FINAL REPORT

Netherlands Pilot Project on Morbidity Statistics

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Authors:

Agnes de Bruin, Laura Voorrips, Janneke Ploemacher (CBS)
Coen van Gool, René Poos, Martin Gommer (RIVM)

Statistics Netherlands (CBS), co-ordinator, and
National Institute for Public Health and the Environment (RIVM), co-partner

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Summary

The Netherlands Pilot Project of Morbidity Statistics was carried out by Statistics Netherlands (CBS) and the National Institute for Public Health and the Environment (RIVM).

For all diseases in the European Diagnosis-specific morbidity shortlist, and for all required incidence and prevalence measures per disease, an inventory was carried out of potential national sources of data. The inventory was limited to those sources that were already available, sources that could be acquired using limited resources, and sources that probably will be available in the near future and could be studied on the basis of older data. For each of these sources, background information was collected to assess the usability for the required morbidity statistics.

Methodological aspects relevant for the calculation of the required measures were elaborated. Special attention was paid to the possibilities of combining several General Practitioner Network data sources by fitting aggregated data of these sources, and to the possibilities of record linkage of different data sources. Also, it was discussed what definition of period prevalence should be applied for the different diagnoses of the shortlist, and what reference population should be used for each of the data sources.

Based on the inventory, data of the potential sources were collected. For the majority of diagnoses of the morbidity shortlist, one or more potential sources could be identified. Data of these sources were compared and differences found were discussed. In some cases, it was not possible to select the required ICD-10 codes in the specific data source. This was mostly due to the fact that the general practitioner networks in the Netherlands use another classification system. In some other cases, it was concluded that the data source was not suitable, because it did not cover most of the prevalent or incident cases for the specific disease. Record linkage was used in some diagnoses, to complement data from hospitals with mortality data, and data from general practitioners with hospital and mortality data. For a number of diseases record linkage resulted in better prevalence estimates.

Overall, for most diseases it was possible to identify best sources for the prevalence and incidence measures. For these diseases the age and sex specific data were filled out in the Morbidity tables, and crude and standardized rates were calculated.

The most suitable national sources in the Netherlands appeared to be general practitioner networks and disease specific registers for infectious diseases and for cancer. The Hospital Discharge Register and sentinel network data on injuries and external causes were also used. The Causes of Death register was sometimes used as complementary data source. Other data sources that were occasionally used are epidemiological studies on mental health disorders and the national Health Interview Survey.

Prevalence and incidence estimates could be worked out for almost all diseases of the morbidity shortlist. However, it was also shown that different sources often resulted in large differences in the estimates. Combined with the fact that the health systems and the available data sources differ between the European countries, it is therefore expected that international harmonization of morbidity statistics will not be reached easily.

For future data collections on morbidity, it is recommended to make more precise and practical definitions of the desired prevalence and incidence measures, based on the type of data sources of diagnosed morbidity available in most European countries.

List of abbreviations

AIDS	human immunodeficiency virus
AMI	Acute Myocardial Infarction
ARC	AIDS-related complex
ATC	Anatomical Therapeutical Chemical
CAK-BZ	Central Administration Office Exceptional Medical Expenses
CBS	Statistics Netherlands
CHI	College of Health Insurances
CMR-Nijmegen	Continuous Morbidity Registration – Nijmegen
CMR-Sentinels	Continuous Registration of Morbidity – Sentinels
COD	Causes of Death register
CVD	cerebrovascular diseases
CVZ	CVZ drug register
DDD	defined daily dose
DRG	diagnose related group
DTC	Diagnosis and Treatment Combinations
ER	emergency room
ESS	European Statistical System
GP	General Practitioner
GPRN	General Practitioners Registration Network
HAV	hepatitis A virus
HBV	hepatitis B virus
HCV	hepatitis C virus
HDR	Hospital Discharge Register
HIS	Health interview survey
HIV	human immunodeficiency virus
ICD	International Classification of Diseases
ICPC	International Classification of Primary Care
ISHMT	International Shortlist for Hospital Morbidity Tabulation
ISIS	ISIS Health Service, national surveillance of infectious diseases
ISS	Dutch Injury Surveillance System
ISS	Injuries Surveillance System
LINH	Netherlands Information Network of General Practice
LIS	Injuries Surveillance System
LZV	National registration of Nursing Home Care
NCR	Netherlands Cancer Registry
NKR	Netherlands Cancer Registry
NTR	Netherlands Tuberculosis Register
PR	Population Register
RIVM	National Institute for Public Health and the Environment
RNH	General Practice Registration Network Limburg
RNUH-LEO	Registration Network of General Practitioners Associated with Leiden University
SHM	Dutch HIV/AIDS monitoring foundation
SOAP	Registration of consultations on sexually transmitted infections
STI	sexually transmitted infections
TB	Tuberculosis
TIA	Transient Ischaemic Attack
VTV	Public Health Status and Forecast

Chapter 1. Introduction

This report describes the work carried out in the Netherlands Pilot Project on Morbidity Statistics, co-funded by Eurostat (Grant agreement no. 10501.2009.004-2009-513). The project started in January 2010 and lasted 18 months.
The project consisted of different work packages, which were carried out simultaneously by Statistics Netherlands (CBS) and the National Institute for Public Health and the Environment (RIVM).

The aim of this pilot was to test the feasibility of the methodological approach for producing diagnosis-specific morbidity statistics required for the ESS (under Regulation (EC) 1338/2008) in the Netherlands.

For the diseases on the European shortlist (Diagnosis-specific morbidity–shortlist, version 6 March 2007), and for all required incidence and prevalence measures per disease (according to Annex III of the Principles and guidelines for diagnosis-specific morbidity statistics, version 23 April 2007), an inventory has been carried out of potential national sources of data.

Special attention has been paid to elaborate on the best possible methodology for diseases for which methodological problems were envisaged or for which new approaches (record linkage) or data sources have become available in the Netherlands. Through this project CBS and RIVM got insight in the adequacy of, and caveats in, the data infrastructure in the Netherlands in the context of future data collection within the ESS.

Chapter 2 describes the process of inventory of potential national sources for diagnosis-specific morbidity data, including a concise description of the different types of sources. In Chapter 3 the focus is on the development of methodology for producing the best national estimates, discussing per type of source the specific methodological aspects encountered and choices made during the search for the best (combination of) data sources. In Chapter 4, for each of the 60 diseases the available data are discussed and if possible the available best choice is indicated. In Chapter 5 the conclusions of the pilot are given, as well as the problems encountered, and recommendations for future data collections.

The results of the pilot data collection are given in the 'Morbidity tables', with the best estimates for absolute, relative and standardized incidence and prevalence rates for the 60 diseases in the list (Annex 6).
Also, the different requested templates are filled out and presented in Annexes 1-3.

Chapter 2. Inventory of potential national sources for diagnosis-specific morbidity data

2.1 Introduction

In the inventory phase of the project, a listing and description was made of all potential national sources for the required incidence and prevalence measures of the diseases in the shortlist *(Diagnosis-specific morbidity – European shortlist, version 6 March 2007).* During the inventory process, RIVM has focused on data sources that were not available at CBS, and CBS has focused on its own data sources and external data sources available at CBS.

For each type of source which could be used to supply data, a short description is given in the present chapter (2.2). A more extensive description and evaluation of each data source is presented in a separate template, as specified by Eurostat (templates 2, Annex 2).

In 2.3 a general assessment of the different data sources is given, as presented in Annex 1. Both main and additional sources were assessed according to several criteria of quality. The data sources were assessed for relevance, accuracy, timeliness & punctuality, accessibility & clarity, comparability (geographical and over time) and coherence. These criteria are explained in "chapter 6 - Statistical quality" of the *Principles and guidelines for diagnosis-specific morbidity statistics* document.

2.2 Summary of data sources

General Practitioner Networks
In the Netherlands, nearly all non-institutionalized inhabitants, and also most people living in homes of the elderly, are registered at a General Practitioner's practice. In the Dutch health care system, the General Practitioner (GP) fulfils a gatekeeper role: when patients need medical care from a medical specialist they have to be referred by the General Practitioner. Afterwards, the medical specialist reports back to the patient's GP. As a result, GPs have contact with patients suffering from diseases in various stages and with nearly all patient groups without selection regarding age, gender, socio-economic status or ethnicity (van der Dungen et al, 2008). For these reasons, routinely collected data from general practice registrations can be used to estimate prevalence and incidence of most chronic diseases. In the Netherlands, GP data are not collected in a central database. In General Practitioner Registration Networks (GPRNs) GPs from different practices are combined in a network. Several GPRNs exist, where some are local initiatives and other are located all over the Netherlands. In a GPRN the GPs have agreed upon what kind of information and what level of detail of their patients and practices are monitored and how. The databases contain coded information about symptoms and diagnoses, treatments, drug prescriptions, and patient characteristics.

In this pilot data have been used from the GP networks LINH, CMR, RNUH-LEO, RNH and Trans. Only short descriptions of these networks are given here; detailed information can be found in the requested Templates 2 (Annex 2).

LINH
The largest GPRN is LINH (92 practices, 350,000 individuals). Practices participating in this GPRN are located all over the Netherlands and cover about 2% of the Dutch population. LINH is a contact and episode based registration. Apart from registration of individual contacts; contacts belonging to the same health problem are also aggregated to episodes. Individual data of LINH are available to Statistics Netherlands (CBS) on a regular basis and can be linked over time, giving future opportunities to provide specific morbidity data. Therefore, special effort is made in this pilot project to investigate the potential of LINH in this respect.

CMR-Nijmegen
Contact based GPRN (4 practices, 9 GPs, 13,500 patients). GPs register all morbidity that is presented by patients, even if not the main reason for GP visit. Information is derived from telephone consults, and nurse practitioner contacts; hospital discharge records are used as well.

CMR- Sentinels
Contact based GPRN with a patient population covering about 0.8% of the Dutch population, spread by region and level of urbanisation (44 practices, 61 GPs, 135,500 patients). CMR-Sentinels [in Dutch: CMR-Peilstations] GPs report weekly on the occurrence of some diseases, events and procedures, in routine records. One of the main topics of the CMR-Sentinels is 'seasonal flu' (influenza-like illness). Therefore this GPRN is used for estimating morbidity statistics for influenza.

RNH
Problem based GPRN (22 practices, 65 GPs, 88,000 patients). GPs register specific conditions that can be regarded as chronic on a problem list. Prevalence and incidence of conditions of less than one year are being underestimated (because GPs may not qualify the condition as chronic upon first contact).

RNUH-LEO
Episode based GPRN (4 practices, 20 GPs, 30,000 patients). GPs register starting date of every condition episode plus diagnosis in electronic health records. Fifteen months after last contact for the condition, the record is being terminated. Condition episodes can get on the problem list (problem-based registry) if they have become chronic (or frequently intermittent). Although not all patients who have conditions on the problem list visit their GP yearly, these conditions are being monitored by the GP, e.g. through prescriptions.

Transition Project
Episode based GPRN (5 practices, 9 GPs, 13,500 patients). GPs register starting and ending date of every condition episode and the diagnosis in electronic health records. For the construction of episodes all contact based information is being used, such as health interventions, referrals, lab results, prescriptions, etc. New episodes can also start after telephone consults.

Hospital Discharge Register
The Hospital Discharge Register (HDR) is a register with data on hospital discharges covering all general and university hospitals and specialised hospitals in the Netherlands with the exception of epilepsy clinics and long-stay centres for rehabilitation and asthma treatment. Private clinics are not included. Inpatients as well as day cases are registered, with the exception of day patient care for childbirth, psychiatric treatment and rehabilitation treatment. For each hospital discharge and day case, information is registered on among others diagnoses, procedures, date of birth, sex, numeric part of postal code, type of hospital, and date of admission and discharge.

Causes of Death Register
The Causes of Death (COD) register contains all causes of death of Dutch citizens who died in the Netherlands. The information is based on the statutory notification of causes of death by the physician treating the deceased at the time of death or by the coroner in case of an external cause of death. The underlying cause of death, max. 3 secondary causes of death, sex, age, postal code, place of death (e.g. hospital, at home), date of death and a personal identification number are registered.

CVZ Drug register
Data about supplied prescribed drugs originate from a register held by the College of Health Insurances (CHI). The data are provided to CHI by health insurance companies, within the framework of risk settlement. The register contains integral data on drugs dispensed in general pharmacies, including data from dispensing physicians or GPs. The data are restricted to medicines that are compensated by basic health insurance schemes. Annual data contain about 150 million records of dispensed medicines. Records contain information about the product dispensed i.e. article code, delivery date, unity, amount of product, debit/credit code, amount of the claim. The article code is used to link with the G-standard medicine database held by Z-index. In this database, additional information is available on the Anatomical Therapeutical Chemical (ATC) classification of a drug or substance, as well as on the defined daily dose (DDD).

Netherlands Cancer Registry
The aim of the Netherlands Cancer Registry (NKR) is to clarify the nature and extent of the cancer problem in the Netherlands. Furthermore, the care for patients with cancer needs constant improvement. The NKR gives insight in how common is cancer, how many and which people are affected, and what the treatment and prognosis is. The NKR is the only oncological disease registration in the Netherlands with records of nearly all cancer patients. Since 1989, data are available at national level. The data are being registered by specially trained staff in hospitals, pathology laboratories, or hematology laboratories. The registration staff administers details of all cancer patients in a hospital, or whose disease has been confirmed through tissue investigation. This represents over 95 percent of all cancer cases in the Netherlands. The registration is a tumor registry, which means that more than one tumor can be registered of one patient.

Netherlands Tuberculosis Register
The Netherlands Tuberculosis Foundation systematically collects, analyzes, and reports data on the incidence and prevalence of tuberculosis in the Netherlands, in close collaboration with regional health services and the Centre for Infectious Disease Control of the National Institute for Public Health and the Environment (RIVM). The data of this Netherlands Tuberculosis Register (NTR) are collected by volunteers in hospitals and

regional health services. After mandatory reporting of a suspected case of TB to the regional health service [in Dutch: GGD], the GGD reports the suspected case to the Centre of Infectious Diseases of RIVM through internet [https://Osiris.rivm.nl/]. Furthermore, the GGD reports additional data such as age, gender, etc., to NTR. After RIVM has reported back the diagnostic data to the GGD, the GGD reports these data to NTR. GGDs also report treatment outcomes to NTR at the end of treatment or when patients are lost to follow-up.

Dutch HIV/AIDS Monitoring Foundation
HIV/AIDS-monitoring is coordinated by the Dutch HIV/AIDS Monitoring Foundation [in Dutch: Stichting HIV Monitoring (SHM)]. Data are collected at 25 HIV/AIDS-treatment centres. Data from all HIV-infected people who visit a treatment centre are being registered. The advantage of this registration is that, along with demographic and virological data, monitoring data are being collected on morbidity and mortality. The recording provides valuable information on disease course and background information of newly diagnosed HIV-infected people who consult treatment centres. HIV infected individuals in care, who were diagnosed prior to the start of SHM in January 2002, were as far as possible included in the cohort retrospectively.

SOAP Electronic notification system
Registration of consultations on sexually transmitted infections (STI) from eight STI centers (consisting of a coordinating regional health center with a number of sub-centers). Each consultation consists of a short questionnaire with demographic data, epidemiological characteristics, laboratory tests and STI diagnoses. These data are entered into a web application (SOAP), so that data are collected uniformly. Main goals of use are insight into trends in STI through STI surveillance centers in the Netherlands and serving the financing of additional STI care. SOAP is a safe, anonymous and quick registration, transmitted to the RIVM through an automated notification system. The target population consists of high-risk groups and people who want to be tested anonymously.

OSIRIS Electronic notification system
Osiris is the online system for local health service authorities to fulfil the statutory reports on the occurrence of infectious diseases to the Health Care Inspectorate. The system also acts as a source of data for ISIS Health Service, which is the national surveillance of infectious diseases (such as legionellosis and hepatitis B) by the RIVM.

Injuries Surveillance System
The Injuries Surveillance System (ISS) [in Dutch: Letsel Informatie Systeem (LIS)] records personal, circumstantial and injury data on accident victims and patients who report at an emergency room (ER) in 14 Dutch hospitals for treatment. The data are collected continuously from January 1, 1997 onwards. To ensure a good quality system, in addition to a random check of the information collected (of which at least 40% of injury records are being checked visually) much attention is paid to the maintenance of the classification, the software and contacts with the hospitals. Also, the validity and reliability of the ISS data are regularly examined. The ISS provides mean annual figures over a period of five years (the data used in this pilot concern the period 2005-2009).

NEMESIS-2 mental health study
NEMESIS-2 is a longitudinal survey on mental health disorders with three three-year intermittent waves among the general population aged 18 to 65 years. In the first wave, which took place between the end of 2007 and mid 2009, 6.646 face to face interviews were held using the 'Composite International Diagnostic Interview 3.0'. A multi-stage, stratified random sampling procedure was used to select potential respondents. The response rate was 65.1%. Amongst others, respondents were asked about mental health problems in their entire life time and in the past year. No incidence figures could be calculated, since only the first round of data collection was available for analysis. After finishing the second and third round of the study also incidence rates will become available.

Health Interview Survey
The national Health Interview Survey of the Netherlands is a continuous national survey among the non-institutionalised population, with 9,000 - 10,000 respondents yearly. The survey collects data about self reported health status, disability, use of medical services and prevention programmes, and life style. The health status items include self reported prevalence of a number of specific conditions, e.g. migraine or severe headache, diabetes, psoriasis, chronic eczema, high blood pressure, back problems, arthrosis, rheumatoid arthritis, stroke, myocardial infarction, cancer, depression, and anxiety disorder.

2.3 General assessment of data sources

Based on the relevance, accuracy, timeliness & punctuality, accessibility & clarity, comparability and coherence criteria, a general assessment was given to each data source (see template 1, Annex 1). In this overall assessment 'relevance' was given the highest weight. The Cancer Registry and the HIV/AIDS Monitoring Foundation were assigned as best data sources (score 5), followed by fitted GPRN data, LINH, Tuberculosis Register, and the CMR-sentinel data on influenza (score 4), Hospital Discharge Register, SOAP Register, the OSIRIS Register, and Injuries Surveillance System (score 3). As secondary or complementary data sources were identified: CVZ drug register, NEMESIS-2 mental health study, Health Interview Survey, and Causes of Death register. The latter is considered to be a complementary source, used for additional case finding by linking with the main morbidity data sources (see chapter 3).

Chapter 3. Development of methodology for producing best national estimates

In this chapter the methodological issues that were studied during this pilot are elaborated. Firstly, research was done to get the most appropriate translations of the ICD-10 definitions of the requested diseases into the other classifications used in the different data sources (3.1). Secondly, the use of registers covering all diagnoses was studied (3.2), i.e. the Hospital Discharge Register (3.2.1) and the GP registers (3.2.2). As GP-network data are an important source for many diseases of the shortlist, a lot of effort was put into studying the possible methods to produce best estimates using these data. Also, research was done into the possibilities of combining register data (3.2.3). In 3.3 - 3.6 the use of other registers and surveys is described. In 3.7 - 3.9 some specific technical issues are described that are relevant for producing the national estimates, including correction of data for the nursing home population, calculation procedures used for filling the Morbidity tables, and the definition of period prevalence. Finally, some conclusions regarding the methodology are summarized in 3.10.

3.1 Translation of ICD-10 to ICPC and ICD-9-CM

To select the appropriate data on prevalence and incidence, the ICD-10 definitions of the diseases in the Morbidity shortlist had to be translated to the most appropriate selection in other classifications used in the different data sources. This includes the International Classification of Primary Care (ICPC-1), used in the GP networks, and the ICD-9-CM, used in the Hospital Discharge Register.

The translation of ICD-10 to ICPC-1 took part in two steps. First, the Dutch ICPC-2–ICD-10 mapping thesaurus was used to find all ICPC-2 codes related to the ICD-10 codes of interest (Okkes, Oskam, & Lamberts, 2005; http://www.transitieproject.nl). ICPC-2 codes were compared with ICPC-1 codes, which generally did not result in differences. Then, the selected ICPC-2 codes were translated back to ICD-10 codes and compared to the original ICD-10 codes requested. In the case that the inclusion of an extra ICPC code was doubted (as it resulted in either more or less than the required ICD-10 codes), several combinations of ICPC codes were checked to minimize the discrepancy between ICD-10 codes requested and ICPC-2 codes selected. In case of discrepancy between ICD-10 codes requested and obtained, mentioning is made in the disease and measure specific overview of potential and best data sources (Annex 3, template 3), and when relevant in the discussion of the disease specific results (4.2).

In the Hospital Discharge Register (HDR) diagnoses are registered according to the ICD-9-CM. Translations of the requested ICD-10 codes to ICD-9-CM have been made for those diseases of the shortlist for which the HDR is a possible source. To make the translations back and forth a thesaurus was used as an auxiliary tool (RIVM, 2010). For the majority of these diseases straightforward translations are available (see Annex 3, template 3). For some diagnoses, however, different translations are possible. For these diseases, it is described in Chapter 4 (4.2) what choices have been made.

For future Eurostat data collections it is recommended to give the preferred translations of the ICD-10 definitions of the requested diseases into the ICPC and ICD-9-CM classifications.

3.2 Use of registers covering all diagnoses

In the Netherlands, the GP registers and the Hospital Discharge Register are data sources that cover all diagnosed morbidity of the patients that use these respective health care services. Therefore, these registers can be an important source of data for a substantial number of diseases in the European shortlist of diagnosis-specific morbidity. In this pilot methodological research was done on the use of these registers for producing prevalence and incidence rates. RIVM developed a method to combine the age and sex specific data of different GP-networks to overall estimates. CBS explored the possibilities of micro record linkage of each data source, and of combinations of GP data, Hospital Discharge data and Causes of Death data. The Causes of Death data were used for additional case-finding in the other registers.

3.2.1. Hospital Discharge Register

The Hospital Discharge Register (HDR) contains data on the level of hospital discharges, not on person level. To be able to follow up persons on hospital discharges and day patient admissions in time, which is especially relevant to derive prevalence and incidence data, CBS has linked the HDR to the Population Register (PR). However, in the HDR only limited linkage variables are available, i.e. sex, date of birth and truncated postal code (4 digits). Because of the limited resolution power of the HDR-PR linkage key, not all discharges can be uniquely linked to a person in the Population Register. To correct for this a weighting method is used, in which the subpopulation of the PR that can be uniquely linked throughout the time-period of interest is used as denominator and weighted on person-level to the entire population in the PR.

The hospital discharges that are linked to this PR subpopulation in a particular year are used to calculate the clinical prevalence of diseases. The clinical prevalence is defined as the number of persons having at least one hospital discharge for the disease in the reporting year. The clinical incidence is defined as the number of persons having at least one hospital discharge for the disease in the reporting year, *and* not having a discharge for the same disease in the preceding 5 years. To measure the prevalences a (weighted) subpopulation of the PR is used, consisting of persons that are (at lifetime) uniquely linkable throughout the reporting year. For the incidences the PR subpopulation consists of persons that are uniquely linkable in the reporting year, and in the 5 preceding years as well.

The above mentioned method assumes that the HDR is a complete register and that all HDR records can be uniquely or multiply linked to the PR. This is not entirely the case, but up to 2004 the percentage of missing and non-linkable records was small (in 2004 1.1% and 2.8%, respectively). However, from 2005 onwards the percentage of missing records in the HDR has much increased (to 12.0% in 2007). As this would result in underestimation of the clinical prevalences and incidences, the outcomes were re-weighted from 2005 onwards to correct for the non-response in the HDR. The additional weighting is done on aggregated level (per diagnosis - age group - sex combination), using information of an old, nearly complete year (2004). The prevalences of the response hospitals in the reporting year are re-weighted, using the proportion of the prevalences of these response hospitals and non-response hospitals in 2004. For the incidences it was assumed that these are constant proportions of the prevalences, again per diagnosis – age group – sex combination. These additional weighting techniques are only sustainable for a limited number of years. Fortunately, it is envisaged that the

coverage of the HDR will increase again in the coming years, so in future the additional weighting may not be necessary anymore.

CBS has published statistics on the clinical prevalences and incidences from 1995 onwards (www.cbs.nl; StatLine database) for three different lists of diagnoses, i.e. the International Shortlist for Hospital Morbidity Tabulation (ISHMT), the diagnoses of the Public Health Status and Forecast (VTV) of RIVM, and the diagnoses of the European Shortlist of Causes of Death. Figures of 2007 from these statistics are used for the diseases that correspond to the requested diseases in the Morbidity shortlist for this pilot. In future, similar figures may also be derived for other diseases of the Morbidity shortlist, but as the production system is rather complicated, this was not yet implemented for this pilot. However, some pilot studies have been done to determine for which diseases of the morbidity shortlist linked HDR data are relevant (see 3.2.3).

3.2.2 Use of GP registers

3.2.2.1 General aspects

GPRNs differ in two important ways. One is the classification system used for diagnoses, which requires mapping to uniform them for data analysis. The other is the method used for data collection: problem-based or episode-based. Problem-based registries systematically collect information about a number of health problems that are permanent, chronic (duration longer than 6 months) or recurrent. A patient marked as having a specific health problem stays registered as such over time, until the problem no longer exists. Episode-based registries are not limited to specific diagnoses and collect information when a person seeks medical care.

GPRNs lack data of nursing home residents. For some diseases the prevalence will be higher in this group, but the number of residents is small compared to the general population. Therefore, the effect on prevalences will be generally small. For some diseases the effect will be more substantial (see 3.7).

In the episode-based LINH, for each episode it should be registered whether this episode refers to a new (incident) or an existing health problem. With this indicator it can be determined whether the episode is to be used for the measurement of prevalence only or also for incidence measurement. However, the quality of this indicator is not good enough in some of the participating GP practices, therefore only a selection of LINH practices can provide data on incidence measurements. This results in a smaller LINH population available for incidence measurements.

3.2.2.2 Combining several GP registers to national estimates

For the Public Health Status and Forecast (VTV) project of the RIVM, data of several GPRNs are combined to estimate national data on prevalence and incidence. For each disease, appropriate GPRNs were selected. Using a regression model, incidence and prevalence were estimated as a function of age, sex and interactions between these variables. The possible systematic differences between the GPRNs registrations were taken into account by including a GPRN identifier as a random intercept. The random intercept in the model is meant to capture all of the differences that exist between GPRNs that may be the result of a range of different underlying reasons (differences in case definition, differences in socio-economic status, differences in GP practices, differences in

GP computer software). For the incidence measures a Poisson model was used, for the prevalence measures a logistic model (Van Baal, 2011). Optimal model fits resulted in overall estimated age and gender specific prevalence and incidence rates. These relative prevalence and incidence figures were then multiplied with the respective age and gender specific Dutch population numbers as per January 1st of the reporting year, to generate disease point prevalence in terms of absolute numbers. Relative incidence figures by age and sex were multiplied with the average Dutch population (period-age model; see 3.8.2) to generate year incidence in terms of absolute numbers. One year prevalence figures can then be derived by adding the point prevalence figures with the one year incidence figures.

These collective analyses of available GPRNs are performed every four years (the last data collection was for the year 2007), for a number of diseases which do not all cover the (ICD-codes of) diagnoses required for this Morbidity Pilot. Theoretically, however, these model fits can be estimated for nearly any disease that is common in the general population and that have multiple data sources. So for future data collections this method can be used for all relevant diagnoses of the morbidity shortlist.

The GPRNs available consist of a mixture of episode and problem oriented GPRNs. Depending on the disease, the variation between GPRNs, and the outcome measure (prevalence, incidence), a choice is made regarding which specific GPRNs to be included in the fitting model. For some chronic diseases patients do not frequently contact the GP, as they are treated by medical specialists. For other diseases, less contact with the GP is required as patients do not need care every year or because no treatment exists. For these diseases, one year data of an episode-based GPRN such as LINH can be used for incidence but not for prevalence measurements. On the other hand problem-oriented GPRNs may continue to report patients as cases while actually the patient has recovered from the disease.

The LINH, mentioned above, is included in some of these regular collective analyses, for which RIVM receives age- and sex-specific relative rates calculated by NIVEL, the owner of the registry. CBS has access to the crude data of LINH. Due to methodological differences, (generally) small differences exist between rates calculated by NIVEL and CBS. One reason is that CBS restricts analysis to those patients that can be linked to the population register. As the linkage key in LINH (date of birth, sex, and 4-digits postal code) has limited resolution power, about 80% of patients can be uniquely linked. For CBS statistics advanced weighting techniques are used to extrapolate the linked data to the entire Dutch population. For future reference, such weighting techniques can also be used for LINH data of the diseases in the Morbidity shortlist. For this pilot unweighted LINH data are used (but data are stratified according to age and sex). To be able to better compare the LINH data of CBS with the fitted data of RIVM using several GPRNs, RIVM has used, for this pilot, the LINH data of CBS in their fitting models.

3.2.2.3 Use of several years of GP-register LINH for prevalence data

The GPRN LINH is episode-based which means that patients only are identified with a certain diagnosis when they contact the GP for this disease or related complaints in the year of interest. As a consequence, chronic diseases that do not require GP contact on a yearly basis will be underestimated. Therefore, LINH-data generally are not used for prevalence measurements of various diseases in the RIVM Public Health Status and Forecast project using fitted models.

A way to cope with the problem of underestimation is to analyse registered episodes of certain chronic diseases in the population of LINH during one, two and three consecutive years. In this pilot we include analyses performed this way and compare them with data collected using fitted models with problem-based GPRNs.

