendar year* (not per unique episode), and that episodes of AMI (K75) are apparently recorded as episodes of chronic care anyway (given the high prevalence compared with incidence, i.e. 8.9 and 0.9 per 1000 patient years, respectively). It seems that a (re)referral is not often needed in this chronic phase. Moreover, we found that an AMI often occurs without initial GP interference, so no referral is recorded in the acute moment. Primary care referrals occur occasionally, mainly to physical therapy. Link/Table 24

Interventions for ischaemic heart disease with angina (K74) are similar to those for episodes of AMI, with 9% annual referrals to specialists and similar prescription rates. Blood tests reflecting CVRM occur in 25% of episodes. Link/Table 25 For ischaemic heart disease without angina (K76), blood tests occur in 29% per year. Link/Table 26

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/acuut-coronair-syndroom#volledige-tekst (2022)

Dutch guideline: https://richtlijnen.nhg.org/standaarden/stabiele-angina-pectoris#volledige-tekst (2019)

Table 17 Table 18 Table 19 Table 20

Table 21 Table 22 Table 23 Table 24

Table 25 Table 26

Heart failure (K77)

MARK VAN DER WEL

1 Clinical course of heart failure

Heart failure is a condition in which the heart is unable to pump blood at the rate needed to fulfil the body's metabolic needs, or only at the cost of high filling pressures. It results from functional or structural heart disorders decreasing the heart's ability to fill or pump, and thus may have several causes, e.g. myocardial infarction, valvular disease, hypertension and atrial fibrillation. Heart failure (HF) is a clinical syndrome, not a single diagnosis. Identification of the underlying cardiac dysfunction is mandatory in the diagnosis of HF, since this will determine subsequent treatment.

Cardinal symptoms of HF are breathlessness, ankle swelling and fatigue. Symptoms increase during exacerbations. Signs at physical examination may be elevated jugular venous pressure, pulmonary crackles and peripheral oedema. Heart failure may become symptomatic at rest and / or during exercise.

Additional examination is indicated if heart failure is suspected, based on history and physical examination. A chest X-ray may help to differentiate from pulmonological causes for dyspnoea, such as showing cardiomegaly or pleural effusion. A (highly) elevated value of natriuretic peptide (BNP or NT-proBNP) makes HF (very) likely. An electrocardiogram (ECG) is advised when HF is suspected. A normal ECG makes HF unlikely, but an abnormal ECG does not yet demonstrate HF. Atrial fibrillation or a paced rhythm on the ECG increase the likelihood of the presence of HF. When HF is suspected and elevated (NT-pro) BNP and / or ECG abnormalities are present, echocardiography is indicated. The diagnosis of heart failure is normally made by the cardiologist, although in consultation with frail or elderly patients, referral to the cardiologist is sometimes omitted.

Cardiologists classify HF in three subgroups according to the left ventricle ejection fraction, which is generally assessed by echocardiography: heart failure with preserved ejection fraction (HFpEF), with mildly reduced ejection fraction (HFmrEF) and with reduced ejection fraction (HFrEF).

Treatment with medication is generally started by the cardiologist and often reduces the symptoms of HF. It can also prevent exacerbations and reduce mortality from heart failure. Daily medication is prescribed and dosed stepwise and includes renin-angiotensin system blockers (e.g. ACE-inhibitors) and diuretics when signs of fluid retention are present. Betablockers may be added in sta-

ble patients. Medication is normally needed life-long. Patients may be advised to take extra diuretics when fluid retention increases (ankle edema, weight gain). In the continuation of the treatment, GPs often contribute. Acute decompensations require prompt management.

2 How is heart failure recorded in FaMe-Net?

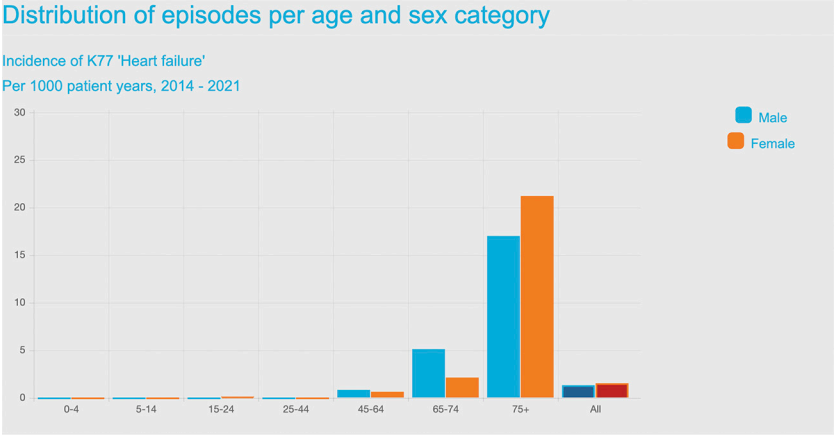
Heart failure is coded with the ICPC-2 code K77.

In addition, the underlying disease(s) will be coded, e.g. myocardial infarction (K75), atrial fibrillation (K78), heart valve disease (K83) and hypertension (K86).

Symptom diagnoses may be coded if there is no diagnosis of heart failure, for example: shortness of breath / dyspnoea (R02), swollen ankles / oedema (K07) or weakness / tiredness general (A04).

3 Epidemiology of heart failure in FaMe-Net

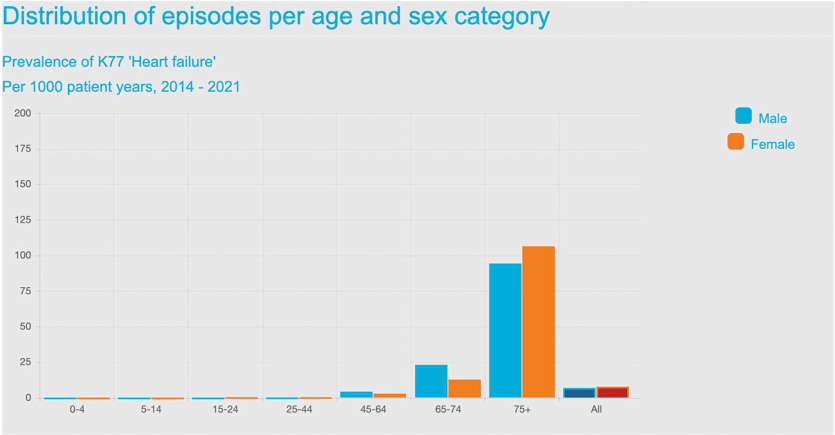
Heart failure is a disease of older aged patients. The incidence is 1.4 per 1000 patient years across all age groups, meaning three new diagnoses of HF per 2000 patients per year. In the age group 65-74, this is 3.6, and in the age group 75+, it is 19.4 per 1000 patient years. Link/Figure 1



The difference in incidence between men (5.1) and women (2.1 per 1000 patient years) in the age group 64-75 is a well described phenomenon and demonstrates the differences in the underlying causes of HF and differences in the timing of first onset of cardiovascular disease. In women, cardiovascular decline starts in the years after menopause when the 'hormonal umbrella of cardiovascular protection' disappears.

Figure 1

The overall prevalence of HF is 7.3 per 1000 patient years and is slightly higher in women then in men. Link/Figure 2 This means that, among 1000 patients in a year, seven individual patients search for help from their GP for HF.



Among the oldest patients (age 75+), this is 101.3 per 1000 patient years, meaning that 10% of these patients are affected by HF and contact their GP for it throughout the year. In this age group, HF ranks 13th among the most prevalent conditions. Link/Table 3 The higher prevalence compared to incidence reflects the chronicity of HF, requiring ongoing attention after the diagnosis.

4 Which initial RFEs do patients with heart failure present to their GP?

Shortness of breath (R02) is by far the most common reason for encounter (RFE) before the first diagnosis of heart failure, followed by swollen ankles (K07) and suspicion of heart failure (K77). HF also commonly starts with the RFE 'administrative contact' (*62). This means that the diagnosis is likely reported for the first time in a (specialist) report to the GP and then added to the electronic health record. Episodes of HF also commonly start with a request for examination (*31), medication prescription (*50) or a test result (*60). The latter means that a new diagnosis of HF is made after tests performed within the course of another episode of care. This shows that HF is not diagnosed as an isolated condition but follows on from other heart disorders. Other common symptoms presented at the start of episodes of HF are tiredness (A04) and cough (R05). Link/Table 4

Age and sex have no (relevant) impact on which signs and symptoms are presented.

5 How do FaMe-Net GPs act?

GPs appear to manage a substantial amount of the workload from heart failure patients

Figure 2 Table 3 Table 4

themselves. Medication for HF is prescribed by GPs in 83% of all episodes per year. Laboratory tests are recorded by the GP in 21% of episodes per year. Diagnostic imaging (chest X-rays) and electrocardiograms occur in 2% of episodes per year. Specialist referrals and consultations occur in 11% and 6% of episodes per year, respectively. Link/Table 5 It seems that care for patients with HF is provided partly in primary and partly in secondary care. Referrals to secondary care mainly involve cardiology, but also internal medicine and pulmonology. Link/Table 6 Primary care referrals for HF are rare and involve home care, physical therapy and other care providers. Link/Table 7

The most prescribed medication type in episodes of HF is lisdiuretics (furosemide, bumetadine), in 59% of all episodes of heart failure, followed by aldosterone agonists (spironolactone, eplerenone, 19%), beta blockers (17%) and ACE inhibitors (15%). Link/Table 8

Note that all intervention reports show only interventions (including referrals and prescriptions) that are linked specifically to the episode heart failure (K77). Underreporting is likely, since interventions may also be registered under the ICPC code of the underlying cause of heart failure. This is specifically the case for prescriptions, since all prescribed medication must be linked to one episode in FaMe-Net, including in patients with multiple reasons (episodes) to prescribe. For example, medication that may also be prescribed for other episodes (e.g. statins or antihypertensives for ischaemic heart disease, K76) can and will often be reported under the alternative ICPC code.

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Table 5 Table 6 Table 7 Table 8

Parkinson disease and parkinsonism (N87)

FRANCA RUIKES

1 Clinical course of Parkinson disease and parkinsonism

Hypokinetic rigid syndrome is a clinical syndrome presenting with any combination of bradykinesia (slowness of movement or speed) with rest tremor, rigidity, and postural instability. The most common form of hypokinetic rigid syndrome is Parkinson disease (PD), a chronic, progressive disorder caused by degenerative loss of dopaminergic neurons in the brain. The diagnosis PD is made by a neurologist and based on distinctive clinical features from the history and neurological examination. At a minimum, bradykinesia plus either (asymmetrical) tremor or rigidity must be present in order to consider the diagnosis of PD. Postural instability usually appears later in the course of PD. An unequivocal, beneficial response to dopaminergic therapy supports the diagnosis.

Hypokinetic rigid syndrome is also called parkinsonism. Parkinsonism with other causes than PD, e.g. medication-induced parkinsonism (antipsychotics, antiemetics), vascular parkinsonism or other rare causes, respond poorly to dopaminergic therapy.

Blood tests or radiologic imaging to confirm the diagnosis are not available. The GP refers a patient with (suspected) parkinsonism or PD to a neurologist or Parkinson expertise centre to confirm the diagnosis and start symptomatic dopaminergic therapy. There is no cure for PD. In the Netherlands, over 3700 primary care and hospital professionals with expertise in parkinsonism collaborate closely in regional healthcare networks within the national 'ParkinsonNet' (www.parkinsonnet.nl). Within these networks, specialised nurses, physical therapists, occupational therapists and others provide daily care to patients and build multidisciplinary networks, leading to improved expertise and improved collaborations.

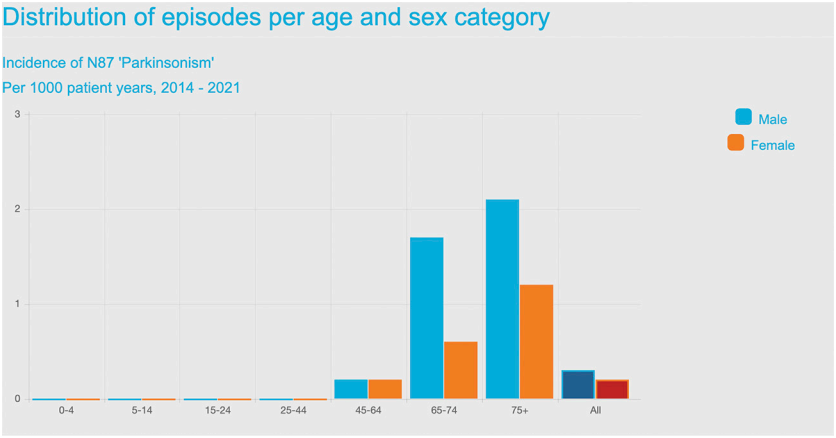
2 How is Parkinson disease and parkinsonism recorded in FaMe-Net?

In ICPC-2, parkinsonism (including Parkinson disease) is coded with N87.

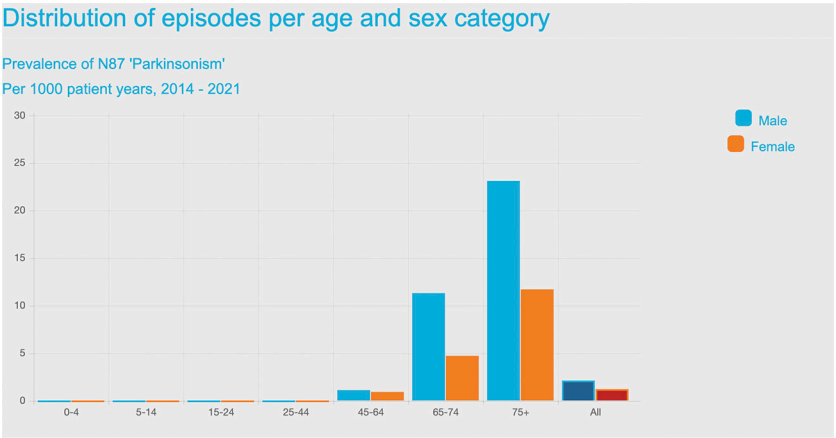
3 Epidemiology of Parkinson disease and parkinsonism in FaMe-Net

PD / parkinsonism has an incidence of 0.2 per 1000 patient years, indicating 2 new diagnoses per 10.000 patients in a year. It

is a disease of older age: a diagnosis before the age of 65 is rare. The incidence is highest in patients aged 75 years and older, with men being affected more often than women (2.1 versus 1.2 per 1000 patient years). Link/Figure 1



The prevalence of PD / parkinsonism is 1.7 per 1000 patient years, indicating that among 1000 patients in a year less than two seek help from their GP for PD / parkinsonism. These encounters include consultations at the GP practice, at the patient's home or by telephone, as well as (repeat) medication prescriptions and administrative contacts (e.g. writing or receipt of letters / notes). Link/Figure 2



In patients aged 65 years and over, PD / parkinsonism is not among the most prevalent conditions as seen by FaMe-Net GPs. Link/Table 3 This means that, although PD / parkinsonism is a serious disease with large implications for patients' daily activities, it is not a condition for which a high proportion of the GP practice population seeks medical help over the course of one year – and that the GP is not regularly consulted for PD / parkinsonism.

4 Which initial RFEs do patients with Parkinson disease and parkinsonism present to their GP?

The most common initial complaint (reason for encounter) of patients with PD / parkinsonism contacting their GP is abnormal involuntary movements (N08). Link/Table 4

5 How do FaMe-Net GPs act?

During a year, in 72% of all episodes of PD / parkinsonism medication is prescribed by the GP. Link/Table 5 The mostly prescribed medication types are dopa and dopa derivates, and dopamine agonists, such as (combinations of) levodopa, decarboxylase inhibitors and COMT inhibitors. Link/Table 6

Next to this, referrals to other primary health care providers (in 23% of the episodes PD / parkinsonism) and to a specialist (in 18%) are relatively common. Link/Table 5 GPs refer mostly to physical therapy (10%) and occupational therapy (8%) in primary care. Link/Table 7 Specialist referrals occur mostly to neurology. Link/Table 8 Note that these are mean percentages calculated per calendar year, and not throughout the entire episode of PD / parkinsonism, which makes these percentages seem relatively low.

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Dutch guideline: https://richtlijnen.nhg.org/standaarden/ziekte-van-parkinson#volledige-tekst (2011)

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Migraine (N89)

JUUL HOUWEN

1 Clinical course of migraine

Migraine is a neurological disorder involving recurrent unilateral headache attacks. During the attack, a cascade of events progresses over the course of hours to days. The four phases in a typical attack are the prodromal phase, aura, headache and postdromal phase. In the prodromal phase, patients may experience fatigue, decreased functioning or mood fluctuations. The aura is a reversible, focal neurological phenomenon including visual impairments (e.g. scotomas) or unilateral sensibility disturbance (e.g. in the face or a hand). It occurs in a quarter to a third of patients with migraine.

The headache phase generally follows within one hour after the onset of the aura and remains for four to up to 72 hours when untreated. The typical headache is unilateral with a throbbing or pulsatile quality and is moderate to severe in intensity, impeding daily functioning. The headache is usually accompanied by nausea, vomiting, or photo- and phonophobia. In some migraine variants, the classical headache lacks. In the postdromal phase, fatigue and concentration problems may persist for up to two days.

The pathophysiologic mechanism of migraine is complex and not yet fully understood. The nervous system becomes disrupted, in part due to neurovascular mechanisms: the headache is caused by the activation of the vascular system around the trigeminal nerve, exciting nerve ends close to meningeal vessels. This process is mediated by a neurotransmitter (CGRP) which can be suppressed with selective serotonin (5HT1) agonists (triptans). In the migraine aura, the process of 'cortical spreading depression' causes a depolarisation wave spreading over the cerebral cortex, temporarily impeding brain activity. After a short hyperaemic phase, a longer phase with reduced speed of blood flow follows, probably causing the neurologic symptoms. In patients with migraine with aura persisting for more than an hour, this phase may, in rare cases, be complicated by migrainous infarction visible on neuroimaging.

Migraine is associated with an increased risk of cardiovascular disease, especially cerebrovascular accident. The risk is highest in migraine with aura, but migraine without aura also presents an increased risk of cardiovascular disease. Several factors are mentioned as potential triggers to a migraine attack, for example, fasting and sleep deprivation, but the literature is inconsistent. Most women with migraine notice an association between their menstruation and migraine, with attacks occurring more frequently, or solely, during menstruation.

The diagnosis is generally made by the GP after careful history taking. Diagnostic testing to confirm the diagnosis is not available. In secondary care, neuroimaging is sometimes performed to exclude other diagnoses, such as subarachnoid haemorrhage, cerebrovascular accident, intracranial aneurysm or brain tumour.

Migraine attacks are best managed by resting. It is advised to discuss the cardiovascular risk upon diagnosis and around the age of 40. Advice appropriate to the cardiovascular risk should be given, including 'stop smoking' advice if applicable. Migraine is a contra-indication for the contraceptive pill because of the increased cardiovascular risk.

Migraine attacks can be treated with paracetamol, NSAIDs, triptans, or combinations thereof, and with anti-emetics when needed. Betablockers, candesartan or amitripytiline can be used to prevent attacks.

2 How is migraine recorded in FaMe-Net?

Migraine is recorded with the ICPC-2 code N89.

When a headache cannot be classified as migraine, nor as another specific headache 'syndrome' (e.g. tension headache, cluster headache), GPs will generally qualify it with the symptom diagnosis 'headache' (N01).

3 Epidemiology of migraine in FaMe-Net

The incidence of migraine is 3.1 per 1000 patient years. After adolescent and young adult age, the incidence gradually decreases with age. Link/Figure 1 Migraine has a higher incidence in women (4.5) than in men (1.6 per 1000 patient years). The peak incidence (between 15 and 45 years) reflects an association with the menstrual cycle to the occurrence of migraine in women.

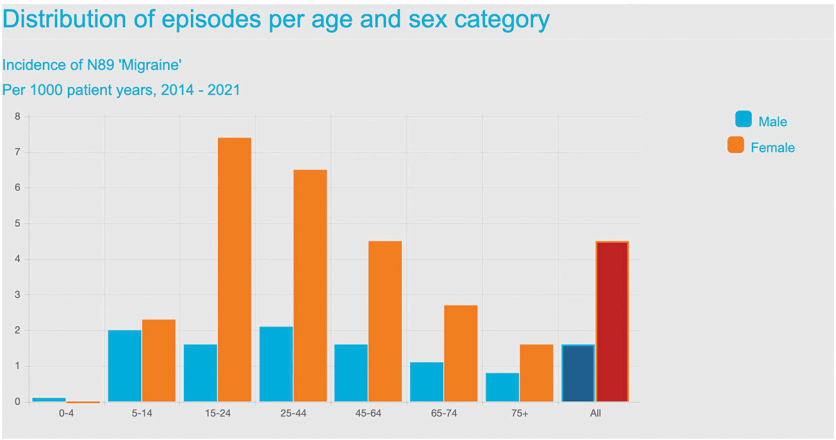
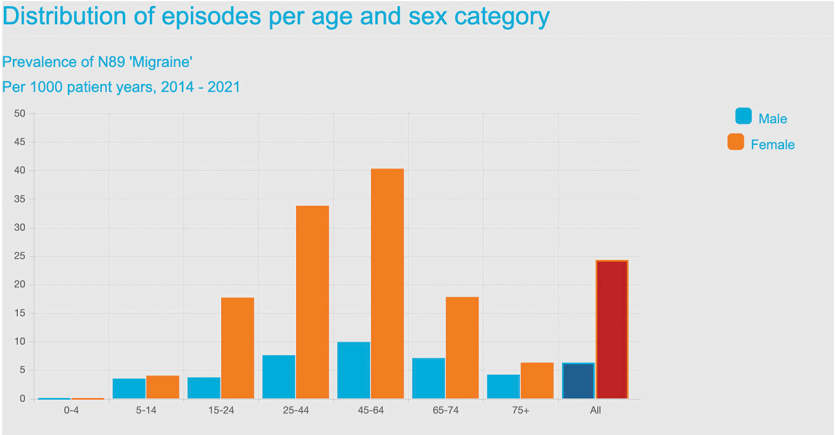


Figure 1 Figure 2 Figure 3 Figure 4



The incidence of the symptom diagnosis headache (N01) is 12.6 per 1000 patient years. Link/Figure 2

The prevalence of migraine is 15.5 per 1000 patient years, meaning that in a year, 16 patients out of 1000 contact their GP with migraine. Again, the prevalence is notably higher in women (24.3) than in men (6.3 per 1000 patient years) and decreases with old age. Link/Figure 3

Prevalence of 'headache' (N01) as the diagnosis is stable over (adult) age groups. Link/Figure 4
The higher prevalence of migraine compared to incidence indicates that this condition often requires prolonged GP attention for many years after the initial diagnosis.