However, for this specific analysis, the LINH-population is restricted to those patients that were part of the LINH population for three consecutive years and that could be uniquely linked during these years. The latter was necessary because of the limited resolution power of the LINH linkage key (see 3.2.2.2 and 3.2.1). This resulted in a smaller and slightly different population than for regular one year LINH analyses.

Selection introduced by following patients for three years

For three reasons the number of patients that can be followed for three years is far below the number of patients available in the total LINH population:

1. The GPs participating in LINH differ slightly from year to year
2. Patients of LINH GPs can enter or leave the practice, when people move or have other reasons to change from GP.
3. The LINH population available to CBS consists of those 80% of patients which are identifiable by date of birth, gender and part of the postal code. As this combination of identifiers can be unique in one year but not necessarily also in a previous year, this will lead to additional loss of patients.

Due to these three reasons, following for three consecutive years is only possible in 29% of the LINH population used for one-year analyses by Statistics Netherlands. From the original 211,677 person years of observation, 60517 are left for a three year analysis. Comparison of 2007 prevalence estimates based on all available LINH-patients and based on those patients present in the population during 2005, 2006 and 2007 shows a certain selection bias. Patients present during all three years appear to have a slightly higher prevalence of most chronic diseases. In future analyses, this effect partially can be corrected for by additional weighting of the population and by reducing the time-period to two years, which leads to a smaller reduction of the population and less bias. When necessary, and if possible, an additional correction factor may be calculated to further decrease the selection bias. In this pilot we have studied for which diseases LINH data of multiple years data can be relevant. Weighting and correction of these data can be studied in future data collections.

3.2.3 Combining register data

3.2.3.1 Linkage of Hospital Discharge Register with Causes of Death Register data

The Hospital Discharge Register (i.e. HDR linked to the PR, see 3.2.1) can be a suitable source to measure the prevalence of certain diseases where hospital admissions nearly always occur. For some of these (mostly acute) diseases, like Acute Myocardial Infarction, patients can however also die before reaching the hospital, in which case they are not included in the HDR. In order to make better estimates of the prevalence for these diseases, the non-hospitalized deaths can be added to the persons with one or more hospital admissions for the disease.

To study the relevance of such estimates, a linkage is made between the HDR and the Causes of Death Register (COD). Because the percentage of not registered records in the

HDR has increased a lot from 2005 onwards; data of an earlier, nearly complete, year (2004) are used for this specific analysis. The admissions that were not registered in the HDR and the admissions that could not be linked to any record in the PR are not included in this analysis. For 2004 these numbers are low (resp. 1.1% and 2.8%); therefore reliable estimates can be given for this year. We did not make estimates for later years, because the weighting or raising of outcomes to correct for the non-response in the HDR is complicated (see 3.2.1). It is envisaged, however, that the coverage of the HDR will increase again in the coming years. So for future morbidity data collections the HDR-COD linkage may be a relevant method.

In this linkage study, both the HDR and the COD register are linked to the PR. For the HDR this linkage is described in 3.2.1. The COD register is completely (and uniquely) linked to the PR. The HDR-PR linkage key (sex, date of birth and numeric part of postal code), however, has limited resolution power; therefore not all admissions can be uniquely linked to a person in the PR. To correct for this a weighting method is used, in which the subpopulation of the PR that can be uniquely linked throughout the year is used as denominator and weighted on person-level to the entire population in the PR. The hospital admissions and causes of death records are linked to this PR subpopulation to calculate the prevalence of different diseases. The weighting method is used to correct for the incomplete linkage. If a person had one or more hospital admissions in 2004 for a certain diagnosis and/or died with this specific cause of death, the person is only counted once to calculate the prevalence.

For most diagnoses the principal diagnosis in the HDR is used, i.e. the main condition of the hospitalisation determined at discharge. As external causes of diseases are only coded as secondary diagnoses in the HDR, secondary diagnoses are used to estimate the prevalence for these items in the Morbidity shortlist. Of the COD register data on primary causes of death are used, and for some diseases data on both primary and secondary causes of death. The group 'All morbidity due to injury, poisoning and certain other consequences of external causes' is however registered as secondary cause of death only.

The results of this study are shown in Annex 4. As the data are of an old year (2004), the results are not included in the Morbidity tables, which include data of 2007. In general, this method has shown to be useful for diagnoses where the prevalence based on the HDR substantially increases after linkage with the COD register. For these diseases it is described in 4.2 what increase of the (2007) prevalence can be (roughly) expected when linked HDR-COD would be used.

The linkage of the HDR with the COD could also be a suitable source to calculate the incidence of certain diseases. To determine the incidences, for both the HDR cases and the COD cases in the reporting year the previous hospital admissions (e.g. in the preceding 5 years) for the same diagnosis should be identified. Such a linkage study has not been done in this pilot. To be able to implement such analyses for future years, the data collection of the HDR should be nearly complete again for a number of consecutive years (because of the retrospective period needed to identify previous admissions). So in comparison to prevalences, it will take a longer time before linked HDR data can be used to measure incidences.

3.2.3.2 Linkage of GP-register LINH with Hospital Discharge Register and Causes of Death Register data

LINH is an episode-based GPRN, which results in an underestimation of the true prevalence rate based on a one-year analysis for most diseases. For certain diagnoses, prevalence measures will improve by extending case finding to hospital records in the same year. Although medical specialists should report back to the GP in case of hospitalization, this does not always occur or will not always include registration of complete diagnosis in the GP register. Also, hospital records can include secondary diagnoses of related diseases which may not be reported back to the GP. In case of death, patients may not have been treated in hospital or by the GP prior to death, in which case they may not have been registered in the GP registration, nor are they registered in the HDR. Therefore, case finding can also be extended to the COD register.

To analyse the effect of extending case-finding to hospital records and causes of death on the prevalence estimates, the LINH population is linked to the HDR and COD register. Due to the temporarily incomplete coverage of the HDR from 2005 onwards, these analyses are performed for the year 2004.

For this specific analysis, the LINH-population is restricted to those patients that were part of the LINH population for three consecutive years (2002-2004) and that could be uniquely linked during these years. The latter was done because of the limited resolution power of both the LINH-PR and HDR-PR linkage key. This resulted in a smaller and slightly different population than for regular one year LINH analyses (see 3.2.2.3). This LINH-subpopulation was subsequently linked to the HDR of 2002-2004 for case finding in hospital records, and with the COD of 2004 to find (additional) fatal cases. For the case finding both principal and secondary diagnoses were used in the HDR, and primary and secondary causes of death in the COD register. Persons who occurred in more than one register for a specific disease, were counted only once.

The 2004 prevalences were calculated using linked data of all three years (2002-2004), of two years (2003-2004), and of one year (2004). Also, data were calculated, for the same periods, using only linked LINH data (see 3.2.2.3), linked LINH-HDR data, and linked LINH-HDR-COD data. So in total 9 estimates were calculated per disease.

The prevalences were calculated for 18 diseases of the shortlist for which this LINH-HDR-COD linkage was considered to be potentially useful. The results of this study are shown in Annex 5. Based on these results it can be evaluated for which diseases the additional case finding through linkage with HDR and COD is relevant. Subsequently, the desired number of years of case-finding can be assessed, by weighing out the degree of additional case-finding when including more years, against the additional bias caused by the more selective LINH population when using more years. In 4.2 this is discussed for the relevant diseases.

3.3 Use of disease-specific registers

Netherlands Tuberculosis Register

For determining year prevalence figures of tuberculosis in 2007 all registered patients in the Netherlands Tuberculosis Registry were used who were 'not recovered' in 2006 and the incident persons in 2007 were added. Unfortunately, the persons not recovered from

tuberculosis in 2006 were not stratified by age and gender. Therefore, year prevalence figures cannot be stratified by age and gender either.

Netherlands Cancer Registry

For determining incidence figures all registered patients in the Netherlands Cancer Registry were used; for determining prevalence figures only patients from the regional cancer centre of Amsterdam covering the entire provinces of Noord-Holland and Flevoland (population of 3 million people) could be used. This regional registry has a better coverage in following patients for longer periods of time. The relative point prevalence figures we used refer to the point prevalence per January 1st 2008 of all patients in the entire provinces of Noord-Holland and Flevoland who have been diagnosed with cancer between January 1st 1989 and January 1st 2008 (20-year point prevalence) divided by the population of these provinces as of January 1st 2008. The absolute point prevalence figures refer to the relative prevalence figures per January 1st 2008 of all patients in the entire provinces of Noord-Holland and Flevoland who have been diagnosed with cancer between January 1st 1989 and January 1st 2008 multiplied by the entire Dutch population of January 1st 2008. Relative and absolute period prevalence were determined by adding the estimated point prevalence per January 1st 2008 and the incidence over 2008. As age of the patients is determined by the registry at moment of diagnosis, the average Dutch population according to the period-age model (see 3.8.2) was used for calculating the incidence and prevalence figures.

Dutch HIV/AIDS Monitoring Foundation

For determining (year) prevalence figures on HIV/AIDS data from the Dutch HIV/AIDS Monitoring Foundation (SHM) are combined with data from the National Causes of Death (COD) register. The latter registers deceased persons with HIV/AIDS as a primary COD. The former also registers deceased persons with HIV/AIDS who have died of another cause than HIV/AIDS. Both sources apply retrospective inclusion. This may lead to odd (and even negative) prevalence figures. For example, it is possible that the SHM registrates only 1 person with HIV/AIDS in a certain age group in a certain year, and that the COD register mentions more than 1 deceased person due to HIV/AIDS in that same age group and year. In this pilot negative figures were set to zero.

3.4 Other registers

CVZ Drug register

The register of supplied drugs is used by Statistics Netherlands to link drug use to other personal characteristics. A person-based identifier is present in the dataset, so person-based statistics on prevalent and incident drug use is possible. For morbidity statistics however, applicability is limited, as the relationship between drug use (according to the Anatomical Therapeutical Chemical (ATC)-code) and specific diagnoses is mostly not straightforward. For most diagnoses, a variety of medicines are used. On the other hand, many drugs are applied for a variety of diseases. Therefore, this register could only be used for the diabetes prevalence estimates.

A limitation of the register is that drug use by in-patients or people living in a nursing home is not included.

Injuries Surveillance System
In the Injuries Surveillance System (ISS) data of the emergency departments of the 14 hospitals taking part in the ISS are extrapolated to a national scale using the hospital discharge data on injuries of the national Hospital Discharge Register (HDR). The total number of cases visiting the emergency department in the Netherlands is derived by multiplying the hospitalized cases in the HDR by all emergency cases of the 14 ISS hospitals, divided by the hospitalized emergency cases of 14 ISS hospitals. From the 14 hospitals concerned it is known that the number of ER treatments strongly correlates with the number of hospital discharges.

3.5 Use of epidemiological studies for national estimates

NEMESIS-2 Mental Health Study
For determining prevalence figures, NEMESIS-2 makes use of a Dutch translation of the WHO instrument CIDI 3.0, which yields psychiatric diagnoses after a structured interview. These diagnoses can be given DSM-IV or ICD-10 codes. Prevalence figures pertain to either the last year, or lifetime. No incidence figures could be calculated, since only the first round of data collection was available for analysis. After finishing the second and third round of the study also incidence rates will become available. A disadvantage of using NEMESIS-2 data is the limited age range of 18 to 65 years among respondents.

3.6 Use of Health Interview Survey data

The national Health Interview Survey includes items about the self reported prevalence of migraine or severe headache, diabetes, psoriasis, chronic eczema, high blood pressure, back problems, arthrosis, rheumatoid arthritis, stroke, myocardial infarction, cancer, depression, anxiety disorder, and some other diseases. For the 2007 prevalences, HIS data of 2006-2008 are used (multiple year average). These data are discussed in the disease specific sections in chapter 4. Disadvantage of the HIS data is that it does not necessarily concern diagnosed morbidity, as it is based on self report. The diseases therefore are also not precisely described in terms of ICD codes. Furthermore, the institutionalised population is not included, which may have impact on the results of the elderly population, of which a substantial number lives in homes of the elderly or nursing homes. For diseases with a high lethality or hospitalisation rate, HIS is not a very suitable source either, because these patients are underrepresented in the surveyed population. Furthermore, the sample size of HIS is often a restraint for producing accurate prevalence rates of specific diseases. On the other hand, the advantage of HIS is that it is a population based survey, is irrespective of the types of health care used, and therefore also includes patients that have not been in contact with the types of health care services that are covered in the register data. Other advantages of HIS are its continuity and that the survey questions will be internationally harmonized in EHIS. For some diseases HIS therefore can be a relevant alternative source.

3.7 Correction of data for population in nursing homes

Several diseases can necessitate prolonged institutionalization of patients, such as stroke, dementia, multiple sclerosis, Parkinson's disease, and schizophrenia. In that case population estimates based on GPRNs are less accurate because the population in nursing homes is not included in the GPRNs. To overcome this, we should add the

number of patients in nursing homes to the number of patients in the general population based on GPRNs. In the past, diagnosis-specific data from a nursing home register, the Landelijke Zorgregistratie Verpleeghuizen (LZV), and from the Centraal Administratie Kantoor Bijzondere Zorgkosten (CAK), were used to estimate the number of days patients spent in nursing homes and homes for the elderly for Parkinson's disease, dementia, stroke, and multiple sclerosis. This was done by projecting the age and gender specific patient estimates per diagnosis from the LZV to the entire institutionalized population. Currently, this is not possible, as the LZV no longer exists and the distinction between the population of homes for the elderly (included in GPRN) and nursing homes cannot be made.

3.8 Calculation procedures used for the Morbidity tables

3.8.1 From person years to persons

In the analyses of prevalence and incidence data using GP-registers, the number of patients consulting the general practitioner for a certain complaint is counted, and divided by the number of person years observed by the practitioner. The number of person years will equal the number of patients when all subjects attend the same GP during the whole year. However, due to birth, death or migration (within the country and internationally), but also due to other reasons people can enter or leave observation by a GP. As in the Netherlands no national register of GPRNs exist, people moving to other GPs mostly move to GPs outside the respective registration network and are lost to follow up.

To convert prevalence data from cases per 1,000 person years to cases per 1000 persons, a conversion factor was calculated using the age and sex specific conversion factors of the entire population, calculated on the basis of the population register. In this way the relative rates of the GP registers are converted from person years to persons.

3.8.2 From source specific population data to national data

Per disease-measure combination of the morbidity shortlist the following figures are presented in the Morbidity tables (see Annex 6), for males and females separately:

- Per age-group: absolute numbers
- Absolute number, all ages
- Crude rate per 10,000 of the population, all ages
- Age-standardized rate per 10,000 of the population

The following procedures and definitions have been adopted to calculate these figures:

- Per age-group: absolute numbers
The national absolute numbers are derived by multiplying per age and sex group the rates in the respective population (of the data source) by the national population.

The national population is defined as follows:

- For point prevalences per 1st January year t, the national population is defined as the population per 1st January of year t.

- For the measures incidence by episode, incidence by person and period prevalence, the national population is defined by the average population in year t. It depends on the definition of population and age of the respective data source which annual average population should be used. In Annex 7 the two possible annual populations are given:
  - the average of the population of age-group L per 1st January year t and the population of age-group L per 1st of January year t+1 (period-age model)
  - the average of the population of age L per 31st December of year t and the population of age L-1 per 1st January year t (period-cohort model)

  It depends on the type and way of processing of the data source which definition is most appropriate. E.g. for the linked LINH and HDR register data the period-cohort model is used (as the data are on person-level and the calculated age per 31st December is used), whereas for the HIS data the period-age model is used (as it is a continuous survey and age is determined at the date of interview).
  Per data source it is mentioned what definition of the average population was applied (see Annex 7).

- **Absolute number, all ages**
  This is the sum of the (national) absolute numbers per age group, calculated as mentioned above.

- **Crude rate per 10,000, all ages**
  This is the absolute number (all ages) as calculated above, divided by the total average population (as defined above). The crude rate is the national estimate of the measure. This crude-rate can differ from elsewhere published figures based on the same data source (because of differences in definition of population and age).

- **Age-standardized rate per 10,000**
  The age-standardized rate is calculated by multiplying the rates per age-group by the 1976 WHO European standard population (per age-group), summing up the resulting numbers per age-group and dividing this sum by the total of the WHO standard population.

In the above-mentioned procedure all figures are based on the age-specific rates of the data source(s) used. These age-specific rates are not published in the morbidity tables, but can be easily derived by dividing the absolute numbers per age-group by the national population of that age-group.

As many estimates are based on data sources that only cover a sample of the Dutch population, the population numbers of these data sources are given in Annex 7. It should be mentioned that for these sources the calculated absolute (national) numbers per age-group are presented with a higher level of precision than justified on the basis of the sample size. To overcome this, the age-specific rates could have been rounded, but this was not done for this pilot project as rounding of figures complicates the possibilities for further calculations by the user.

3.9 Definition of period prevalence

In the European shortlist two prevalence measures are distinguished, i.e. point prevalence and period prevalence. However, for the measure period prevalence there are no specific guidelines as to how to interpret this measure for the different types of diseases in the shortlist. We distinguished two different definitions of period prevalence, i.e. year prevalence (persons with a disease episode in year t) and lifetime prevalence (persons with a disease episode in year t or earlier). For each disease of the shortlist we made a choice whether year prevalence or lifetime prevalence should be measured (see Annex 3, template 3). For diseases that can be intermittent, can pass or be cured the year prevalence was selected; for the other diseases lifetime prevalence. The choices made are sometimes arbitrary and can be debated.

3.10 Conclusions

Overall, several specific methodologies were developed to measure the large majority of disease-measure combinations of the morbidity shortlist. The most important data sources in the Netherlands are fitted or linked GP-data, disease-specific registers, and linked hospital discharge data.

Present limitations of the data are a.o.:

- Incomplete coverage of the HDR hampers record linkage with this data source. It is however expected that the HDR will be complete again in future.
- Following patients in the LINH for multiple years sometimes leads to a biased patient group.
- A disadvantage of using NEMESIS-2 data is the limited age range of 18 to 65 years of respondents.
- There is no recent data source for diagnosis-specific data of the population of nursing homes. For some diseases that often require prolonged stays in nursing homes, such as dementia, these data are necessary to correct the estimates for the morbidity in this specific population, especially in the older age groups.
- For period prevalence clear instructions are missing as to how to operationalize this measure for specific diseases. We made a preliminary list applying specific register-based definitions for year prevalence and lifetime prevalence. This may serve as input for further decision-making by Eurostat regarding the contents of future data collection.
- Many data sources use classification systems other than ICD-10. Translation is often feasible, but for some diseases it was not possible to make a good translation.

A particular feature of the Dutch spectrum of data sources is that insurance data usually do not contain (detailed) information on diagnoses and therefore are not used for morbidity statistics. In the future however, new data sources that have been set up for a new financing system may become important for measuring disease-specific morbidity in the Netherlands. These diagnose related group (DRG)-like registers have become available for hospital care and mental health care. It is expected that these registers can be linked on person level in the near future, which make them an interesting source for measuring prevalence and incidence of diseases. The hospital dataset also includes out-patient treatments, rehabilitation care and part of private health care, which are not present in the HDR. However, diagnoses are not yet registered in ICD-10 in the hospital dataset, but there are plans to enter the ICD-10 in this registration. The mental health

care dataset includes DSM-IV diagnoses, but excludes the population with long term (>1 year) inpatient health care.

Chapter 4. Results of pilot data collection

4.1 Introduction

In this chapter the various diseases of the shortlist are presented for which data on incidence or prevalence are to be delivered.

First, the indicator(s) to be reported are mentioned and in case of period prevalence, the choice for either lifetime or year prevalence is motivated. In some cases, it was necessary to give a short description of the various diagnoses of a disease group, to illustrate the type of period prevalence chosen.

Also, a description is given of the choices made to cover requested ICD-10 codes as good as possible.

Of the relevant sources, a comparison was made of crude and age/sex specific rates and finally the choice for the best source (for the moment and/or the near future) is motivated.

In the case that no useful data source of sufficient quality was available, it is described why this conclusion was drawn.

4.2 Results per disease

Between brackets [] the number on the shortlist is given.

4.2.1. Tuberculosis (A15-A19, B90) [1]

The indicators to be reported for tuberculosis are:
- Period prevalence, operationalized as year prevalence, as tuberculosis is a disease that can be cured.
- Incidence by episode

Possible sources
In the Netherlands, tuberculosis is an infection for which any health professional that comes across a tuberculosis infection is required to notify the regional health services and/or the centre for infectious disease control. These data are registered in the Netherlands Tuberculosis Registry (NTR). This source is used for calculating the tuberculosis estimates.

Classification
For this Eurostat pilot data on ICD-10 codes A15-A19 and B90 are requested. The Netherlands Tuberculosis Register however uses the ICD-9 classification codes 010.0 to 018.9. These latter ICD-9 codes overlap the ICD-10 codes A15-A19 and B90, but also include ICD-10 codes J65 and O98. These both codes, however, are secondary to the tuberculosis (J65: Pneumoconiosis associated with tuberculosis; O98: Tuberculosis complicating pregnancy, childbirth and the puerperium). Thus the codes used for tuberculosis are broader than requested in the Morbidity shortlist.

Period prevalence (year)

The year prevalence over 2007, based on the NTR, is operationalized as not-recovered cases from 2006 plus the incidence by person over 2007.

Crude Rates
In table 4.2.1.1. the prevalence of tuberculosis per 10,000 Dutch inhabitants is presented.

Table 4.2.1.1. Crude prevalence rates of tuberculosis per 10,000 persons in the average Dutch population, 2007.

	men	women
Netherlands Tuberculosis Register	0.7	0.5

Age and sex specific prevalence rates cannot be presented for the NTR. It was not possible to perform a complete break down in terms of age and gender and treatment outcome, because not-recovered patients from 2006 were not available by age and gender.

Incidence by episode
The episode incidence over 2007 is not registered in the NTR. However, in the Netherlands (preventive) treatment takes about 6 months. In this period it is unlikely that a new episode of TB develops in already incident patients. As such, NTR only collects treatment outcomes the year following the incidence of TB. We feel that in the Netherlands the incidence by person is about equal to the incidence by episode. Therefore we will present incidence by person figures, based on the NTR, operationalized as all new patients with tuberculosis in the Netherlands over 2007.

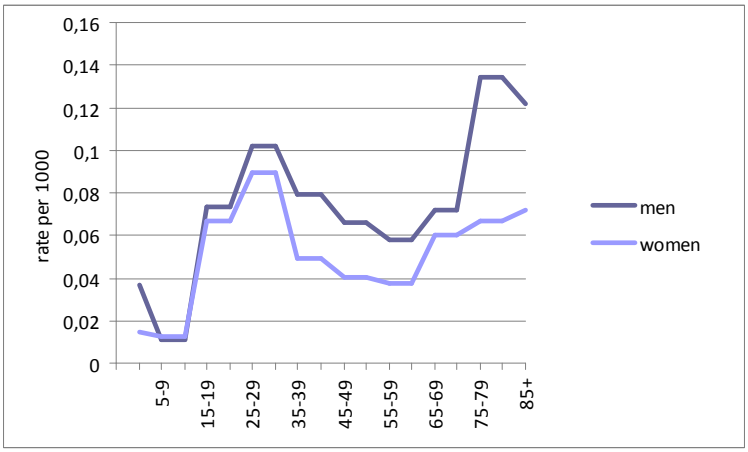
Crude Rates
In table 4.2.1.2. the total number of newly diagnosed persons with TB per 10,000 Dutch inhabitants is presented.

Table 4.2.1.2. Crude incidence rates of diagnosed tuberculosis per 10,000 persons in the average Dutch population (incidence by person)

	men	women
Netherlands Tuberculosis Register	0.7	0.5

Age and sex specific incidence rates are shown in figure 4.2.1.1.

Figure 4.2.1.1 Age and sex specific incidence of tuberculosis, based on the Netherlands Tuberculosis Register; per 1,000 persons per year, 2007.



Conclusion
For tuberculosis prevalence and incidence the NTR is the preferred data source. In the Netherlands it is unusual to present prevalence data of tuberculosis. That explains the lack of the age and gender-specific break down of tuberculosis prevalence. These data will not become available.

4.2.2. Sexually transmitted diseases (A50-A64) [2]

The indicators to be reported for sexually transmitted diseases are:
- Period prevalence, operationalized as year prevalence, as sexually transmitted diseases can be cured.
- Incidence by episode

Possible sources
In the Netherlands, general practitioners perform the bulk of sexually transmitted infections (STI) consultations. Furthermore, there is a STI surveillance system in the Netherlands, which is organised into eight regions. In each region there is one STI centre that is responsible for regional coordination of STI control. In total, 29 specific STI centres provide low threshold STI testing and care, free of charge, targeted at high-risk groups and people who want to be tested anonymously.

Possible sources are:
- LINH
- Surveillance at STI centres (incidence only)

Classification
For this Eurostat pilot data on ICD-10 codes A50-A64 are requested.

In LINH, ICPC codes X70, X71, X73, X90, X91, Y70, Y71, Y72 and Y76 encode for A50-A53 (syphilis), A54 (gonococcal infection), A59 (trichomoniasis), A60 (anogenital herpesviral [herpes simplex] infection) and A63.0 (anogenital (venereal) warts). In

conclusion, all chlamydial diseases, chancroid (ulcus molle) and granuloma inguinale (donovanosis) are not covered by the codes selected in the LINH registration. Missing codes can be covered by selecting ICPC-1 X99 and Y99 (other female/male genital disease), but this would result in inclusion of many other diseases that are not requested in the pilot.

The surveillance at the STI centres includes ICD-10 codes A51-A53 (syphilis), A54 (gonococcal infection), A55 (chlamydial lymphogranuloma (venereum)), A56 (other sexually transmitted chlamydial diseases), A57 (ulcus molle), A59 (trichomoniasis), A60 (anogenital herpesviral [herpes simplex] infection) and A63.0 (anogenital (venereal) warts). In conclusion, the coverage of the surveillance at the STI centres is broader than the coverage of LINH. In the surveillance, only granuloma inguinale (donovanosis) is not covered.

Period prevalence (year)

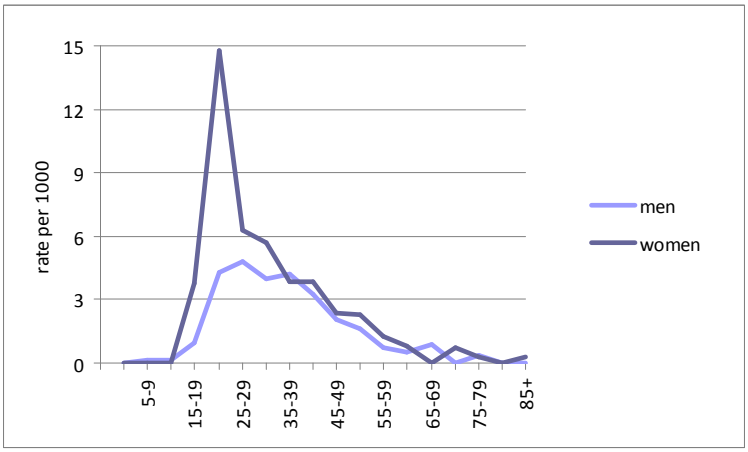
Crude Rates
In table 4.2.2.1 the prevalence of sexually transmitted diseases per 10,000 Dutch inhabitants is presented. For the STI centres, no prevalence data are available, as the unit of analysis is 'new STI consultation'.

Table 4.2.2.1 Crude prevalence rates of sexually transmitted diseases per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	19	29

Age and sex specific prevalence rates are shown in figure 4.2.2.1.

Figure 4.2.2.1 Age and sex specific prevalence of sexually transmitted diseases, based on LINH per 1,000 persons per year, 2007.



Incidence by episode

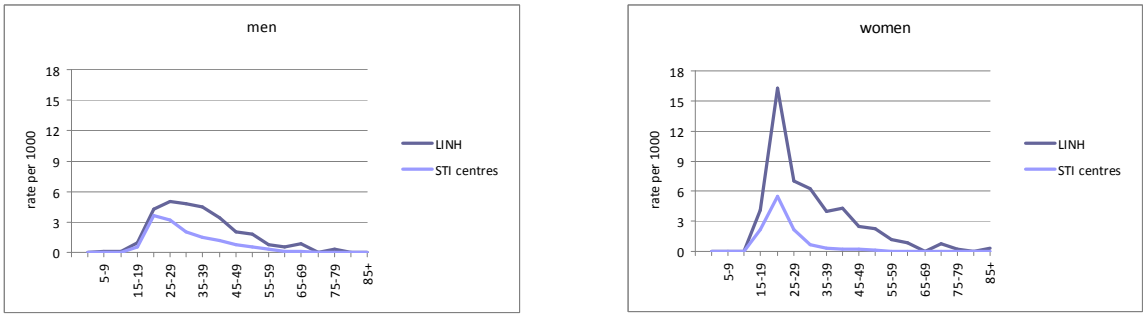
Crude Rates
In table 4.2.2.2 the incidence of sexually transmitted diseases per 10,000 Dutch inhabitants is presented.

Table 4.2.2.2. Crude incidence rates of diagnosed episodes of sexually transmitted diseases per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	20	31
Surveillance at STI centres	9	7

Age and sex specific incidence rates are shown in figure 4.2.2.2.