4 Which initial RFEs do patients with migraine present to their GP?

The most common initial reasons for encounter (RFE) in episodes of migraine are headache (N01) and migraine (N89), in 29% and 26% of all episodes respectively. Other common reasons for encounter are visual complaints (F05 and F04). Link/Table 5 When children (age 0-14) are left out of consideration, migraine itself (N89) is the most common RFE in episodes of migraine, especially among women. This means that the patient often suspects the diagnosis. Link/Table 6

5 How do FaMe-Net GPs act?

The most common coded intervention in episodes of migraine is the prescription of medication, occurring in 81% of episodes per year. Link/Table 7 Prescriptions are slightly more common in female patients with migraine compared to males. Link/Table 8

GPs most commonly prescribe triptans (selective serotonin agonists, N02CC) to patients with migraine: in 62% of episodes of migraine. Beta-blockers are prescribed in 10%. Link/Table 9 Medication bought 'over the counter' is out of sight of GPs and not recorded.

Table 5 Table 6 Table 7 Table 8

Only in 6% of episodes per year do GPs refer a patient with migraine to a medical specialist. This may occur before or after the final diagnosis has been made. Younger patients are referred to a specialist more often than older patients. Link/Table 10 Specialisms that GPs refer to are neurology, ophthalmology and, in younger patients, paediatrics. Link/Table 11

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Sleep disturbance (P06)

HILDE LUIJKS

1 Clinical course of sleep disturbance

Many people experience sleep disturbances (sleep problems) regularly and a proportion of them (10-15%) consult a doctor for it. Sleep disturbances include problems in falling or staying asleep and may include waking up early, not being well rested upon waking up and restless dreaming.

Sleep disorders are most widely classified according to the International Classification of Sleep Disorders (ICSD). The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) largely parallels the ICSD. It distinguishes seven major categories of sleep disorder.
'Sleeplessness' (insomnia) is defined by sleep disturbance with a negative impact on daily functioning, occurring under appropriate conditions for sleep. Insomnia can be unspecified or classified as short-term (often related to a significant stressor) or long-term / chronic.
Other specific sleep disorders include sleep-related breathing disorders (e.g. central or obstructive sleep apnoea disorder), central disorders of hypersomnolence (excessive daytime sleepiness, e.g. narcolepsy) and parasomnias, which are undesirable physical events (movements, behaviours) or experiences (emotions, perceptions, dreams) that occur during sleep (or when entering into or waking from sleep), such as sleep walking.

Making note of the patient's history with sleeping is the main instrument used when making a diagnosis. Some specific sleep disorders are diagnosed after additional specialist investigations in secondary care.

Treatment of sleeplessness includes education and behavioural advice. Treatment of (short-term) sleeplessness is preferably non-medicinal and focused on the trigger, although medication may help to address interference with daytime functioning and anxiety about sleeplessness. Cognitive behavioural therapy is a treatment option for (chronic) sleeplessness.
Management of specific sleep disorders may be initiated by a specialist (e.g. pharmacotherapy).

2 How is sleep disturbance recorded in FaMe-Net?

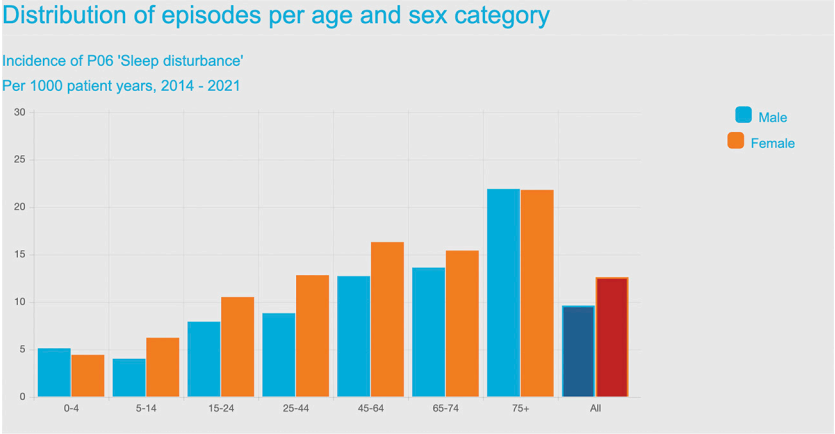
Sleep disturbance and sleep disorders are coded P06, as long as the sleep disturbance is a health problem in itself and does not occur in the context of another health problem, such as depression. P06 is a symptom diagnosis. According to the ICPC classifica-

tion, symptom diagnoses are coded when health problems cannot be classified more accurately at the level of a disease diagnosis. To classify a health problem with P06 it is not necessary but possible that any of the specific sleep disorders has been diagnosed. The ICPC code does not distinguish between non-specific 'sleep problems' and a specific 'sleep disorder'. This would be possible with additional data extractions using the ICD-10 subclassification.

P06 includes, for example, 'obstructive sleep apnoea syndrome', 'nightmares' and 'sleep-walking'. 'Jetlag' is coded separately as A88 (adverse effect physical factor).

3 Epidemiology of sleep disturbance in FaMe-Net

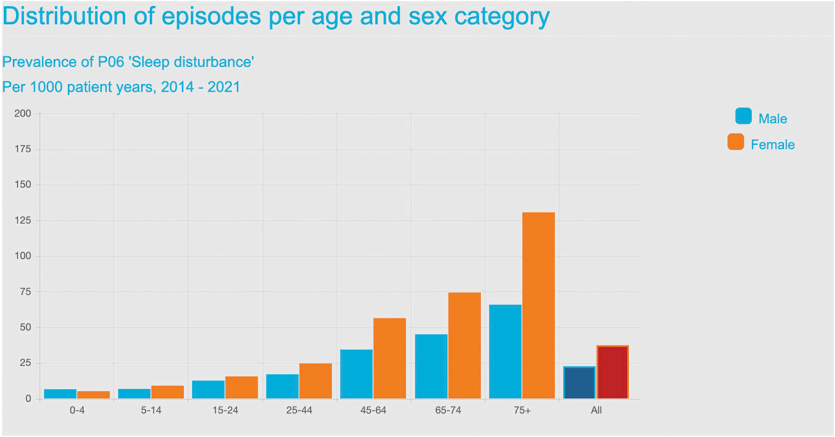
The incidence of sleep disturbance (P06) is 11.1 per 1000 patient years, meaning 11 new diagnoses of sleep disturbance among 1000 patients in a year. Link/Figure 1



The prevalence of sleep disturbance is 30.2 per 1000 patient years, meaning that per 1000 patients per year, 30 individual patients seek help from their GP for a known or a new sleep problem, including requests for repeat prescriptions. Link/Figure 2

Figure 1

Figure 2



Incidence and prevalence rise with increasing age. 'Sleep disturbance' is recorded most often among patients aged 75+. In this group, the prevalence exceeds 100 per 1000 patient years. Sleep disturbance is ranked as the 11th most prevalent condition for which patients aged 75+ most frequently contact their GP about. Link/Table 3

The prevalence of sleep disturbance as a health problem is higher among women than among men in all age groups, except in the youngest children. The sex difference in prevalence is highest in the 75+ age group, with double the rate for women when compared to men. Remarkably, in this oldest group (75+) the *incidence* (the occurrence of a *new* episode of sleep disturbance) is not more common among women than among men. Sleep disturbance presented to the GP by older women is typically an existing / recurring (not a new) problem. The higher prevalence compared to incidence in all patient groups indicates that sleep disturbance often requires repeated GP attention throughout the years.

4 Which initial RFEs do patients with sleep disturbance present to their GP?

Patients with a diagnosis of sleep disturbance (P06) generally present 'sleep disturbance' (P06) as their reason for encounter (RFE). Followed by a request for medication (*50), these are the most common RFEs, occurring in the majority of episodes of sleep disturbances. Link/Table 4 Other RFEs include tiredness (A04), a request for advice (*45) or being sent by someone else (*65). In older patients, the RFE request for medication (*50) increases but remains in the second position of RFEs.

5 How do FaMe-Net GPs act?

Prescription of medication is a common intervention in episodes of sleep disturbance, occurring in 73% of episodes per year. Other interventions occur less frequently. Sometimes 'therapeutic counselling / listening' is recorded as intervention by the GP. Link/Table 5

Table 3 Table 4 Table 5

The percentage of patients experiencing an episode of sleep disturbance receiving a prescription is highest among the older population. Link/Table 6
Prescriptions are mostly benzodiazepines but also include melatonin, antidepressants and, occasionally, antipsychotics (ATC class N05AH). Link/Table 7

Referrals to secondary care occur mainly to pulmonology, neurology and otorhinolaryngology. Link/Table 8 Primary care referrals are made occasionally and include physical therapy and psychology. Link/Table 9 In the Netherlands, training by registered exercise therapists ('cesar therapists') may include qualified therapy for sleep disturbance. FaMe-Net records these referrals under 'physical therapy'.

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/slaapproblemen-en-slaapmiddelen#volledige-tekst (2014)
Judd BG, Sateia MJ. Classification of sleep disorders. In: UpToDate, Harding SM Eichler AF (Eds), UpToDate, Waltham, MA, 2023

Table 6 Table 7 Table 8 Table 9

Dementia (P70)

CHANTAL HENSENS-WIJNEN

1 Clinical course of dementia

Dementia is a neurodegenerative disorder characterised by a decline in cognition, affecting two or more of the following domains: the ability to store and remember new information (learning and memory); language functions; reasoning, judgment and performing complex tasks (executive functioning); perceiving and processing spatial information; behaviour and personality. The decline in cognitive functioning interferes with daily functioning and cannot be explained by a delirium or depression.

The most common form of dementia in older adults is Alzheimer's disease (AD). The hypothesis is that it is caused by beta-amyloid plaques in the brain which disturb the communication between braincells. MRI imaging shows atrophic changes in the hippocampus to begin with, followed by changes throughout the cortex. Alzheimer's disease typically progresses slowly, over months and years and the most common symptom is memory problems. Language issues, executive functioning and orientation problems also commonly exist in this disease. The second most common form of dementia is vascular dementia due to cerebrovascular damage. Because both small and large vessels can be affected, symptoms can vary and fluctuate widely. In elderly patients, mixtures of AD and vascular dementia are not uncommon. Rarer causes of dementia are Lewy body dementia and frontotemporal dementia.

Mild cognitive impairment (MCI) is a state in which someone might have (objective) cognitive impairments but preserved daily functioning. Some subtle changes in cognition may occur in normal ageing. MCI can be a precursor to dementia but, in over 50% of patients, this is not the case. It is not possible to reliably predict which patients with MCI will develop dementia.

The diagnostic process can be performed by the GP or in consultation with a geriatric specialist, if needed. Hetero-anamnesis is essential but the diagnosis cannot be established without repeated consultations with the patient themselves. Diagnosis requires objective assessment of cognitive functioning. Commonly used instruments are the Mini Mental State Examination (MMSE) and the clock drawing test. The RUDAS test may also be considered. Physical examination is aimed at signs indicative of dementia (e.g. head turning sign, actions during dressing and undressing, recognition of objects in the room; pay attention to a patient's personal care) and / or signs of other causes for memory problems (delirium, depression, psychosis, subdural haemorrhage). More extensive

(neurologic) investigation and blood tests are performed on indication. Routine imaging is not recommended.

Providing information about the diagnosis and prognosis to the patient and their caregivers is important once dementia is diagnosed. Case-management and personal guidance to the patient and caregivers should be offered. In the Netherlands, dementia case-managers are regionally available.
The effects of non-medicamental therapy, such as occupational or movement therapy are uncertain but these therapies may improve the patients' daily routine and well-being. Day-care and other non-medicamental options may also be supportive to a patient's caregivers. Part of the education offered to patients and their caregivers may be to explain that treatment with anticholinesterases is not effective. An individual care plan can help clarify and prioritise problems. It can also help to get an overview on the (in)formal caregivers involved and align actions.

Referral may be helpful in case of diagnostic uncertainty (e.g. symptoms at a younger age or a suspected rare cause of dementia), in case of (psychiatric) comorbidity, problematic behaviour or in case of legal incapacity and involuntary care.

2 How is dementia recorded in FaMe-Net?

In ICPC-2, dementia is coded P70. Memory disturbance, including mild cognitive impairment is coded P20.

3 Epidemiology of dementia in FaMe-Net

Dementia is a disease of the elderly. It has an incidence of 0.7 per 1000 patient years (less than one new diagnosis per 1000 patients per year). New diagnoses in patients under the age of 65 are rare. Among patients aged 65-74, the incidence is 1.5 per 1000 patient years. Over the age of 75, the incidence is 12.2 per 1000 patient years. Link/Figure 1

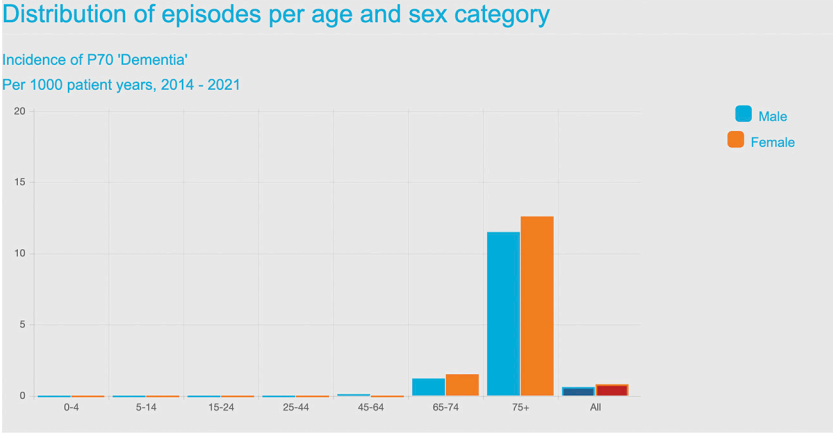
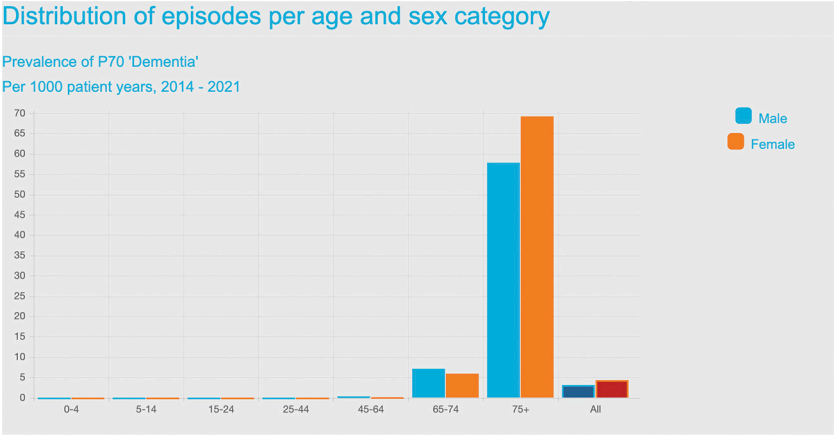


Figure 1 Figure 2 Table 3

The prevalence of dementia is 3.7 per 1000 patient years. In the age group 75+, the prevalence is 64.4, meaning that among 1000 patients aged 75+, 64 seek help from their GP for dementia during a year. Link/Figure 2



Dementia is ranked 26th in the list of the most prevalent conditions among patients aged 75+. Link/Table 3
Its higher prevalence when compared to incidence indicates that dementia is a chronic disease requiring GP attention throughout the years.

4 Which initial RFEs do patients with dementia present to their GP?

The most common presented symptom of dementia is memory disturbance (P20) which is the initial reason for encounter (RFE) in 14% of all new episodes of dementia. More commonly, the initial RFE is an administrative procedure (*62), which might imply (the request for) some note or declaration, or the problem is brought to the attention by someone else (*65), for example, a patient's partner or child. These are RFEs in 21% and 20% of new episodes of dementia, respectively. Link/Table 4
The GP sometimes raises the topic (*64, in 13%). This is more common in women with dementia (Link/Table 5), whereas in men, an administrative procedure and initiation by someone else are more common reasons for encounter. Link/Table 6 A possible but speculative explanation could be that men with dementia are more likely than women with dementia to be surrounded by concerned loved ones (informal carers) who raise the issue. Women with dementia sometimes present with a request for medical examination (e.g. cognitive testing, *31). In younger patients with dementia, the initial RFE is most commonly memory disturbance (P20, in 30% of episodes), suggesting that patients themselves experience symptoms and raise the issue, but the absolute numbers are very small. Link/Table 7

Table 4 Table 5 Table 6 Table 7

5 How do FaMe-Net GPs act?

Prescription of medication (*50) occurs in 33% of episodes of dementia. Other common interventions apart from health education (*45) and medical examination (*31) are referral to (*66) and consultation with (*46) primary care health providers (in 27% and 20% respectively) and referral to (*67) and consultation with (*47) specialists in secondary care (in 18% and 9% of the episodes, respectively). Administrative interventions (*62) are also common (19%). Blood tests (*34) occur in 15% and therapeutic counselling / listening (*58) in 9%. All percentages are calculated per calendar year. Link/Table 8 This variety of interventions reflects the substantial workload for GPs in the care for patients with dementia.

Prescribed medication concerns mostly anti-dementia drugs such as anticholinesterases (N06D), followed by antipsychotics (N05A). Other prescribed medication includes antidepressants, vitamins, anxiolytics and sedatives. Link/Table 9

Referrals to primary care providers are commonly to an 'other' or unknown care provider (in 15%, annually) – probably the dementia case-manager in most cases. Other primary care referrals involve occupational therapy, physical therapy, home care and elderly care medicine. Link/Table 10 Secondary care referrals are mainly to geriatric medicine (in 8%) and to psychiatry. Link/Table 11 The information on this website does not make it possible to distinguish the specialities that are consulted (without referral) in primary (*46) or secondary care (*47). This would be possible in additional data extractions.

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/dementie#volledige-tekst (2020)

Table 8 Table 9 Table 10 Table 11

Depression (P76)

TIM OLDE HARTMAN

1 Clinical course of depression

'Depression' is often used to refer to a 'depressive disorder' but the term may also refer to 'depressive symptoms'. 'Depressive disorder' comprises a constellation of symptoms and signs. The DSM-5 outlines criteria to diagnose a depressive disorder, which should include either depressed mood or loss of interest or pleasure in (almost) all activities, or both of these 'core symptoms', lasting at least two weeks. Other symptoms may include: fatigue or loss of energy; weight loss or gain, or a change in appetite; a slowing down of thinking and a reduction of physical movement; (inappropriate) feelings of worthlessness or guilt; indecisiveness or impaired thinking and concentration or recurrent thoughts of death or (plans for) suicide. Daily functioning is impeded in patients with a depressive disorder.

'Depressive symptoms' or 'depressed feelings' merely describe a mood state without specifying the duration or co-occurrence of other symptoms. Depressed feelings can be described as feelings of sadness, emptiness, discouragement or hopelessness and may be a normal reaction to circumstances. They can also occur as part of a specific psychopathological disorder other than depression (e.g. anxiety disorder, psychosis). Depressive disorder often includes physical symptoms and can occur without a specific trigger, although (recent) stressful events appear to be a risk factor.

When patients seek help from their GP with depressive symptoms as their main problem but criteria for a 'depressive disorder' are not met, the problem will be classified as 'depressed feelings'. A 'depressive disorder' will be classified when the criteria are met and cannot be (more appropriately) attributed to another disorder, such as substance abuse.

Risk factors in developing a depressive disorder can be divided into three categories. First, internalising (emotional) factors, such as neuroticism or low self-esteem form a risk factor. A previous depressive disorder or early-onset anxiety disorder also increases the risk for a new 'depression'. Secondly, externalising (behavioural) factors are a risk factor, such as substance abuse and / or a behavioural disorder. Genetics seem to play a role in these two categories. The third category consists of adverse factors, such as trauma during childhood or adulthood, stressful life-events, parental loss, low parental warmth, divorce or marital problems, low social support and low education.