Figure 4.2.2.2. Age and sex specific incidence of sexually transmitted diseases, based on LINH and surveillance at STI centres; per 1,000 persons per year, 2007.



Conclusion
None of the available sources in the Netherlands is suitable to give a clear estimate of incidence and prevalence rates of sexually transmitted diseases. In the GP registration LINH chlamydial infections are not included (see classification). The STI surveillance system is targeted at high-risk groups only. Furthermore in the STI centres people are tested anonymously, so the data cannot be combined with the data from LINH.

4.2.3. Viral hepatitis (including hepatitis B) (B15-B19) [3]

The indicators to be reported for viral hepatitis are:
- Period prevalence, operationalized as year prevalence, as viral hepatitis can be cured, although some tend to become chronic
- Incidence by episode

Possible sources
In the Netherlands, there is an obligatory notification on newly diagnosed acute hepatitis A virus (HAV) infections, acute hepatitis B virus (HBV) infections, chronic HBV infections and acute hepatitis C virus (HCV) infections. All public health services notify HAV, HBV and HCV infections by using a web-based application (OSIRIS).

Possible sources are:

- LINH
- Obligatory notification using the web-based application OSIRIS (incidence only)

Classification
For this Eurostat pilot data on ICD-10 codes B15-B19 are requested.

In LINH, ICPC code D72 encodes for viral hepatitis, which corresponds to ICD-10 codes B15-B19, meaning a full coverage of the requested codes.

The obligatory notification using OSIRIS only includes ICD-10 codes B15 (acute hepatitis A), B16 (acute hepatitis B), B17.1 (acute hepatitis C), B18.0 and B18.1 (chronic hepatitis B).

Period prevalence (year)

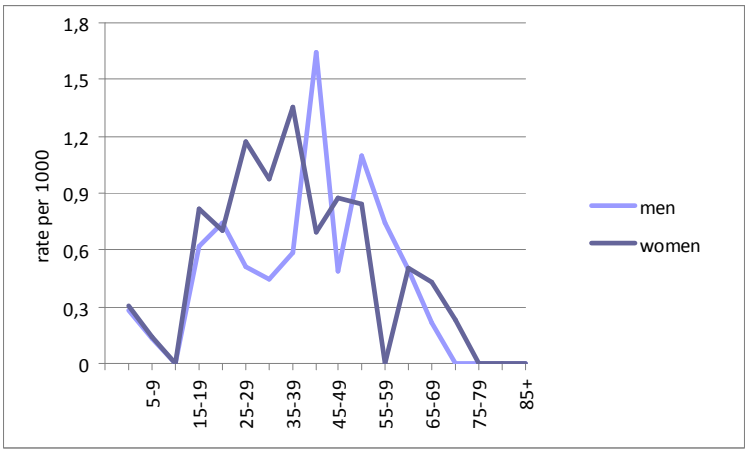
Crude Rates
In table 4.2.3.1. the prevalence of viral hepatitis per 10,000 Dutch inhabitants is presented. For the obligatory notification of hepatitis A, B and C using OSIRIS, no prevalence data are available, as only new cases are registered. Furthermore there have been multiple changes in de obligatory notification in the past few years.

Table 4.2.3.1. Crude prevalence rates of viral hepatitis per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	6	6

Age and sex specific prevalence rates are shown in figure 4.2.3.1.

Figure 4.2.3.1. Age and sex specific prevalence of viral hepatitis, based on LINH per 1,000 persons per year, 2007.



Incidence by episode

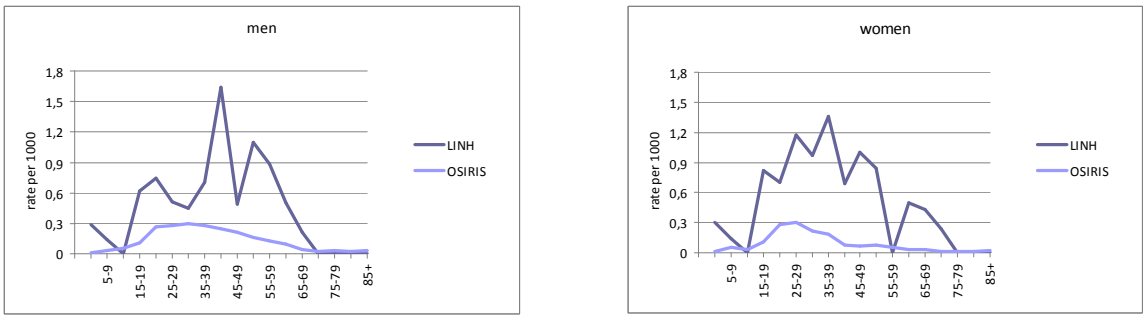
Crude Rates
In table 4.2.3.2. the incidence of viral hepatitis per 10,000 Dutch inhabitants is presented.

Table 4.2.3.2. Crude incidence rates of diagnosed episodes of viral hepatitis per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	6	6
Notification OSIRIS	2	1

Age and sex specific incidence rates are shown in figure 4.2.3.2.

Figure 4.2.3.2. Age and sex specific incidence of viral hepatitis, based on LINH and OSIRIS; per 1,000 persons per year, 2007.



Conclusion
For viral hepatitis incidence LINH is the preferred source, though the estimate is hindered by the small numbers. In LINH there is no clear difference in incidence and prevalence rates of viral hepatitis. A possible explanation is that an episode of a chronic hepatitis infection is registered as a new (incident) episode.
The obligatory notification using OSIRIS does not include acute viral hepatitis other than acute hepatitis A, B and C. Furthermore it does not include chronic hepatitis other than chronic hepatitis B. It also excludes all unspecified viral hepatitis (see classification).
Fitted GPRNs are no suitable source due to the small numbers and regional differences.

4.2.4. Human immunodeficiency virus disease (HIV/AIDS) (B20-B24, Z21) [4]

The indicators to be reported for human immunodeficiency virus disease are:
- Period prevalence, operationalized as lifetime prevalence, as human immunodeficiency virus disease cannot be cured (can only be treated and survived)
- Point prevalence
- Incidence by episode

Possible sources
In the Netherlands, longitudinal data of all newly registered HIV infected individuals are collected by the 'Stichting HIV Monitoring' (SHM), the Dutch HIV monitoring foundation. HIV infected individuals registered in 25 recognised HIV treatment centres (including four children's centres) in the Netherlands are monitored by SHM. HIV infected individuals in care, who were diagnosed prior to the start of SHM in January 2002, were as far as possible included in the cohort retrospectively.

Possible sources are:
- LINH
- Dutch HIV monitoring foundation (SHM)

Classification
For this Eurostat pilot data on ICD-10 codes B20-B24 and Z21 are requested.
In LINH, ICPC code B90 encodes for HIV infections (including AIDS and AIDS-related complex (ARC), which corresponds to ICD-10 codes B20-B24 and Z21, meaning full coverage of the requested codes.
Registration in SHM also fully covers the requested codes.

Period prevalence (lifetime)

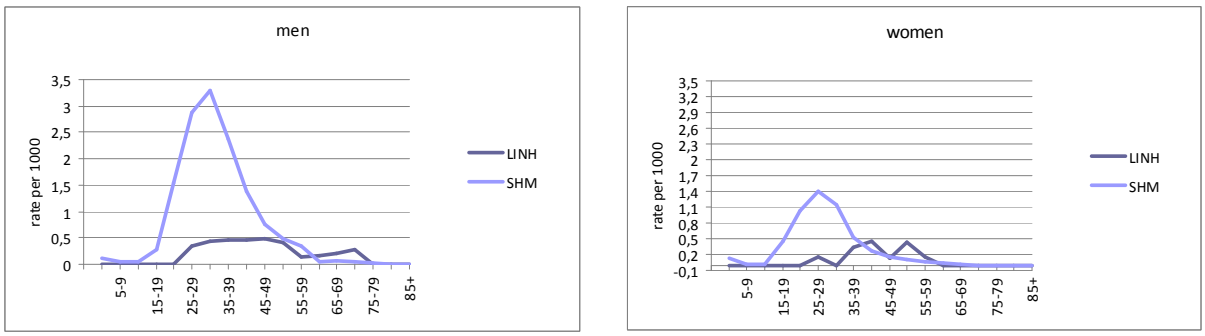
Crude Rates
In table 4.2.4.1. the prevalence of human immunodeficiency virus disease per 10,000 Dutch inhabitants is presented. The lifetime prevalence over 2007, based on SHM, is operationalized as the total number of cases registered at SHM until 31 December 2007 minus the number of persons deceased from AIDS until 31 December 2006, as registered by CBS. Age specific data are used.

Table 4.2.4.1. Crude prevalence rates of human immunodeficiency virus disease per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	2	1
SHM	9	3

Age and sex specific prevalence rates are shown in figure 4.2.4.1.

Figure 4.2.4.1. Age and sex specific prevalence of human immunodeficiency virus disease, based on LINH and SHM per 1,000 persons per year, 2007.



Point prevalence

Crude Rates

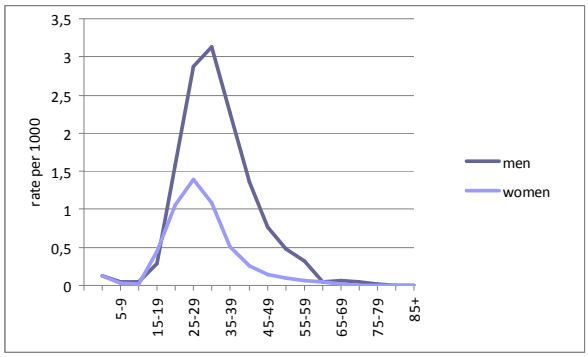
In table 4.2.4.2. the point prevalence of human immunodeficiency virus disease per 10,000 Dutch inhabitants is presented. The point prevalence per 1 January 2007, based on SHM, is operationalized as the total number of cases registered at SHM until 31 December 2007 minus the number of persons deceased from AIDS until December 2007, as registered by CBS. Age specific data are used.

Table 4.2.4.2. Crude point prevalence rates of human immunodeficiency virus disease per 10,000 persons in the average Dutch population, 1-1-2007.

	men	women
SHM	9	3

Age and sex specific point prevalence rates are shown in figure 4.2.4.2.

Figure 4.2.4.2. Age and sex specific point prevalence of human immunodeficiency virus disease, based on SHM per 1,000 persons per year, 1-1-2007.



Incidence by episode

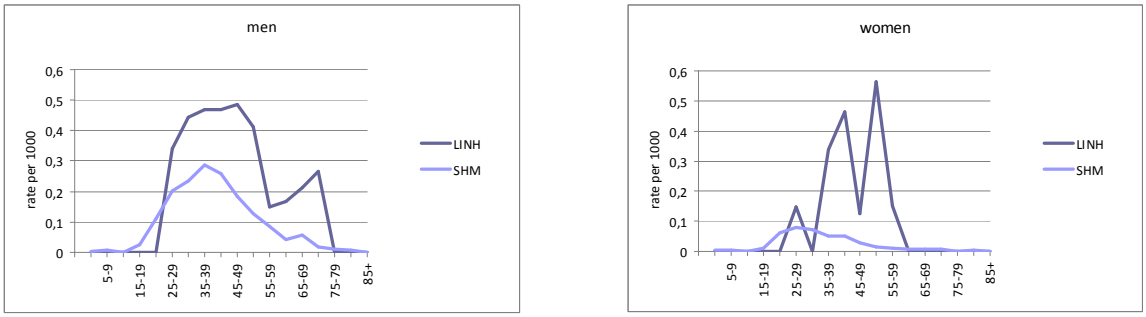
Crude Rates
In table 4.2.4.3. the incidence of human immunodeficiency virus disease per 10,000 Dutch inhabitants is presented.

Table 4.2.4.3. Crude incidence rates of diagnosed episodes of human immunodeficiency virus disease per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	2.3	1.2
SHM	1.2	0.3

Age and sex specific incidence rates are shown in figure 4.2.4.3.

Figure 4.2.4.3. Age and sex specific incidence of human immunodeficiency virus disease, based on LINH and SHM; per 1,000 persons per year, 2007.



Conclusion
For immunodeficiency virus disease SHM (the Dutch HIV monitoring foundation) is the best available source.

4.2.5. All malignant cancers (C00–C97) [5]

The indicators to be reported for all malignant cancers are:
- Period prevalence, defined as lifetime prevalence, because cancer is considered to be a chronic disease.
- Incidence by person, defined as the number of persons having had a first cancer diagnosis in the year 2008.

Possible sources
The main source for data on incidence and prevalence of cancer is the Netherlands Cancer Registry (NKR), which registers over 95% of all cancer diagnoses. As point prevalences were available for 2008 and not for 2007, both prevalence and incidence

data are presented for 2008. Prevalence data are only available for one regional cancer centre (covering 2 provinces with a population of 3 million persons).

The national Health Interview Survey of the Netherlands survey collects data about self reported health status, including self reported prevalence of cancer.

No other sources (LINH, fitted GPRNs or HDR) are included nor looked at in this pilot.

Classification
For this pilot ICD-10 codes C00-C97 are requested. However, when compiling diagnosis groups, the codes C77-C79 (secondary neoplasms) and C97 (malignant neoplasms of independent (primary) multiple sites) are excluded in the Netherlands Cancer Registry. The presented data therefore pertain to codes C00-C96, with the exclusion of C77 through C79.

Period prevalence (lifetime)
The operationalization of the period prevalence is described in detail in chapter 3.3.

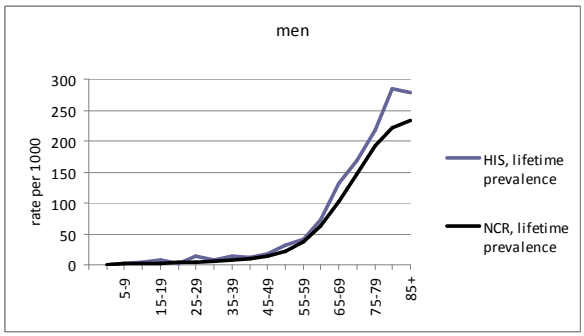
Crude Rates
In table 4.2.5.1. the total number of persons diagnosed with any localization of cancer per 10,000 Dutch inhabitants is presented.

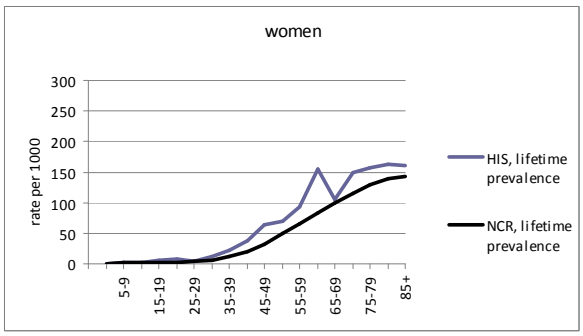
Table 4.2.5.1. Crude prevalence rates of all malignant neoplasms per 10,000 persons in the average Dutch population, 2008.

	men	women
Netherlands Cancer Registry	318	388
HIS (ever had cancer, 2006-2008)	387	548

Age and sex specific prevalence rates are given below.

Figure 4.2.5.1. Age and sex specific prevalence rates of all malignant neoplasms per 1,000 persons in the average Dutch population (NCR 2008 and HIS 2006-2008).





Incidence by person

The incidence by person was defined as the number of persons having had a first cancer diagnosis in the year 2008.

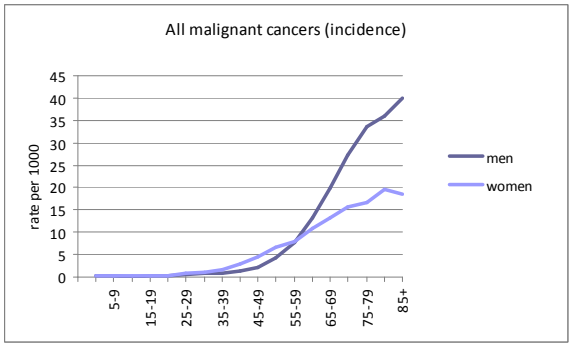
Crude Rates
In table 4.2.5.2. the total number of newly diagnosed persons with any cancer localization per 10,000 Dutch inhabitants is presented.

Table 4.2.5.2. Crude incidence rates of cancer (any malignant neoplasm) per 10,000 persons in the average Dutch population, 2008

	men	women
Netherlands Cancer Registry	57	52

Age and sex specific incidence rates are shown in figure 4.2.5.2.

Figure 4.2.5.2. Age and sex specific incidence rates of cancer (any malignant neoplasm), per 1,000 persons in the average Dutch population in 2008 (NKR).



Conclusion
The Netherlands Cancer Registry (NCR) is the preferred source of data on cancer incidence and prevalence, although 20 year prevalence data are only available for one regional cancer centre (covering 2 provinces with a population of 3 million persons). Prevalence data from the Health Interview Survey (HIS) are self reported data. Disadvantage of these data is that they do not necessarily concern diagnosed morbidity and that the disease is not described in terms of ICD codes. The lifetime prevalence based on HIS is somewhat higher than the lifetime prevalence based on NCR. Probably this is caused by the fact that HIS-data include self reported benign cancers.

4.2.6. Malignant cancers per type (C15, C16, C18-C21, C33-C34, C43, C45, C50, C53, C54-C55, C56, C61, C67, C81-C96) [6-18]

The types of malignant cancers included in this report are listed in table 4.2.6.1.
The indicators to be reported for malignant cancers are:

- Period prevalence, defined as lifetime prevalence, because cancer is considered to be a chronic disease.
- Incidence by person, defined as the number of persons having had a first cancer diagnosis in the year 2008.

Possible sources
The source for data on incidence and prevalence of cancer is the Netherlands Cancer Registry (NKR), which registers over 95% of all cancer diagnoses. As point prevalences were available for 2008 and not for 2007, both prevalence and incidence data are presented for 2008. Prevalence data are only available for one regional cancer centre (covering 2 provinces with a population of 3.0 million persons).

No other sources (LINH, fitted GPRNs, HDR) are included nor looked at in this pilot.

Classification
The diagnoses of the different types of malignant cancer as registered in the Netherlands Cancer Registry correspond to the requested ICD-10 codes (see table 4.2.6.1.).

Table 4.2.6.1. Types of malignant cancers included in this report and their corresponding ICD-10 codes.

C15	Malignant neoplasm of oesophagus
C16	Malignant neoplasm of stomach
C18-C21	Malignant neoplasm of colon, rectum and anus
C33, C34	Malignant neoplasm of trachea, bronchus and lung
C43	Malignant melanoma of skin
C45	Mesothelioma
C50	Malignant neoplasm of breast
C53	Malignant neoplasm of cervix uteri
C54, C55	Malignant neoplasm of uterus other than cervix
C56	Malignant neoplasm of ovary
C61	Malignant neoplasm of prostate
C67	Malignant neoplasm of bladder
C81-C96	Leukaemia and other malignant neoplasms of lymphoid and haematopoietic tissue

Period prevalence (lifetime)
The operationalization of the period prevalence is described in detail in chapter 3.3.

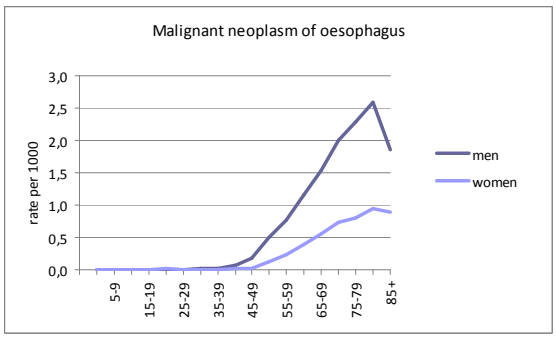
Crude Rates
In table 4.2.6.2. the total number of persons diagnosed with malignant cancer per type, per 10,000 Dutch inhabitants is presented.

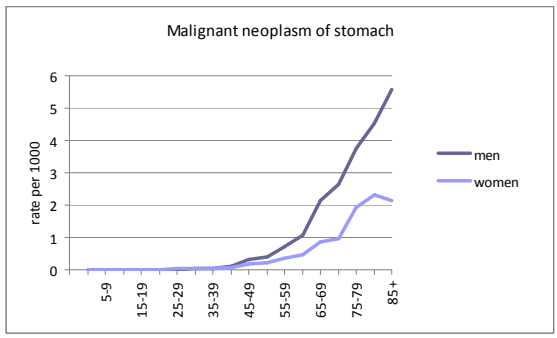
Table 4.2.6.2. Crude prevalence rates of all malignant cancer per type and per 10,000 persons in the average Dutch population, 2008.

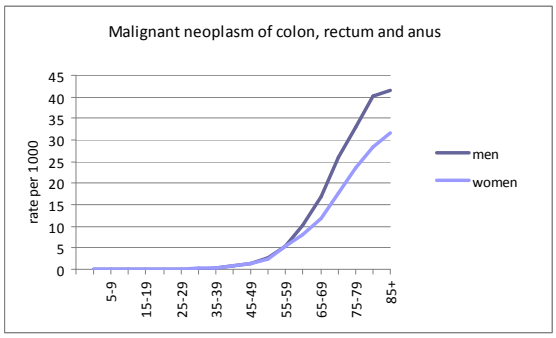
Netherlands Cancer Registry	men	women
Malignant neoplasm of oesophagus	4.4	1.8
Malignant neoplasm of stomach	5.9	3.5
Malignant neoplasm of colon, rectum and anus	49.3	47.0
Malignant neoplasm of trachea, bronchus and lung	24.2	15.5
Malignant melanoma of skin	20.7	30.7
Mesothelioma	1.3	0.2
Malignant neoplasm of breast	0.8	174.3
Malignant neoplasm of cervix uteri	-	13.1
Malignant neoplasm of uterus other than cervix	-	22.2
Malignant neoplasm of ovary	-	10.1
Malignant neoplasm of prostate	92.6	-
Malignant neoplasm of bladder	17.3	4.6
Leukaemia and other malignant neoplasms of lymphoid and haematopoietic tissue	33.6	26.7

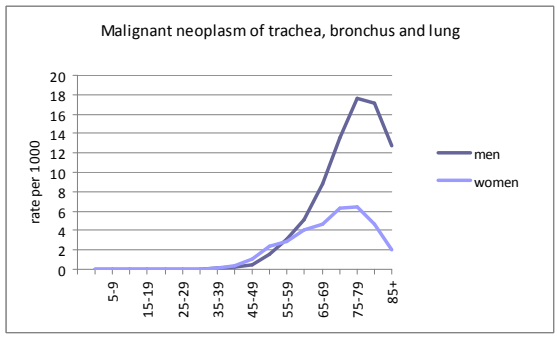
Age and sex specific prevalence rates are presented in figures 4.2.6.1.

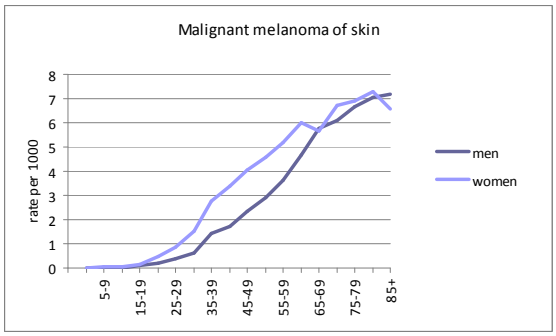
Figure 4.2.6.1. Age and sex specific prevalence rates of all malignant cancers per type, per 1,000 persons in the average Dutch population, 2008.

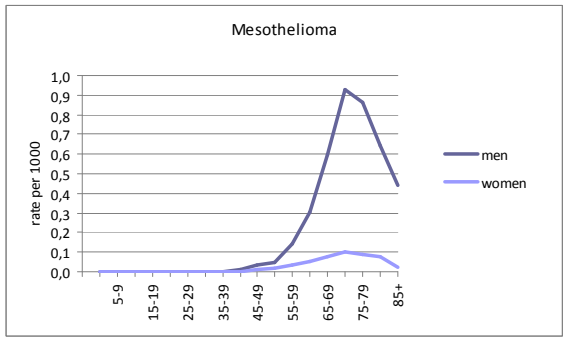


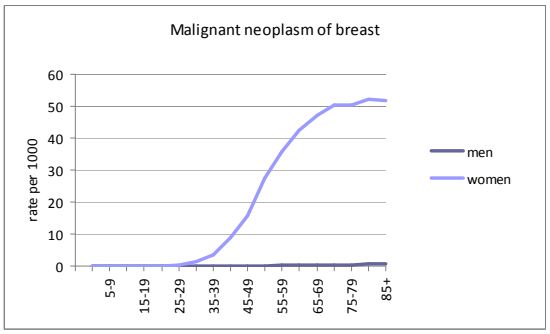


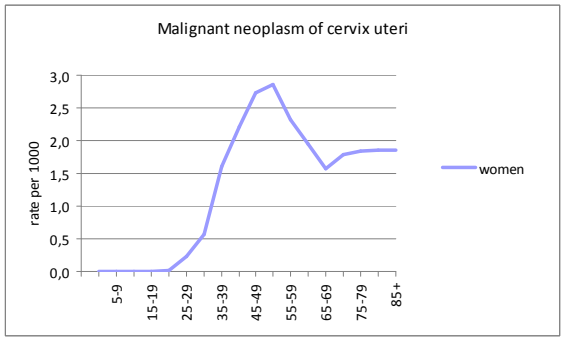


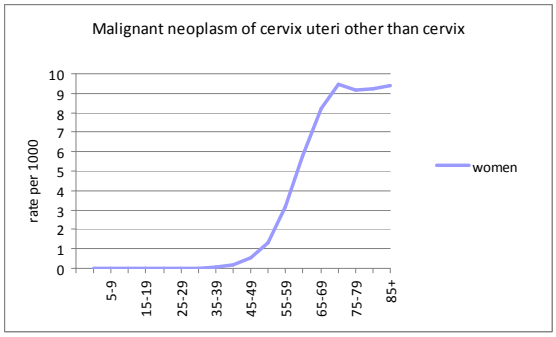


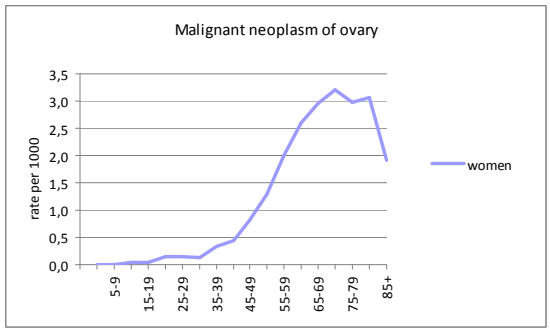


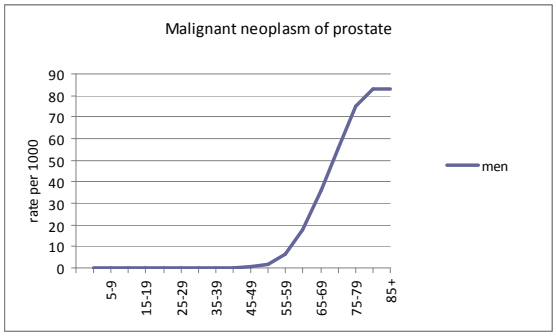


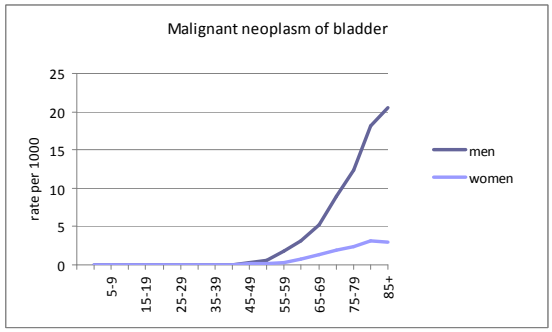


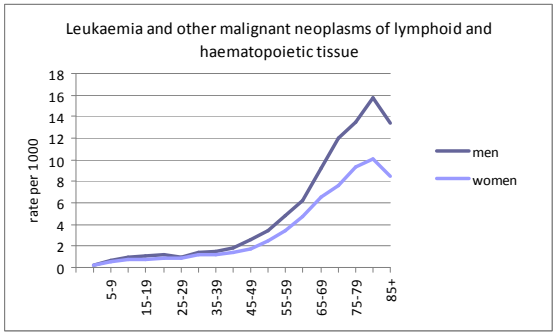












Incidence by person

The incidence by person was defined as the number of persons having had a first malignant neoplasm diagnosis in the year 2008.

Crude Rates
In table 4.2.6.3. the total number of newly diagnosed persons with malignant cancer per type per 10,000 Dutch inhabitants is presented.

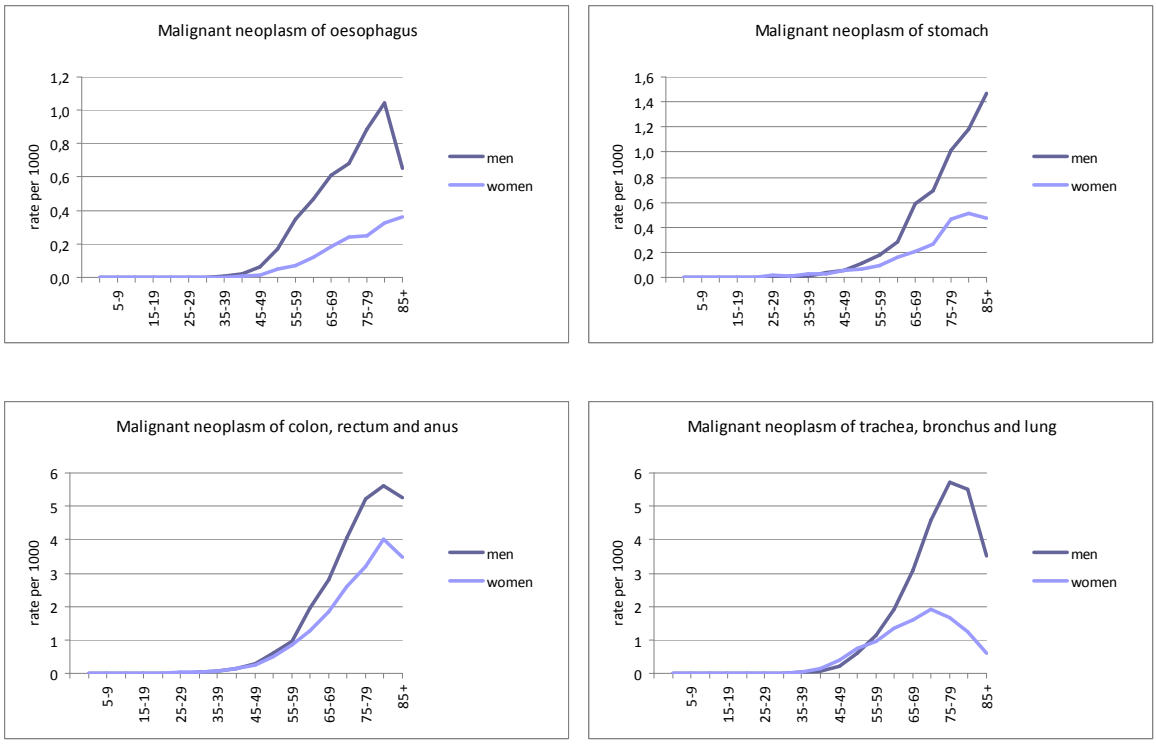
Table 4.2.6.3. Crude incidence rates of malignant cancer per type per 10,000 persons in the average Dutch population, Netherlands Cancer Registry, 2008

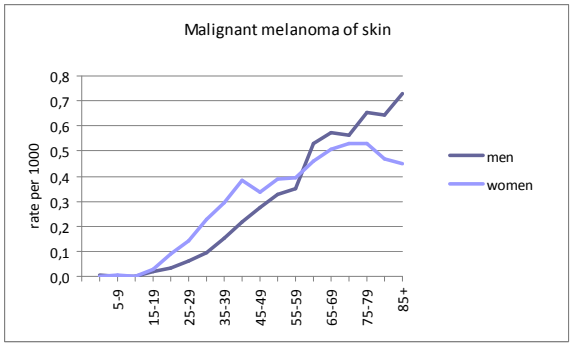
	men	women
Malignant neoplasm of oesophagus	1.7	0.6
Malignant neoplasm of stomach	1.6	0.9
Malignant neoplasm of colon, rectum and anus	8.1	6.8

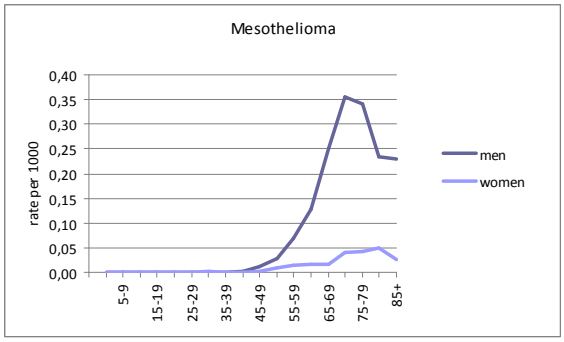
Malignant neoplasm of trachea, bronchus and lung	8.3	4.9
Malignant melanoma of skin	2.2	2.7
Mesothelioma	0.5	0.1
Malignant neoplasm of breast	0.1	15.6
Malignant neoplasm of cervix uteri	-	0.8
Malignant neoplasm of uterus other than cervix	-	2.3
Malignant neoplasm of ovary	-	1.4
Malignant neoplasm of prostate	11.8	-
Malignant neoplasm of bladder	2.7	0.8
Leukaemia and other malignant neoplasms of lymphoid and haematopoietic tissue	4.9	3.7

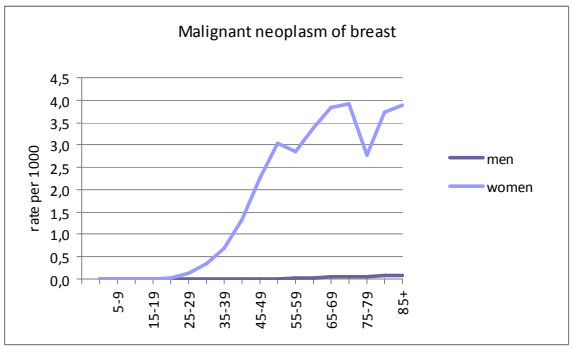
Age and sex specific incidence rates are shown in figures 4.2.6.2.

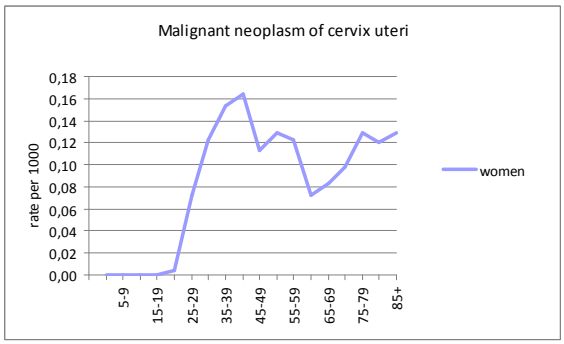
Figure 4.2.6.2. Age and sex specific incidence rates of malignant cancer per type per 1,000 persons in the average Dutch population, 2008.

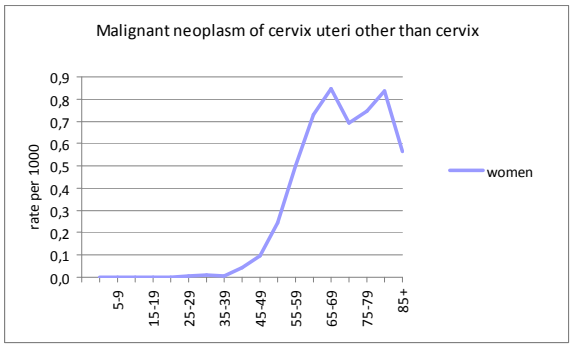


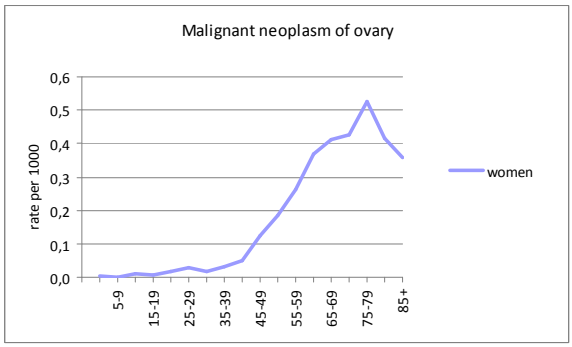

Malignant melanoma of skin
rate per 1000
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0,0
5-9
15-19
25-29
35-39
45-49
55-59
65-69
75-79
85+
men
women

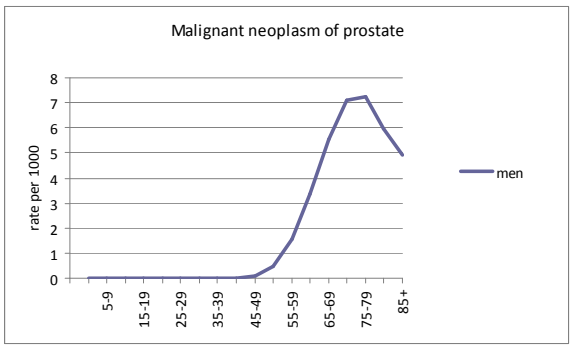

Mesothelioma
rate per 1000
0,40
0,35
0,30
0,25
0,20
0,15
0,10
0,05
0,00
5-9
15-19
25-29
35-39
45-49
55-59
65-69
75-79
85+
men
women

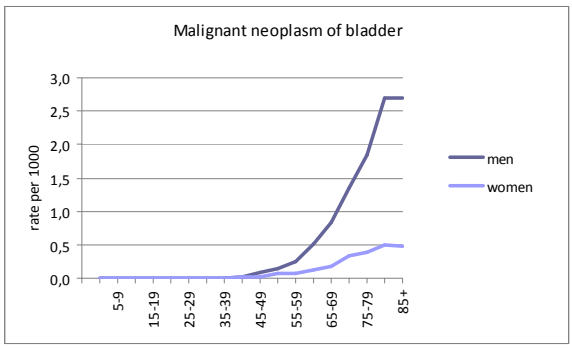

Malignant neoplasm of breast
rate per 1000
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
5-9
15-19
25-29
35-39
45-49
55-59
65-69
75-79
85+
men
women

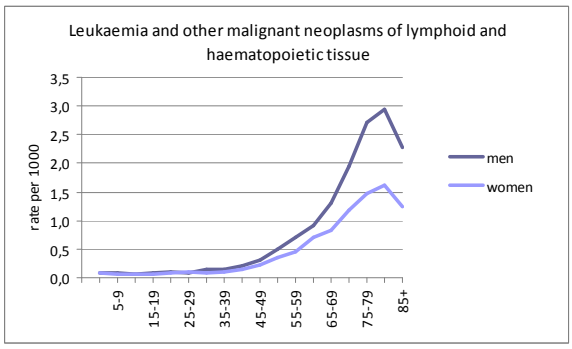

Malignant neoplasm of cervix uteri
rate per 1000
0,18
0,16
0,14
0,12
0,10
0,08
0,06
0,04
0,02
0,00
5-9
15-19
25-29
35-39
45-49
55-59
65-69
75-79
85+
women


Malignant neoplasm of cervix uteri other than cervix
rate per 1000
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0,0
5-9
15-19
25-29
35-39
45-49
55-59
65-69
75-79
85+
women


Malignant neoplasm of ovary
rate per 1000
0,6
0,5
0,4
0,3
0,2
0,1
0,0
5-9
15-19
25-29
35-39
45-49
55-59
65-69
75-79
85+
women


Malignant neoplasm of prostate
rate per 1000
8
7
6
5
4
3
2
1
0
5-9
15-19
25-29
35-39
45-49
55-59
65-69
75-79
85+
men


Malignant neoplasm of bladder
rate per 1000
3,0
2,5
2,0
1,5
1,0
0,5
0,0
5-9
15-19
25-29
35-39
45-49
55-59
65-69
75-79
85+
men
women



Conclusion
The Netherlands Cancer Registry is the preferred source of data on cancer incidence and prevalence, although 20 year prevalence data are only available for one regional cancer centre (covering 2 provinces with a population of 3 million persons).
No other sources (LINH, fitted GPRNs or HDR) are included nor looked at in this pilot.

4.2.7. Diabetes mellitus (E10–E14)[19]

Diabetes mellitus is a group of metabolic diseases in which a person has high blood sugar resulting from the body's failure to produce insulin, or cells to use insulin properly.

The indicators to be reported for diabetes are:
- Prevalence, defined as lifetime prevalence, as both types are chronic conditions that usually cannot be cured.
- Point prevalence
- Incidence by person

Classification
ICD-10 codes E10-E14 include insulin dependent diabetes mellitus. GP registers use ICPC-1 code T90 which also includes insulin dependent diabetes mellitus. The Hospital Discharge Register uses ICD-9 code 250 which also completely covers E10-E14. In HIS respondents indicate whether they suffered from diabetes in the last 12 months, using separate questions for insulin dependent and independent diabetes. Prescribed Medicines with the ATC-code A10 (drugs used in diabetes), and underlying subgroups, were included in the analysis.

<u>Period prevalence (lifetime)</u>

Possible sources
In The Netherlands, diabetes is largely managed in primary care. Therefore GPRN data are a relevant source, but (single) hospital data are not. Possible sources are:
- Fitted GPRNs: As most patients will contact the general practitioner (GP) at least once a year, both problem-based and episode-base GPRNs will provide useful data on diabetes prevalence. LINH is included in fitted GPRNs.
- LINH, including multiple year analysis to trace patients that were not counted as prevalent in 2007

- LINH linked to the Hospital Discharge Register
- Health Interview Survey (HIS)
- Prescribed anti-diabetic drugs (CVZ Drug register, register of supplied prescribed drugs reimbursed by basic insurance)

No national register exists of all patients diagnosed with diabetes.

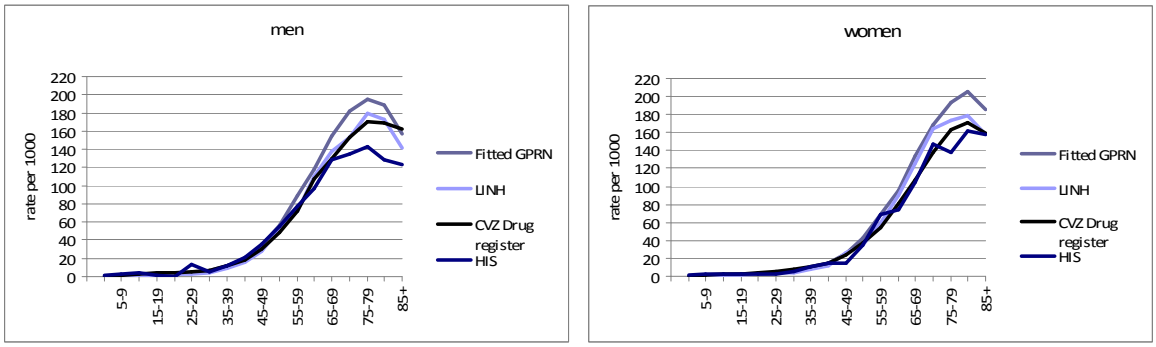
Crude Rates

In Table 4.2.7.1. the prevalence of diabetes per 10,000 Dutch inhabitants is presented.

Table 4.2.7.1. Crude prevalence rates of diabetes per 10,000 persons in the average Dutch population, 2007 (HIS: 2006-2008).

	men	women
Fitted GPRNs	455	463
LINH	407	427
LINH multiple years		
Base	409	412
Two years	447	456
Three years	466	479
HIS (2006-2008)	389	379
CVZ Drug register	399	396

Figure 4.2.7.1. Age and sex specific prevalence of diabetes, based on fitted GPRNs (including LINH), LINH only, CVZ Drug register and HIS; per 1000 persons per year, 2007 (HIS: 2006-2008).

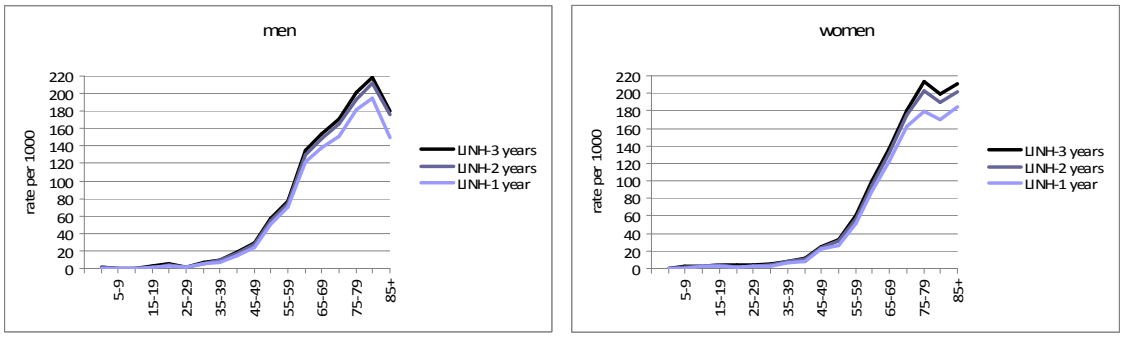


Multiple year LINH

Results counting persons with one or more diabetes-related GP contacts in one, two or three years are shown in figure 4.2.7.2. As base values for the LINH subpopulation suitable for three year follow-up differ from the full LINH population, these figures are presented separately. It can be concluded that one extra year of observation importantly

improves the estimation of life time prevalence and then resembles the estimate on the basis of the fitted GPRNs. Two extra years are not preferred, as the relatively small increase in prevalence does not make up for the additional bias introduced by using the 3-year LINH population.

Figure 4.2.7.2. Age and sex specific prevalence of diabetes in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Addition of cases found in hospital discharge register
Linking the 3-year LINH-population mentioned above to the hospital discharge register results in 2% extra persons with diabetes as primary or secondary diagnosis in the hospital, which were not found in the LINH register. This small increase does not justify adding HDR-data for calculating prevalence rates for diabetes.

Conclusion
Prevalences based on fitted GPRNs seem to give the best estimates of diabetes prevalence. Alternatively, two-year observation in LINH can also be considered a suitable data source. Weighting of the multiple year LINH population may decrease the selection bias in this group (see 3.2.2.3). Estimates based on the register of prescribed medicines end up at the same level as one year in the contact-based LINH. HIS-data seem to underestimate the prevalence of diabetes.

<u>Incidence by person</u>

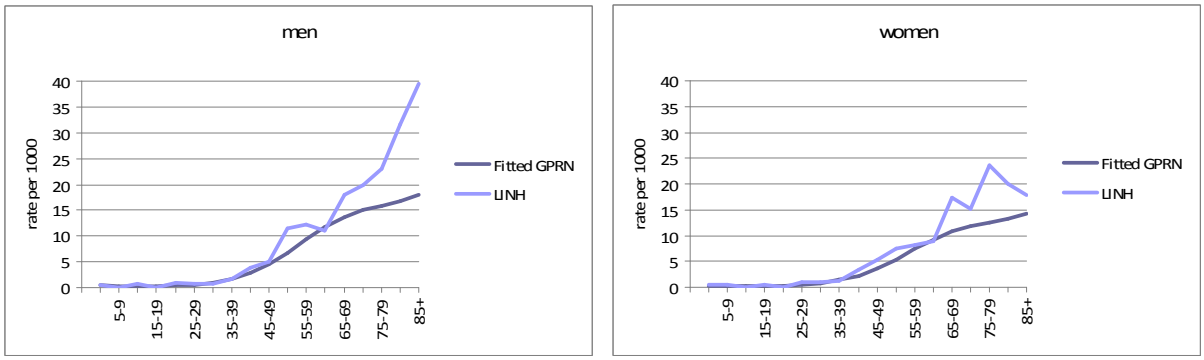
Possible sources:
- Fitted GPRNs: As most patients will contact the GP with complaints leading to the diagnosis of diabetes, both problem-based and episode-based GPRNs will provide useful data on diabetes incidence. LINH is included in fitted GPRNs.
- LINH

Crude Rates
In Table 4.2.7.2. the incidence of diabetes per 10,000 Dutch inhabitants is presented, and in figure 4.2.7.3. the age and sex specific incidence, for fitted GPRNs and for LINH separately.

Table 4.2.7.2. Crude incidence rates of diabetes per 10,000 persons in the average Dutch population, 2007

	men	women
Fitted GPRNs	46	41
LINH	64	57

Figure 4.2.7.3. Age and sex specific incidence of diabetes, based on fitted GPRNs and on LINH only, per 1000 persons per year, 2007.



Conclusion

Fitted GPRNs give lower incidence estimates than data on LINH only. Apparently, the other GP networks involved in the fitted numbers register less incident cases than LINH. Maybe some of the incident episodes registered in one year LINH are actually prevalent cases whose previous history of diabetes was missed. In that case fitted GPRNs give better estimates of diabetes incidence.

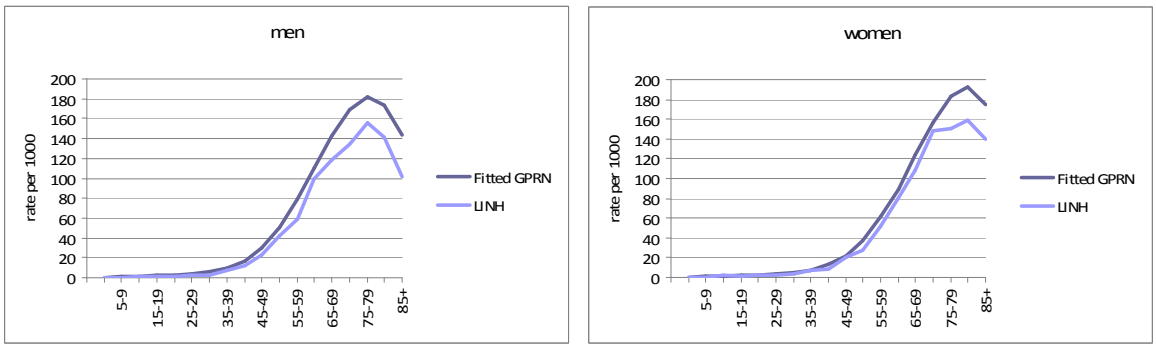
Point prevalence:

Point prevalence for diabetes is calculated as prevalence minus incidence over 2007, divided by the population of January 1 2007, based on the same sources available for incidence rates: fitted GPRNs and LINH.

Table 4.2.7.3. Crude point prevalence rates of diabetes per 10,000 persons in the Dutch population, January 1 2007

	men	women
Fitted GPRNs	410	422
LINH	331	360

Figure 4.2.7.4. Age and sex specific point prevalence of diabetes, based on fitted GPRNs and on LINH only, per 1000 persons, January 1, 2007



Conclusion
As fitted GPRNs are considered the best source for both prevalence and incidence measurement, point prevalence also is best represented by fitted GPRNs.

4.2.8. Dementia (incl. Alzheimer's disease) (F00-F03, G30) [20]

The indicator to be reported for dementia is prevalence, defined as lifetime prevalence, as dementia is a disease that cannot be cured.

Possible sources
In the Netherlands, dementia will be first presented at the general practitioner. Therefore GPRN data are a relevant source. Possible sources are:

- Fitted GPRNs: the contact-based LINH is not included. Patients with dementia do not all contact their GP yearly and LINH is a contact-based registration and does not have a problem list. Therefore, LINH will underestimate prevalence.
- LINH, including multiple year analysis to trace patients that were missed in prevalence by the GP in 2007

Classification
For the pilot ICD-10 codes F00-F03 and G30 are requested. In both the fitted GPRNs and LINH, ICPC-1 code P70 encodes for dementia, and corresponds to ICD-10 codes F00-F03 and G30.

<u>Period prevalence (lifetime)</u>

Crude Rates
In table 4.2.8.1. the prevalence of dementia per 10,000 Dutch inhabitants is presented.

Table 4.2.8.1. Crude prevalence rates of dementia (incl. Alzheimer's disease) per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	27	57
LINH	16	26
LINH multiple years		
Base	15	28
Two years	19	36
Three years	22	39

Age and sex specific prevalence rates are shown in figures 4.2.8.1.

Figure 4.2.8.1. Age and sex specific prevalence rates of dementia per 1,000 persons in the average Dutch population, 2007.

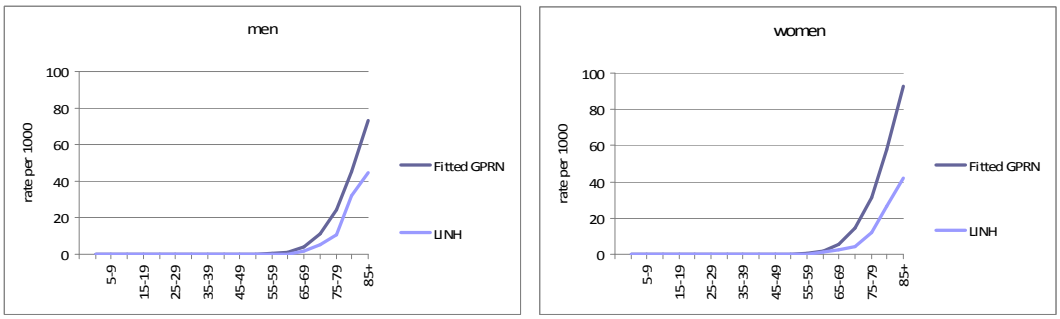
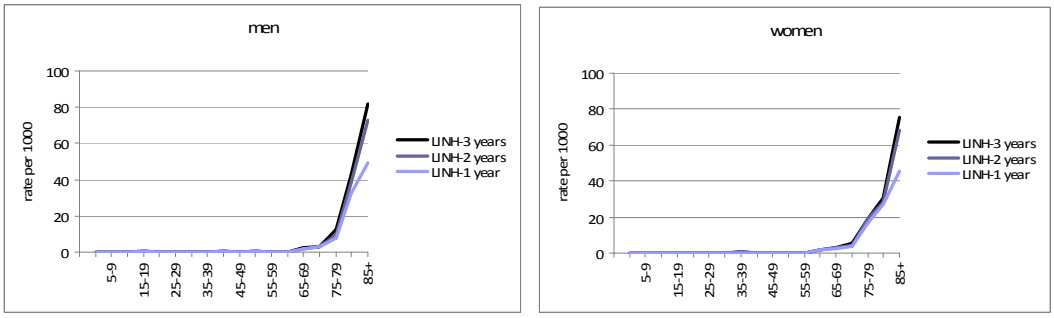


Figure 4.2.8.2. Age and sex specific prevalence of dementia in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion
Fitted GPRN data constitute the best available source on dementia in the Netherlands. Even multiple year analysis of LINH data does not come up to the level of the fitted GPRN data. Both fitted GPRNs and LINH data lack information on dementia diagnoses in nursing homes, resulting in an underestimation of the prevalence rate.

4.2.9. Mental and behavioural disorders due to use of alcohol (incl. alcohol dependence) (F10) [21]

The indicator to be reported for mental and behavioural disorders due to use of alcohol (incl. alcohol dependence) is period prevalence, defined as year prevalence, because most of these disorders can be cured.

Possible sources
Although a lot of data on alcohol use are collected in the Netherlands, only a few sources are relevant for estimating the prevalence of mental and behavioural disorders due to the use of alcohol. A possible source is:

- NEMESIS-2: respondents, aged 18 to 65 years, answer questions about past alcohol use in a structured interview by a trained interviewer; both DSM-IV and ICD-10 diagnoses are registered.

Classification
For the pilot, Eurostat requests ICD-10 code F10. NEMESIS-2 diagnoses include alcohol abuse and alcohol dependence, which correspond to DSM-IV codes 305.00 and 303.90. In turn, these codes correspond to ICD-10 codes F10.1 and F10.2. F10.0 (Alcohol intoxication), F10.3 (Alcohol withdrawal syndrome), F10.4 (Delirium tremens), F10.5 (Alcoholic hallucinosis), F10.6 (Korsakoff's syndrome) and F10.9 (alcohol use, unspecified) are not included in the selection.

Period prevalence (lifetime)

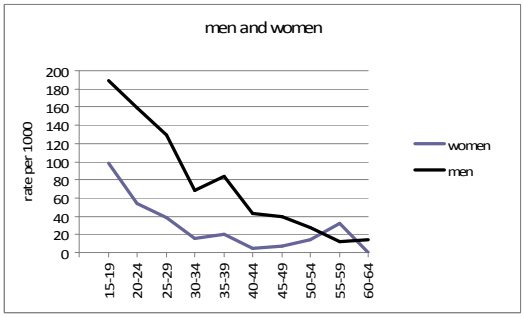
Crude Rates
In table 4.2.9.1. the prevalence of mental and behavioural disorders due to the use of alcohol per 10,000 Dutch inhabitants, aged 18 to 65 years, is presented.

Table 4.2.9.1. Crude prevalence rates of mental and behavioural disorders due to use of alcohol (incl. alcohol dependence) per 10,000 persons aged 18 to 65 years in the average Dutch population, 2007.

	men	women
NEMESIS-2	667	224

Age and sex specific prevalence rates are shown in figures 4.2.9.1.

Figure 4.2.9.1. Age and sex specific prevalence rates of mental and behavioural disorders due to the use of alcohol per 1,000 persons aged 18 to 65 years in the average Dutch population, 2007.



Conclusion
For mental and behavioural disorders due to use of alcohol (incl. alcohol dependence) NEMESIS-2 is the preferred source of data, in spite of a limited age range of the respondents (18 to 65 years) and the fact that the ICD-10 codes requested were not fully covered.

4.2.10. Mental and behavioural disorders due to use of psychoactive substances other than alcohol and tobacco (incl. drug dependence) (F11-F16, F18, F19) [22]

The indicator to be reported for mental and behavioural disorders due to use of psychoactive substances other than alcohol and tobacco (incl. drug dependence) is period prevalence, defined as year prevalence, because these disorders can be cured.

Possible sources
Although a lot of data on psychoactive substances use are collected in the Netherlands, only a few sources are relevant for estimating the prevalence of mental and behavioural disorders due to use of psychoactive substances other than alcohol and tobacco. A possible source is:

- NEMESIS-2: respondents, aged 18 to 65 years, answer questions about past psychoactive substances use in a structured interview by a trained interviewer; both DSM-IV and ICD-10 diagnoses are registered.