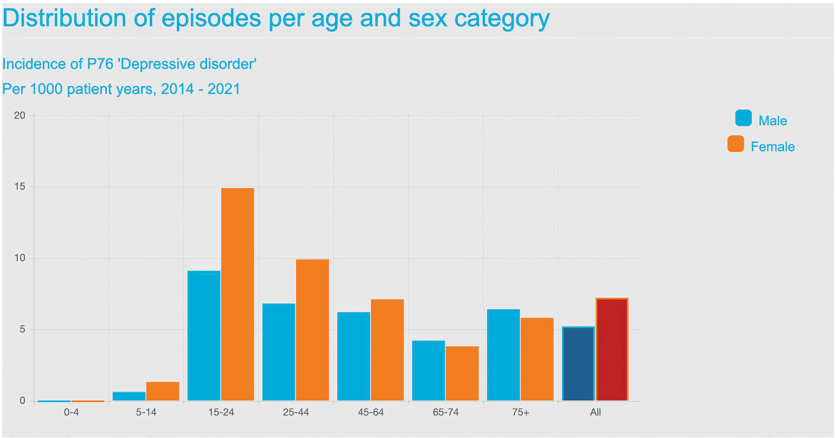
Treatment includes patient education and advice on how to structure the day and on activity planning. Psychological treatment can be helpful if depressive symptoms are persistent, or if a depressive disorder is present. In a (serious) depressive disorder, psychotherapy (more intensive talk therapy aimed at more severe depression, carried out by specialised psychotherapists) and / or medication with antidepressants may be indicated. Sometimes, referral is needed. Patient participation is essential and it is recommended to discuss the treatment options with the patient. Finally, a good doctor-patient relationship can, in itself, be supportive.

2 How is depression recorded in FaMe-Net?

In ICPC-2, depression ('depressive disorder') is coded P76. The symptom diagnosis of 'depressed feelings' is coded P03.

3 Epidemiology of depression in FaMe-Net

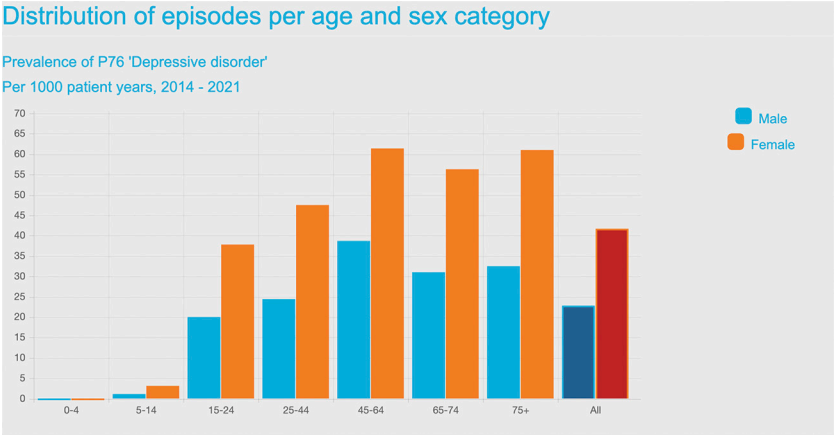
The incidence of depressive disorder (P76) is 6.2 per 1000 patient years, meaning that in a practice with 1000 patients, the diagnosis 'new depressive disorder' is made six times in a year. New diagnoses are made more often in women than in men and the incidence is highest between 15 and 44 years of age. Link/Figure 1



The incidence of depressed mood (P03) increases over time (2014-2021). The mean incidence is 7.3 per 1000 patient years. Link/Figure 2 Over the years GPs have tended to diagnose 'depressed mood' more often than a 'depressive disorder'.

Depressive disorder (P76) has a prevalence of 32.5 per 1000 patient years, meaning that among 1000 patients in a year, 33 individual patients seek help from their GP for depressive disorder. The prevalence of depressive disorder increases with age until 65, then remains quite stable. Link/Figure 3

Figure 1 Figure 2 Figure 3 Table 4



It is the twelfth most common condition for which patients have contact with their GP during a year. Link/Table 4
The higher prevalence compared to incidence indicates that a depressive disorder often requires ongoing attention from the GP in the years after the initial diagnosis.

4 Which initial RFEs do patients with depression present to their GP?

The most common initial reason for encounter (RFE) for depressive disorder is feeling depressed (P03). However, depressive disorder (P76), a request for a prescription (*50) or a referral (*66), as well as feeling anxious (P01) are other frequently presented RFEs. Link/Table 5

5 How do FaMe-Net GPs act?

In 65% of episodes of depressive disorder (P76) medication is prescribed (Link/Table 6), whereas in only 25% of episodes of depressed feelings (P03) is medication prescribed. Link/Table 7 The percentage of prescriptions for depressive disorder (P76) is lower in patients of 25-44 years (57%) than in patients of older age (75%). Link/Table 8, Link/Table 9

Table 5 Table 6 Table 7 Table 8

GPs most commonly prescribe SSRIs (N06AB) to patients with depressive disorder (in 38% of episodes, Link/Table 10). Prescription of SSRIs occurs only 13% in episodes of depressive symptoms (P03). Link/Table 11

Other commonly prescribed medication types for depressive disorder (P76) are other antidepressants (N06AX, in 14%, e.g. mirtazapine, venlafaxine), various types of benzodiazepines and tricyclic antidepressants (N06AA, in 6%).

With regard to referrals, in 14% of episodes of depressive disorder (P76) patients are referred to a psychologist (Link/Table 12), whereas in 9% of episodes of depressive disorder patients are referred to a psychiatrist. Link/Table 13

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/depressie#volledige-tekst (2022)

Diagnostic criteria DSM-5: www.psycom.net/depression/major-depressive-disorder/dsm-5-depression-criteria (2022)

Table 9

Table 10

Table 11

Table 12

Table 13

Mental exhaustion / burnout (P78)

SUZANNE LIGTHART

1 Clinical course of mental exhaustion / burnout

Mental exhaustion, neurasthenia ('surmenage') and burnout are terms that have been used interchangeably throughout the years, with variations in their definition and use. Generally, these terms refer to the inability to cope with chronic psychological stress, mainly at work (but not limited to work) because of insufficient resources to meet (work) demands.

The diagnosis is not part of the DSM classification and there are no strict diagnostic criteria. Treatment recommendations are mainly based on practical experience.

The 2018 Dutch NHG guideline states that being 'overworked' or 'mentally exhausted' (in Dutch, *'Overspanning'*) can be diagnosed when four criteria are met. The first (1) is having at least three of the following stress symptoms: fatigue, disturbed sleep, irritability, lability, not being able to deal with busy environments, excessive worrying, feeling pushed, concentration problems and forgetfulness. This may lead to (2) (feelings of) loss of control in daily living and (3) malfunctioning. Furthermore (4), these symptoms cannot be attributed to a psychiatric disease.

Burnout is considered a severe form of mental exhaustion / overwork when these symptoms persist for at least six months and feelings of fatigue / exhaustion are in the forefront. We refer to all diagnoses with 'mental exhaustion' because it's not possible to distinguish mental exhaustion from burnout within the FaMe-Net data.

In the course of mental exhaustion / burnout, three phases are distinguished. In the first (crisis) phase, rest and acceptance are important, with practical advice on how to structure the day. In the second phase, the problem and possible solutions are defined and discussed, followed by the third phase in which the patient can try to implement possible solutions and find a new balance. In the treatment phase, the GP can collaborate with the mental health nurse in general practice (in Dutch, '*poh-ggz*') and an occupational health physician. Interventions such as mindfulness or coaching may help. In complex cases, the help of a psychologist might be needed or, in occasional cases, a referral to secondary care is warranted.

2 How is mental exhaustion / burnout recorded in FaMe-Net?

In ICPC-2, Neurasthenia ('surmenage') / mental exhaustion is coded P78, which includes (the more severe) burnout. However, 'burnout' can alternatively be coded P29 ('other psychological symptoms / complaints') with an ICD-10 code specifying burnout (Z73.0, 'Problems related to life-management difficulty'). This means that using only ICPC-2 data is insufficiently specific for studying all episodes (and / or only episodes) of 'burnout'. Additional data extractions using ICD-10 subclasses would be possible.

Symptom diagnoses such as P01, 'feeling anxious, nervous, tense', or P02, 'acute stress reaction', may be recorded if the problems cannot be classified as 'mental exhaustion' (P78). If problems are (only) related to the workplace but cannot be classified as 'mental exhaustion' (P78), the symptom diagnosis Z05 ('work problem') can be coded.

3 Epidemiology of mental exhaustion / burnout in FaMe-Net

The incidence of neurasthenia / mental exhaustion (P78) is 7.2 per 1000 patient years, meaning that out of 1000 patients in a year, seven patients contact their GP with a new episode of mental exhaustion. New diagnoses are made more often in women (9.3) than in men (5.0 per 1000 patient years) and the incidence is highest between 15 and 64 years (which corresponds with those ages at which people are engaged in a 'working life'), with the peak between 25 and 44 years (13.3 per 1000 patient years), followed by the 45-64 age group. The incidence increases slightly over time and is more pronounced in women than in men. Link/Figure 1

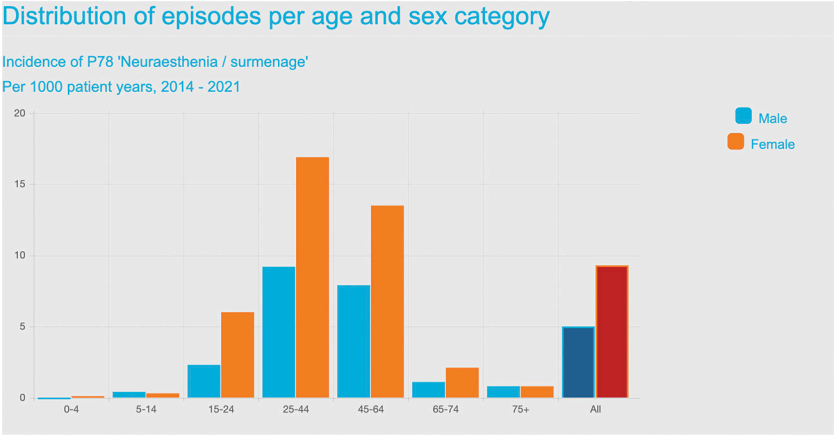


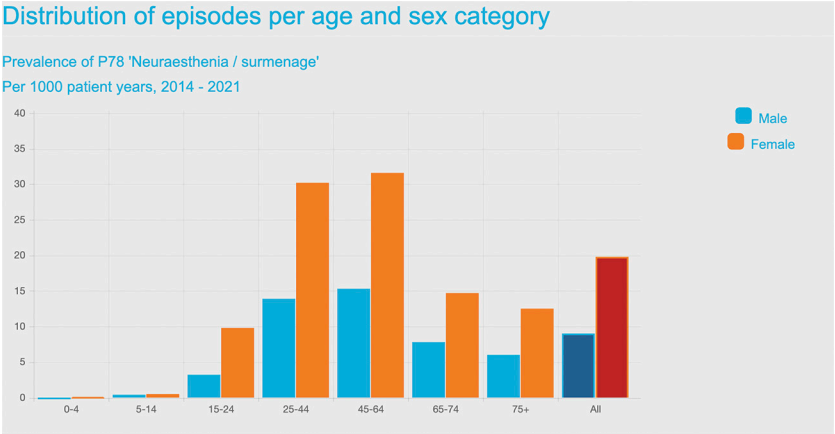
Figure 1 Figure 2 Figure 3

'Other psychological symptoms / complaints' (P29), which may include burnout, have an incidence of 4.9 per 1000 patient years, again higher in women than in men with the highest incidence in the 15-24 and 25-44 age groups. Link/Figure 2

The incidence of P01 (Feeling anxious, nervous, tense) is 12.6 per 1000 patient years which presents also more often in women (16.7) than in men (8.5 per 1000 patient years). Link/Figure 3 For an 'acute stress reaction' (P02) the incidence is 2.4 per 1000 patient years (3.1 in women and 1.8 in men).

Link/Figure 4 The incidence of work problems (Z05) is also 2.4, but with smaller differences between men (2.2) and women (2.7 per 1000 patient years) and mainly occurring in the 25-64 age group. Link/Figure 5

Neurasthenia / mental exhaustion (P78) has a prevalence of 14.5 per 1000 patient years, meaning that out of 1000 patients in a year, 15 individuals seek help from their GP for this problem. Again, there is a clear sex difference: women are twice as likely to seek help for P78 as men. Link/Figure 6



The prevalence of 'other psychological symptoms / complaints' (P29) is 8.2 per 1000 patient years.

The higher prevalence number compared to incidence number of mental exhaustion (P78) indicates that this episode often requires GP attention for a longer period than one calendar year. The same applies to P29.

4 Which initial RFEs do patients with mental exhaustion / burnout present to their GP?

The most common initial reason for encounter (RFE) for mental exhaustion / burnout is RFE P78 ('neurasthenia / mental exhaustion', in 34%), meaning that many patients recognise and name 'mental exhaustion' as the

Figure 4 Figure 5 Figure 6 Table 7

problem on initial presentation. This implies that a proportion of patients (or their family members / colleagues) are well capable of defining the (origin of the) problem at the moment they visit their doctor – a problem that often evolves over months or years. However, the majority of patients initially present with other (mental or physical) problems. In 14%, feeling anxious (P01) is the initial RFE, followed by fatigue (A04), depressive feelings (P03) and acute stress reaction (P02). Link/Table 7 In the remaining cases, a variety of problems (e.g. sleep problems (P06), headache (N01), palpitations (K04), chest symptoms (L04) and dizziness (N17)) are recorded as RFEs.

5 How do FaMe-Net GPs act?

In many episodes of mental exhaustion / burnout (P78, in 43%) the GP records the intervention 'therapeutic counselling' (*58), meaning that the GP takes time to listen to, coach and advise the patient. Other common interventions include medical examination (*31, in 38% per year), which can involve both psychiatric and somatic examination (auscultation of heart or lungs, pulse and blood pressure measurement) and providing education and advice (*45, in 31%) (i.e. less extensive compared to 'therapeutic counselling'). Link/Table 8 In about a quarter of the episodes per year medication is prescribed (*50), mostly benzodiazepines and SSRIs. Link/Table 9 Referrals to primary care professionals (*66, in 23% of episodes) are more common than referrals to secondary care (*67, in 6% per year). Referrals to primary care mainly involve psychology (in 16%) or physical therapy (in 4%) (Link/Table 10), and referrals to secondary care involve psychiatry (in 2%) or psychotherapy (in 2%). Link/Table 11

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/overspanning-en-burn-out#volledige-tekst (2018)

Table 8 Table 9 Table 10 Table 11

Attention deficit hyperactivity disorder (ADHD) (P81)

FLORIS VAN DE LAAR

1 Clinical course of ADHD

Attention Deficit Hyperactivity Disorder (ADHD) is a condition affecting cognitive and behavioural functioning, leading to hyperactive behaviour and / or difficulties in concentrating. It originates in childhood, although sometimes it isn't diagnosed before adulthood. ADHD often leads to problems in school or social functioning and may also affect emotional functioning. The aetiology of ADHD is unclear, but genetics play a role. Traumatic experiences at a very young age and low socio-economic status increase the risk of developing ADHD.

Impaired daily functioning is an obligatory criterion for diagnosis. The diagnosis should be based on extensive consultations, including developmental history, several observations and information from school or other organisations. This is usually done by a psychologist or psychiatrist, although a trained GP can also make the diagnosis.

The DSM-5 distinguishes the ADHD subtypes 'combined type', including both hyperactivity and inattention, and two less common subtypes, 'predominantly inattentive' (which is also named ADD) and 'predominantly hyperactive-impulsive' (in which hyperactivity and / or impulsivity predominates).

Treatment consists of the education of patients, caregivers and sometimes teachers. In addition, many cognitive-behavioural programmes exist in various forms, for example, those targeting individuals, groups, teachers, families, and so on. Psychostimulant drugs (e.g. methylphenidate) are also an important treatment option, either in addition to psychological interventions or as monotherapy.

Behavioural problems that do not meet the criteria for the diagnosis of ADHD are labelled (in children or adolescents) as 'behavioural symptoms', unless they occur as part of another condition, e.g. a psychiatric diagnosis (anxiety disorder, depression, oppositional defiant disorder) or a somatic condition (hearing or vision problems, medication side effects) and can be classified as such. In adults, 'other psychological symptoms' or

another symptom diagnosis may be used to classify the problems if a diagnosis of ADHD cannot be made.

2 How is ADHD recorded in FaMe-Net?

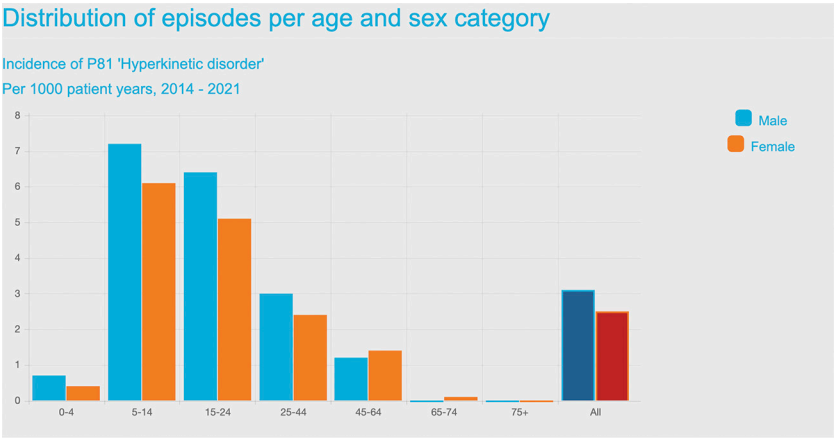
ADHD is recorded with the ICPC code P81, labelled 'hyperkinetic disorder'. This code covers all variants of ADHD, including the 'predominantly inattentive' subtype.

ICPC code P22 is used for behaviour symptoms / complaints in children, and P23 for behaviour symptoms / complaints in adolescents.

'Other psychological symptoms / complaints' are coded P29.

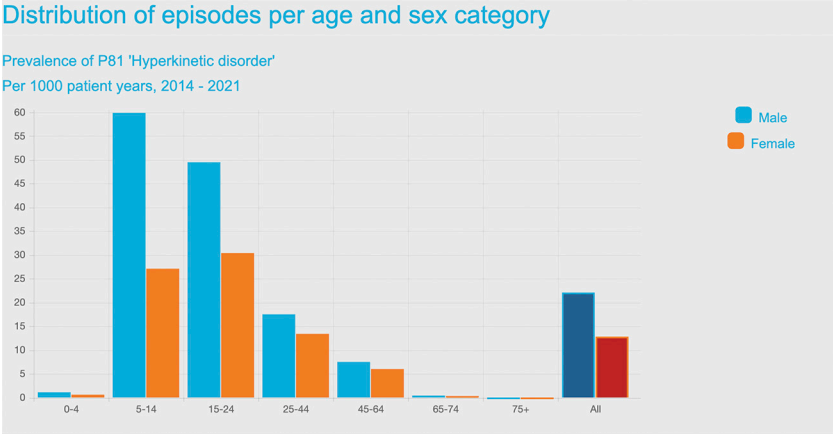
3 Epidemiology of ADHD in FaMe-Net

In general practice, ADHD is typically diagnosed in younger patients. The incidence of ADHD is 2.8 per 1000 patient years, meaning there are three new diagnoses per 1000 patients in a year. It is most often diagnosed in patients aged 5-14 and 15-24 years, followed by those in the 25-44 years group. Only occasionally is it diagnosed in patients younger than five or older than 44. The incidence has typically been higher among boys / men than among girls / women, but the trend chart shows that the gender difference in new diagnoses has been disappearing in recent years. Link/Figure 1



In girls, the inattentive type of ADHD (without the hyperactivity) is more common, which is often less obvious for teachers and parents. Probably, the diagnosis has gained attention and teachers and parents have become more aware of it, both in girls and in boys. This is also reflected in the prevalence numbers. In the entire data period (2014-2021), the prevalence of ADHD is 17.3 per 1000 patient years. This means that out of 1000 patients, 17 contact their GP for ADHD each year. Prevalence is highest in the age group 5-14 (44.1 per 1000 patient years) and 15-24 years, followed by the age group 25-44 years.

The prevalence among boys / men is substantially higher than among girls / women, although they have come closer together in recent years. Link/Figure 2



The prevalence of ADHD has increased dramatically over the years. In data (not shown on the website) from 2005-2007, the prevalence of ADHD was only 0.3 per 1000 patient years. Data from before 2014 is available on request.
The higher prevalence relative to incidence indicates that ADHD requires GP attention over several years.

4 Which initial RFEs do patients with ADHD present to their GP?

In most cases patients or caregivers present a suspected diagnosis of ADHD (P81) – "I think I / they have ADHD". This is the initial RFE in 26% of episodes. Other common initial RFEs are a request for a referral to a psychologist (*66, in 13%) or psychiatrist (*67, in 9%), or a request for medication (*50, in 13%). Link/Table 3 No obvious differences among the sexes or age groups exist. Common symptoms presented as RFEs are problems with memory (P20) or feeling nervous / stressed (P01). In children and adolescents, instigation by someone else (*65) is the RFE in 5% of episodes, probably the teacher. Link/Table 4

5 How do FaMe-net GPs act?

In 11% of all ADHD episodes, referrals are made to a (paediatric) psychologist (Link/Table 5) and in 13%, to specialist care. Link/Table 6 Secondary care referrals mostly involve a psychiatrist and sometimes a psychotherapist or paediatrician. Link/Table 7 Primary care referrals to professionals other than a psychologist occur occasionally and include an (ortho)pedagogue. Link/Table 5 It should be noted that these percentages are calculated per calendar year and not on the basis of unique episodes, which makes the referral rates seem relatively low. Com-

Table 5 Table 6 Table 7 Table 8

bining annual referral rates with the prevalence / incidence proportion suggests that many patients with an episode of ADHD will be referred to a primary or secondary care provider at some point in the course of the disease.

In 69% of episodes of ADHD, medication is prescribed by the GP. Link/Table 6 The most commonly prescribed medication types are centrally acting sympathicomimetics (e.g. methylphenidate), in 64%. Other prescriptions include melatonin receptor agonists (in 4%) and other antidepressants (in 2%). Link/Table 8 Especially in the younger age group (5-25 years), medication (specifically psychostimulants) is more often prescribed to boys (Link/Table 9, Link/Table 10: 70% medication, 67% psychostimulants) than girls (Link/Table 11, Link/Table 12: 65% medication, 61% psychostimulants).

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/adhd-bij-kinderen#volledige-tekst (2014)

Krull KR, Chan E. Attention deficit hyperactivity disorder in children and adolescents: Clinical features and diagnosis. In: UpToDate, Augustyn M, Blake D (Eds), UpToDate, Waltham, MA, 2023

Rhinosinusitis (R75)

TIM OLDE HARTMAN

1 Clinical course of rhinosinusitis

Sinusitis is caused by the obstruction of the paranasal sinuses. Swelling of the mucosa obstructs the ostium of the ostiomeatal complex, which is continuous with the nasal mucosa and the mucosa of the sinuses. This impedes the drainage and ventilation of the sinuses, causing pressure and pain and creates a breeding ground for micro-organisms. Generally, sinusitis starts with a viral infection of the nasal mucosa. Rhinosinusitis refers to inflammation in the nasal cavity and paranasal sinuses. Bacterial superinfection in the sinuses is possible and more common in patients consulting the GP for their symptoms.
Usually, several sinuses are inflamed at the same time, with the maxillary sinus almost always being affected. Isolated inflammations of sinus frontalis, ethmoidalis and sphenoidalis are rare. Facilitating factors are anatomic variations (e.g. palatoschisis, previous surgery of the nose or sinuses), allergies and smoking.

Symptoms can be (unilateral) facial pain or pressure, pain or pressure in the sinuses (which increases when bending over), tooth or molar pain, affected smell and headache. The diagnosis can be made based on history taking and the presence of at least one of these symptoms, in addition to nasal congestion or purulent rhinorrhoea. Temperature might be subfebrile. It is not necessary for diagnosis to obtain pus from a sinus, or to prove sinusitis radiologically. Acute rhinosinusitis lasts less than four weeks.

Chronic rhinosinusitis is an inflammation of the paranasal sinuses and the linings of the nasal passages that lasts 12 weeks or longer. This may present abruptly, starting as acute sinusitis or nonspecific upper respiratory infection that fails to resolve, or it may develop slowly, over months or years. In adults, it is often accompanied by nasal drainage, nasal congestion, facial pain or pressure, and a reduction or loss of the sense of smell. Children with chronic rhinosinusitis may cough instead of having a diminished sense of smell. Three subtypes of chronic rhinosinusitis can be distinguished: a subtype with nasal polyposis, a subtype without nasal polyposis and allergic fungal rhinosinusitis.

The treatment of acute rhinosinusitis is focused on symptom relief. Analgesics play an important role, since pain seems to be the major nuisance and often negatively impacts daily functioning. Decongestants can provide relief for the nasal obstruction complaints. Antibiotics are commonly prescribed but often unnecessary, since they only have

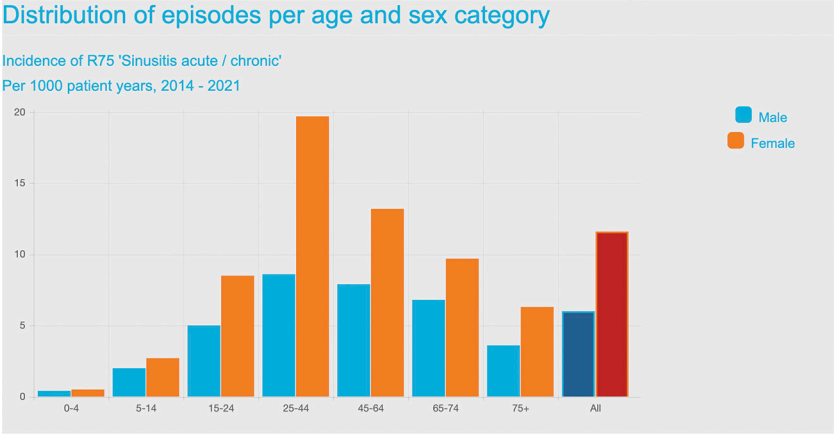
a small effect on recovery, while side effects and resistance may occur. In the context of the Dutch healthcare system, where continuous GP care is readily accessible and patients can return to the same GP (practice) in case of persistent or worsening symptoms, GPs can apply 'watchful waiting' and prescribe antibiotics at a later time if necessary. The Dutch Royal College of General Practitioners advises to prescribe antibiotics in exceptional cases only. Their guideline focuses on acute rhinosinusitis and provides no specific treatment advice for the chronic variant. International treatment recommendations for chronic rhinosinusitis include the use of intranasal corticosteroids and other options that can be performed after referral, e.g. endoscopic surgery.

2 How is rhinosinusitis recorded in FaMe-Net?

In ICPC-2, acute / chronic (rhino)sinusitis is coded R75. Based on the ICPC-2 data, the distinction between acute or chronic rhinosinusitis cannot be made.
'Headache' (N01), 'facial pain' (N03) or 'upper respiratory tract infection' (R74) can be coded when criteria of an acute / chronic rhinosinusitis are not met.

3 Epidemiology of rhinosinusitis in FaMe-Net

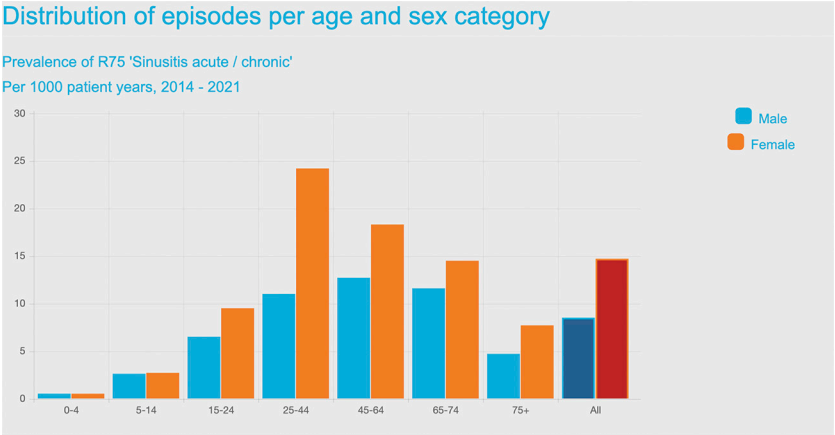
Rhinosinusitis has an incidence of 8.9 per 1000 patient years, meaning there are on average nine new diagnoses of rhinosinusitis per 1000 patients each year. The incidence is highest in the age group 25-44. Link/Figure 1



The prevalence of rhinosinusitis is 11.7 per 1000 patient years, meaning that among 1000 patients in a year, 12 persons seek help from their GP for rhinosinusitis. In the age group 25-44, the prevalence is highest (18.0 per 1000 patient years). Link/Figure 2

Figure 1

Figure 2



The numbers for women are almost double to those for men, both for incidence of rhinosinusitis (new diagnoses, Link/Figure 1) and for prevalence (affected persons, Link/Figure 2). The higher prevalence compared to incidence indicates that rhinosinusitis sometimes requires GP attention during more than one calendar year. Some episodes that run across the calendar year border may be chronic rhinosinusitis.

4 Which initial RFEs do patients with rhinosinusitis present to their GP?

The most common initial reason for encounter (RFE) for rhinosinusitis is 'rhinosinusitis' (R75), which means that the condition is easily self-diagnosed. Other frequent reasons for encounter are symptoms of the sinus (R09) and upper respiratory tract infection (R74). Link/Table 3 Headache (N01) is the most common RFE in patients younger than 25, who may less often recognise the symptoms from previous episodes. Link/Table 4

5 How do FaMe-Net GPs act?

The most common GP intervention coded for rhinosinusitis is the prescription of medication. In 73% of episodes, GPs prescribe medication during the episode of rhinosinusitis. A referral to a medical specialist is recorded in only 6% of the episodes of rhinosinusitis. Link/Table 5

It is interesting to know what specific medication is prescribed since, in most episodes of rhinosinusitis, 'some' prescription occurs. Intranasal corticosteroids (R01AD) are prescribed in 37% of episodes. Different classes of antibiotics are prescribed: tetracyclins (J01AA, including doxycycline), in 18%, penicillins (J01CA, including amoxicillin), in 16%; and macrolides (J01FA, including azithromycin), in 3%. Link/Table 6

The Dutch primary care guideline on rhinosinusitis was updated in 2014, stating that (1) antibiotics are not recommended in (single episodes) of rhinosinusitis, including in cases where the symptoms do not improve after 14 days, and (2) macrolides have no

Table 3 Table 4 Table 5 Table 6

place in the treatment of rhinosinusitis anymore due to resistance problems.

The FaMe-Net prescription data for rhinosinusitis show clearly declining percentages of prescribed antibiotics from 2015 onwards. It is possible to adjust the calendar years on the website to see prescription rates in a selected time period. Since 2016, penicillins have taken over the first position of prescribed antibiotic types from tetracyclins, in line with the 2014 guideline. Link/Table 7

The Dutch rhinosinusitis guideline furthermore advises to (3) consider intranasal corticosteroids only in prolonged or recurring episodes of rhinosinusitis. After 2014, the percentages of prescribed intranasal corticosteroids (R01AD) gradually increase, which may be related to the declining antibiotics prescription rates. Link/Table 7

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/acute-rhinosinusitis#volledige-tekst (2014)

Patel ZM, Hwang PH. Acute sinusitis and rhinosinusitis in adults: Clinical manifestations and diagnosis. In: UpToDate, Deschler DG, File TM, Givens F, Bond S (Eds), UpToDate, Waltham, MA, 2022

Holbrook EH. Chronic rhinosinusitis: Clinical manifestations, pathophysiology, and diagnosis. In: UpToDate, Peters AT, Deschler DG, Feldweg AM (Eds), UpToDate, Waltham, MA, 2023

Table 7

Tonsillitis (R76)

LIESBETH HUNIK

1 Clinical course of tonsillitis

Tonsillitis is an infection of the mucosa and parenchyma of the tonsils. The most common causative micro-organisms of an uncomplicated tonsillitis are viruses (e.g. coxsackievirus, respiratory syncytial virus) or bacteria (e.g. *Haemophilus influenzae*, *Streptococcus pneumoniae* and *Staphylococcus aureus*). Epstein-Barr virus (EBV) is the causative agent in 2% of cases. The beta-haemolytic *Streptococcus* group A subtype (that may also cause scarlet fever) used to be notorious for causing complications but this is less common nowadays.
A distinction between the viral and bacterial causes of tonsillitis cannot reliably be made in the office.

Patients with tonsillitis most often present complaining of a sore throat. Other cold-like symptoms are often present. In addition, the tonsils are swollen and red and there is exudate present. Lymph nodes in the neck region may be swollen and painful. Patients' temperatures can be (sub)febrile. Tonsillitis is a 'clinical' diagnosis and additional diagnostic tests are not necessary. It may occur in isolation or it may overlap with pharyngitis. Sometimes, the two conditions are referred to as 'pharyngotonsillitis'. The clinical picture of the Epstein-Barr virus infection is called 'infectious mononucleosis' and includes fever, pharyngitis (or pharyngotonsillitis) and lymphadenopathy.

Tonsillitis in most cases tends to last between seven and ten days, regardless of the pathogen. Treatment is focused on symptom relief with analgesics. Dutch GPs will apply 'watchful waiting', which is possible in the context of easily accessible and continuous GP care for everyone in the Netherlands, allowing patients to come back if symptoms persist or worsen. The Dutch College of General Practitioners advises against antibiotics, unless the patient is seriously ill or has an increased risk of complications. In these cases, small-spectrum antibiotics are advised.

Complications may occur when the inflammation expands to the tissue between the tonsil and pharyngeal muscle. This is called a peritonsillar cellulitis (also named peritonsillitis) or a peritonsillar abscess (when pus is present). It is difficult to differentiate between these diagnoses and if suspected, the patient should be referred to the otorhinolaryngologist, especially when the patient is very ill, immunocompromised, or has difficulty swallowing or opening the mouth. If this is not the case, the GP should prescribe a broad-spectrum antibiotic and frequently check on the patient. In the very rare case of an (imminent) upper airway obstruction, an emergency referral is needed.

In young children, 'cervical lymphadenitis' is a rare complication of tonsillitis in which the lymph nodes themselves get infected, usually with a *Staphylococcus* or *Streptococcus* bacteria. Broad spectrum antibiotics or referral are indicated in this case.

2 How is tonsillitis recorded in FaMe-Net?

Acute tonsillitis, including peritonsillar abscess, is coded 'R76' in ICPC-2. The symptom diagnosis 'throat symptom / complaint' (R21) is coded as such when the criteria of tonsillitis are not met (e.g. no abnormalities observed in the mouth region). A symptom diagnosis is more likely recorded in telephone or email consultations.

Upper respiratory tract infections (R74) may show overlap with tonsillitis and will be recorded if the clinical picture fits best to that diagnosis. If, along with a (mild) upper respiratory infection, an evident tonsillitis is present and requires intervention, GPs will probably identify tonsillitis as the primary diagnosis and classify it as such (R76). An isolated pharyngitis (without affected tonsils) is classified as 'R74'.

In addition, proven *Streptococcus* throat infection (e.g. scarlet fever) is coded 'R72' and proven infectious mononucleosis (caused by the Epstein-Barr virus) is coded 'A75'. This means that mild cases of scarlet fever and mononucleosis, in which no further testing is performed, will likely be coded 'R76' (when tonsils show signs of inflammation) or 'R74' (when symptoms mimic a common cold or pharyngitis). Finally, an acute (cervical) lymphadenitis is coded 'B70'.

3 Epidemiology of tonsillitis in FaMe-Net

The overall incidence of tonsillitis is 8.1 per 1000 patient years. Incidence of tonsillitis differs between age and sex groups. It occurs frequently under the age of 45 and is much less common in older age groups. Incidence is generally higher among females (9.6 per 1000 patient years, compared to 6.6 among men), with the highest incidence in females in the age group 15-24 years. Among boys and men, the incidence of tonsillitis is highest in the youngest age group (0-4 years), at 19.8 per 1000 patient years. Link/Figure 1

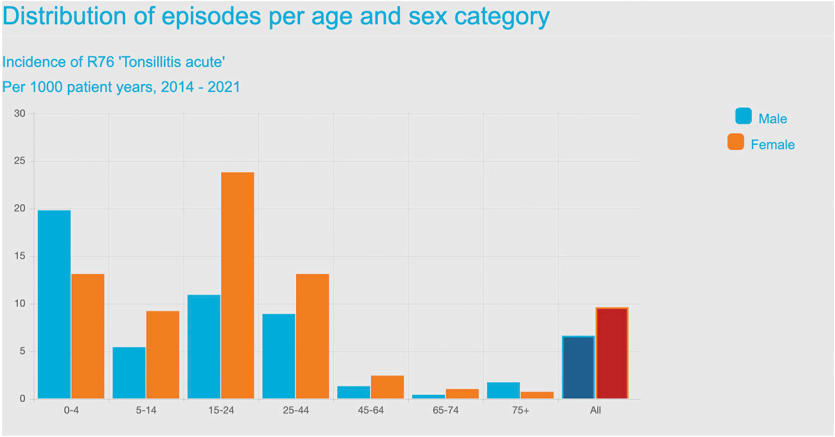
The prevalence of tonsillitis is 8.3 per 1000 patient years, meaning that among 1000 patients in a year, eight seek help from their GP for tonsillitis. The prevalence shows similar fluctuations among different age and sex groups as the incidence. Link/Figure 2

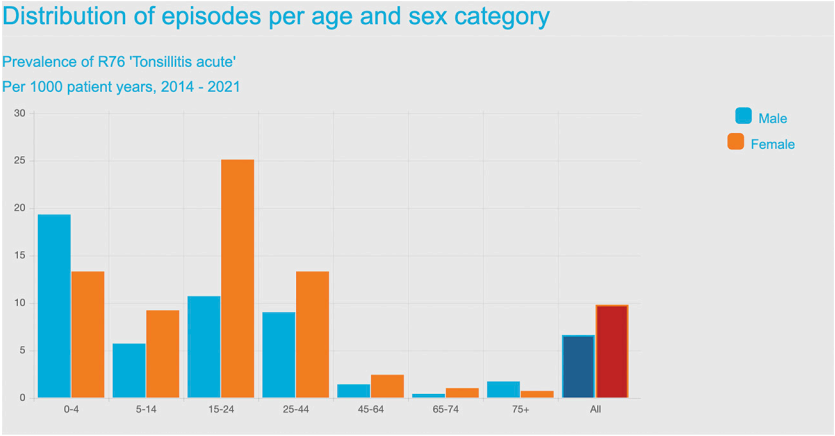
The similar incidence and prevalence rates reflect that tonsillitis is an episodic (acute) disorder.

The rolling three year averages graph shows a smoothened trend curve with an obvious decrease in the incidence and prevalence of tonsillitis in 2020, which was an effect of the COVID-19 pandemic.

The symptom diagnosis throat pain (R21) has an incidence of 13.3 per 1000 patient years. Link/Figure 3

Figure 1 Figure 2 Figure 3 Figure 4





Infectious mononucleosis (A75) has a low (0.7 per 1000 patient years) overall incidence, occurring mainly in the age group 15-24 years (2.6 per 1000 patient years for those aged 15-24 and is 3.8 among girls / women and 1.4 among boys / men). Link/Figure 4

A *Streptococcus* throat infection (R72) has become an uncommon diagnosis (with an incidence of 0.4 per 1000 patient years). Link/Figure 5

Acute lymphadenitis (B70) also has a low incidence rate (0.5 per 1000 patient years). Link/Figure 6

4 Which initial RFEs do patients with tonsillitis present to their GP?

The most common initial reason for encounter (RFE) for tonsillitis is throat symptom / complaint (R21), in 53% of all new episodes. This

Figure 5 Figure 6 Table 7

is followed by fever (A03), in 15%, and tonsillitis (R76) itself, in 10%, meaning that patients already believe the diagnosis is tonsillitis when the consultation starts. Link/Table 7
Fever (A03) is the most common RFE among children aged 0-4 with tonsillitis. Link/Table 8

5 How do FaMe-Net GPs act?

In 10% of episodes of tonsillitis (including peritonsillar abscess), a referral to the otorhinolaryngologist and, in rare cases, the paediatrician, occurs. Link/Table 9
In 61% of episodes, medication is prescribed. Link/Table 10 This concerns (small spectrum) beta-lactam sensitive penicillin (J01CE, e.g. pheneticillin), in 32%, (broad spectrum) penicillin combinations (J01CR, e.g. amoxicillin with beta-lactamase inhibitor), in 10%, and macrolides (J01FA, e.g. azithromycin, erythromycin), in 8% of episodes. Link/Table 11 Other prescribed drugs include NSAIDs (M01A, in 10% of episodes) or occasionally other analgesics. Link/Table 12 The percentage of prescriptions is higher among older patients with tonsillitis (81% in patients aged 45 and older). Link/Table 13 Percentages of referrals and antibiotic prescriptions may seem relatively high. Probably, this reflects GPs' classification habits, making 'tonsillitis' (R76) the most likely diagnostic label when a specific intervention is warranted for tonsillitis, but at the same time the patient has symptoms that could fit a diagnostic label of an 'upper respiratory airway infection' (R74).

Over the years, the percentage of annual prescriptions of antibiotics for tonsillitis has gradually decreased. Comparing the calendar years 2014-2015 (Link/Table 14) to 2016-2021 (Link/Table 15), it becomes clear that the prescribing of penicillin as a group (i.e. choosing four rather than five digits in the ATC classification, which classifies broad and small spectrum penicillin in one group) decreases from 46% (2014-2015) to 43% (2016-2021). Macrolide prescriptions also fell from 13%, in 2014-2015, to 7%, in 2016-2021. This decline in antibiotic prescription may be the result of the adjusted guideline for acute throat symptoms as published by the Dutch College of General Practitioners in 2015, advising restraint in prescribing antibiotics, which may have led to a gradual shift in GPs' prescribing behaviour. On the website, it is possible to modify variables, such as age group, sex, calendar period or, for prescriptions, the level of detail of medication classes, according to the ATC level, as required.

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/acute-keelpijn#volledige-tekst (2015)

Table 8 Table 9 Table 10 Table 11

Table 12 Table 13 Table 14 Table 15

COPD (R95)

ERIK BISCHOFF

1 Clinical course of COPD

Chronic obstructive pulmonary disease (COPD) is characterised by persistent airway symptoms and airflow limitation due to airway inflammation and irritation (chronic bronchitis) and / or alveolar abnormalities (emphysema). COPD is caused by significant exposure to noxious particles or gases. The main risk factor for developing COPD is tobacco smoking, but other environmental exposures, such as biomass fuel exposure and air pollution, may also contribute.