Classification
For the pilot, Eurostat requests ICD-10 codes F11-F16, F18, and F19. NEMESIS-2 diagnoses include substance abuse and dependence for opioids, cannabis, sedatives, cocain, inhalants, hallucinogens, which correspond to DSM-IV codes 305.10 through 305.90 and 304.00 through 304.90. In turn, these codes correspond to ICD-10 codes F11.1, F11.2, F12.1, F12.2, F13.1, F13.2, F14.1, F14.2, F15.1, F15.2, F16.1, F16.2, F18.1, F18.2, F19.1 and F19.2. In general, for each substance ICD-10 subcodes on intoxication (F1X.0), withdrawal state (F1X.3), withdrawal state with delirium (F1x.4), psychotic disorder (F1x.5), amnesic syndrome (F1x.6), Residual and late-onset psychotic disorder (F1x.7), other mental and behavioural disorder (F1x.8) and unspecified mental and behavioural disorder (F1x.9) are not included in NEMESIS-2.

Period prevalence (year)

Crude Rates

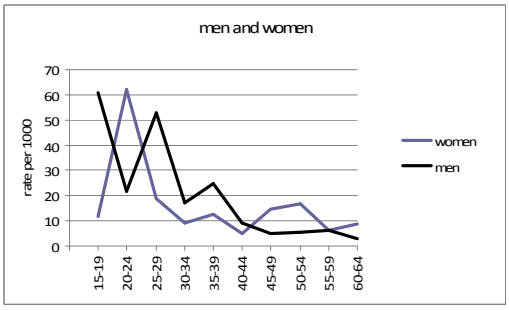
In table 4.2.10.1. the prevalence of mental and behavioural disorders due to the use of psychoactive substances other than alcohol and tobacco per 10,000 Dutch inhabitants, aged 18 to 65 years, is presented.

Table 4.2.10.1. Crude prevalence rates of mental and behavioural disorders due to use of psychoactive substances other than alcohol and tobacco (incl. drug dependence) per 10,000 persons aged 18 to 65 years in the average Dutch population, 2007.

	men	women
NEMESIS-2	172	160

Age and sex specific prevalence rates are shown in figures 4.2.10.1.

Figure 4.2.10.1. Age and sex specific prevalence rates of dementia per 1,000 persons aged 18 to 65 years in the average Dutch population, 2007.



Conclusion

For mental and behavioural disorders due to use of psychoactive substances other than alcohol and tobacco (incl. drug dependence) NEMESIS-2 is the preferred source of data in spite of a limited age range of the respondents (18 to 65 years) and the fact that some of the subcodes are lacking.

4.2.11. Schizophrenia (F20-F29) [23]

The indicators to be reported for schizophrenia is prevalence, defined as lifetime prevalence, as schizophrenia is a disease that cannot be cured.

Possible sources

In the Netherlands, schizophrenia will be first presented at the general practitioner. Therefore GPRN data are a relevant source. Possible sources are:

- Fitted GPRNs from the problem list: the contact-based LINH is not included in the fitted GPRNs.
- LINH (including multiple year LINH)

Classification
For the pilot ICD-10 codes F20-F29 are requested. GPRNs use ICPC-1 classification, with ICPC-1 code P72 corresponding to ICD-10 codes F20, F21, F22.0, F22.8/9, F24, F25.0/2, F25.8/9 and F28 and ICPC-1 P98 coding for ICD-10 codes F23 and F29. The combination of P72 and P98 therefore is the preferred selection, although also ICD-10 code F53.1 is included this way. However, this combination presently was not available for fitted GPRNs. As presented in table 4.2.11.1. and figure 4.2.11.2. using LINH, it is shown that P98 is encoding for more than half of the cases of schizophrenia.

Period prevalence (lifetime)

Crude Rates
In table 4.2.11.1. the prevalence of schizophrenia per 10,000 Dutch inhabitants is presented.

Table 4.2.11.1. Crude prevalence rates of schizophrenia per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs (P72 only)	24	18
LINH (P72 only)	10	8
LINH (P72 + P98)	21	20
LINH multiple years (P72 + P98)		
Base	17	20
Two years	23	27
Three years	30	33

Age and sex specific prevalence rates are shown in figures 4.2.11.1.

Figure 4.2.11.1. Age and sex specific prevalence rates of schizophrenia per 1,000 persons in the average Dutch population, 2007.

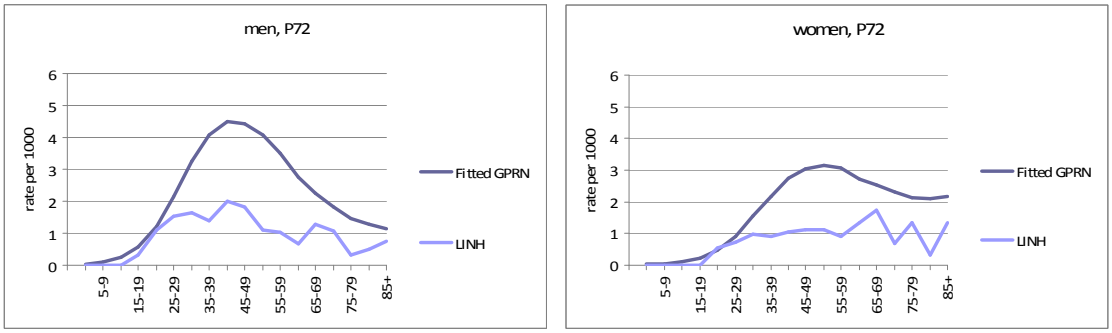


Figure 4.2.11.2. Age and sex specific prevalence rates of schizophrenia, based upon ICPC-1 code P72 or the combination of P72 and P98 in LINH, per 1,000 persons in the average Dutch population, 2007.

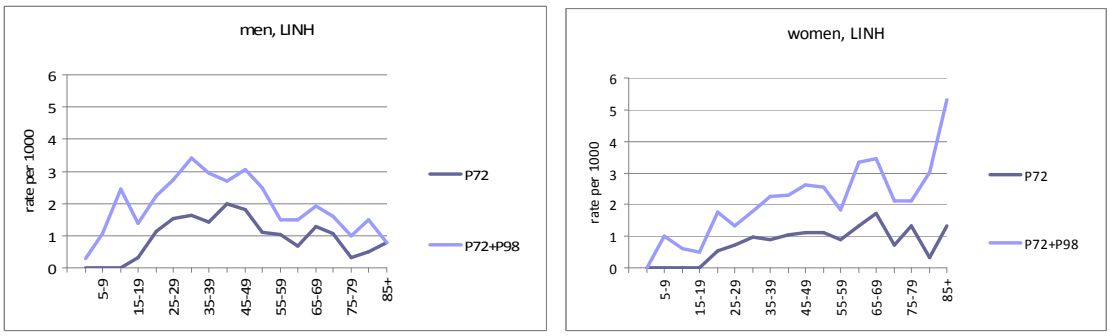
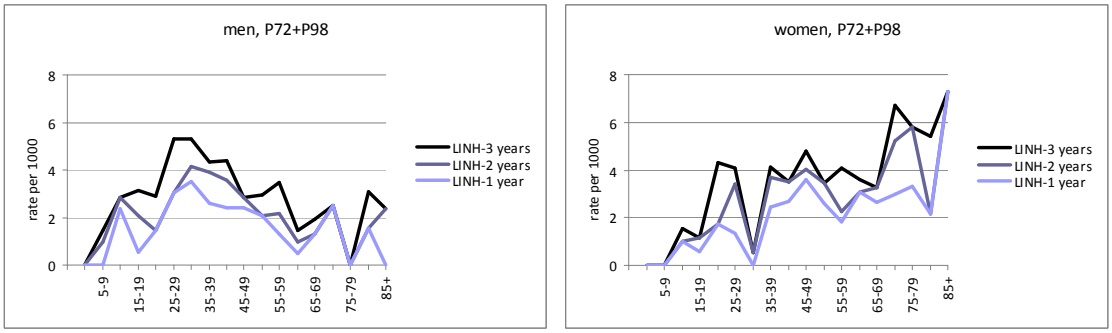


Figure 4.2.11.3. Age and sex specific prevalence of schizophrenia in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion

For schizophrenia, probably the fitted GPRN data would be preferred over the data of LINH, mainly because LINH is a contact-based GPRN. However, for this pilot the required combination of ICPC-1 codes was not available for fitted GPRNs. Three year LINH was analyzed for the requested codes. However, analysis in LINH shows that the combination of ICPC-1 codes P72+P98 results in at least twice the amount of cases compared to the single code of P72. Therefore it remains plausible that the fitted GPRNs using the preferred codes would present higher numbers than three year LINH. For the moment, three year LINH is indicated to be the best choice. Weighting of the multiple year LINH population may decrease the selection bias in this group (see 3.2.2.3).

It should be noted that GPRN data lack information on schizophrenia diagnoses in psychiatric hospitals and institutions, resulting in an underestimation of the prevalence rate.

4.2.12. Depression and other affective disorders (F30-F39) [24]

The indicator to be reported for depression and other affective disorders is period prevalence, defined as year prevalence, because depression and other affective disorders can be cured.

Possible sources
In the Netherlands, few sources constitute a relevant source on depression and other affective disorders. Possible sources are:

- HIS
- LINH

NEMESIS-2 can also be considered a potential source. However, due to logistic problems, in this pilot NEMESIS-2 data for depression and other affective disorders could not be included.

Classification
In this pilot, ICD-10 codes F30 through F39 are requested. LINH uses ICPC-1 code P76 (leading to F32 through F39, excluding F34) and P73 (F30, F31, F34). The combination however also encodes for ICD-10 F41.2 (mixed anxiety and depressive disorder), and F53.0 (mild mental and behavioural disorders associated with the puerperium, not elsewhere classified).
In HIS, respondents answer questions whether he/she had a period of at least 2 weeks during which he/she was very depressed or down in the last year.

Period prevalence (year)

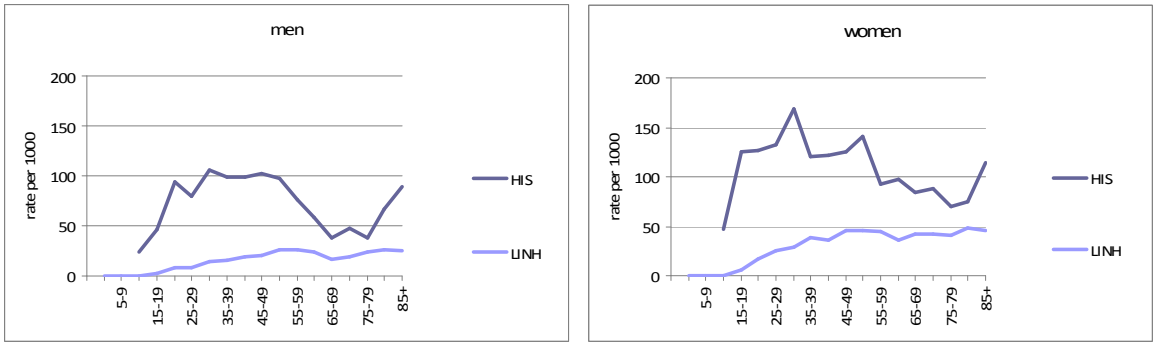
Crude Rates
In table 4.2.12.1. the prevalence of depression and other affective disorders per 10,000 Dutch inhabitants is presented.

Table 4.2.12.1. prevalence rates of depression and other affective disorders per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	143	294
HIS: had a period of at least 2 weeks during which person was very depressed or down during the last year (2006-2008)	792	1157

Age and sex specific prevalence rates are shown in figures 4.2.12.1.

Figure 4.2.12.1. Age and sex specific prevalence rates of depression and other affective disorders per 1,000 persons in the average Dutch population, 2007 (HIS 2006-2008).



Conclusion
For depression, LINH is the preferred data source. Prevalence data from the Health Interview Survey (HIS) are self reported data. Disadvantage of these data is that they do not necessarily concern diagnosed morbidity and that the disease is not described in terms of ICD codes. Due to logistic problems, in this pilot NEMESIS-2 data for depression and other affective disorders were not included. For future use, these data may be available, but the limitation to subjects aged 18-65 year is a limitation for the use of these data.

4.2.13. Anxiety disorders (F40, F41) [25]

The indicator to be reported for anxiety disorders is period prevalence, defined as year prevalence, because anxiety disorders can be cured.

Possible sources
In the Netherlands, few sources constitute a relevant source on anxiety disorders.
- HIS
- LINH

NEMESIS-2 can also be considered a potential source. However, due to logistic problems, in this pilot NEMESIS-2 data for anxiety disorders could not be included.

Classification
In this pilot ICD-10 codes F40 and F41 are requested. LINH uses ICPC-1 codes P74 and P79. The combination does not encode for ICD-10 F41.2 (mixed anxiety and depressive disorder). HIS: respondents answer questions whether he/she had a period of at least 2 weeks during which he/she was very afraid or concerned in the last year.

Period prevalence (year)

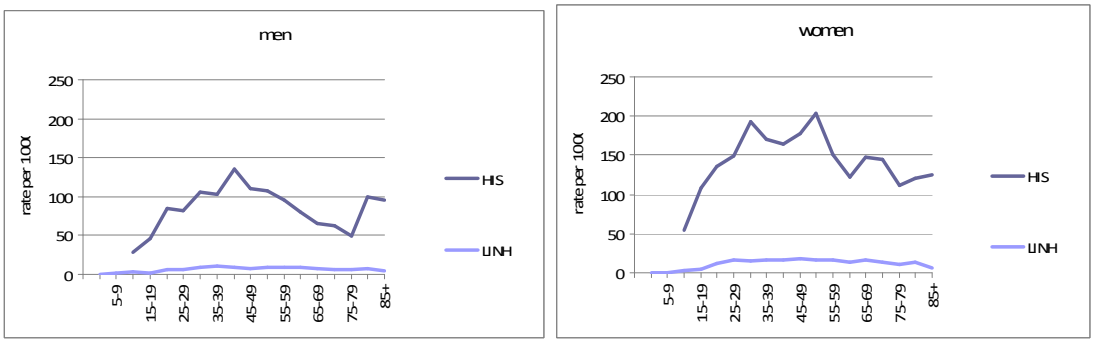
Crude Rates
In table 4.2.13.1. the prevalence of anxiety disorders per 10,000 Dutch inhabitants is presented.

Table 4.2.13.1. Crude prevalence rates of anxiety disorders per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	64	122
HIS: had a period of at least 2 weeks during which person was very afraid or concerned in the last year (2006-2008)	902	1515

Age and sex specific prevalence rates are shown in figures 4.2.13.1.

Figure 4.2.13.1. Age and sex specific prevalence rates of anxiety disorders per 1,000 persons in the average Dutch population, 2007 (HIS 2006-2008).



Conclusion
For anxiety disorders, LINH is the preferred data source. Prevalence data from the Health Interview Survey (HIS) are self reported data. Disadvantage of these data is that they do not necessarily concern diagnosed morbidity and that the disease is not described in terms of ICD codes. Due to logistic problems, in this pilot NEMESIS-2 data for anxiety disorders were not included.

4.2.14. Eating disorders (F50) [26]

The indicator to be reported for eating disorders is period prevalence, defined as year prevalence, because eating disorders can be cured.

Possible sources
In the Netherlands, very few sources constitute a relevant source on eating disorders. Numbers are too small for fitted GPRN data. A possible source is:

- LINH

Classification
In this pilot ICD-10 code F50 is requested. In LINH ICPC-1 code T06 is used, which corresponds only with ICD-10 code F50.0 to F50.4. Codes 50.5 (vomiting associated with other psychological disturbances) and 50.8 (other eating disorders) and F50.9 (eating disorder, unspecified) are missing.

<u>Period prevalence (year)</u>

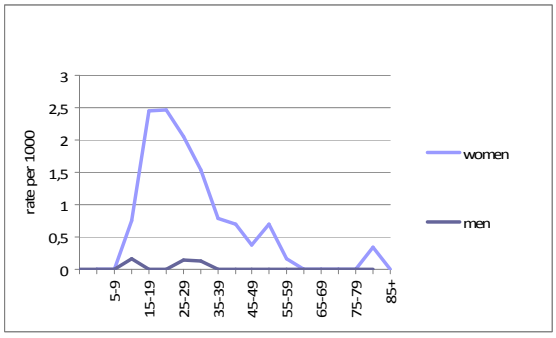
Crude Rates
In table 4.2.14.1. the prevalence of eating disorders per 10,000 Dutch inhabitants is presented.

Table 4.2.14.1. Crude prevalence rates of eating disorders per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	0,3	7,6

Age and sex specific prevalence rates are shown in figures 4.2.14.1.

Figure 4.2.14.1. Age and sex specific prevalence rates of eating disorders per 1,000 persons in the average Dutch population, 2007.



Conclusion
For eating disorders, LINH seems to be the best available data source. Probably, primary health care psychologists or institutions for eating disorders would be a better source, but no register data are available from those health care providers.

4.2.15. Parkinson's disease (G20) [27]

The indicator to be reported for Parkinson's disease is prevalence, defined as lifetime prevalence, as Parkinson's disease is a disease that cannot be cured.

Possible sources
In the Netherlands, Parkinson's disease will be first presented at the general practitioner. Therefore GPRN data are a relevant source. Possible sources are:

- Fitted GPRNs
- LINH (including multiple year analysis)
- HDR
- a combination of LINH, HDR and COD

Classification
In this pilot ICD-10 code G20 is requested. GP registers use ICPC-1 code N87. This code corresponds to ICD-10 code G20 (Parkinson's disease), but also with codes G21 (secondary parkinsonism) and G22 (parkinsonism in diseases classified elsewhere). Therefore the definition in the GP registers is somewhat broader than requested. ICD-9-CM code 332 used in the HDR is fully covering ICD-10 code G20.

<u>Period prevalence (lifetime)</u>

Crude Rates
In table 4.2.15.1. the prevalence of Parkinson's disease per 10,000 Dutch inhabitants is presented.

Table 4.2.15.1. Crude prevalence rates of Parkinson's disease per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	18	15
LINH	14	11
Hospital Discharge Register	1	1
LINH multiple years		
Base	15	13
Two years	17	16
Three years	20	17

Age and sex specific prevalence rates are shown in figures 4.2.15.1.

Figure 4.2.15.1. Age and sex specific prevalence rates of Parkinson's disease per 1,000 persons in the average Dutch population, 2007.

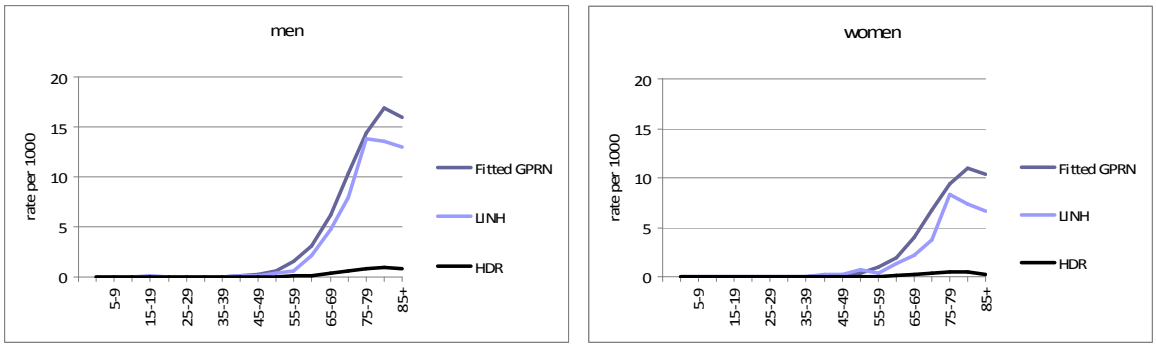
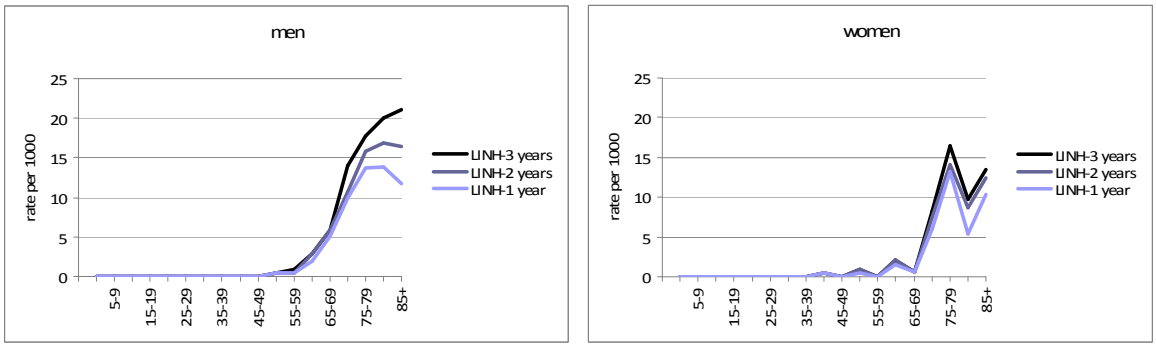


Figure 4.2.15.2. Age and sex specific prevalence of Parkinson's disease in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion
Fitted GPRN data on Parkinson's disease constitute the best available source on Parkinson's disease in the Netherlands. Parkinson diagnoses rise steeply when age progresses into old age. Both fitted GPRN data as well as LINH data lack information on Parkinson's disease diagnoses in nursing homes, so that the prevalence figures presented here are an underestimation. Multiple year analysis (2 or 3 years) or multiple year analysis (2 years) in combination with HDR data and COD data (see 3.2.3.2 and Annex 5) are a reasonable alternative for the fitted GPRN data.

4.2.16. Multiple sclerosis (G35) [28]

The indicator to be reported for multiple sclerosis is prevalence, defined as lifetime prevalence, as multiple sclerosis is a disease that cannot be cured.

Possible sources
In the Netherlands, multiple sclerosis will be first presented at the general practitioner. Therefore GPRN data are a relevant source. Possible sources are:
- Fitted GPRNs
- LINH, including multiple year analysis
- HDR
- a combination of LINH, and HDR

Classification
In this pilot ICD-10 code G35 is requested. GP registers use ICPC-1 code N86; this code corresponds to ICD-10 code G35. In HDR, ICD-9 code 340 is used, corresponding to ICD-10 code G35.

<u>Period prevalence (lifetime)</u>

Crude Rates
In table 4.2.16.1. the prevalence of multiple sclerosis per 10,000 Dutch inhabitants is presented.

Table 4.2.16.1. Crude prevalence rates of multiple sclerosis per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	6	14
LINH	4	9
Hospital Discharge Register	1	4
LINH multiple years		
Base	4	9
Two years	5	10
Three years	5	12

Age and sex specific prevalence rates are shown in figures 4.2.16.1.

Figure 4.2.16.1. Age and sex specific prevalence rates of multiple sclerosis per 1,000 persons in the average Dutch population, 2007.

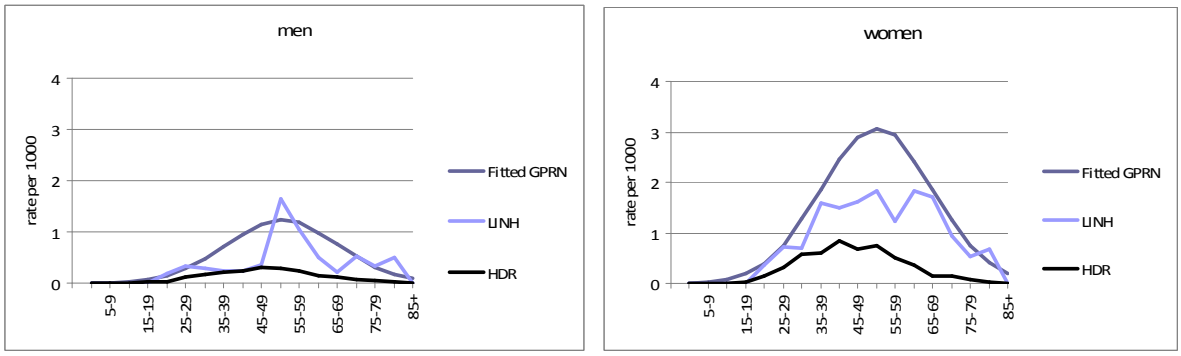
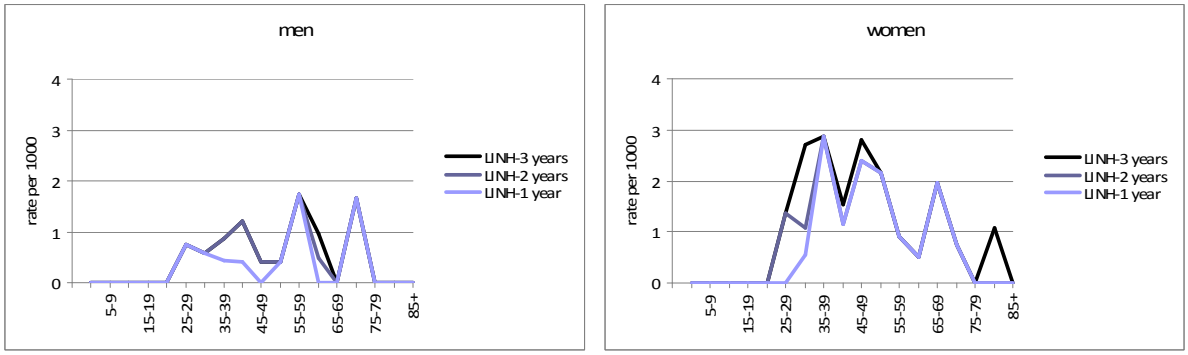


Figure 4.2.16.2. Age and sex specific prevalence of multiple sclerosis in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion
For multiple sclerosis, the fitted GPRNs are the preferred source of data in the Netherlands. Multiple year analysis (2 years) in combination with HDR data (see 3.2.3.2 and Annex 5) are a reasonable alternative for the fitted GPRN data. Weighting of the multiple year LINH population may decrease the selection bias in this group (see 3.2.2.3). Both fitted GPRN data as well as LINH data lack information on Parkinson's disease diagnoses in nursing homes, so the prevalence figures presented here are an underestimation.

4.2.17. Epilepsy (G40, G41) [29]

The indicator to be reported for epilepsy is prevalence, defined as lifetime prevalence, as epilepsy is considered to be a disease that generally cannot be cured.

Possible sources
In the Netherlands, epilepsy will be first presented at the general practitioner. Therefore GPRN data are a relevant source. Possible sources are:

- Fitted GPRNs from the problem list: the contact-based LINH is not included in the fitted GPRNs for this prevalence measure. As patients with epilepsy not all contact their GP yearly and the LINH is a contact-based registration and does not have a problem list, the LINH will give an underestimation.
- LINH, including multiple year analysis to trace patients that were missed in prevalence by the GP in 2007

HDR is not considered to be a good source as specialized epilepsy hospitals are not included.

Classification
In this pilot ICD-10 codes G40 and G41 are requested. GP registers use ICPC-1 code N88; this code corresponds to ICD-10 codes G40 and G41.

Period prevalence (lifetime)
Crude Rates
In table 4.2.17.1. the prevalence of epilepsy per 10,000 Dutch inhabitants is presented.

Table 4.2.17.1. Crude prevalence rates of epilepsy per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	75	73
LINH	36	31
LINH multiple years		
Base	46	39
Two years	57	46
Three years	66	52

Age and sex specific prevalence rates are shown in figures 4.2.17.1.

Figure 4.2.17.1. Age and sex specific prevalence rates of epilepsy per 1,000 persons in the average Dutch population, 2007.

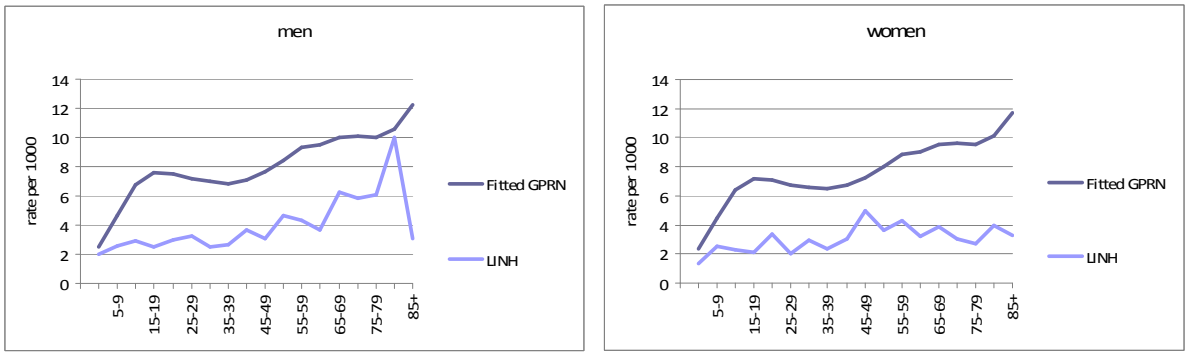
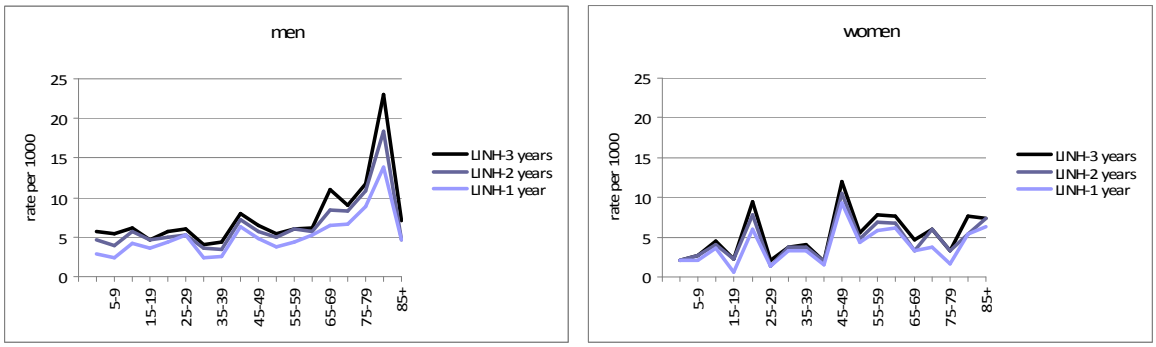


Figure 4.2.17.2. Age and sex specific prevalence of epilepsy in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion
For epilepsy, the fitted GPRN data is the preferred source of data in the Netherlands.