The most common airway symptoms are dyspnoea, a cough, and extensive sputum production, which may significantly impact daily life. Patients with COPD may experience exacerbations, periods of acute symptom worsening that require treatment with oral corticosteroids and / or antibiotics.
The diagnosis of COPD is made in patients over 40 years of age with respiratory symptoms, a relevant smoking history (more than 10 pack years), or other relevant exposure, and a persistent airflow limitation during spirometry testing after maximal bronchodilation (Z-score of the FEV1 / FVC ratio < -1.64). Usually, COPD is diagnosed by the GP.

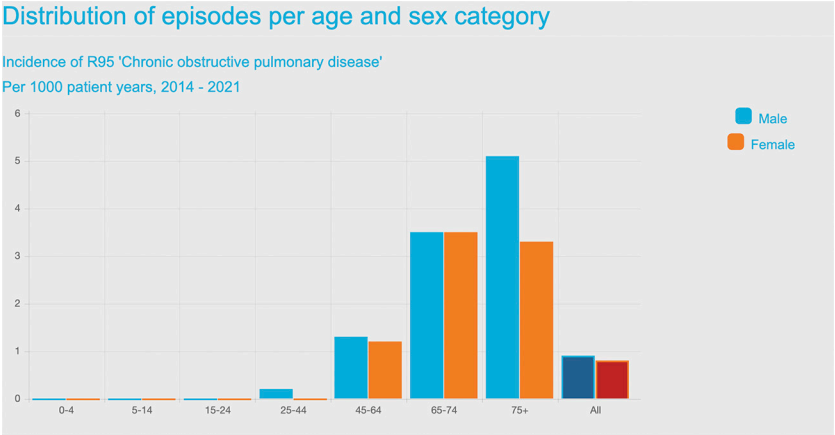
Management of COPD involves stop-smoking counselling, dietary advice to prevent being under or overweight, exercise advice, the prescription of inhaled bronchodilators, and regular monitoring of symptoms and limitations. In case of the insufficient effect of one long-acting bronchodilator, a second bronchodilator from the other group can be added. If patients show frequent exacerbations, inhaled corticosteroids can be prescribed. A combination of two different types of bronchodilators plus corticosteroid inhalators is called 'triple therapy'.

2 How is COPD recorded in FaMe-Net?

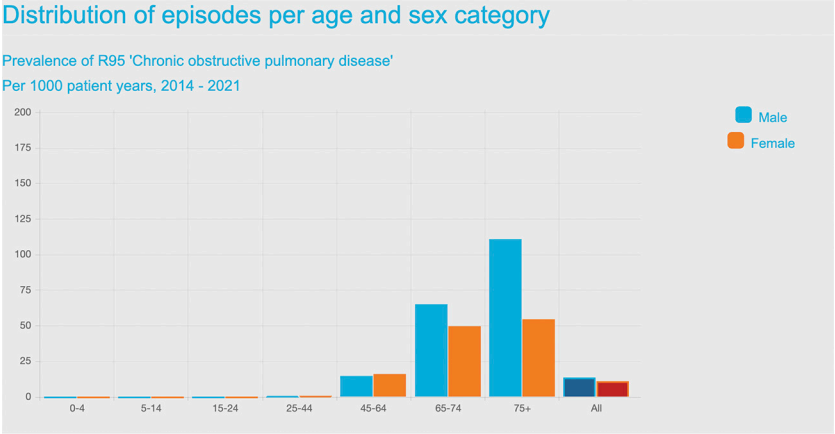
In ICPC-2, COPD (including chronic bronchitis) is recorded as R95. Exacerbations of COPD cannot be recorded separately within ICPC-2.

3 Epidemiology of COPD in FaMe-Net

The incidence of COPD is 0.8 per 1000 patient years. Incidence is highest in patients ≥ 75 years (4.1 per 1000 patient years) with more male than female patients being diagnosed (5.1 versus 3.3 per 1000 patient years in those aged 75^{+}). This means that, per 1000 patients aged 75^{+} in a year, four new diagnoses of COPD are made (five among men and three among women aged 75^{+}). The incidence of COPD has gradually decreased over the last years. Link/Figure 1



COPD has a mean prevalence of 12.0 patients per 1000 patient years, meaning that among 1000 patients in a year, 12 patients have COPD and sought help for COPD from their GP throughout the year. Among patients older than 65, more men than women have been diagnosed with COPD. The prevalence is highest in patients aged 75+ years (78.1 per 1000 patient years). Link/Figure 2



In patients aged over 65 years COPD is the 14th most commonly present condition in the GP patient population. Link/Table 3 The prevalence of COPD has decreased noticeably since 2014, meaning that the proportion of the patient population of GPs who have COPD and contact the GP for COPD has decreased. Link/Figure 2

The higher number of prevalence compared to incidence indicates that COPD is a chronic

disease, requiring continued GP attention after diagnosis.

4 Which initial RFEs do patients with COPD present to their GP?

The two most common symptoms as initial reasons for encounter (RFE) for COPD are shortness of breath (R02) and cough (R05). Link/Table 4 More female than male patients present with shortness of breath as the initial RFE: 27% of all new diagnoses in women (Link/Table 5) versus 16% in men (Link/Table 6). In men, a new diagnosis of COPD is more likely to start with self-suspected COPD (RFE R95) at initial contact (in 7%, compared to <1% in women) or, more commonly (in 22%), with an administrative procedure (RFE *62). This means that the diagnosis is for the first time reported in a specialist letter, or that the episode starts with a request for a letter / declaration. In women, RFE *62 is the initial RFE in 13% of episodes only.

5 How do FaMe-Net GPs act?

In one calendar year, in 78% of the episodes of COPD, medication is prescribed by the GP. Only in 7% of the episodes are patients referred to a specialist (Link/Table 7) throughout the year, generally to a pulmonologist. Link/Table 8 In 3% of the episodes, patients are referred to the physical therapist, in the course of one calendar year. Link/Table 9 These percentages may seem relatively low but note they are calculated per calendar year, not throughout the entire episode of COPD.

When prescribing medication, GPs mostly prescribe inhaled bronchodilators, such as anticholinergics and selective beta-2 adrenoreceptor agonists. Link/Table 10 Since 2015, the Dutch College of General Practitioners's COPD guideline recommends prescribing inhaled corticosteroids only to patients with two or more exacerbations or at least one hospital admission due to COPD in one year. This advice did not seem to affect the prescription behaviour of GPs as, since 2016, the percentage of prescriptions of inhaled corticosteroids as a single device or in combination with one or more bronchodilators (ATC codes R03AK, R03BA, and R03AL) is still as high as in previous years (50% in 2014-2015 (Link/Table 10) versus 51% in 2016-2021 (Link/Table 11), respectively). Since the introduction of so-called 'triple therapy' inhalers in 2017, the percentage of prescriptions for these inhalers (R03AL) has shown a tremendous increase, up to 25%, in 2021. Link/Table 12

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/copd#volledige-tekst (2021)

Table 5 Table 6 Table 7 Table 8

Table 9 Table 10 Table 11 Table 12

Asthma (R96)

ERIK BISCHOFF

1 Clinical course of asthma

According to the Global Initiative for Asthma (GINA), asthma is a respiratory disease that can be diagnosed by a history of characteristic respiratory symptoms such as wheezing, shortness of breath, tightness of chest and a cough that varies in intensity over time, along with variable expiratory airflow limitation. Asthma is usually associated with a respiratory response to direct and indirect stimuli such as exercise, exposure to allergens, irritants, weather changes or viral respiratory infections and a chronic inflammatory process in both the small and larger airways. Symptoms and airflow limitation may vary in time and intensity and may disappear with adequate treatment. During physical examination, the degree of dyspnea is evaluated and attention is paid to a possible wheeze and prolonged expiration. Variability in airflow limitation can be demonstrated by spirometry and forms an important condition for diagnosing asthma. Airflow limitation shows reversibility, i.e. an FEV_1 increase of >12% and 200 ml after using a bronchodilator during one visit, or variability, i.e. an increase in FEV_1 >12% and 200 ml between two visits.

Asthma is called a heterogeneous disease because it has several different phenotypes, i.e. clusters of clinical and / or pathophysiological features, which may require different treatment strategies. The most common phenotype is allergic asthma, which is often diagnosed in childhood. Allergic asthma is characterised by eosinophilic airway inflammation and responds well to treatment with inhaled corticosteroids. In non-allergic phenotypes of asthma, symptoms and airflow limitation are not caused by allergens but by other stimuli, such as (eosinophilic) inflammation (which may often present in combination with nasal polyps), exercise induced asthma, late-onset asthma or asthma with obesity. In case of phenotypes with only little eosinophilic inflammation (such as asthma with obesity) patients may have a limited response to inhaled corticosteroids. Patients with long-standing asthma may develop a persistent airflow limitation, most likely due to airway remodelling. Asthma is usually diagnosed by the GP and managed in primary care.

Treatment is aimed at achieving good asthma control, tailored to personal treatment goals. In other words, as few symptoms and as few exacerbations as possible, no restrictions in activities, and normal participation in social life. Not smoking and having a smoke-free environment are important measures against asthma. Inhaled medication is the basis of medication therapy and this includes inhaled corticosteroids (ICS) in most asthma

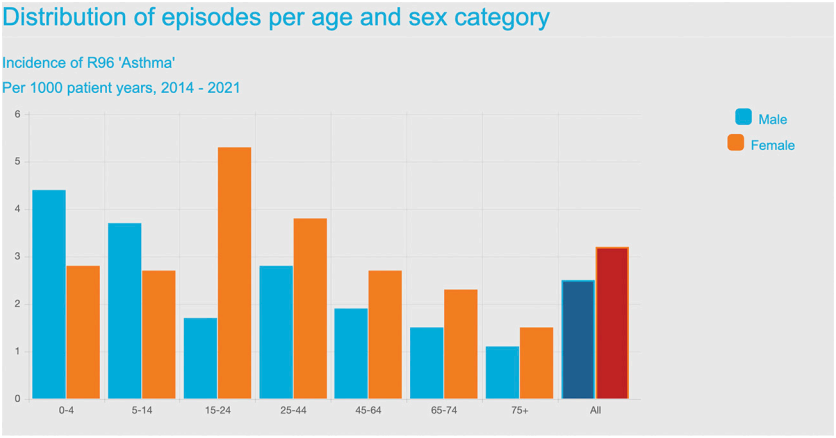
phenotypes, which may or may not be combined with long-acting beta-2 agonists (LABA). With good asthma control in adults, the use of short-acting beta-2 agonists (SABA) is not usually necessary. SABA use is advised in children with frequent symptoms (and in children under six years of age with episodic expiratory wheezing but for who 'asthma' is usually not yet definitively diagnosed). LABA use in children with asthma, if necessary, is usually prescribed by a paediatrician or (paediatric) pulmonologist.

2 How is asthma recorded in FaMe-Net?

In ICPC-2, asthma is recorded as R96. The different phenotypes cannot be recorded separately within ICPC-2.

3 Epidemiology of asthma in FaMe-Net

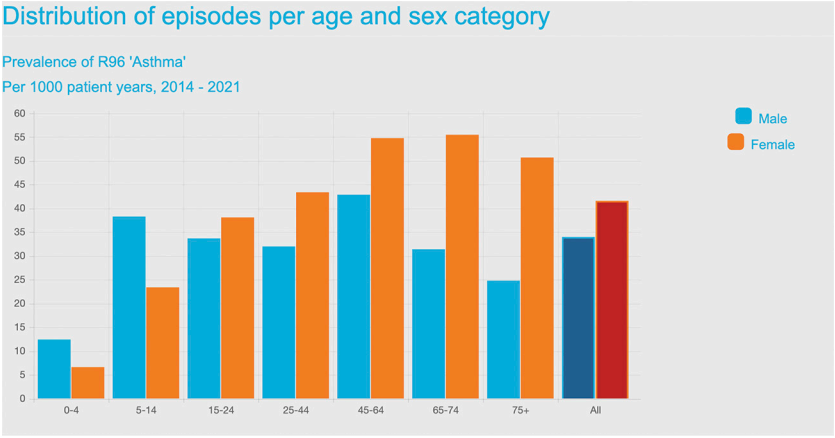
The mean incidence of asthma is 2.9 per 1000 patient years, which means that per 1000 patients in a year, three new diagnoses of asthma are made. Slightly more female than male patients are diagnosed (3.2 versus 2.5 per 1000 patient years). Incidence is highest in patients aged 0-4 years (3.6 per 1000 patient years), with more boys than girls being diagnosed (4.4 versus 2.8 per 1000 patient years). Incidence is lowest in patients older than 75 years. Link/Figure 1



The mean incidence of asthma in both men and women has gradually decreased in the period 2005-2021, and which is most apparent in children under five years of age (data from 2014-2021 is shown on the website, data from before 2014 is available upon request). This may be due to the advice in the most recent GP asthma guidelines to be cautious when diagnosing asthma in very young children.

Figure 1

The mean prevalence of asthma is 37.9 patients per 1000 patient years, meaning that among 1000 patients in a year, 38 patients have asthma and contact their GP for it over the course of that year. Mean prevalence is higher in female (41.6) than male patients (34.0 per 1000 patient years) and highest in patients between 45 and 74 years. From early childhood to puberty, prevalence is highest among male patients, whereas, from 15 years and upwards, the prevalence is highest in female patients. Due to the decreasing incidence of asthma, the prevalence of asthma has also somewhat decreased over time. Link/Figure 2



The higher prevalence when compared to incidence indicates that asthma is a chronic disease requiring the ongoing attention of the GP after the diagnosis has been made, often lasting many years.

4 Which initial RFEs do patients with asthma present to their GP?

The three most common initial symptoms presented as reasons for encounter (RFE) for asthma are shortness of breath (R02, in 27% of all episodes), a cough (R05, in 18%) and wheezing (R03, in 5%). Other common initial RFEs are a request for medication or the renewal of a prescription (*50, in 15%), as well as self-suspected asthma (R96, in 9%). Link/Table 3 RFEs do not differ significantly between women and men or between age groups.

5 How do FaMe-Net GPs act?

In most episodes of asthma, regardless of sex and age, medication is prescribed (in 91% per year). Other common interventions are medical examination (*31, in 29%), health education (*45, in 22%) and a physical function test, most probably spirometry (*39, in 9% per year). Link/Table 4

Figure 2 Table 3 Table 4

The most prescribed medication is a selective beta-2 adrenoceptor agonist (R03AC, in 56% of episodes per year), followed by inhaled corticosteroids as a single inhaler (R03BA, in 36% per year) or as a combination device with a selective beta-2 adrenoreceptor agonists (R03AK, in 25% per year). Other medication, such as anticholinergics (5%), leukotriene receptor antagonists (2%) and antihistamines (4%) are prescribed less often. Link/Table 5

Referrals within primary care (*66, Link/Table 4) are rare (1% per year) and involve physical therapy in <1%, Link/Table 6) while referrals to a specialist (*67) occur in only 4% of the asthma episodes per year (most often to pulmonology and paediatrics). Link/Table 7 In children under five, the percentage of referrals is the highest (13%). Link/Table 8

References

Dutch guideline 'Asthma in adults': https://richtlijnen.nhg.org/standaarden/astma-bij-volwassenen#volledige-tekst (2020)

Dutch guideline 'Asthma in children': https://richtlijnen.nhg.org/standaarden/astma-bij-kinderen#volledige-tekst (2022)

Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2022. Available from: www.ginasthma.org

Table 5 Table 6 Table 7 Table 8

Allergic rhinitis (R97)

HILDE LUIJKS

1 Clinical course of allergic rhinitis

Allergic rhinitis is caused by inflammation of the nasal mucosa occurring when the immune system overreacts to (mainly aerogenous) allergens. Symptoms include sneezing, rhinorrhoea, nasal obstruction and an itch in the nose and throat. Allergic rhinitis may also cause more general symptoms such as fatigue, malaise and sleep disturbance, and can have a negative influence on daily functioning (work, school, sports).

'Hay fever' refers to seasonal allergic rhinitis caused by inhaled grass or tree pollen, causing seasonal symptoms. 'Perennial' allergic rhinitis is usually caused by indoor allergens, such as house dust mites and pet dander. People with allergic rhinitis may have a predisposition for other allergic conditions (and vice versa) such as eczema and asthma. This trait is referred to as atopy. It also includes co-occurrence with allergic conjunctivitis, causing (bilateral) ocular itch and redness, and often eyelid oedema and watery discharge. The diagnosis of allergic rhinitis can reliably be based on clinical history alone. A positive blood test for inhaled allergens is not necessary, however, it can be useful in indistinct cases. Allergic rhinitis can be treated with nasal corticosteroids and with antihistamines.

2 How is allergic rhinitis recorded in FaMe-Net?

In ICPC-2, allergic rhinitis is coded R97. A clinically relevant allergic *conjunctivitis* is separately coded F71.

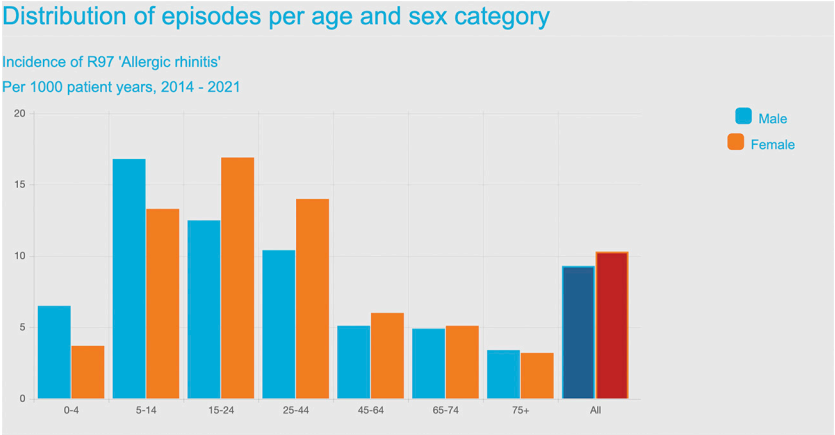
3 Epidemiology of allergic rhinitis in FaMe-Net

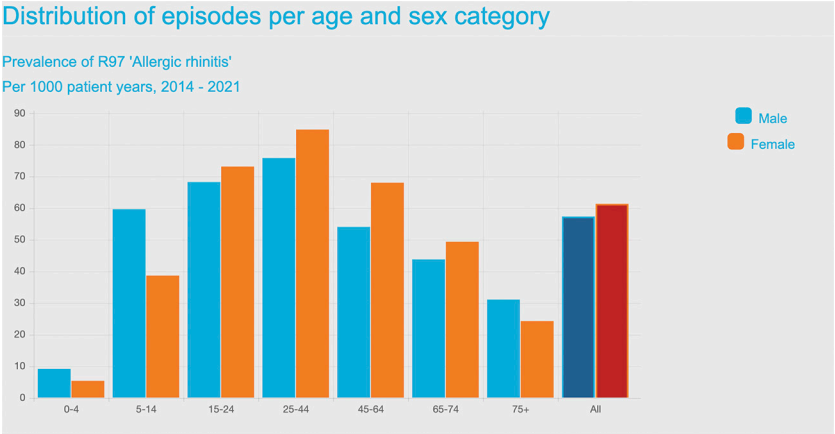
Allergic rhinitis has an incidence of 9.8 per 1000 patient years (10 new diagnoses per 1000 patients per year) and is highest in populations under 45 years of age (15 per 1000 patients per year in patients 5-25 years old). Link/Figure 1

Prevalence of allergic rhinitis is 59.3 per 1000 patient years, meaning that among 1000 patients in a year, 59 seek help from their GP with allergic rhinitis. Link/Figure 2


Figure 1


Figure 2





Allergic rhinitis follows hypertension (K86) and upper respiratory infection (R74) in conditions ranked on prevalence. This means that allergic rhinitis is a condition affecting a relatively large proportion of the general practice population and is the third most common condition for which patients seek medical help and have contact with their GP throughout the year. Link/Table 3

In the youngest groups (age 0-15), the incidence is highest with boys / young men, whereas in the age groups 15-25 and 25-45, new diagnoses of allergic rhinitis are more common among women. Overall, there is no obvious sex difference in the incidence of allergic rhinitis (men 9.3, women 10.2 per 1000 patient years).

Table 3 Figure 4 Figure 5

The increasing prevalence of allergic rhinitis over time (Link/Figure 2), without a rising incidence (Link/Figure 1), suggests an increase in the severity of symptoms of allergic rhinitis over time, at least leading to more contacts with the GP. This may point at a true increase in the experienced 'disease burden' of allergic rhinitis, since self-management has probably grown too. 'Over the counter' availability of systemic antihistamines has expanded over time in the Netherlands and the same goes probably for knowledge in the Dutch population on its use, in part owing to growing attention for the website www.thuisarts.nl (www.GPinfo.nl), developed and maintained by the Dutch College of GPs, providing patient education.

Allergic conjunctivitis (F71) has an incidence of 3.1 per 1000 patient years (Link/Figure 4) and a prevalence of 6.7 per 1000 patient years. Link/Figure 5

4 Which initial RFEs do patients with allergic rhinitis present to their GP?

The most common initial reason for encounter (RFE) for allergic rhinitis is 'allergic rhinitis' (R97), which means that the condition is easily self-diagnosed. Other frequent reasons for encounter are a request for medication (*50), sneezing or nasal congestion (R07) and 'other nose symptoms' (R08). Link/Table 6 A 'self-diagnosed' allergic rhinitis as an initial RFE (R97) is especially common among patients under 45.

5 How do FaMe-Net GPs act?

By far the most common intervention coded for allergic rhinitis is the prescription of medication. Help for allergic rhinitis includes all kinds of encounter types, ranging from extensive counselling to simple repeat prescriptions. Link/Table 7 Most prescribed medication types are nasal corticosteroids and systemic antihistamines. Link/Table 8 Note that this includes only medication prescribed by the GP, not medication bought 'over the counter'.

Referrals are rare and concern the specialisms otorhinolaryngology or allergology. Link/Table 9

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/allergische-en-niet-allergische-rinitis#volledige-tekst (2018)

DeShazo RD, Kemp SF. Allergic rhinitis: Clinical manifestations, epidemiology, and diagnosis. In: UpToDate, Corren J, Feldweg AM (Eds), UpToDate, Waltham, MA, 2022


Table 6


Table 7


Table 8


Table 9

Naevus (S82)

JULIAN KIERS

1 Clinical course of naevus

Melanocytic naevi (moles) are benign proliferations of a specific type of melanocytes called 'naevus cells'. They are only seldomly present from birth (congenital melanocytic naevi) but manifest themselves throughout life. Naevi are a normal phenomenon and new ones may develop as old ones disappear or grow. Especially during childhood and adolescence, the enlargement and increasing elevation of naevi will take place and can be regarded as a natural process. Sun exposure in childhood, heredity and skin type are factors related to the development of new naevi.

Most naevi remain benign and do not need treatment. They usually do not cause complaints, however, patients may ask for excision for cosmetic reasons. Naevi are mostly presented to the GP to check if they are benign.

Diagnosis is based on the clinical picture and the examination of melanocytic naevi considers their shape, colour, symmetry and size. Naevi have a wide variety of shapes but tend to be less than 6 mm in diameter, symmetric and with even pigmentation, have a round or oval shape, a regular outline, a homogeneous surface and a sharply demarcated border.

The distinction of normal ('common' or 'banal') naevi from other types of skin proliferations, especially from melanoma (the most serious form of skin cancer) is the focus of the examination. A melanoma only very rarely arises from a common naevus – it mostly appears 'de novo'.

Atypical naevi (dysplastic naevi) are benign, acquired melanocytic naevi that share some of the clinical features of melanoma such as asymmetry, border irregularities, colour variability, or a diameter of more than 6 mm. The presence of five or more atypical naevi is associated with an increased risk of melanoma. In these cases, a referral to the dermatologist for periodic skin checks is advised.

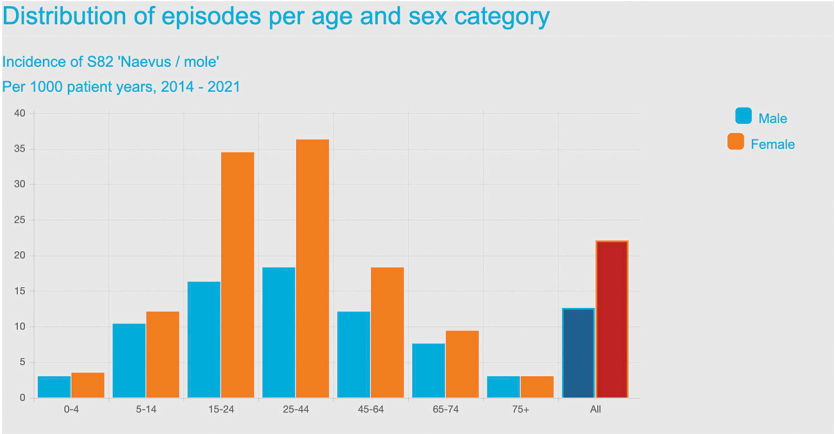
2 How is naevus recorded in FaMe-Net?

A naevus is coded S82. If the patient seeks help for multiple naevi, they will be recorded together, with one ICPC code, and thus in one episode. Help for naevi in follow-up visits may also be recorded in the same episode.

S82 is used to code a common naevus and to code an atypical naevus. This means that based on ICPC-2 data, the distinction between common naevi and atypical naevi cannot be made.

3 Epidemiology of naevus in FaMe-Net

The incidence of naevi is 17.5 per 1000 patient years, meaning 18 new diagnoses per 1000 patients per year. Women present to their GP with a new naevus more often than men. The incidence is 22.1 per 1000 female and 12.6 per 1000 male patients, respectively. Patients in the age group 15-44 years are those most likely to present with a new naevus. Link/Figure 1

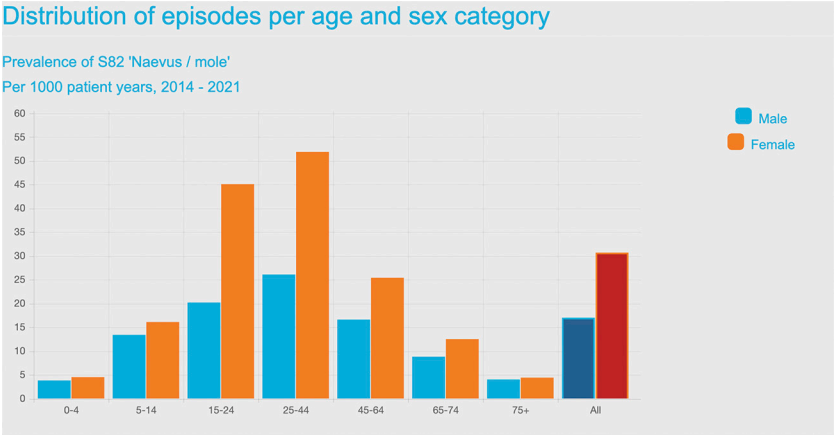


The prevalence of naevi is 24.0 per 1000 patient years, meaning that among 1000 patients in a year, 24 search for help from their GP for naevi. Again, the prevalence is highest in female patients and in patients aged 15-44 years. Link/Figure 2 That said, 'naevi' are a health condition for which GPs provide care to patients from all sex and age categories.

The higher prevalence when compared to incidence implies that naevi often require repeated attention from the GP, which often crosses the calendar year border. In the case of naevi, this means that several GP encounters may take place over successive calendar years yet be recorded within the same (and not a new) episode. This may involve the recurrent examination of the same particular naevus, the same few naevi or different naevi over different encounters. An ongoing episode with the title 'naevus' (S82) may thus describe just one naevus but may alternatively describe multiple / different naevi.

Figure 1

Figure 2



4 Which initial RFEs do patients with naevus present to their GP?

The most common reason for encounter (RFE) for naevus is 'naevus'. In 54% of all new episodes, patients have recognised the spot on their skin as a mole and present it as such. Patients also commonly present to the GP with the request to check their skin (*31, in 19%). In 5% of episodes, patients present with a request for an excision or removal of the naevus (*52). Link/Table 3 With increasing age, the RFE 'request for skin check' (*31) gradually becomes increasingly important to eventually (in the age group 75+) become a more common RFE than the RFE 'naevus' (S82). Link/Table 4 It is worth noting that the 'age range' can be altered to see RFEs in different age groups.

Of all the episodes starting with the RFE 'naevus', the final diagnosis was 'naevus' in 75% of episodes. Link/Table 5 This means that the condition is easily self-diagnosed. Other common final diagnoses in episodes starting with RFE 'naevus' are 'other skin disease' (S99, in 12%), and which includes actinic keratosis, 'benign or unspecified skin neoplasm' (S79, in 6%), including dermatofibroma, and warts (S03, in 2%).

5 How do FaMe-Net GPs act?

Common interventions in episodes of naevus are referral to the specialist (*67, in 18%) and excision by the GP (*52, in 17%). These percentages may be higher than expected because of the benign nature of common naevi. This might be due to some under reporting by the GP of naevi that do not require intervention, for example when patients present with multiple problems in one consultation and finally ask for a naevus check. Histologic examination (*37) is recorded in 9%, exclusively after surgery by the GP. It is worth noting that these are percentages per year. Link/Table 6 Specialist referrals are usually to the dermatologist (in 15% of episodes), sometimes to the plastic surgeon and occasionally to the surgeon

Table 3 Table 4 Table 5 Table 6

or ophthalmologist, although this is quite rare. Link/Table 7 No obvious sex differences were observed in the interventions made for naevi. Referral to the specialist was slightly more common (at 21% per year) in patients aged 45-74. Link/Table 8 Excisions by the GP were uncommon in children and generally absent in the youngest children (0-4). Link/Table 9

References

Hunt RH, Schaffer JV, Bolognia JL. Acquired melanocytic nevi (moles). In: UpToDate, Levy ML, Dellavalle RP, Tsao H, Corona R (Eds), UpToDate, Waltham, MA, 2023

Dutch patient leaflet: https://www.thuisarts.nl/moedervlekken/ik-heb-moedervlekken


Table 7


Table 8


Table 9

Atopic dermatitis (eczema) (S87)

ROGIER JASPERS

1 Clinical course of atopic dermatitis (eczema)

'Eczema' is an umbrella term for polymorphic, pruritic skin conditions caused by a non-infectious inflammation of the skin. It is caused by intrinsic and / or environmental factors. 'Atopic dermatitis (eczema)' is a type of eczema with skin abnormalities in characteristic, age-dependent locations and an atopic constitution. A characteristic feature of atopic eczema is an innately disturbed barrier function of the skin caused by genetic defects in the protein filaggrin, resulting in dry skin.
The atopic constitution involves the predisposition to develop IgE mediated conditions, such as eczema, asthma and allergic rhinitis and is often accompanied by elevated levels of immunoglobulin E (IgE).

Dry skin and an intense itch are the most prominent signs of atopic dermatitis. Presentation varies largely and depends on the patient's age, ethnicity and disease activity.
Characteristic acute lesions are erythematous papules and (mainly in young children) vesicles with exudation and crusting. Longer existing lesions present as dry, scaly or excoriated papules and (mainly in adults) as skin thickening from chronic scratching (lichenification).

In young children, atopic dermatitis typically presents on the extensor side of arms and legs and cheeks or scalp. In older children, adolescents and adults, plaques present more typically on the flexor surfaces (e.g. in knees, elbows, wrists) and they are more localised in adults.

Atopic dermatitis occurs mainly in children, with the very youngest (under one year of age) most commonly affected. Generally, atopic dermatitis presents before the age of five, and most affected children (80%) are free of symptoms by the age of 15. In under-five age groups, atopic dermatitis is by far the most common type of eczema.

Atopic dermatitis is a chronic skin disease, in which symptom-free periods often alternate with exacerbations. Factors that may aggravate the condition are transpiration, warm or cold temperatures, rough textile fibres (e.g. wool), illness, stress, soap, shampoo and cleaning products.

The diagnosis is made clinically, based on the history, appearance and distribution of skin lesions taking the patient's age into account. Additional investigation is rarely needed but

may be helpful when contact / allergic dermatitis or a food allergy are suspected.

Scratching aggravates dermatitis and should be avoided. Nails are best kept short. Bathing should be short, using lukewarm water and non-frequent. The use of emollients to increase the hydration of the skin and to reduce itch and irritation is the basis of the treatment, even when skin eruptions are minimal or absent. The personal preference of the patient or their parents is important in choosing which type of emollient to use. In addition, corticosteroids for topical use are often needed. They suppress the inflammation and reduce itching. Topical corticosteroids are categorised in four classes and the class of corticosteroid prescribed depends on the severity of the eczema, its effect, and the frequency of exacerbations. For moderate eczema, class i is advised, which can be replaced by class ii if the effects are insufficient. Class iii is advised for severe atopic dermatitis. Patients should be informed about how to apply creams or ointments. Referral to the dermatologist is appropriate if the response to treatment is insufficient or when the use of corticosteroids cannot be phased out.

2 How is atopic dermatitis recorded in FaMe-Net?

In ICPC-2, atopic dermatitis is recorded as S87. Seborrheic dermatitis (S86) and other forms of dermatitis (S88) are recorded separately within ICPC-2.

3 Epidemiology of atopic dermatitis in FaMe-Net

Atopic dermatitis has an incidence of 10.2 per 1000 patient years (10.9 in women and 9.6 in men), meaning there are 10 new diagnoses of atopic dermatitis in a practice with 1000 patients in a year. Atopic dermatitis is mostly diagnosed in young children (0-4 years), with an incidence of 52.7 per 1000 patient years in this age group (54.8 for boys and 50.5 for girls per 1000 patient years). Link/Figure 1

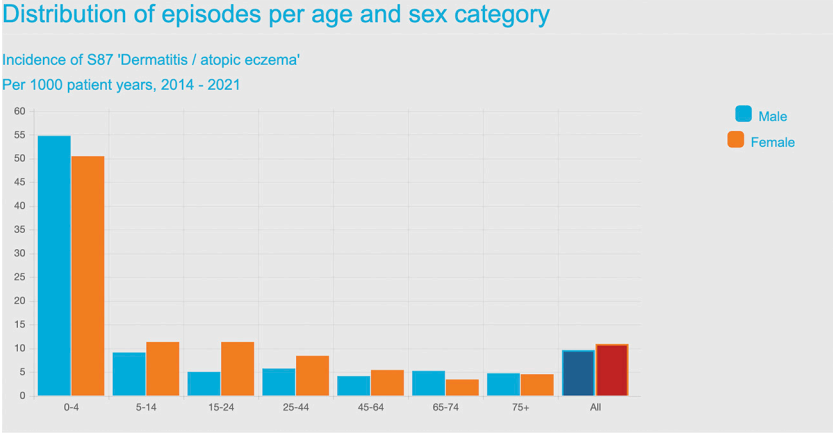
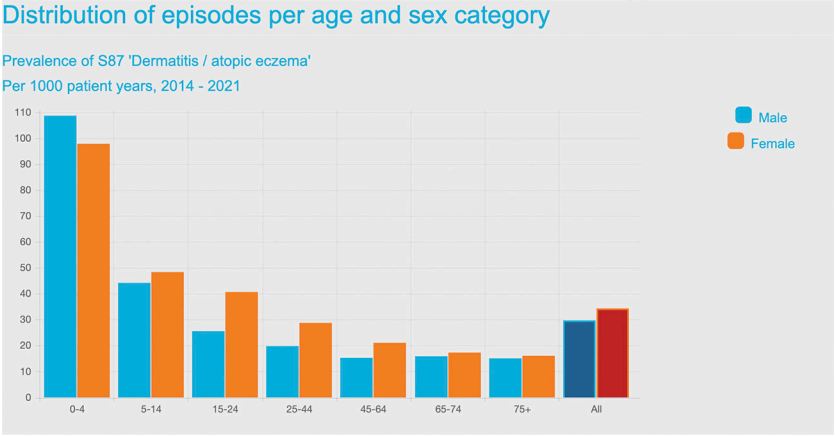


Figure 1 Figure 2 Figure 3

The prevalence of atopic dermatitis is 32.1 per 1000 patient years. Link/Figure 2



Again, prevalence is highest among the youngest children, with a prevalence of 103.4 per 1000 patient years in the age group 0-4 (108.7 for boys and 97.9 for girls), meaning that one out of ten children under the age of five presents to the GP with atopic dermatitis each year. For this age group, atopic dermatitis is the fourth most common condition presented to the GP, after acute upper respiratory tract infection, acute otitis media and fever. Link/Figure 3 In all other age groups, the prevalence is higher among female than among male patients, especially for those between 15 and 44 years of age.

The higher prevalence compared to incidence indicates that atopic dermatitis is a chronic condition, generally requiring GP attention over the course of several years.
Incidence and prevalence have increased slightly since 2014. We do not have an obvious explanation for this trend. An increasing trend of incidence and prevalence of atopic dermatitis has been reported in the last few decades across several continents.

4 Which initial RFEs do patients with atopic dermatitis present to their GP?

The two most common initial reasons for encounter (RFE) for atopic dermatitis are 'atopic dermatitis' (S87) and 'rash localised' (S06), both of which account for 28% of all RFEs. This is followed by pruritus (itch, S02), in 9%, a request for medication (*50), in 7% of episodes, and a request to check the skin (*31) in 5%. Link/Table 4 The common presentation of 'atopic dermatitis' as an initial RFE demonstrates that many patients or their parents recognise the skin abnormalities as atopic dermatitis (eczema). Prominent differences in RFEs among different age or sex groups are largely absent.

5 How do FaMe-Net GPs act?

By far the most common intervention for episodes of atopic dermatitis is the prescription of medication, occurring in 91% of all episodes in one year. Link/Table 5 This concerns mainly corticosteroids for topical use, prescribed in 69% of episodes, and emollients and protectives, prescribed in 47% of episodes of atopic dermatitis per year. Link/Table 6 Five-character specification of the ATC code demonstrates that prescribed corticosteroids concern mostly low potency and moderate potency corticosteroids (group i and ii), both of which are prescribed in 31% of all episodes each. The more potent corticosteroids from group iii and iv are prescribed in 15% and 3% of episodes, respectively. Link/Table 7 Sometimes, other medication classes are prescribed, e.g. antihistamines, antifungals or antibiotics for topical use, paraffin / fat products, agents such as tacrolimus / pimecrolimus and tars. Note that patients may receive several prescriptions for their eczema.

In children, emollients and protectives are prescribed more frequently (in 58% and 57% of episodes in the age groups 0-4 and 5-14, respectively) than in older age groups. When corticosteroids are prescribed to young children (age 0-4), the preference for less potent corticosteroids is clear: group i, ii and iii were prescribed in 52%, 23% and 2% of episodes, respectively. Link/Table 8 To a lesser extent, similar patterns are observed in children aged 5-14. Link/Table 9

Prescriptions of emollients, in 47% of episodes, and across all age groups, may seem relatively low, since this is the cornerstone in the treatment of atopic dermatitis. This can be explained by the fact that this medication can be bought over the counter without a doctor's prescription. All prescribed medication for children is fully reimbursed by health insurance (i.e. free of a personal contribution), probably explaining the higher prescription rates of emollients among children.

In only 6% of episodes of atopic dermatitis, a specialist referral is made to a dermatologist or, occasionally, to an allergologist. Link/Table 10 Primary care referrals for atopic dermatitis (to the dietician) are rare. Link/Table 11

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/eczeem#volledige-tekst (2014)

Howe W. Atopic dermatitis (eczema): Pathogenesis, clinical manifestations, and diagnosis. In: UpToDate, Dellavalle RP, Levy ML, Fowler J, Corona R (Eds), UpToDate, Waltham, MA, 2023

Howe W, Paller AS, Butala S. Treatment of atopic dermatitis (eczema). In: UpToDate, Dellavalle RP, Levy ML, Fowler J, Corona R (Eds), UpToDate, Waltham, MA, 2023


Table 8


Table 9


Table 10


Table 11

Type 2 diabetes mellitus (T90)

HILDE LUIJKS

1 Clinical course of Type 2 diabetes mellitus (T2DM)

Diabetes mellitus is a disease of disturbed carbohydrate metabolism, characterised by hyperglycaemia. An absolute or relative decrease of insulin secretion caused by the malfunctioning of the beta cells of the pancreas, and insulin resistance in liver, muscular and fatty cell tissue contribute to the development of type 2 diabetes mellitus (T2DM). These metabolic abnormalities may also contribute to the development of other clinical conditions, such as hypertension, dyslipidaemia and obesity. The pathogenesis is multifactorial, with genetic factors (impaired insulin secretion) and environmental factors (insulin resistance: overeating, sedentary lifestyle). Altogether, T2DM may lead to severe microvascular (neuropathy, retinopathy, nephropathy) and macrovascular (coronary heart disease, stroke) disease. This implies that patients with T2DM must be encouraged to adopt a healthy lifestyle aimed at not only reducing hyperglycaemia but also at the reduction of all risk factors for micro- and macrovascular disease. Moreover, the monitoring of, and, if necessary, treatment of their metabolic abnormalities is indicated.

Symptoms of diabetic hyperglycaemia may be thirst, polyuria and weight loss, although most patients do not experience these symptoms at the time T2DM is diagnosed. Hyperglycaemia is often noted during routine laboratory testing and a diagnosis is made with two fasting plasma glucose values ≥7.0 mmol/l taken on two different days. The diagnosis can also be made with one fasting plasma glucose value ≥7.0 mmol/l or one non-fasting plasma glucose value ≥11.1 mmol/l in combination with hyperglycaemic symptoms. Because not all patients with T2DM will develop symptoms or vascular complications, T2DM might be considered a risk factor instead of a disease in asymptomatic patients.

Pharmacologic treatment is needed in most cases to attain treatment goals, namely, the prevention and treatment of symptoms and complications, for example: (the progression of) cardiovascular disease, chronic renal insufficiency, retinopathy and neuropathy. Options have expanded to various medication categories, such as metformin, sulfonylureas (SU derivatives) and insulin, along with newer medication types such as SGLT2 inhibitors and GLP-1 receptor agonists. Our

knowledge of diabetes and its treatment is constantly being developed with updates of treatment recommendations every few years. Treatment recommendations are increasingly personalised, with pharmacological options based on the patient's risk of complications and comorbidity. As a result, diabetes management has become increasingly complex. Yet, in the Netherlands, it is mainly managed in primary care.