4.2.18. Migraine and other headache syndromes (G43, G44) [30]

The indicator to be reported for migraine and other headache syndromes is period prevalence. The prevalence is defined as year prevalence, as migraine and other headache syndromes may pass.

Period prevalence (year)

Possible sources

In The Netherlands migraine and other headache syndromes will be mostly presented at the general practitioner. Patients may be redirected to a medical specialist who will prescribe medication during start of treatment. Afterwards, patients may come back to the GP to continue treatment, for regular visits and/or the prescription of medicines.

Possible sources are:

- Fitted GPRNs, but no data available

- LINH: including multiple-year analyses
- HIS

Classification

For this Eurostat pilot data on ICD-10 codes G43 and G44 are requested. In the Netherlands, General Practitioners use ICPC-1 as classification system. The combination of ICPC-1 N89, N90 and N02 translates in ICD-10 codes G43 and G44, but miss G44.3 (chronic post-traumatic headache), G44.4 (drug-induced headache, not elsewhere classified) and G44.8 (other specified headache syndromes). In the HIS, included are those who answered 'yes' to the question: 'Did you suffer from migraine or frequent serious headache in the last 12 months?'.

Crude rates

Crude prevalence rates of migraine and other headache syndromes are presented in Table 4.2.18.1., expressed per 10,000 Dutch inhabitants.

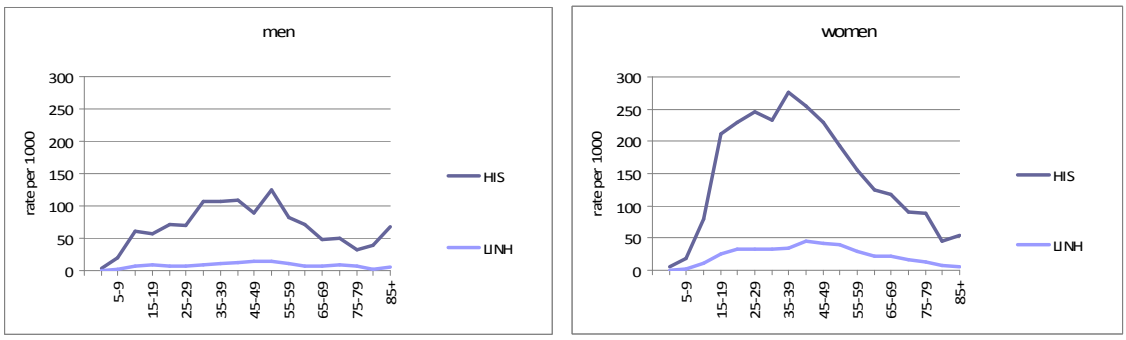
Table 4.2.18.1.Crude prevalence rates of migraine and other headache syndromes per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	86	257
LINH multiple years		
Base	92	247
Two years	137	374
Three years	179	477
HIS (2006-2008)	735	1643

The Health Interview Survey gives by far the highest prevalence estimates, the rates are both for men and women higher than those of LINH.

Age and sex specific rates are shown in figure 4.2.18.1.

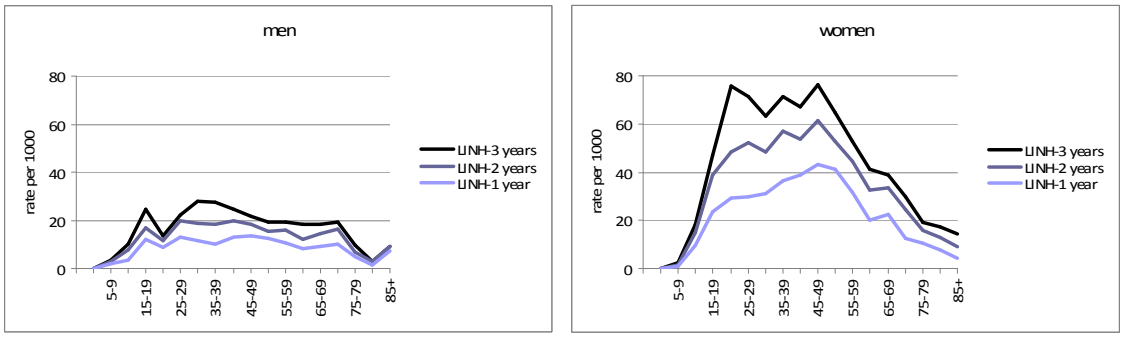
Figure 4.2.18.1. Age and sex specific prevalence of migraine and other headache syndromes, based on LINH and HIS; per 1000 persons per year, 2007 (LINH) and 2006-2008 (HIS).



Multiple year LINH

Results counting persons with one or more GP contacts relating to migraine and other headache syndromes in one, two or three years are shown in figures 4.2.18.2. As base values for the LINH subpopulation suitable for three year follow-up differ from the full LINH population, these figures are presented separately. It can be concluded that each extra year of observation substantially rises the estimation of prevalence. This increase may be caused by patients that still suffer from migraine but do not contact the GP every year. On the other hand, it also may include patients that no longer suffer from migraine or other headache syndromes.

Figure 4.2.18.2. Age and sex specific prevalence of migraine and other headache syndromes in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion

In the Health Interview Survey, frequent serious headaches may include complaints that cannot be defined as 'headache syndromes' as required for this Morbidity Pilot. Therefore, LINH is considered to be the best source available. As each extra year in LINH results in a substantial increase of the same order, these may represent patients that no longer suffer headaches. Therefore, the best source for year prevalence is considered to be one year of LINH.

4.2.19. Cataract (H25, H26, H28) [31]

The indicator to be reported for cataract is period prevalence. The prevalence is defined as year prevalence, as cataract is a disease that after surgery (removal of lens) can be considered to be not present anymore.

Period prevalence (year)

Possible sources

In the Netherlands, cataract is mostly first seen in primary care or by an optician and after that it is mostly managed in the hospital. Possible sources are:

- LINH
- HDR
- Fitted GPRNs: the contact-based LINH is not included. Fitted GPRN data however represent lifetime prevalence, while we here focus on year prevalence.

Classification

For this Eurostat pilot data on ICD-10 codes H25, H26 and H28 are requested. ICPC F92 translates in these ICD-10 codes and for the hospitals ICD-9-CM code 366 fully covers the requested ICD-10 codes.

Crude rates

In table 4.2.19.1. the prevalence of cataract per 10,000 Dutch inhabitants is presented.

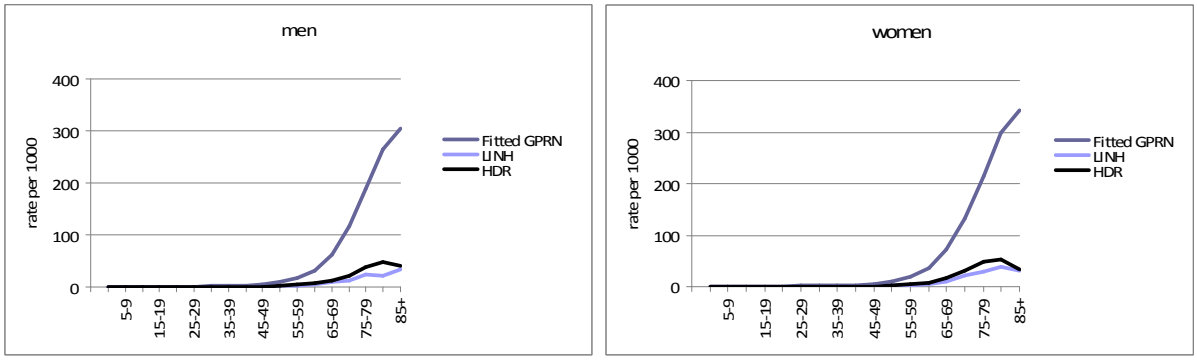
Table 4.2.19.1. Crude prevalence rates of cataract per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	229	365
LINH	30	49
HDR	45	68

Fitted GPRNs give the highest prevalence estimates, the rates are both for men and women higher than those of the other data sources. Numbers of the HDR are higher than of LINH: apparently many cases are treated in the hospital without intervention of the general practitioner. The numbers in the HDR will however also give an underestimation because treatments in outpatient clinics and Independent Treatment Centres are not included in the HDR.

In future, DRG-like data from hospitals may also be a source (see 3.10). Outpatient clinics and independent treatment centres are included in this source.
Age and sex specific rates are shown in figure 4.2.19.1.

Figure 4.2.19.1. Age and sex specific prevalence of cataract, based on fitted GPRNs, LINH and HDR; per 1000 persons per year, 2007



Combination of registrations
Using 2004 data, the number of cases found in the LINH population is increased with 123% by linking with the HDR (see 3.2.3.2 and Annex 5). Probably LINH predominantly covers the cases that are not yet treated, and HDR the surgical cases. Assuming that this percentage will be stable for a couple of years and this percentage is applied to 2007 data, the prevalence of LINH + HDR is estimated to be about 68 per 10,000 for men and about 110 per 10,000 for women.

Conclusion
As fitted GPRNs give an estimate of the lifetime prevalence of cataract but the prevalence is defined as year prevalence, LINH linked with the HDR gives the best year prevalence estimate. These data are however not available for 2007, because of the incomplete HDR-registration in recent years. Only estimates can be made (see above). In the morbidity tables (see Annex 6) only these estimated totals are given, without age-specific data.

4.2.20. Glaucoma (H40, H42) [32]

The indicator to be reported for glaucoma is period prevalence. The prevalence is defined as lifetime prevalence, as glaucoma is a disease that can be treated to prevent further degeneration but cannot be cured.

Period prevalence (lifetime)

Possible sources

In the Netherlands glaucoma is mostly (first) seen in primary care and sometimes in the hospital. Possible sources are:

- Fitted GPRNs: the contact-based LINH is not included.
- LINH (including multiple year analysis)

Glaucoma is not separately presented in the regular published statistics of Statistics Netherlands which are based on the HDR, so there are no numbers for the HDR available. However only a few patients with glaucoma are treated in the hospital, so the HDR would underestimate the prevalence of glaucoma.

Classification

For this Eurostat pilot data on ICD-10 codes H40 and H42 are requested. ICPC F93 translates in ICD-10 codes H40 and H42.

As mentioned earlier glaucoma is not separately presented in the regular published statistics which are based on the HDR. For the linkage between LINH and HDR (with 2004 data) the ICD-10 codes are translated to ICD-9-CM code 365.

Crude rates

In table 4.2.20.1. the prevalence of glaucoma per 10,000 Dutch inhabitants is presented.

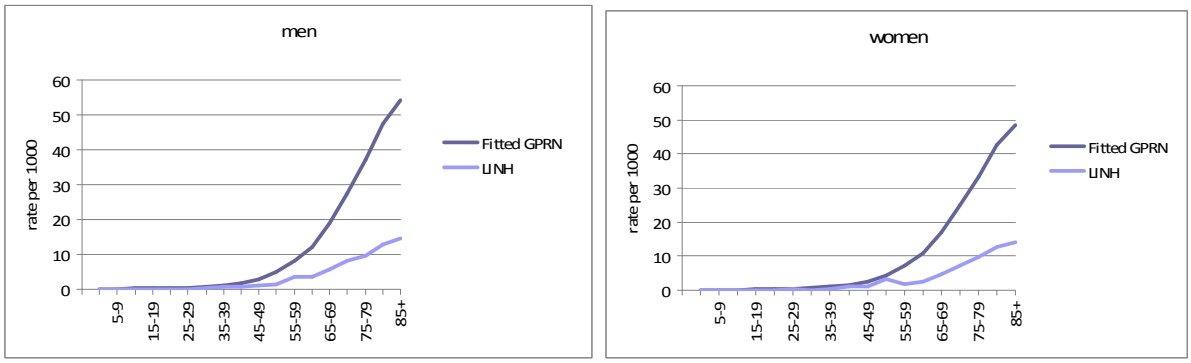
Table 4.2.20.1. Crude prevalence rates of glaucoma per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	61	70
LINH	20	23
LINH multiple years		
Base	17	24
Two years	25	36
Three years	32	44

Fitted GPRNs give the highest prevalence estimates.

Age and sex specific rates are shown in figure 4.2.20.1.

Figure 4.2.20.1. Age and sex specific prevalence of glaucoma, based on fitted GPRNs and LINH; per 1000 persons per year, 2007

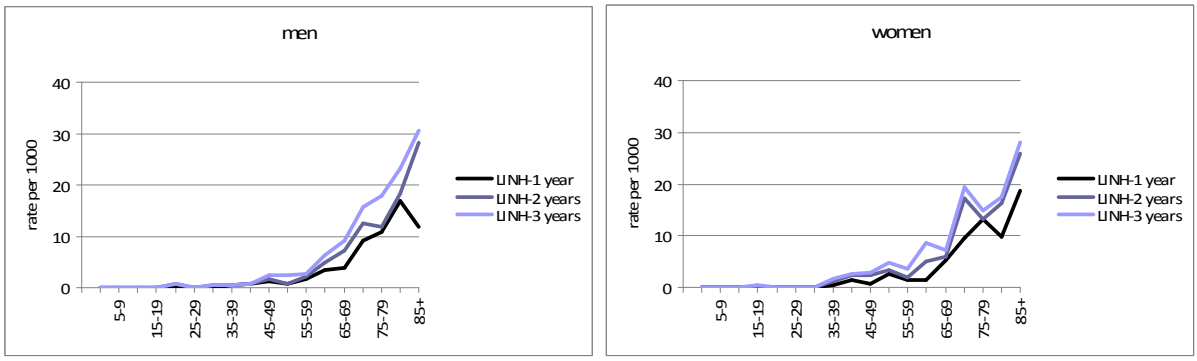


Multiple year LINH

Results counting persons with one or more GP contacts relating to glaucoma in one, two or three years are shown in figures 4.2.20.2. It can be concluded that one extra year of observation improves the estimation of life time prevalence. Two extra years add to the prevalence in men but not much in women.

Also with two extra years of LINH, fitted GPRNs give substantially higher prevalence. So 3 years LINH is not enough to cover lifetime prevalence.

Figure 4.2.20.2. Age and sex specific prevalence of glaucoma in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Combination of registrations

Using 2004 data, the number of cases found in the LINH population is increased with 4% by linking with the HDR (see 3.2.3.2 and Annex 5); so the HDR does not add a lot of patients to the prevalence estimate.

Conclusion

Fitted GPRNs give higher prevalence estimates than data of LINH and multiple year LINH. As patients with glaucoma do not necessarily visit their GP every year, the lifetime prevalence found in LINH is probably underestimated. Fitted GPRNs are the best source to estimate lifetime prevalence of glaucoma.

4.2.21. Hearing loss (H90, H91) [33]

The indicator to be reported for hearing loss is period prevalence. The prevalence is defined as lifetime prevalence, as hearing loss is a disease that cannot be cured.

Period prevalence (lifetime)

Possible sources

In The Netherlands, initially the general practitioner will be consulted for hearing loss. After excluding other causes, patients will be redirected to a medical specialist, or an audiological center for an hearing aid. After that, general practitioners will not regularly see patients for hearing loss.

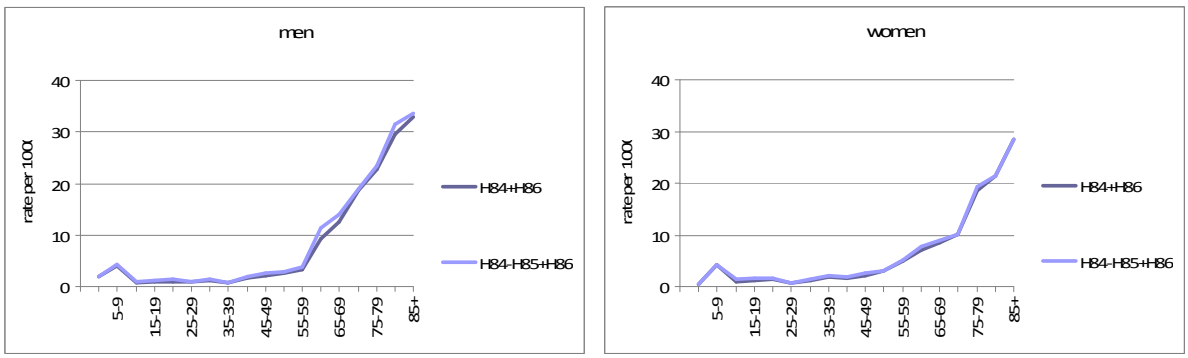
Possible sources are:

- Fitted GPRNs: the contact-based LINH is not included in the fitted GPRNs for this prevalence measure as the prevalence rates may be underestimated because there is little involvement of physicians.
- LINH: including multiple-year analyses

Classification

For this Eurostat pilot data on ICD-10 codes H90 and H91 are requested. ICPC H84 and H86 translate in ICD-10 codes H90 and 91. However, for fitted GPRNs also ICPC H85 was included (ICD-10 H83.3 Acoustic trauma), leading to an overestimation of 9% in men and 5% in women, bases on analysis in the LINH data as shown in figure 4.2.21.1.

Figure 4.2.21.1. Comparison of age and sex specific prevalence of hearing loss using ICPC-1 codes H84+H86 and H84+H85+H86, based on LINH; per 1000 persons per year, 2007



Crude rates

In table 4.2.21.1. the prevalence of hearing loss per 10,000 Dutch inhabitants is presented.

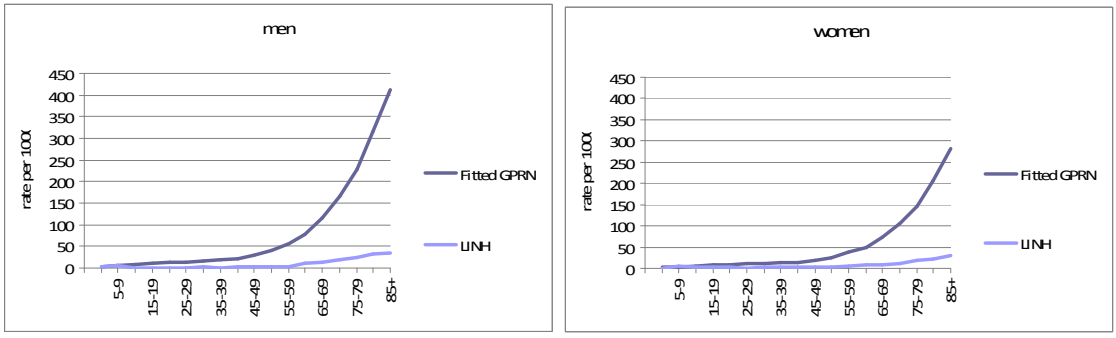
Table 4.2.21.1. Crude prevalence rates of hearing loss per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	460	377
LINH	50	49
LINH multiple years		
Base	42	43
Two years	81	78
Three years	117	111

Fitted GPRNs give by far the highest prevalence estimates, the rates are both for men and women higher than those of the other data sources.

Age and sex specific rates are shown in figure 4.2.21.2.

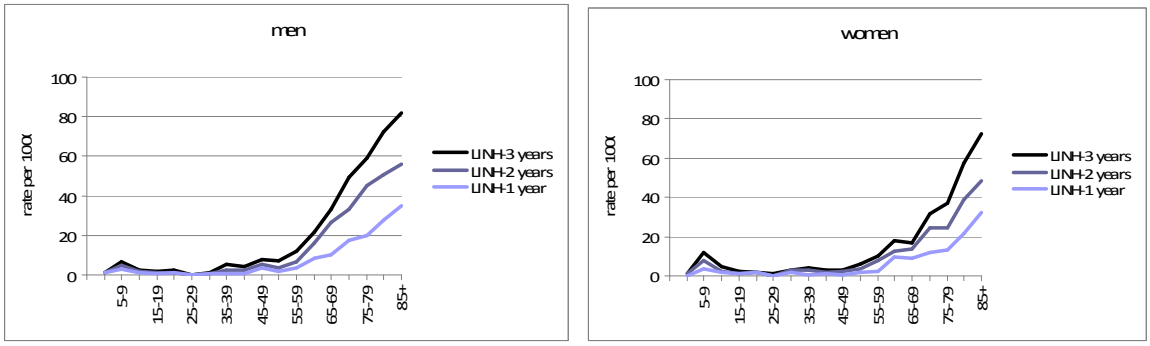
Figure 4.2.21.2. Age and sex specific prevalence of hearing loss, based on fitted GPRNs and LINH; per 1000 persons per year, 2007



Multiple year LINH

Results counting persons with one or more GP contacts relating to hearing loss in one, two or three years are shown in figures below. As base values for the LINH subpopulation suitable for three year follow-up differ from the full LINH population, these figures are presented separately (figure 4.2.21.3.). It can be concluded that each extra year of observation importantly improves the estimation of prevalence, but even three years is not enough to approach lifetime prevalence as measured in fitted GPRNs. Fitted GPRNs include only problem-bases networks.

Figure 4.2.21.3. Age and sex specific prevalence of hearing loss in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion
Fitted GPRNs, excluding the contact-based LINH, give higher prevalence estimates than (even multiple year) data in LINH. Fitted GPRNs are considered to be the best source to estimate the prevalence of hearing loss. He here presented rates cover more ICD-codes than requested, but in future data collections the requested selections can be made.

Chapter IX Diseases of the circulatory system

4.2.22. Hypertensive diseases (I10-I13, I15) [34]

The indicator to be reported for hypertensive diseases is period prevalence. Hypertensive diseases cover both essential (primary) hypertension, hypertensive heart/renal disease and secondary hypertension. Assuming that the majority of the cases will be chronic, we defined the desired prevalence measure as lifetime prevalence.

Period prevalence (lifetime)

Possible sources
Hypertensive diseases are largely managed in primary care and out-patient departments Therefore LINH is a relevant source. Fitted GPRN data are not available for this disease, but figures can be calculated in future. In the health interview survey (HIS) hypertension is included.

Possible sources therefore are:
- LINH (including multiple year analysis)
- HIS

Classification
Hypertensive diseases (I10-I13, I15) is translated in K86-K87 in ICPC-1 (LINH), which fully covers the requested ICD-10 codes.

Crude Rates

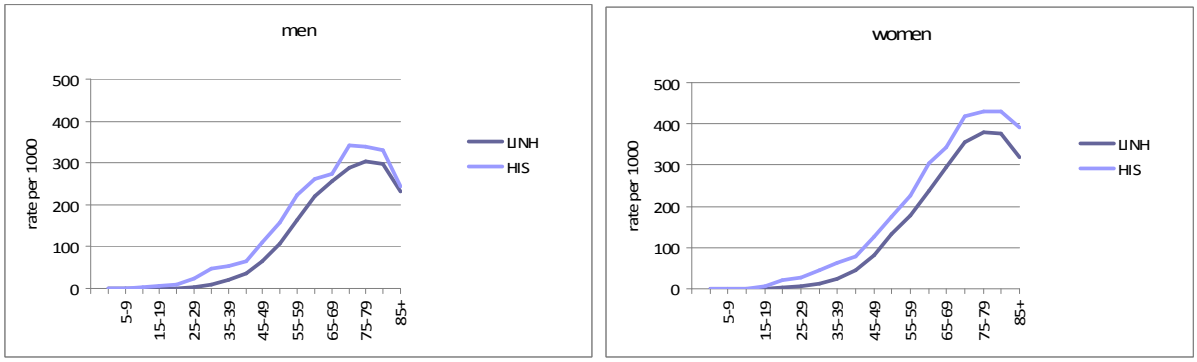
In table 4.2.22.1. LINH and HIS prevalence rates of hypertensive diseases per 10,000 Dutch inhabitants is presented.

Table 4.2.22.1. Crude prevalence rates of hypertensive diseases per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	794	1061
LINH multiple years		
Base	912	1208
Two years	1026	1352
Three years	1097	1432
HIS	1047	1365

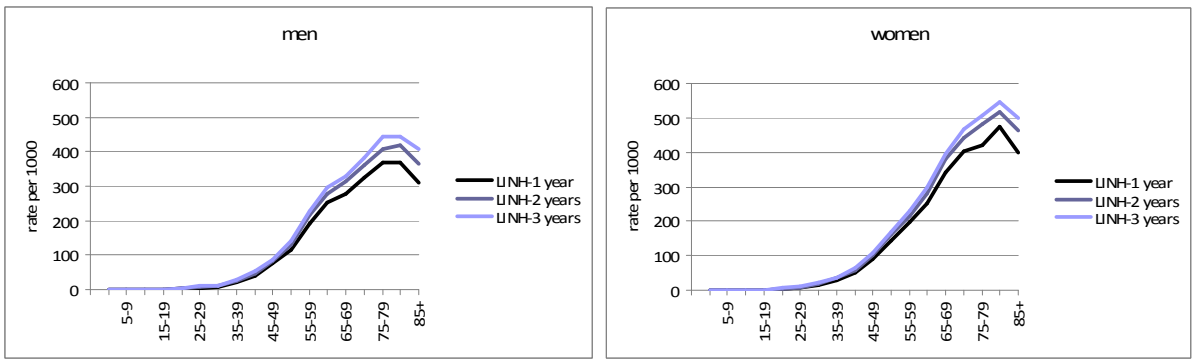
The 2007 base figures for men and women of the multiple year LINH group are higher than those of the total LINH population. Apparently the multiple LINH group is a somewhat different patient group than that of the total LINH population. The HIS figures are higher than that of the total LINH population, for all age-groups (see Figure 4.2.22.1.)

Figure 4.2.22.1. Age and sex specific prevalence rates of hypertensive diseases per 1,000 persons in the average Dutch population, 2007.



When looking at the multiple year LINH figures, the largest increase in prevalence occurs from a one year to a two years reference period, in all age-groups (see figure 4.2.22.2.). The three years period give the highest prevalences. Apparently, several years of GP contact registration seem to be necessary to measure prevalence of hypertensive diseases, probably because patients do not need GP contact frequently for these diseases.

Figure 4.2.22.2. Age and sex specific prevalence of hypertensive diseases in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



The HIS figures fall between the two years and three years prevalences of the multiple year LINH group (see Table 4.2.22.1.). The HIS figures are however based on a not very specific survey question whether the respondent has had 'high blood pressure' in the past 12 months.

Conclusion
Three years of GP contact registration in LINH seems to be the best available source for measuring diagnosed (lifetime) prevalence of hypertensive diseases. Weighting of the multiple year LINH population may decrease the selection bias in this group (see 3.2.2.3). Fitted GPRN data can be made available in future. Though based on self-assessment, HIS is also a possible alternative source for this disease. The HIS prevalence rates are similar to those of multiple year LINH.

4.2.23. Ischaemic heart diseases (I20-I25) [35]

The indicator to be reported for ischaemic heart diseases (i.e. angina pectoris, acute and subsequent myocardial infarction, certain current complications following myocardial infarction, other acute ischaemic heart diseases, and chronic ischaemic heart disease) is period prevalence. This disease group is a combination of acute diseases and chronic diseases. Assuming that the majority of patients in this group suffer from chronic diseases, we defined the desired measure as lifetime prevalence.

Classification
Ischaemic heart disease (ICD-10 I20-I25) is translated in K74-K76 in ICPC-1 (fitted GPRNs and LINH) and in 410-414 in ICD-9-CM (HDR). These translations fully cover the requested ICD-10 codes.

<u>Period prevalence (lifetime)</u>

Possible sources
Patients with ischaemic heart disease can be treated in primary care, out-patient departments, as wel in hospitals. Possible sources are:

- Fitted GPRNs: the contact-based LINH is not included in the fitted GPRNs for this prevalence measure, as patients ever having had an ischaemic heart disease do not

necessarily have to contact their GP in a particular year, e.g. because they are treated by a medical specialist (who may not always report back to the GP), or because the patient does not need care every year, or because there are no complaints or need for care anymore.

- LINH (multiple year LINH)
- HDR

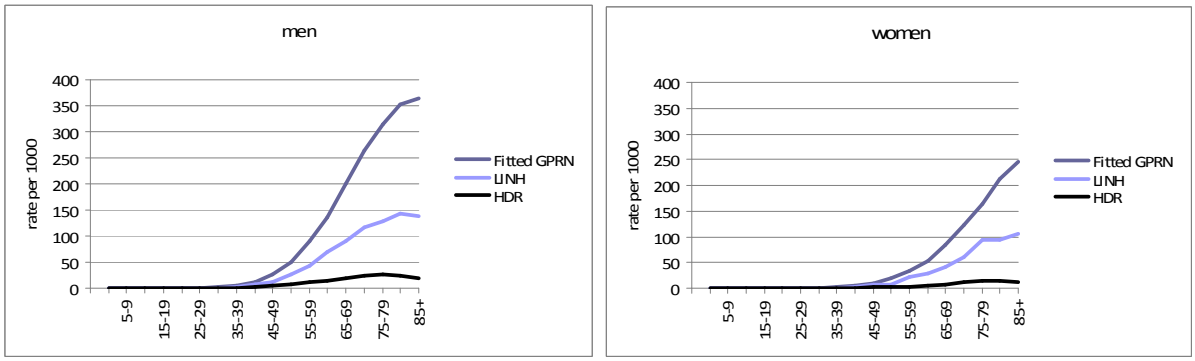
Crude Rates

In table 4.2.23.1. and figure 4.2.23.1. the prevalence of ischaemic heart diseases per 10,000 Dutch inhabitants is presented, based on different sources.

Table 4.2.23.1. Crude prevalence rates of ischaemic heart disease per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs (lifetime prevalence)	557	329
LINH	262	171
LINH multiple years		
Base	298	202
Two years	354	251
Three years	392	282
HDR	57	29

Figure 4.2.23.1. Age and sex specific prevalence rates of ischaemic heart disease per 1,000 persons in the average Dutch population, 2007.



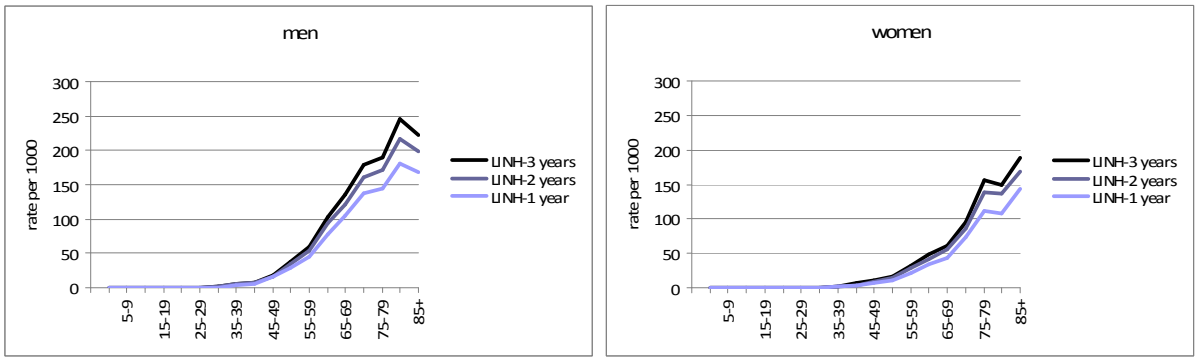
It is clear that lifetime prevalence cannot be measured by one-year data of the HDR, as patients with episodes in previous years will be largely missed. When HDR is linked with COD at least 20 percent additional cases can be found for ischaemic heart disease (see 3.2.3.1 and Annex 4), but also with this increase the prevalence rates would be far less than those found in the GP data sources.

Fitted GPRNs give the highest prevalence estimates, the rates for men and women are also substantially higher than those of multiple year LINH. Apparently even 3 years of

contact registration does not cover all the persons that ever had an ischaemic heart disease. Furthermore, the multiple year LINH group seems to be a somewhat biased patient group, as the one year base figure is higher than that of the LINH 2007 figure of the total LINH population.

In Figure 4.2.23.2. it is shown that the prevalence increases with each year added to LINH, for all age groups. This also seems to indicate that 3 year of contact registration may not be sufficient to catch all the prevalent cases.

Figure 4.2.23.2. Age and sex specific prevalence ischaemic heart disease in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



From the pilot study in which LINH 2002-2004 data were linked with the HDR and COD register (see 3.2.3.2 and Annex 5), it can be concluded that linking HDR data increases the multiple year LINH prevalence of ischaemic heart disease with about 10 percent. Additional linking of COD increases the prevalence with another 1-2 percent. But even with an increase of 10-12 percent, the LINH prevalence estimates of 2007 would still be substantially lower than that of the fitted GPRNs.

Conclusion
Fitted GPRNs is the best available source of measuring ischaemic heart disease (life time) prevalence. In case one-year prevalence would be the desired measure, the contact-based LINH, linked with the HDR (and COD) would be a suitable source.

4.2.24. Acute myocardial infarction (I21-I22) [36]

The indicators to be reported for acute myocardial infarction are incidence by person and period prevalence. As this is and acute disease, we defined the period prevalence as one year prevalence.

Classification
Acute myocardial infarction (ICD-10 I21, I22) is translated in 410 in ICD-9-CM (HDR) and K75 in ICPC-1 (LINH and fitted GPRNs). The ICD-9-CM code fully covers the requested ICD-10-codes, but the ICPC-1 code K75 also includes some post myocardial infarction complications (ICD-10 I23 and I24.1) and therefore is somewhat broader than requested.

Period prevalence (year prevalence)

Possible sources

Patients with an Acute Myocardial Infarction (AMI) are mostly treated in hospitals or die before they reach hospital. After the patient is discharged from hospital, the GP is usually informed about the patient's condition and further treatment of the patient normally occurs by the medical specialist (in out-patient department) or by the GP in primary care. Possible sources for the one-year prevalence rates of AMI are:

- LINH: AMI's are likely to be registered in this contact-based GPRN, although it is not clear whether this always occurs when the patient died. Also, contacts may sometimes refer to an earlier AMI (e.g. in the previous year), which can lead to overestimation of the one-year prevalence.
- HDR
- COD
- HIS

Fitted GPRNs are not listed here, as the available prevalence rates are lifetime prevalences.

Crude Rates

In table 4.2.24.1. the prevalence of AMI per 10,000 Dutch inhabitants is presented.

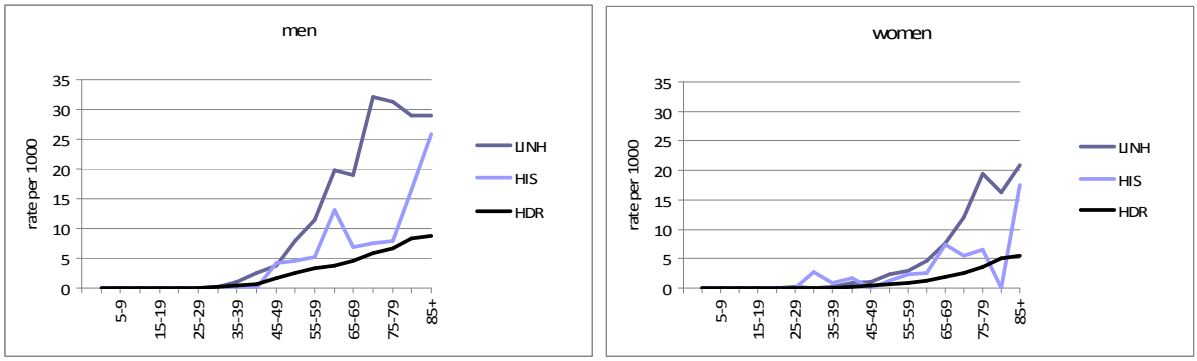
Table 4.2.24.1. Crude prevalence rates of acute myocardial infarction per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	67	33
HDR	17	8
HIS (last 12 months acute myocardial infarction, 2006-2008)	30	19

The LINH prevalences are about twice as large as those of HIS. This will be partly due to the fact that the lethal cases are missed in the survey data of HIS. Furthermore, in the LINH contact registration also follow-up treatment of AMI events of the previous year may be counted, which would result in overestimation of the one year prevalence. The ICPC-code for AMI also includes some post myocardial infarction complications (ICD-10 I23 and I24.1) which are not included in the Eurostat definition. This can also lead to some overestimation in the LINH data. On the other hand, when LINH data are linked to HDR and COD, the one year AMI prevalence rate rises with about 25 percent (see 3.2.3.2 and Annex 5), which implies that LINH also misses AMI events of its population.
The HDR figures are the smallest; about half of the HIS rates. However, when HDR is linked with COD nearly 40 percent additional (lethal) AMI cases can be found (see 3.2.3.1 and Annex 4). When applying this factor on the 2007 HDR figures presented here, the HDR-COD prevalence rate would be about 23 per 10,000 men and 11 per 10,000 women.

In figure 4.2.24.1. it is shown that due to the small population numbers the age-specific figures of especially HIS fluctuate strongly (even with this 3-years average of HIS data, 2006-2008); while those of HDR smoothly increase with age.

Figure 4.2.24.1. Age and sex specific one year prevalence rates of acute myocardial infarction per 1,000 persons in the average Dutch population, 2007.



Conclusion

Because of the acute and serious nature of AMI which nearly always requires hospitalisation or leads to death, and because of the nation-wide coverage of HDR and COD, we think the best source of one year AMI prevalences is HDR linked with COD. These data are however not available for 2007, because of the incomplete HDR-registration in recent years. Only estimates can be made (see above). In the morbidity tables (see Annex 6) only these estimated totals are given, without age-specific data. LINH is an alternative source, but these data probably also include AMI events of the previous year.

<u>Incidence by person</u>

Possible sources

For the incidences it is necessary to have information about the person's medical history to ascertain whether the AMI was the first in the person's lifetime. Possible data sources are:

- Fitted GPRNs: LINH is included in the fitted GPRNs.
- LINH
- HDR
- COD

Crude Rates

In table 4.2.24.2. the incidence of AMI per 10,000 Dutch inhabitants is presented for different sources.

Table 4.2.24.2. Crude prevalence rates of acute myocardial infarction per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	20	14
LINH	12	5
HDR	16	8

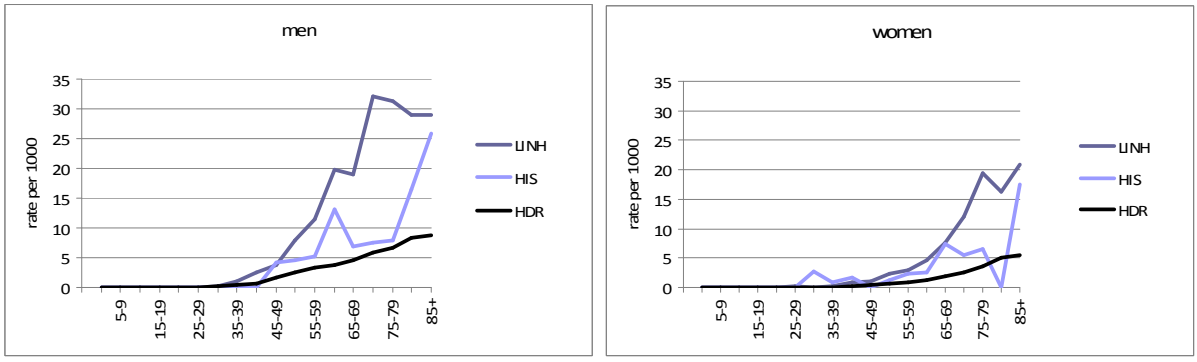
The HDR incidences are defined as the number of persons having had at least one hospital admission for AMI in 2007, and not having had an earlier admission for AMI in the preceding 5 years. The HDR incidences are only slightly lower (about 3 percent) than the HDR one-year prevalences of 2007 (see previous Table 4.2.24.1.), which would imply the large majority of cases are first admissions (in 5 years). However, when we compare the LINH incidences with the LINH one year prevalences of AMI, we see a large reduction (85 percent) in rates. Given that the AMI incidence estimates of the different sources are more similar than the prevalence estimates, this might indicate that the one-year prevalences of LINH do include a large number of AMI's of the previous year(s) and thus would be overestimated.

HDR estimates will decrease somewhat when all admissions in lifetime could be taken into account (which is not possible with the HDR in the Netherlands), but will substantially increase when also the lethal (first) AMI cases outside hospital are counted. The latter will be possible in future, when HDR coverage is complete again for a number of years, by linking HDR to COD and by also identifying previous admissions (in 5 years) of the lethal non hospitalized cases (see 3.2.3.1). If the lethal non hospitalized cases would also contribute to a near 40 percent increase in the incidences, like with the prevalences, then the incidence estimates based on HDR-COD would be similar to those of the fitted GPRNs.

The LINH estimates are substantially lower than those of fitted GPRNs. In Appendix 2 it is shown however, that linkage of LINH with HDR and COD will yield substantial additional AMI cases. Thus, linkage of LINH with HDR and COD, could also provide suitable incidence estimates. But given the nation-wide coverage of HDR-COD, this linkage would be preferred because it gives more accurate estimates.

The age-specific incidence rates of the different sources are presented in figure 4.2.24.2. The difference between the HDR and fitted GPRN estimates increases with age. It is not clear however, whether the lethal cases that are not included in the HDR could account for this.

Figure 4.2.24.2. Age and sex specific one year prevalence rates of acute myocardial infarction per 1,000 persons in the average Dutch population, 2007.



Conclusion
The best available source to measure incidence of AMI is fitted GPRNs, though the AMI definition in the ICPC-classification of the GPRNs is somewhat broader than required. The best possible source is probably HDR linked with COD. However, because of the present incomplete coverage of HDR, HDR-COD estimates are not available for 2007. But these may be worked out in future, when HDR has complete coverage again. The advantage of HDR-COD data is nation-wide coverage, which allows more accurate disaggregations by age and other characteristics.

4.2.25. Heart failure (I50) [37]

The indicator to be reported for heart failure is period prevalence. Heart failure is mostly a progressive chronic disease, and we therefore defined this measure as lifetime prevalence. However, heart failure can sometimes also be temporary present, e.g. as a result of high blood pressure or myocardial infarction.

Period prevalence (lifetime)

Possible sources
Patients with heart failure can be treated in primary care, out-patient departments, as well in hospitals. Possible sources are:

- Fitted GPRNs: the contact-based LINH is included in the fitted GPRNs for this measure, as treatment of heart failure usually requires regular contacts with the GP. The patients are often treated by the GP, sometimes also by the cardiologist or internist.
- LINH (multiple year LINH)
- HDR

Classification
Heart failure (ICD-10 I50) is translated in K77 in ICPC-1 (LINH and fitted GPRNs) and in 428 in ICD-9-CM (HDR). These translations fully cover the requested ICD-10 codes.

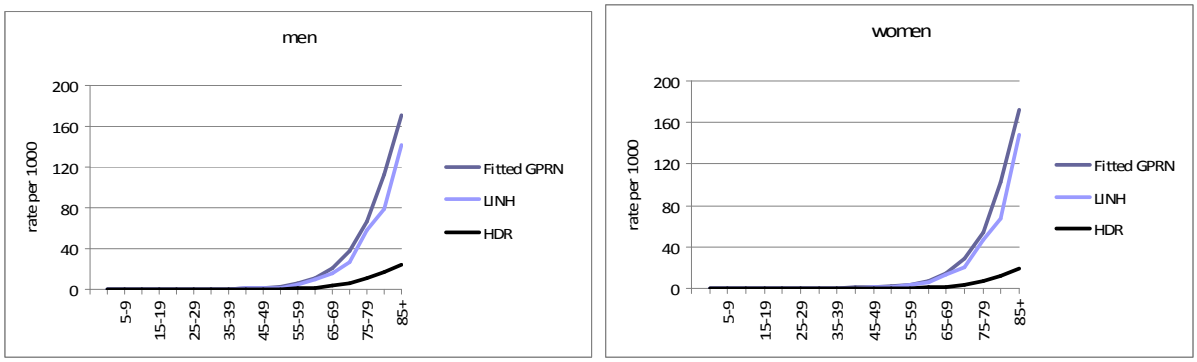
Crude Rates
In table 4.2.25.1. the prevalence of heart failure per 10,000 Dutch inhabitants is presented.

Table 4.2.25.1. Crude prevalence rates of heart failure per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	87	113
LINH	71	95
LINH multiple years		
Base	86	121
Two years	109	146
Three years	122	159
HDR	14	14

As expected, HDR estimates are low, as most heart failure patients are ambulatory and are not hospitalized in a particular year. The HDR prevalence estimates are therefore not suitable to measure lifetime prevalence. However, when one year LINH data are linked with HDR still about 7 percent additional heart failure cases are found, and when also COD is linked another 2 percent additional cases are found (see 3.2.3.2 and Annex 5). So linkage with HDR/COD does result in additional cases, which are patients that are hospitalized for heart failure or died of the (consequences of) heart failure, and thus are likely to be patients that are suffering from heart failure in the reporting year.

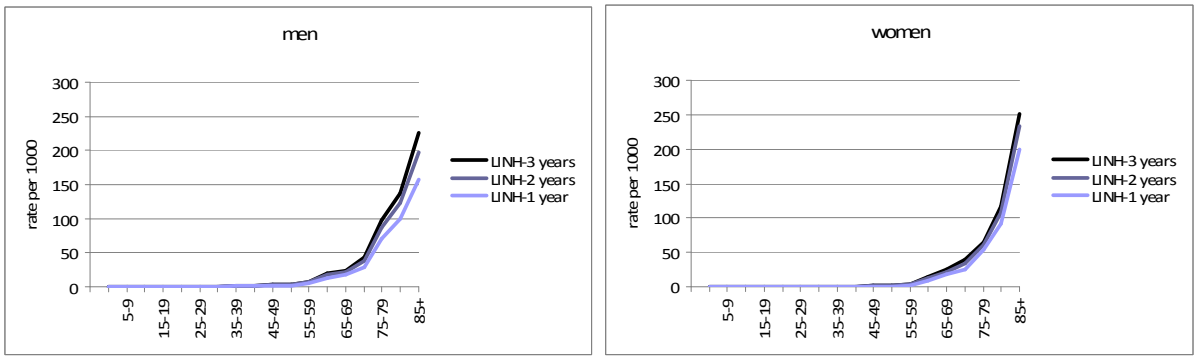
Figure 4.2.25.1. Age and sex specific prevalence rates of heart failure per 1,000 persons in the average Dutch population, 2008.



Fitted GPRN prevalences are slightly higher than those of one year LINH. When multiple years LINH are included the prevalences rises with 20-25 percent when two years are taken into account, and with 30-40 percent when 3 years are included (figure 4.2.25.2.). It is not clear how many of these additional cases are old, recovered cases, and how many are still suffering from heart failure in the reporting year. Given the steady increase per year added, and the fact that prevalent heart failure patients usually need regular GP contacts for treatment, it might be that a considerable proportion of the additional cases are old cases. Fitted GPRN estimates are partly based on problem-based GPRNs that also

register patients as prevalent when they do not have a specific GP contact for the disease in a particular year, but are still suffering from the disease. As the fitted GPRN estimates are lower than the 2-3 year multiple LINH estimates, one might stipulate that the multiple year LINH estimates do include recovered cases. This is however not certain, and its relevance depends on how lifetime prevalence of heart failure is defined (with or without recovered cases). These uncertainties makes it difficult to assign a 'best source' for the prevalence of this disease.

Figure 4.2.25.2. Age and sex specific prevalence heart failure in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion
It is difficult to assign a best source to measure lifetime prevalence of heart failure, because of uncertainties in definition and data. Assuming that (probably) recovered heart failure patients should be excluded; fitted GPRNs is the best available source, and one year LINH linked with HDR/COD is a good alternative.

4.2.26. Cerebrovascular diseases (I60-I69) [38]

The indicators to be reported for cerebrovascular diseases (CVD) are incidence by person and period prevalence. As long term handicaps are often present after an cerebrovascular accident, we defined the period prevalence as life time prevalence.

Classification
Cerebrovascular disease (ICD-10 I60-I69) is translated in 430-434 and 436-438 in ICD-9-CM (HDR) and K90 in ICPC-1 (LINH and fitted GPRNs). ICPC-1 code K90 excludes I65-I69, and therefore covers less ICD codes than requested. The ICD-9-CM translation fully covers the requested ICD-10 codes.

<u>Period prevalence (lifetime)</u>

Possible sources
Patients with an acute cerebrovascular accident are mostly admitted to hospital or die before they reach hospital. When patients with cerebrovascular disease are stable they are transferred to nursing homes for convalescence or return home. In the stable situation there is not always frequent contact with the GP, although most patients regulary get precriptions, e.g. for antiplatelet drugs.
Possible sources for the lifetime prevalence rates of CVD are:

- Fitted GPRNs: The contact-based LINH is not included for the lifetime prevalence, as stable patients do not necessarily have GP contacts every year.
- LINH (multiple year)
- HDR
- COD
- HIS

Crude Rates
In table 4.2.26.1. the prevalence of CVD per 10,000 Dutch inhabitants is presented.

Table 4.2.26.1. Crude prevalence rates of cerebrovascular diseases per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	139	137
LINH	61	65
LINH multiple years		
Base	68	67
Two years	82	85
Three years	92	94
HDR	17	17
HIS (ever stroke/ cerebrovascular accident/ cerebral haemorrhage, 2006-2008)	233	168

It is evident that lifetime prevalence cannot be measured by one-year data of the HDR, as patients with cerebrovascular accidents in previous years will be largely missed. However, for one year prevalences of cerebrovascular accidents (attacks) the HDR, linked with COD, is a good source of data (see 3.2.3.1 and Annex 4). Linkage with COD results in 35 percent additional cases.

For life time prevalences fitted GPRNs provide substantial higher estimates than LINH and multiple year LINH. Evidently, also 3 years of contact registration does not cover all the persons that ever had CVD.

Figure 4.2.26.1. Age and sex specific prevalence rates of cerebrovascular diseases per 1,000 persons in the average Dutch population, 2007.

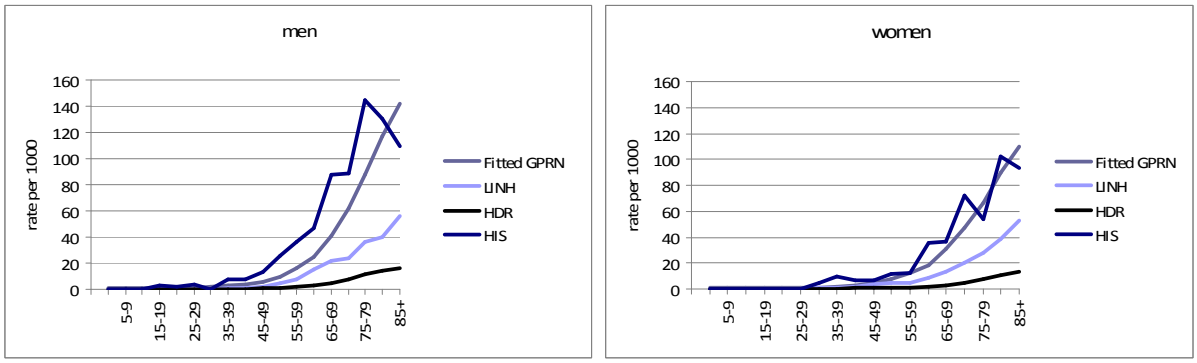
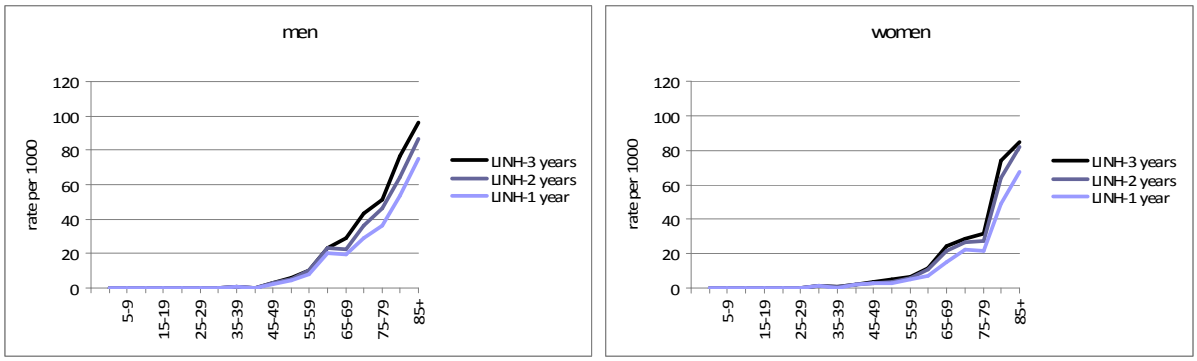


Figure 4.2.26.2. Age and sex specific prevalence cerebrovascular diseases in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



HIS (item about 'ever had stroke') gives higher estimates than fitted GPRNs. Maybe respondents also take into account Transient Ischaemic Attacks (TIAs), which is not included in the ICD-definition. Also, the fitted GPRN data cover less ICD codes than requested. On the other hand, lethal strokes in the reporting year will be missed in HIS. The HIS estimate for women is substantially lower than for men, which is not found in the other data sources. This may be partly caused by the exclusion of the institutionalized population in HIS, especially the population in homes for the elderly. The latter is included in GPRNs. However, the population in nursing homes is excluded in both sources, which probably causes underestimation of the prevalences for this disease.

Conclusion
The best source for measuring life time prevalence of CVD is fitted GPRNs, although the CVD definition in the ICPC classification of the GPRNs does not cover all the requested ICD-10 codes. Ideally the GPRN data should be corrected for the CVD patients in nursing homes. However, due to lack of recent data, this was not possible (see 3.7).

<u>Incidence by person</u>

Possible sources
Possible data sources for the incidence of CVD are:
- Fitted GPRNs: for the incidence measure, LINH is included in the fitted GPRNs.
- LINH

- HDR
- COD

Crude Rates
In table 4.2.26.2. the incidence of CVD per 10,000 Dutch inhabitants is presented for different sources.

Table 4.2.26.2. Crude incidence rates of cerebrovascular diseases per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	21	22
LINH	16	17
HDR	16	15

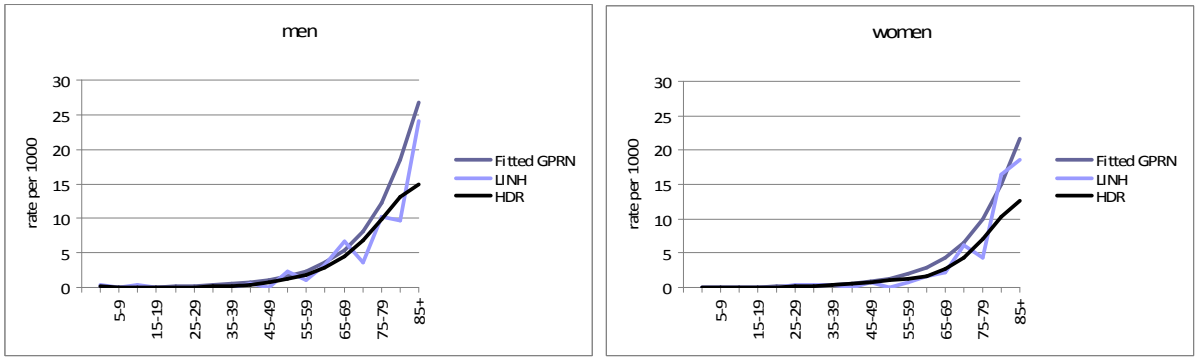
The HDR incidences are defined as the number of persons having had at least one hospital admission for CVD in 2007, and not having had an earlier admission for AMI in the preceding 5 years. The HDR estimates will decrease somewhat when all admissions in lifetime could be taken into account (which is not possible with the HDR in the Netherlands), but will substantially increase when also the lethal (first) CVD cases outside hospital are counted. The latter will be possible in future, when HDR coverage is complete again for a number of years, by linking HDR to COD and by also identifying previous admissions (in 5 years) of the lethal non hospitalized cases (see 3.2.3.1). If the lethal non hospitalized cases would also contribute to a 35 percent increase in the incidences, like with the one year prevalences, then the incidence estimate based on HDR-COD would be about 22 per 1,000 men and about 20 per 1,000 women in 2007. These figures are similar to those of fitted GPRNs. The fitted GPRN data however cover less ICD codes than requested.

LINH figures are lower than those of fitted GPRNs In Appendix 2 it is shown however, that linkage of one year LINH with HDR and COD rises the CVD prevalences with nearly 20 percent. Thus, linkage of LINH with HDR and COD, could also provide suitable incidence estimates. But given the nation-wide coverage of HDR-COD and the full coverage of the requested ICD codes in these registers, HDR-COD would be preferred as a source.

The age-specific incidence rates of the different sources are presented in figure 4.2.26.3.

Because of the large population coverage, HDR figures give more stable age-specific rates than LINH. This is also true for the GPRN-figures, but because the data are fitted the line is (artificially) smoothed.

Figure 4.2.26.3. Age and sex specific incidence of cerebrovascular diseases, based on fitted GPRNs, LINH and HDR; per 1000 persons per year, 2007.



Conclusion
The best available source to measure incidence of CVD is fitted GPRNs, but the CVD definition in the ICPC classification of the GPRNs does not cover all the requested ICD-10 codes. Furthermore, the GPRN data should ideally be corrected for the CVD patients in nursing homes. However, due to lack of recent data, this was not possible (see 3.7).

HDR linked with COD is a good alternative source, but because of the present incomplete coverage of HDR, HDR-COD estimates are not available for 2007. But these may be worked out in future, when HDR has complete coverage again.

Chapters X. Diseases of the respiratory system

4.2.27. Influenza (J09-J11))[39]

The indicator to be reported for influenza is incidence by episode.

Possible sources
Patients with acute influenza-like infections do not always contact their general practitioner. Incidence recorded by LINH or other GP-registers therefore will be an underestimation of the actual incidence. On the other hand, patients presenting acute influenza-like infections at the general practitioner's are not always actually infected by the influenza virus.