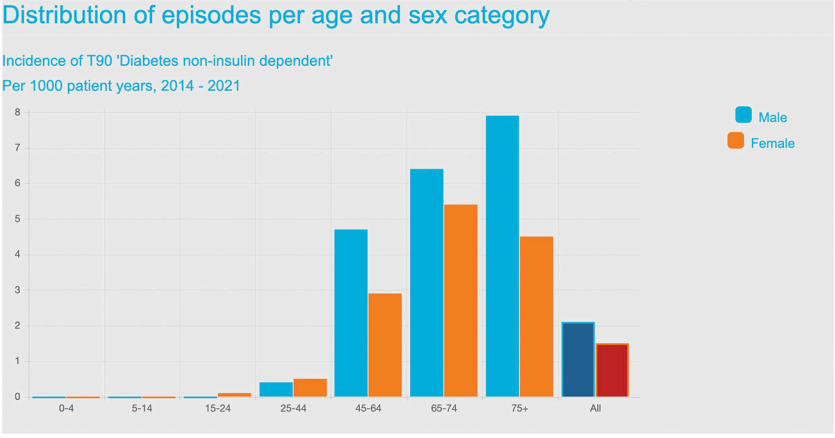
In Type 1 diabetes mellitus, the autoimmune destruction of beta cells causes absolute insulin deficiency. Type 1 diabetes generally presents with symptomatic hyperglycaemia in children or adolescents and, in 25%, as diabetic ketoacidosis. (Subtypes of) Type 1 diabetes may be diagnosed in adults. Type 1 diabetes is managed in secondary care.

2 How is Type 2 diabetes mellitus recorded in FaMe-Net?

Type 2 diabetes mellitus is recorded with the ICPC code T90. It should be distinguished from type 1 diabetes mellitus, which is classified as T89.

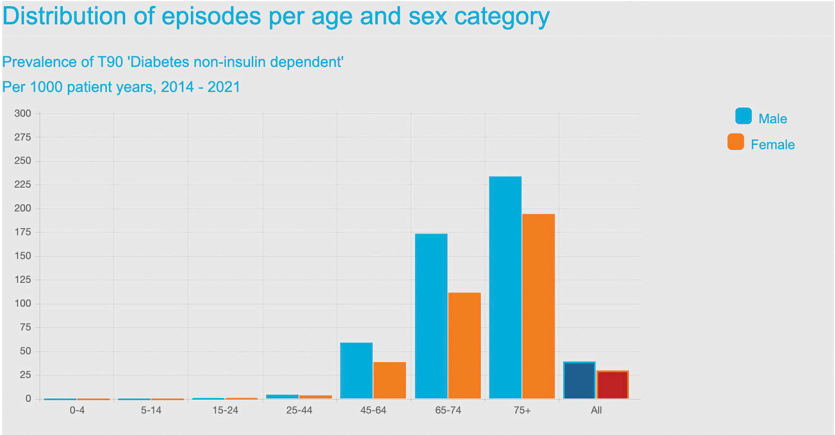
3 Epidemiology of Type 2 diabetes mellitus in FaMe-Net

The incidence of type 2 diabetes mellitus is 1.8 per 1000 patient years, meaning two new diagnoses per 1000 patients in a year. The diagnosis is made mainly in older patients, with incidence numbers increasing from 45 years of age and with more new diagnoses in men than in women. Link/Figure 1



The prevalence of T2DM is 34.1 per 1000 patient years, meaning that among 1000 patients in a year, 34 have T2DM and seek help for it from their GP. Prevalence increases with increasing age. Among the elderly population (age 75+), over one fifth of the practice population is affected by T2DM. Prevalence is highest among men. This sex difference is most pronounced in the age group 65-75. Link/Figure 2

Figure 1 Figure 2 Table 3



T2DM is ranked 11th of conditions with the highest prevalence as seen by FaMe-Net GPs; these are conditions for which a high proportion of the practice population seeks medical help over the course of one year. Link/Table 3 The high prevalence when compared to incidence indicates that T2DM is a chronic disease requiring the ongoing attention of the GP many years after the diagnosis has been made.

Type 1 diabetes has a prevalence of 3.2 per 1000 patient years. Link/Figure 4

4 Which initial RFEs do patients with Type 2 diabetes mellitus present to their GP?

T2DM initially presents asymptomatically in most patients. In FaMe-Net this is reflected in the table of Reasons for Encounter (RFEs) for T2DM. Link/Table 5 Most episodes start with a (request for) a blood test (*34), check (*31), test result (*60), as administrative contact (*62) or are initiated by the GP (*64). This means that the diagnosis is made after a patient requests some kind of screening, or as an (incidental) finding during another episode or as reported in a letter. Further, the diagnosis itself (T90) can be the RFE, which means that the patient thinks he or she has T2DM. This may be the case when the diagnosis has been suspected elsewhere, for example, in a (commercial) screening setting. When a sign or symptom is the RFE, excessive thirst (T01) and / or tiredness / weakness (A04) are reported.

5 How do FaMe-Net GPs act?

Most patients diagnosed with T2DM receive health education / diet (*45), blood tests (*34) and prescriptions (*50) and a yearly medical examination (*31). Link/Table 6

Most common prescriptions in episodes of T2DM are biguanides (metformin), sulfonylureas (SU derivatives) and HMG COA reductase inhibitors (statins), followed by insulin. Link/Table 7 Note that this report shows only prescribed medication that was linked to this specific episode (T90 T2DM) during

Figure 4 Table 5 Table 6 Table 7

the course of a calendar year. In FaMe-Net, all prescribed medication must be linked to one episode, including in patients with multiple reasons (episodes) to prescribe. Medication that may also be prescribed for other episodes, such as statins or antihypertensives for ischaemic heart disease (K76), will be underreported here since they can be reported elsewhere.

Referrals to specialists and to other primary healthcare providers occur in a minority of T2D episodes. Specialist referrals concern mainly ophthalmologist referrals. Only a small percentage is referred to internal medicine on a yearly basis. Link/Table 8 Primary care referrals are mainly to dieticians and podiatry / podotherapy. Link/Table 9

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/diabetes-mellitus-type-2#volledige-tekst (2023)

Robertson RP, Udler MS. Pathogenesis of type 2 diabetes mellitus. In: UpToDate, Nathan DM, Rubinow K (Eds), UpToDate, Waltham, MA, 2021

Wexler DJ, Udler MS. Initial management of hyperglycemia in adults with type 2 diabetes mellitus. In: UpToDate, Nathan DM, Rubinow K (Eds), UpToDate, Waltham, MA, 2021


Table 8


Table 9

Urinary tract infection (U71)

HILDE LUIJKS

1 Clinical course of urinary tract infection

The clinical picture of urinary tract infection includes infections of the lower urinary tract (bladder, urethra) and the upper urinary tract / renal pelvis (i.e., pyelonephritis). The most typical presentation is 'acute simple cystitis', where there is no indication that the infection has extended beyond the bladder. This is generally caused by infection with the microbe *Escherichia coli*, a normal intestinal coloniser. Other bacteria such as *Klebsiella pneumoniae* and *Proteus mirabilis* are occasional causes of acute simple cystitis. Due to anatomic differences, a urinary tract infection is much more common in women than in men.

Symptoms of a urinary tract infection are dysuria (painful voiding), frequent voiding and (lower) abdominal pain. Symptoms are less typical in elderly patients and children, in whom a urinary tract infection may present with general illness or confusion.
Current guidelines distinguish urinary tract infections with or without tissue invasion. Tissue invasion implies that the infection involves the upper urinary tract tissue, which is accompanied by general symptoms such as fever, illness or pain in the flank. Examples are pyelonephritis and prostatitis.

Diagnosing urinary tract infection is relatively simple. When the symptoms are typical, it is sufficient to demonstrate nitrite in the urine or the actual presence of bacteria in the urine (with a sediment or a 'dipslide' – a culture method in general practice). If needed, a culture to identify the causative microbe (and to determine antibiotic resistance) can prove the diagnosis and guide treatment.

Urinary tract infections are generally treated with antibiotics. However, conservative treatment may suffice sometimes, e.g. analgesics and extra drinking.

An (isolated) urethritis (in men) is generally caused by a sexually transmittable pathogen (e.g. *Neisseria gonorrhoea*, *Chlamydia trachomatis*) and considered a different clinical picture.

2 How is urinary tract infection recorded in FaMe-Net?

A urinary tract infection can be recorded with three ICPC codes from the 'Urological' (U) chapter, namely U70 (pyelonephritis / pyelitis), U71 (cystitis) or U72 (urethritis). FaMe-Net records U71 for 'acute simple cystitis'. U70 (pyelonephritis / pyelitis) is recorded in patients with bacteriuria and clinical signs

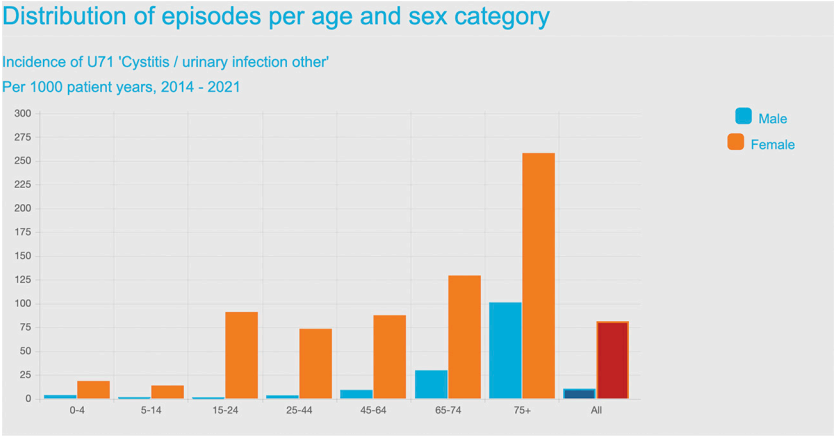
of involvement of the renal pelvis (e.g. fever, pain in the flank, serious illness).
U72 is used in cases of urethritis where no microbe has been demonstrated justifying a specific alternative diagnosis (e.g. gonorrhoea, chlamydia).
In this section, we focus on cystitis (U71).

Prostatitis is coded separately in the 'male genital' chapter (Y73).
Sexually transmittable diseases with a demonstrated pathogen should be distinguished from urinary tract infections. They are coded in the 'female genital' chapter (e.g. ICPC codes X70, X71, X72, X73) or in the 'male genital' chapter (e.g. ICPC codes Y70, Y71, Y72).

In patients presenting with symptoms, but in whom a urinary tract infection cannot be demonstrated, FaMe-Net records the most prominent symptom as symptom diagnosis, e.g. dysuria (U01), frequent voiding (U02) or 'other urination problem' (U05).

3 Epidemiology of urinary tract infection in FaMe-Net

Urinary tract infection (U71) is one of the most common diagnoses GPs make, following acute respiratory infection (R74) and close to excessive ear wax (H81). Link/Table 1 The incidence is 46.6 per 1000 patient years, meaning 47 diagnoses per year in a practice with 1000 patients. The diagnosis is significantly more common among women, with an incidence of 81.3 per 1000 patient years, compared to 10.3 per 1000 patient years among men. Link/Figure 2

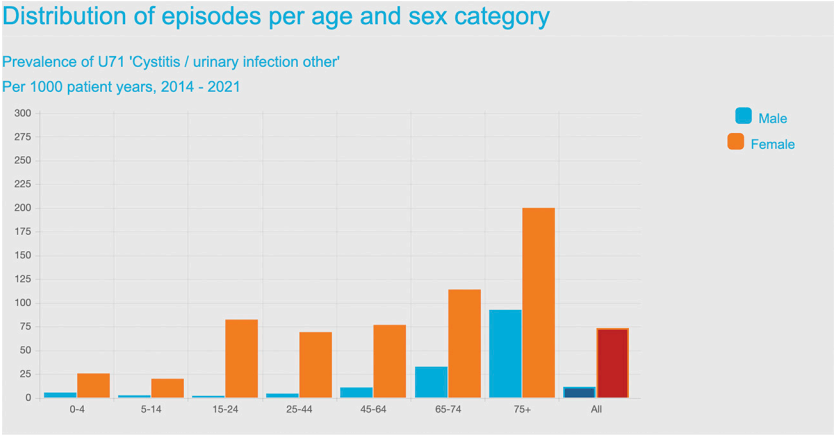


Among women, urinary tract infection is the most commonly made new (incident) diagnosis. Link/Table 3 The sex difference in the incidence of urinary tract infection between women and men is most prominent in the age group 15-25. These young women have a high incidence (91.0 new diagnoses per 1000 patient years), while a urinary tract infection

in young men is rare (1.2 per 1000 patient years). The incidence of urinary tract infection rises in patients over 65 years of age, with an obvious peak among the eldest (75+) in whom the incidence reaches 192.2 per 1000 patient years. The difference between women and men in the incidence of urinary tract infection becomes much smaller in the oldest age group (only two and a half times higher in women).

The incidence of the symptom diagnosis dysuria (U01) is 16.4 per 1000 patient years (26.6 in women and 5.9 in men (Link/Figure 4), and the incidence of frequent voiding (urinary frequency, U02) is 13.1 per 1000 patient years (18.1 in women and 7.1 in men). Link/Figure 5

The prevalence of urinary tract infection is 43.0 per 1000 patient years, meaning that per 1000 patients, 43 individual persons have a urinary tract infection and contact their GP for it throughout the year. Link/Figure 6



The higher incidence number compared to prevalence indicates that urinary tract infections may recur in the same person within a year. Urinary tract infection is among the most common conditions for which patients seek help from their GP throughout the year. Link/Figure 7

4 Which initial RFEs do patients with urinary tract infection present?

Commonly, patients themselves suspect that something is wrong: the most common reason for encounter (RFE) in episodes of urinary tract infection is a request to check the urine. A self-suspected diagnosis of urinary tract infection (U71) is another prevailing RFE. Link/Table 8 The Positive Predictive

Figure 5 Figure 6 Figure 7 Table 8

Value (PPV) for patients presenting with the RFE 'urinary tract infection' is quite high: 73% are eventually diagnosed with a urinary tract infection. Link/Table 9

Common symptoms coded as RFEs are dysuria (U01), frequent voiding (U02) or abdominal pain (D06). A request for medication for cystitis (*50) is also a common RFE. Link/Table 8

Compared to women, men with a urinary tract infection are relatively more likely to present with fever (RFE A03) or haematuria (U06). Link/Table 10 Women on the contrary present more often with abdominal pain (D06). Link/Table 11 In young children with a urinary tract infection (0-4 years) fever is a common RFE. Link/Table 12

5 How do FaMe-Net GPs act?

In most episodes of urinary tract infection, medication is prescribed. Link/Table 13 The most commonly prescribed types of antibiotics are nitrofurantoin, followed (with distance) by fosfomycin ('other antibacterials, J01XX'), fluoroquinolones and trimethoprim. Link/Table 14 Medication classes can be looked up in the ATC classification.

Another (obvious) intervention recorded in most episodes is the investigation of urine. Microbiological investigation occurs sometimes. Referrals are needed in only 2% of the episodes of urinary tract infection. Link/Table 13 This includes referrals in the acute phase or later in the episode, for example, when complaints persist or recur. Referrals are mainly to urology, paediatrics or internal medicine. Link/Table 15

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/urineweginfecties#volledige-tekst (2020)

Gupta K. Acute simple cystitis in females. In: UpToDate, Calderwood SB, Bloom A (Eds), UpToDate, Waltham, MA, 2023

Table 9 Table 10 Table 11 Table 12

Table 13 Table 14 Table 15

Chronic Renal Failure (U99)

INGE NOBACHT-WAGENVOORT

1 Clinical course of chronic renal failure (CRF)

An important function of the kidney is to excrete waste products by (glomerular) filtration and / or secretion. The kidney function is estimated by calculating the glomerular filtration rate (eGFR). The eGFR is calculated with the CKD-EPI formula which includes sex, age, body size and the level of circulating creatinine. The renal function shows a physiologic decline with increasing age. Chronic renal failure (CRF) is defined by a persisting (more than three months) decrease of the glomerular filtration rate (eGFR <60 ml/min/1,73m^2) and / or albuminuria (albumin / creatinine ratio >3 mg/mmol) and / or abnormalities in the urinary sediment (e.g. dysmorphic erythrocytes or erythrocyte cylinders).

Clinical symptoms of chronic renal failure may occur in more severe cases of renal failure and are not frequently seen in general practice. In CRF with an eGFR below 30 ml/min/1,73m^2 patients may present with metabolic complications such as anaemia, itch, gout, acidosis and gastrointestinal symptoms (e.g. nausea, decreased appetite).

Common causes of CRF are hypertension, type 2 diabetes mellitus, and atherosclerotic vascular disease. Specific (familiar) renal diseases may also cause CRF.
A decreased eGFR and increased albuminuria are independent risk factors and predictors in themselves of (cardiovascular) mortality, the (acute) progression of CRF and of end stage renal failure (eGFR <15 ml/min/1,73m^2).

In the diagnosing and staging of CRF, the GP assesses the eGFR, the albumin-creatinine ratio in the urine, and the cardiovascular risk profile. Treatment consists of optimising the cardiovascular risk profile and reducing the risk of progression of CRF. RAS-inhibitors are the preferred antihypertensives in the case of albuminuria. Nephrotoxic medication is best avoided. To support safe prescribing in patients with CRF, an alert should be created in the Electronic Health Record that CRF is present, so that medication monitoring systems can warn for nephrotoxic medication or when medication dosage needs to be adjusted.

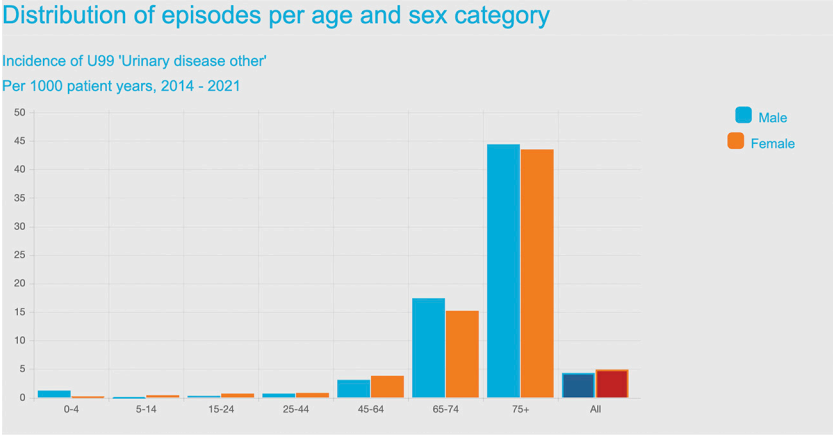
2 How is chronic renal failure recorded in FaMe-Net ?

Chronic Renal Failure is coded with the ICPC code U99, 'other urinary disease'. CRF is the most important condition coded U99,

although some other (less common) diseases of the urinary tract are also coded U99, mainly acquired / anatomical abnormalities of the urological system (for example, vesico-ureteral reflux, hydronephrosis, renal cysts and neurological bladder dysfunction). In this FaMe-Net dataset, based on the ICPC classification, CRF cannot be distinguished from other conditions recorded with U99. For research specifically focussing on CRF, it would be possible to make an extraction of data that includes the additional ICD-10 classification, which refers only to 'chronic renal failure'.

3 Epidemiology of chronic renal failure in FaMe-Net

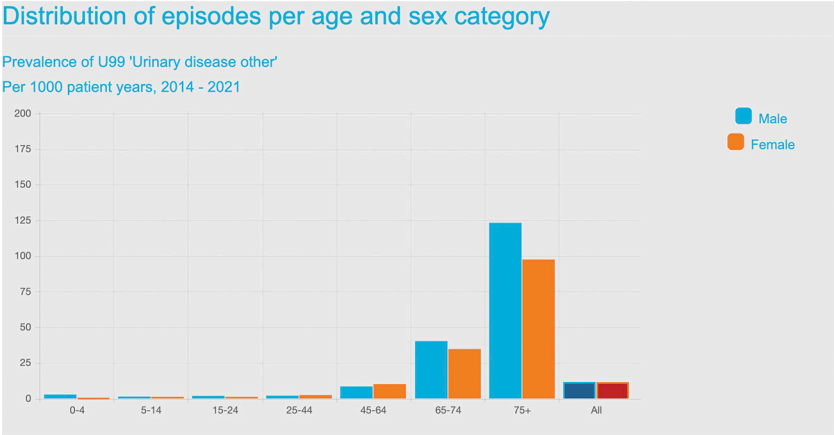
The incidence of CRF is 4.6 per 1000 patient years, meaning five new diagnoses per 1000 patients in a year across all age groups. CRF occurs mainly among elderly patients, with incidence numbers increasing from the age of 65 onwards. This is explained by the main aetiological factors for CRF: ageing and cardiovascular diseases. In the age group 45-64, the incidence is 16.3, and in the age group 75+, the incidence is 43.9 per 1000 patient years. Link/Figure 1



The prevalence of CRF is 11.6 per 1000 patient years, meaning that among 1000 patients in a year, 12 patients seek help from their GP for CRF. Prevalence increases with age from 45 years of age onwards. Most patients contacting their GP for CRF are older than 75 years. The prevalence is equal between men and women. Link/Figure 2

Figure 1

Figure 2



Among patients aged 75 and older, CRF is ranked as the ninth most common condition for which patients consult their GP. Link/Table 3

4 Which initial RFEs do patients with chronic renal failure present to their GP?

CRF initially presents as being asymptomatic. This is reflected by the recorded Reasons for Encounter (RFEs) for CRF. Link/Table 4 Most episodes (69%) start with an administrative RFE (*62) which means that the episode starts with a note or letter, for instance, a laboratory test result following routine control for other conditions such as hypertension or diabetes, or a (specialist) letter reporting the CRF, which may have been an occasional finding. The other commonly reported RFEs also indicate that CRF presents without specific symptoms, for example, as a request for a test result (*60), after initiation by the GP (*64) or someone else (*65) or as a request to perform a control (*31) or a test (*34 and *35). Renal failure itself (U99) as an RFE (in 5% of all episodes) is probably the result of testing or screening elsewhere. Urinary frequency (U02) as initial RFE is also reported for episodes U99, but probably mostly concerns 'other diseases' than CRF.

5 How do FaMe-Net GPs act?

Therapeutic and preventative actions aimed at optimising the risk of CRF will often be reported under the episode of conditions co-occurring with CRF, such as type 2 diabetes (T90), hypertension (K86) or other vascular conditions. This means that many interventions related to renal failure will be recorded elsewhere and that the numbers of interventions mentioned below do not give a complete overview of GPs' actions as part of the management of CRF. For research purposes, it is possible to make an extraction of individual patients with CRF to assess the occurrence of prescriptions (or other interventions) in any episode, i.e. including those reported under episodes other than U99. Additional data are available upon request.

Table 3

Table 4

Commonly reported interventions for CRF (U99) are blood tests (*34), the prescription of medication (*50) and health education (*45). GPs consult a specialist (*47) in 4% of all episodes of CRF per year. The consulted specialisms cannot be distinguished from this dataset, but they will mostly concern nephrologists. Referral to a specialist (*67) occurs in 6% of episodes annually. Link/Table 5 This involves specialists in internal medicine (nephrologists), in 3% of all episodes with ICPC code U99, urologists, in 2% and, very rarely (less than 1% of episodes), other specialists. Link/Table 6 The above referrals to urologists most likely concern referrals for diseases other than CRF but which are also coded U99. The opportunity for GPs to consult a nephrologist for advice (instead of making a referral) facilitates CRF to be managed mainly in primary care, which is also reflected in the low rate of referrals to a nephrologist. Looking at a selection of patients aged 65 years and above shows that with increasing age, the occurrence of 'consultation of a specialist' (*47) starts to favour 'referral to a specialist' (*67). Link/Table 7

The most prescribed medication types for CRF are vitamin D analogues. The prescription of medication in FaMe-Net is always linked to one episode (and cannot be linked to multiple episodes). As explained above, prescriptions for CRF will often be reported under co-occurring conditions. Some common prescriptions for CRF, such as RAS-inhibitors, are underreported in the overview of prescriptions for episodes of U99. Link/Table 8 Medication classes such as urogenital antispasmodics (G04BD) or alfa-adrenoreceptor antagonists (G04CA) are reported under the ICPC code U99 but concern 'other diseases' and not CRF.

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/chronische-nierschade#volledige-tekst (2018)


Table 5


Table 6


Table 7


Table 8

Subfertility (W15 / Y10)

JOLIEN POERINK

1 Clinical course of subfertility

Subfertility is defined as a failure to become pregnant for more than twelve months, despite focused attempts to conceive. The terms 'subfertility' and 'infertility' are sometimes used interchangeably and mean the same thing. However, in Dutch, the term 'infertility' (*infertiliteit*) can be interpreted negatively as it can also mean permanent infertility. Subfertility is a common condition affecting couples, with important psychological, economic, demographic and medical implications.
Several conditions can cause subfertility, but, in about 30% of the couples who have problems getting pregnant, the cause remains unexplained. Known causes are ovulation disorders (24%), reduced sperm quality (20%), disturbance in the interaction of semen and cervical mucus (15%) and tuba pathology (11%, e.g. due to severe endometriosis). Both male and female factors may contribute. Increasing female age is a major factor associated with subfertility. (Female) cases of being overweight and obesity are related to reduced fertility. Cigarette smoking and alcohol consumption may decrease the rate of successful conception.

When a pair presents with subfertility, the GP will take a thorough history from both and, on indication, perform a physical examination, focused on ovulation disorders and tuba pathology. The pair's knowledge on the fertile period and possible sexual problems should be assessed. This is also relevant when periods of less than twelve months of failure to conceive have passed. Subfertility may be associated with emotional problems and may have an impact on relationships and work.
When the diagnosis of subfertility is made, semen analysis and a female chlamydia antibody titres assessment may be performed.

Depending on the findings, a referral to the gynaecologist is suggested to discuss possibilities for treatment. If all findings are normal, it depends on the chances of spontaneous pregnancy and the couple's preference whether waiting or referral to the gynaecologist is most appropriate. Prognostic models are available to estimate the chance of pregnancy, including the woman's age, the presence or absence of a previous pregnancy and the results of the sperm investigation.

2 How is subfertility recorded in FaMe-Net?

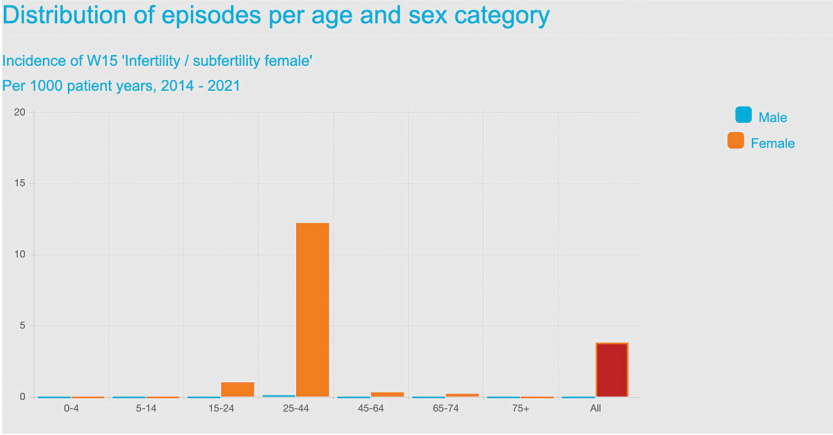
In ICPC-2, 'infertility / subfertility female' is coded W15. 'Infertility / subfertility male' is coded Y10. Both are symptom diagnoses: they classify the symptom (failure to become pregnant) and not an underlying cause. If additional investigation results in a classi-

fying disease / disorder, the new diagnosis will be recorded. This may replace the symptom diagnosis 'subfertility', but it may also be added to it, especially if treatment is primarily focused on the subfertility and not on the underlying disease.

Additional diagnoses besides 'infertility / subfertility' may also be other symptom diagnoses, for example, menstrual cycle disorders. Irregular menstruation (X07) or oligomenorrhoea / amenorrhoea (scanty or absent menstruation, X05) can be added if they lead to specific advice or other interventions for this. If patients or couples present with questions or complaints regarding fertility, but the GP does not classify this health problem as 'subfertility' (W15 / Y10), FaMe-Net GPs can use the ICPC-2 code A98 ('Prevention') and use the ICD-10 subclass 'advice regarding reproduction'.

3 Epidemiology of subfertility in FaMe-Net

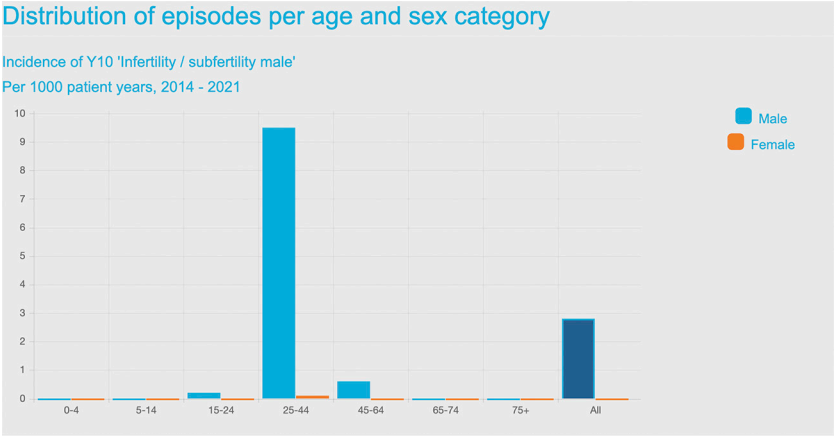
Female subfertility (W15) has an incidence of 3.8 per 1000 patient years, meaning almost four new diagnoses of female subfertility in a year in a practice with 1000 female patients. Link/Figure 1



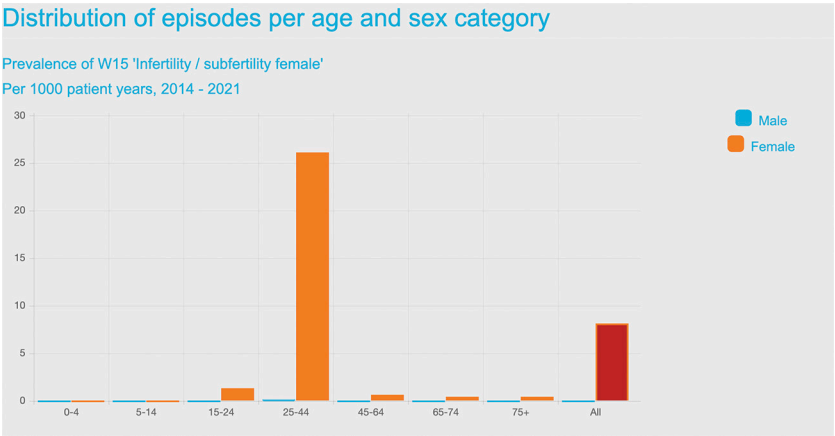
Male subfertility (Y10) has an incidence of 2.8 per 1000 patient years, meaning almost three new diagnoses of male subfertility in a year in a practice with 1000 male patients. Link/Figure 2

Figure 1

Figure 2



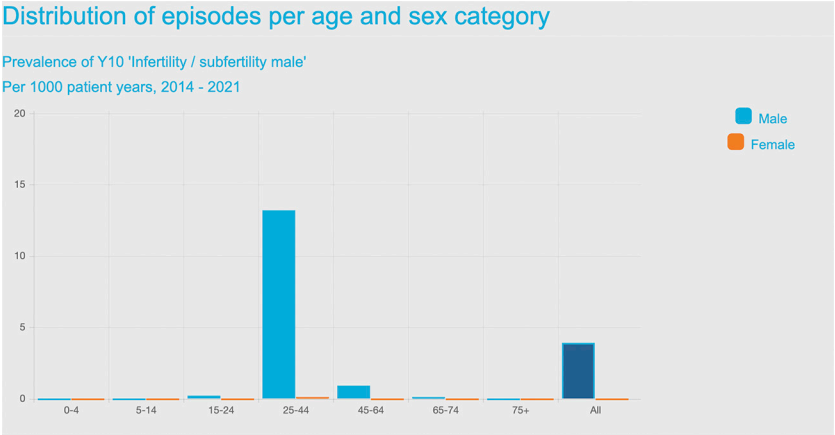
The prevalence of 'subfertility female' (W15) is 8.1 per 1000 female patient years, meaning that among 1000 female patients in a year, eight receive help or guidance from their GP for subfertility. Link/Figure 3



The prevalence of 'subfertility male' (Y10) is 3.9 per 1000 male patient years, meaning that among 1000 male patients in a year, four receive help or guidance from their GP for subfertility. Link/Figure 4

Figure 3

Figure 4



Subfertility is usually a problem for a couple, but is recorded more commonly among female patients in the FaMe-Net database than among males. In this website, data cannot be studied in residential association (i.e. for couples). This would be possible with additional data extractions (on request). The data implies, however, that subfertility as a health problem is sometimes presented to the GP by a couple but sometimes by a woman alone.

The incidence and prevalence are highest in the age group 25-44 years, both among women and men. In this age group, 26 per 1000 female patients present to their GP with subfertility throughout the year (prevalence). Subfertility is also prevalent in the age group 15-24 years, especially among women (1.3 per 1000 patient years). In the age group 45-64 years, a new or existing diagnosis of subfertility is rare, but occurs more often in men (incidence 0.6, prevalence 0.9 per 1000 patient years) compared to women (incidence 0.3, prevalence 0.6 per 1000 patient years).

Among women aged 25-44, subfertility is ranked 34 in the 'Top Prevalence' list of conditions affecting a large proportion of the population and presented to the GP. 'Pregnancy' (W78) is the number one prevalent condition in this group, followed by two other reproduction related conditions (oral contraception (W11) and intrauterine contraception (W12)). Link/Table 5

4 Which initial RFEs do patients with subfertility present to their GP?

'Subfertility' (W15 and Y10) is a symptom diagnosis and thus also the most common reason for encounter (RFE). Other frequent RFEs are a request for a referral to the hospital (*67), a request for advice (*45) or the need for 'reproductional advice' (A98). In women, subfertility is sometimes initially presented with the RFE irregular menstruation (X07). Link/Table 6 Men sometimes present with the request for a sperm investigation (*38) or being sent by someone else (*65). Link/Table 7

5 How do FaMe-Net GPs act?

A referral to secondary care is made in 50% of episodes of subfertility among women (W15, Link/Table 8) and in 60% among men (Y10, Link/Table 9). This concerns the percentage of referrals made per episode per calendar year. These referrals are directed to the gynaecologist and, in men, occasionally to the urologist. Link/Table 10, Link/Table 11 Other common interventions are health education / advice, lab tests, and in men (Y10), sperm investigation (in 36%). Medication prescriptions for subfertility (W15) occur only seldomly by the GP. Link/Table 12

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/subfertiliteit#volledige-tekst (2010)

Hornstein MD, Gibbons WE, Schenken RS. Natural fertility and impact of lifestyle factors. In: UpToDate, Barbieri RL, Eckler K (Eds), UpToDate, Waltham, MA, 2021

Table 9 Table 10 Table 11 Table 12

Breast cancer (X76)

ANNEMARIE UIJEN

1 Clinical course of breast cancer

Signs and symptoms of breast cancer may include a lump in the breast or eczema at the nipple. In symptomatic patients, mammography or breast ultrasound can show a suspicious lump. Breast cancer may also be detected by mammography screening.

A definite diagnosis is made when malignant epithelial cells are found. The most common histologic types are infiltrating ductal, infiltrating lobular and mixed ductal / lobular carcinomas.

To detect breast cancer at an early stage, all Dutch women aged between 50 and 75 years receive an invitation to participate in a mammography screening every two years.

Breast cancer in men occurs very rarely. Factors that are associated with an increased risk of breast cancer – besides female sex – are increasing age, a family history of breast cancer, alcohol consumption, smoking, and having had oestrogen and progesterone circulating for a long time. Examples of long hormonal exposure are early menarche (having your first menstrual period at a young age), late menopause, nulligravidity (never having been pregnant), giving birth for the first time at an older age and using postmenopausal hormone therapy. Breastfeeding and physical activity reduce the risk of breast cancer.

Most women (around 98%) will survive breast cancer for five years or more after diagnosis. Treatment occurs in secondary or tertiary care and depends on the stage of breast cancer at presentation. Specialist treatment may involve surgery, radiation therapy and medical oncology (e.g. chemotherapy, hormonal treatment, immunotherapy).

In the text below, we will focus only on female breast cancer.

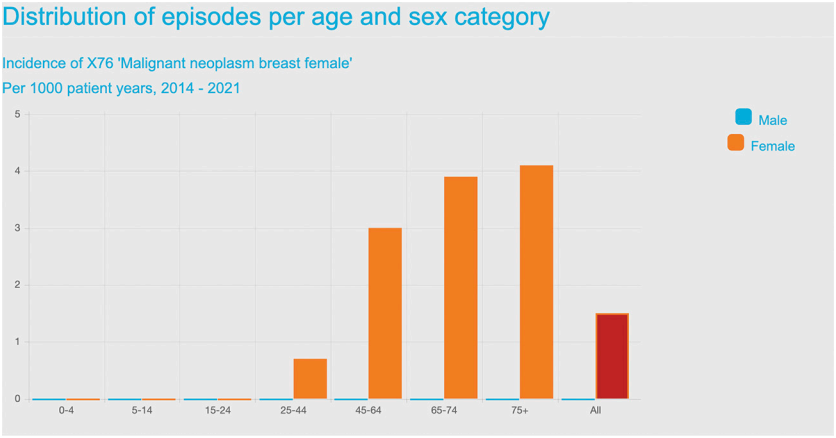
2 How is breast cancer recorded in FaMe-Net?

Breast cancer is coded in ICPC-2 as X76.

3 Epidemiology of breast cancer in FaMe-Net

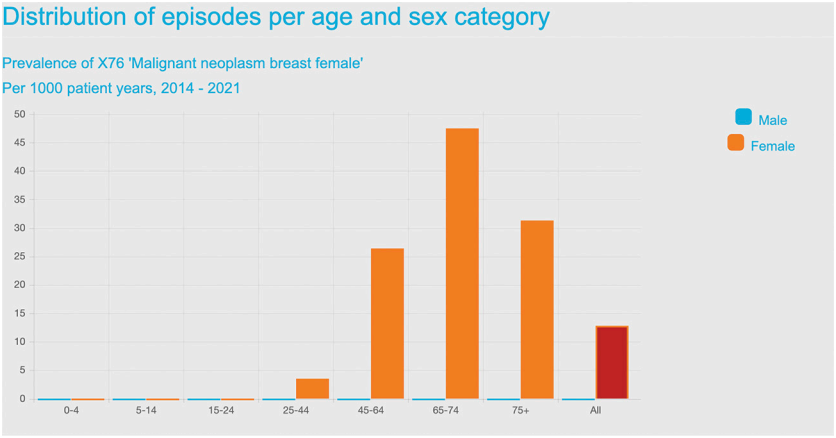
Incidence of breast cancer is 1.5 per 1000 female patient years, meaning there are three new diagnoses in a practice with 1000 female patients every two years. The diagnosis is generally made in patients older than 45 years of age but there are sometimes cases in the age group 25-44 as well. Inci-

dence is highest in patients aged between 65 and 74 and in those over 75 (4.0 per 1000 patient years). Link/Figure 1



The prevalence of breast cancer is 12.8 per 1000 female patient years. This means that among 1000 female patients per year, 13 have (had) breast cancer and sought help from the GP for it. Prevalence is highest in patients aged 65-74 years, at 47.5 per 1000 patient years. Link/Figure 2

The higher prevalence compared to incidence indicates that breast cancer requires ongoing GP attention in the years after the diagnosis.



4 Which initial RFEs do patients with breast cancer present to their GP?

The most common reason for encounter (RFE) for breast cancer is a breast lump / mass (X19), which is presented in 35% of all new breast cancer diagnoses. Another frequently recorded reason to start this episode is an abnormal screening result. The GP can receive this result as a letter (RFE *62), the screening care provider can contact the GP about the abnormal finding (*65) or the GP can initiate the contact with the patient in response to an abnormal screening result (*64). Link/Table 3 In younger women with breast cancer (25-45 years), a breast lump / mass is even more common as an initial RFE of an episode breast cancer (but note that these numbers are low). Link/Table 4

In previous research with FaMe-Net data, a positive predictive value of 15% was found for diagnosing breast cancer in patients aged 45 years and older presenting with a breast lump (RFE X19). This means that 15% of those patients who presented with a breast lump were to be diagnosed with breast cancer (final diagnosis X76). The positive predictive value in the current dataset is 10%. Link/Table 5 This lower percentage is probably caused by the younger average age of women contributing to the current dataset when compared to the previously published data; after new practices joined the registration in 2014, the age composition of the entire FaMe-Net population shifted towards one with a smaller proportion of older patients, resulting in a lower average age in those over 45.

5 How do FaMe-Net GPs act?

When the diagnosis is still unclear, GPs request diagnostic radiology / imaging (*41) or refer to a specialist (*67, Link/Table 6), most often a surgeon. Link/Table 7 During a breast cancer episode, the most common intervention by GPs is the prescription of medication (*50). Most commonly, anti-oestrogens and aromatase inhibitors are prescribed. Link/Table 8 Referral to physical therapy is also a common intervention. Link/Table 9

References

Dutch guideline: https://richtlijnen.nhg.org/standaarden/borstkanker#volledige-tekst (2016)

Van Boven *et al*. The diagnostic value of the patient's reason for encounter in diagnosing cancer in primary care. *JABFM* 2017.

Table 5 Table 6 Table 7 Table 8 Table 9

Acknowledgements

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‘Morbidity in primary care’ is a medical textbook that presents a selection of diseases, disorders and clusters of symptoms registered in ‘Family Medicine Network’ (FaMe-Net). FaMe-Net is a Dutch primary care registration network with decades of experience in the accurate registration of all morbidity presented to the GP. This registration is embedded in the daily practice of GPs providing regular care to their enrolled patients. All morbidity data from 2014 up to and including 2021 can be accessed at www.famenet.nl/morbidity-data.

Each chapter presents the incidence and prevalence of the selected condition and the age and sex groups in which this condition is most common. Common reasons for encounter are described: symptoms, complaints or requests that patients present to their GP at the beginning of the episode of care. In addition, each chapter discusses common GP interventions (policy). The clinical course and registration of the condition are also described.

Reading the chapters in this book familiarises the user with how epidemiological numbers can be found on the website. The chapters contain links to the web pages where the relevant data are displayed. This makes it an interactive textbook, as the user can apply their own selections and look up their own epidemiological question. For example, change the calendar period or answer the same question for a different condition, including conditions not yet described in this book. The accompanying text in the chapters helps interpret the numbers correctly and guard against potential pitfalls.

The database and this book are updated periodically.

This book is written by general practitioners practising in registering practices, many of whom are also affiliated with Radboud University Medical Centre as researchers, lecturers or trainers. The book is intended for general practitioners, GPs in training, medical students and researchers.

Family Medicine Network

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