To provide actual data on influenza epidemics, the Continuous Morbidity Registration of the Dutch Sentinel General Practice Network (CMR-sentinels, in Dutch: CMR-Peilstations) weekly assesses and delivers data on influenza-like patients, covering with the patients registered in these practices about 0.8% of the Dutch population. The GPs register all patients consulting them for an acute influenza-like infection known as ILI, that meets the Pel criteria (see: classifications).

Possible data sources for the incidence of influenza are:
- LINH
- CMR-sentinels

Classification
For this Eurostat pilot data on ICD-10 codes J09-J11 are requested. In the ICPC-1 classification system, ICPC-code R80 covers J10-J11. For J09 (influenza due to identified avian influenza virus) no separate ICPC-1 code exists. J10.0 and J11.0 (influenza with pneumonia) are not included in ICPC-1 code R80. For CMR, cases found are defined as 'acute influenza-like infections, that meet the Pel criteria' (an acute beginning, therefore a prodromal phase of not more than three to four days (including pre-existing airway infections at a non-pathogenic level), accompanied by a rectal temperature increase of at least 38º, and at least one of the following symptoms must be present: cough, coryza, sore throat, frontal headache, retrosternal pain, or myalgins).

Incidence by episode

Crude Rates
In table 4.2.27.1. the incidence by episode of influenza per 10,000 Dutch inhabitants is presented.

Table 4.2.27.1. Crude incidence rates of episodes of influenza per 10,000 persons in the average Dutch population, 2007, CMR-sentinels: July 2006-July2008.

	men	women
LINH	37	43
CMR	142	143

Incidence by episode as measured by CMR is much higher than measured in LINH. This is due to the fact that in the case of influenza GPs often encode complaints: cough, runny nose or sore throat, and not the disease.
Also, data of CMR are presented per season of influenza (July-July), thus covering a different time-span than LINH data. In future data collection, it will be possible to present CMR data by calendar year. In the present comparison however, the span difference has hardly affected the data. The 2006-2007 and 2007-2008 influenza season did not differ very much (figure 4.2.27.1.).

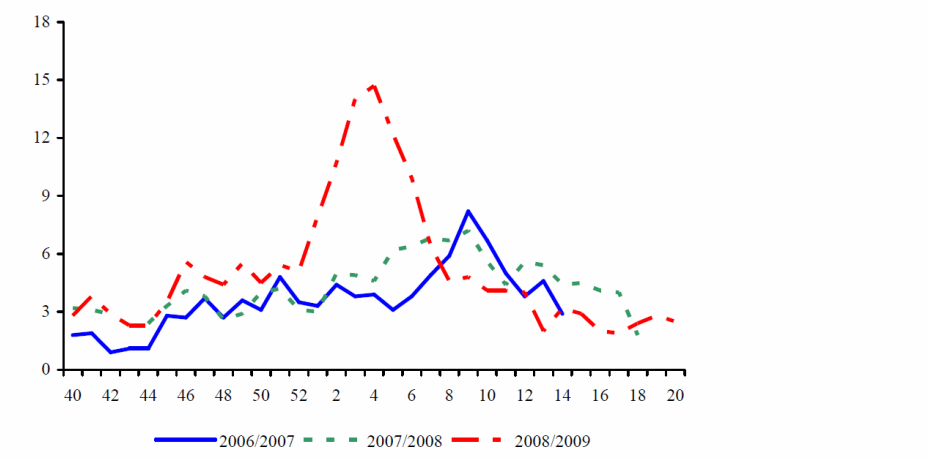
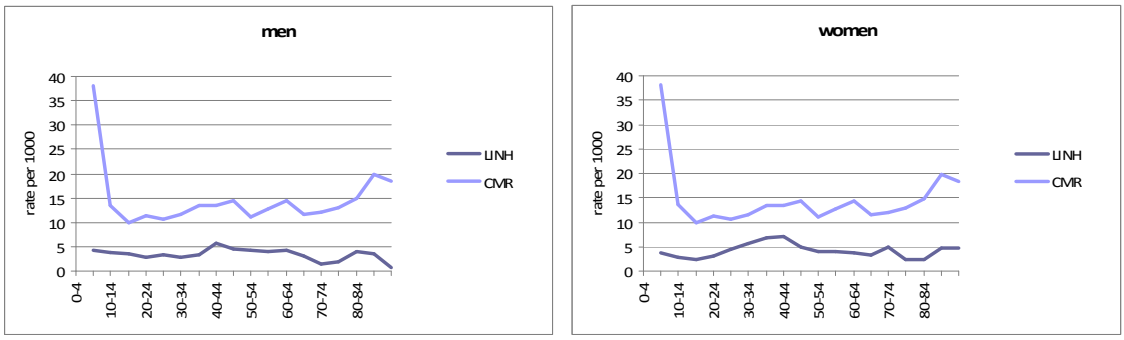


Figure 4.2.27.1. Number of patients with influenza-like illness per week per 10,000 inhabitants, for The Netherlands in 2006/2007, 2007/2008 and 2008/2009, from CMR Continuous Morbidity Registration at Dutch Sentinel Stations 2008.

Age and sex specific incidence rates are shown in figure 4.2.27.2.

Figure 4.2.27.2. Age and sex specific incidence rates of episodes of influenza, based on LINH and CMR; per 1000 persons per year, 2007, CMR: July 2006-July2008.



Conclusion
In The Netherlands, Continuous Morbidity Registration of the Dutch Sentinel General Practice Network is considered to be the provider of the 'official' influenza figures and the best source for European morbidity statistics.

4.2.28. Pneumonia (J12-J18)[40]

The indicators to be reported for pneumonia are:

- Period prevalence, defined as year prevalence, because pneumonia can be cured

Possible sources
In The Netherlands, pneumonia is mostly managed in primary care. Sometimes, admission to a hospital is required. Therefore (fitted) GPRNs and HDR data are a relevant source.

Possible sources are:

- Fitted GPRNs (only available for incidence), including LINH
- LINH
- Hospital Discharge Register

Classification
For this Eurostat pilot data on ICD-10 codes J12-J18 are requested.

ICPC-code R81 (pneumonia) encodes for ICD J12-J18, but also includes J10.0 and J11.0 (Influenza with pneumonia), and A48.1 (Legionnaires' disease). ICD-9-CM codes 480-486 fully encode ICD-10 J12-18. Although GPRNs present data of a broader selection of diseases, this difference cannot explain the higher prevalence and incidence observed in GPRNs.

Period Prevalence (year)

Crude Rates
In table 4.2.28.1. the prevalence of pneumonia per 10,000 Dutch inhabitants is presented.

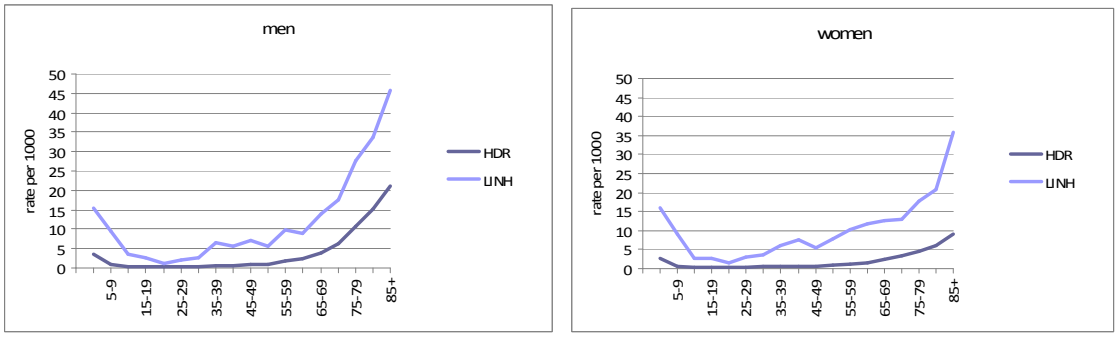
Table 4.2.28.1. Crude prevalence rates of pneumonia per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	83	87
Hospital Discharge Register	20	15

As expected, prevalence estimates based on LINH (general practitioners) are higher than based on hospital discharges. Data from fitted GPRNs were not available for the present analyses but will be in the future.

Age and sex specific incidence rates are shown in figure 4.2.28.1.

Figure 4.2.28.1. Age and sex specific prevalence of pneumonia, based on LINH and HDR; per 1000 persons per year, 2007.



Incidence

Crude Rates
In table 4.2.28.2. the incidence of pneumonia per 10,000 Dutch inhabitants is presented.

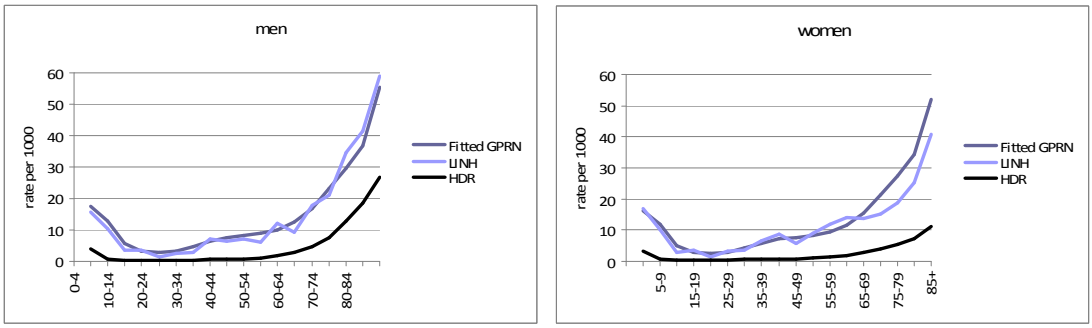
Table 4.2.28.2. Crude incidence rates of episodes of pneumonia per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	102	106
LINH	95	98
HDR	23	17

For the Hospital Discharge data, the number of discharges is counted, which may slightly overestimate the number of episodes. However, overall HDR will underestimate the incidence of pneumonia as only the most serious cases will be hospitalized.

Age and sex specific incidence rates are shown in figure 4.2.28.2.

Figure 4.2.28.2. Age and sex specific incidence of pneumonia, based on fitted GPRNs, LINH and HDR; per 1000 persons per year, 2007.



Conclusion
As most cases of pneumonia are treated by a general practitioner, GP registrations are the best available source in The Netherlands. Fitted GPRN data were not available for prevalence measurements, leaving LINH for the moment as best source. For incidence by episode, estimates of LINH and fitted GPRNs are close to each other.
As HDR may include patients that were not included in the registration of general practitioners, a combination of registers may be relevant for future analyses.

4.2.29. Asthma (J45, J46)[41]

Asthma is a common chronic inflammatory disease of the respiratory tract, affecting the bronchi. Unlike the irreversible chronic obstructive pulmonary diseases (COPD), airway obstruction in asthma is usually reversible. However, if left untreated, the chronic inflammation of the lungs during asthma can become an irreversible obstruction due to airway remodelling. The symptoms occur in attacks, which may be shorter or longer periods. The attacks alternate with asymptomatic periods.

The indicators to be reported for asthma are:
- Period prevalence, defined as year prevalence, as asthma is not a chronic disease.
- Incidence by person

Possible sources
Usually, the diagnosis is made by the general practitioner who also takes care of the treatment. Part of the patients with asthma will consult a pulmonologist for further diagnosis and treatment.

Possible sources are:
- Fitted GPRNs (including LINH, but excluding RNH and RNUH-LEO as patients with asthma in these problem-oriented GPRNs do not necessarily still suffer from asthma)
- LINH (including multiple year analysis)

Classification
For this Eurostat pilot data on ICD-10 codes J45 and J46 are requested. These codes are covered entirely by ICPC-code R96.

Period Prevalence (year)

Crude Rates
In table 4.2.29.1. the prevalence of asthma per 10,000 Dutch inhabitants is presented.

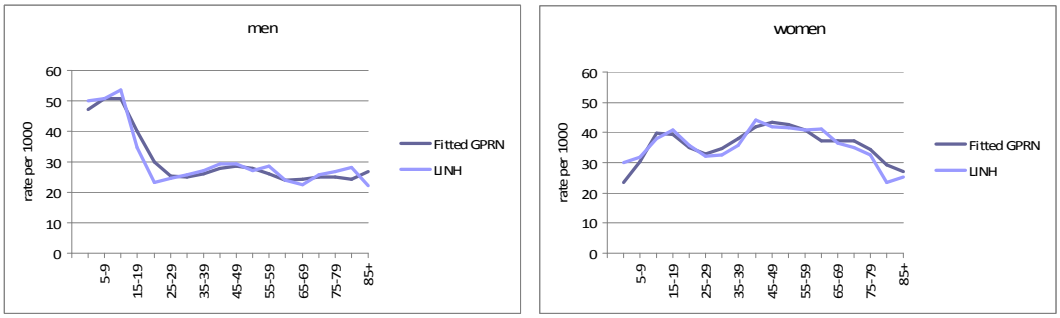
Table 4.2.29.1. Crude prevalence rates of asthma per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	316	367
LINH	314	367
LINH multiple years		
Base	332	388
Two years	442	523
Three years	523	610

Prevalence measurements based on LINH and fitted GPRNs are almost identical, which is not surprising as problem-oriented GPRNs are not included in fitted GPRNs.

Age and sex specific incidence rates are shown in figure 4.2.29.1.

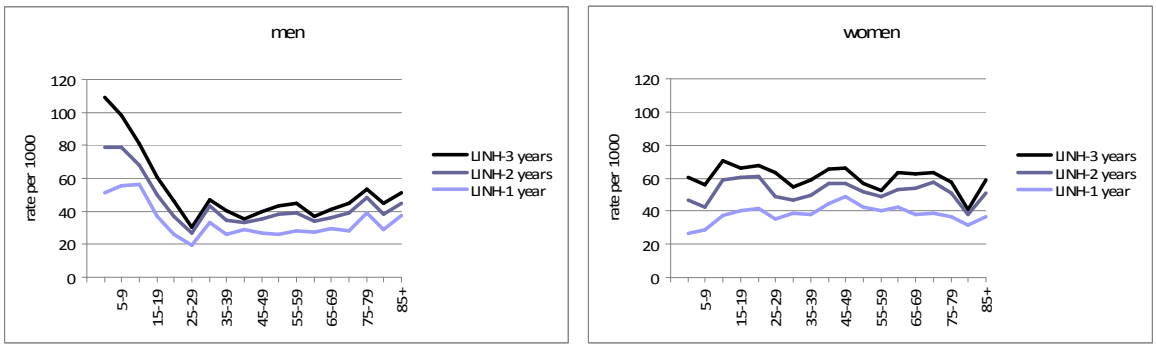
Figure 4.2.29.1. Age and sex specific prevalence of asthma, based on fitted GPRNs and LINH; per 1000 persons per year, 2007.



Multiple year LINH

Results counting persons with one or more GP contacts relating to asthma in one, two or three years are shown in figures below (4.2.29.2.). As base values for the LINH subpopulation suitable for three year follow-up differ from the full LINH population, these figures are presented separately. It can be concluded that one extra year of observation importantly rises the prevalence rates, whereas the increase with the inclusion of the third year is less.

Figure 4.2.29.2. Age and sex specific prevalence of asthma in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Incidence

Crude Rates

In table 4.2.29.2.the incidence of asthma per 10,000 Dutch inhabitants is presented.

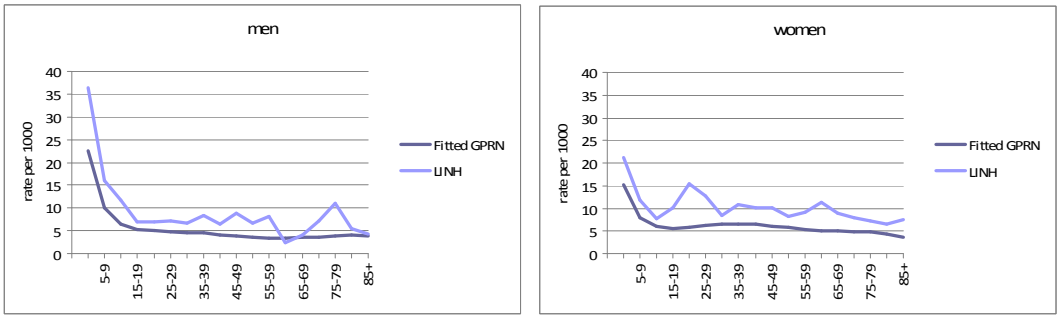
Table 4.2.29.2. Crude incidence rates of asthma per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	58	64
LINH	94	105

Incidence rates are higher in LINH than in the fitted GPRNs (including LINH). It is not clear what the reason is for the observed difference. It may be the result of another definition for 'incident cases' in LINH compared to other GPRNs. As asthma shows a pattern of attacks, it depends on the definition whether a new attack is called incident.

Age and sex specific incidence rates are shown in figure 4.2.29.3.

Figure 4.2.29.3. Age and sex specific incidence of asthma, based on fitted GPRNs and LINH; per 1000 persons per year, 2007.



Conclusion
For prevalence measurement, data from fitted GPRNs and LINH are similar. However, following the LINH-population for two years provides a substantial increase of cases. As asthma is a reversible chronic disease that occurs in attacks and generally lasts over one year, two-year analyses of LINH may be a better measure for prevalence of asthma. On the other hand there appears to be a difference in interpretation of what should be called a new case of asthma between different GPRNs. With the choice of two year LINH as best source for prevalence, fitted GPRNs are the best choice for incidence measurement.

4.2.30. Chronic lower respiratory diseases other than asthma (incl. COPD) (J40-J44, J47)[42]

Chronic lower respiratory diseases other than asthma (incl. COPD), from here mentioned as 'COPD', are poorly reversible and usually get progressively worse over time. The indicators to be reported are:

- Period prevalence, defined as life time prevalence, because COPD cannot be cured
- Incidence by person

Possible sources
In The Netherlands, patients with COPD usually are in regular contact with the GP. Sometimes, diagnoses or treatment is taken over by the pulmonologist. Patients may not contact the GP for a year or more, but generally GP are well aware of the patient having COPD.
COPD is mostly managed in primary care or in hospital. Therefore, GPRNs and HDR are the main source of data.

Possible sources are:
- Fitted GPRNs (including LINH)
- LINH (including multiple year analysis)
- HDR
- Combination LINH and HDR

Classification
For this Eurostat pilot data on ICD-10 codes J40-J44, and J47 are requested.

ICPC-1 codes R91 and R95 cover the requested codes with the exception of J40 (Bronchitis, not specified as acute or chronic). Adding ICPC R78 however, would include J40 but also J20-J22 (Other acute lower respiratory infections). There fore the choice was made to use R91 and R95.

Period prevalence (lifetime)

Crude Rates
In table 4.2.30.1. the prevalence of COPD per 10,000 Dutch inhabitants is presented.

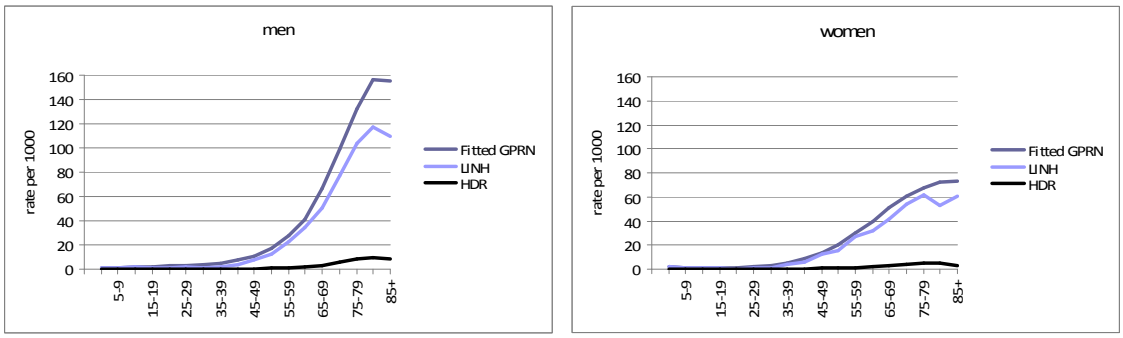
Table 4.2.30.1. Crude prevalence rates of COPD per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	216	188
LINH	168	157
HDR	11	10
LINH multiple years		
Base	166	164
Two years	212	218
Three years	247	247

Prevalence rates confirm that COPD generally is managed in primary care. In fitted GPRNs, a larger difference is found between men and women than in LINH and HDR.

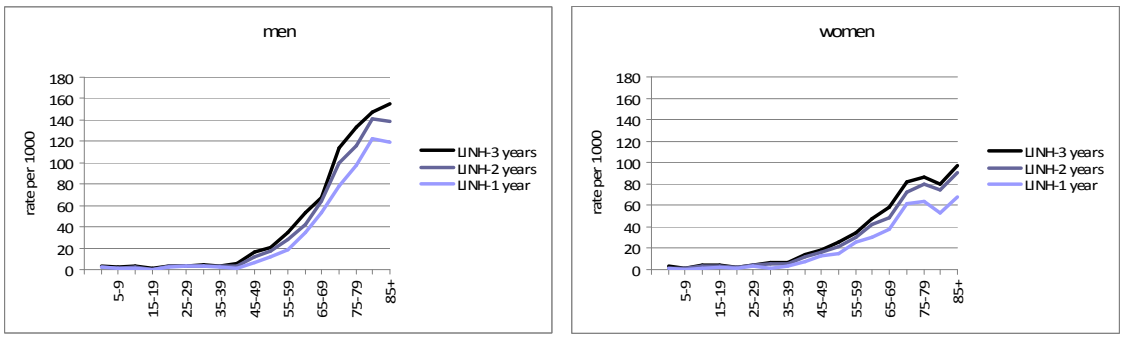
Age and sex specific prevalence rates are shown in figure 4.2.30.1.

Figure 4.2.30.1. Age and sex specific prevalence of COPD in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Multiple year LINH
Results counting persons with one or more GP contacts relating to COPD in one, two or three years are shown in figure 4.2.30.2. As base values for the LINH subpopulation suitable for three year follow-up differ from the full LINH population, these figures are presented separately. It can be concluded that one extra year of observation importantly improves the estimation of life time prevalence.

Figure 4.2.30.2. Age and sex specific prevalence of COPD in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Combination of registrations
Using 2004 data, the number of cases found in the LINH population is increased with 5% by linking with the HDR (see chapter 3.2.3.2. and Annex 5). Overlap between cases found in HDR and LINH is substantial. Due to the relatively poor recent coverage of HDR however, calculations can not be repeated for 2007. It is assumed that quality of HDR will increase in the near future.

<u>Incidence</u>
Crude Rates
In table 4.2.30.2. the incidence of COPD per 10,000 Dutch inhabitants is presented.

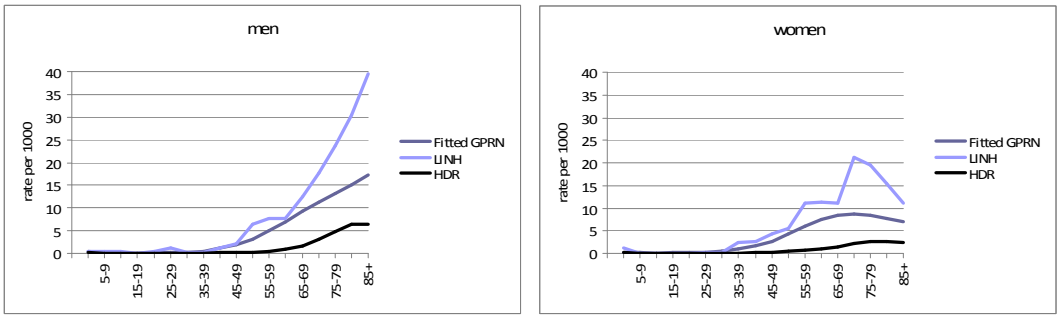
Table 4.2.30.2. Crude incidence rates of COPD per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs	29	30
LINH	46	53
HDR	7	6

Incidence rates are higher in LINH than in the fitted GPRNs (including LINH). It is not clear what the reason is for the observed difference. It may be the result of another definition for 'incident cases' in LINH compared to other GPRNs.

Age and sex specific incidence rates are shown in figure 4.2.30.3.

Figure 4.2.30.3. Age and sex specific incidence of COPD, based on fitted GPRNs, LINH and HDR; per 1000 persons per year, 2007.



Conclusion
For prevalence measurement, LINH over 2 years and fitted GPRNs are best sources for prevalence. In the future, additional linking to HDR will improve prevalence estimation. There appears to be a difference in interpretation of what should be called a new case of COPD between different GPRNs. Fitted GPRNs, including problem-based GPRNs, is considered the best choice for incidence measurement.

Chapter XI. Diseases of the digestive system and XII Diseases of the skin and subcutaneous tissue

4.2.31. Gastric and duodenal ulcer (peptic ulcer) (K25-K28)[43]

The indicator to be reported for gastric and duodenal ulcer (peptic ulcer), from here mentioned as 'peptic ulcer', is period prevalence, defined as year prevalence. Peptic ulcer can develop to be a chronical disease, but good medication is available and patients may not suffer complaints for years between episodes.

Possible sources
In The Netherlands, peptic ulcers are mostly managed in primary care. Therefore, GPRNs and LINH are the main source of data. Also, hospital discharge data are considered.

Possible sources are:
- Fitted GPRNs (including LINH)
- LINH
- HDR (presently only available for duodenal ulcer, but in future also for gastric or peptic ulcer)

Classification
For this Eurostat pilot data on ICD-10 codes K25-K28 are requested. ICPC-1 code D85 codes for duodenal ulcers (ICD-10 K26), ICPC D86 for other peptic ulcers. D86 also includes ICD-10 code E16.4 (abnormal secretion of gastrin). Fitted GPRNs were only available for D85 and D86 separately. Based on results in LINH it was decided to add those numbers to obtain rates for peptic ulcer. However, in the future it will be no problem to provide combined data. ICD-9-CM code 366 fully covers the ICD-10 codes requested.

Period Prevalence (year)

Crude Rates
In table 4.2.31.1. the prevalence of peptic ulcer per 10,000 Dutch inhabitants is presented.

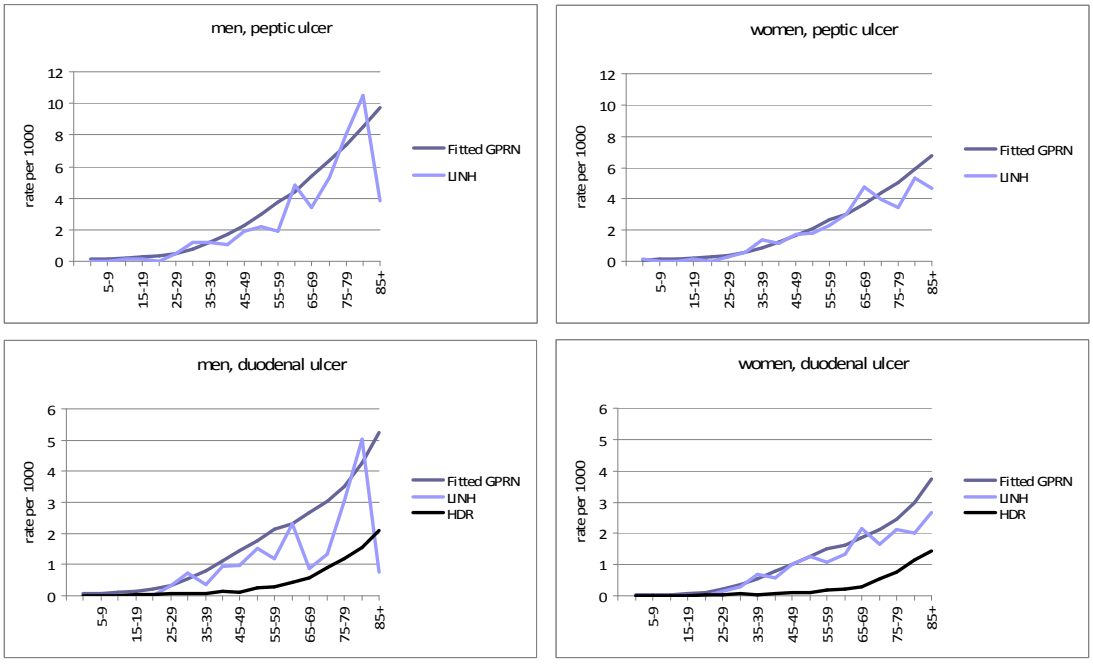
Table 4.2.31.1. Crude prevalence rates of peptic ulcer per 10,000 persons in the average Dutch population, 2007.

	men	women
Gastric ulcer		
Fitted GPRNs	10	8
LINH	10	8
Duodenal ulcer		
Fitted GPRNs	12	9
LINH	8	8
HDR	2	2
Peptic Ulcer		
Fitted GPRNs	21	17
LINH	18	16

Fitted GPRNs show slightly higher prevalence rates for peptic ulcer, resulting from higher rates for duodenal ulcer. Hospital admission clearly is much lower (data limited to duodenal ulcer), confirming that most peptic ulcers are treated by general practitioners.

Age and sex specific prevalence rates are shown in figure 4.2.31.1.

Figure 4.2.31.1. Age and sex specific prevalence of both peptic ulcer (gastric and duodenal ulcer) and duodenal ulcer only in 2007, per 1000 persons per year.



Due to low prevalence and small population numbers, LINH age and sex specific prevalence rates are instable. This will be responsible for the artificial drop in the 85+ men.

Conclusion
Fitted GPRNs and LINH provide comparable data on total number of peptic ulcers. Due to modelling, GPRN figures show a stable line. As requested age and sex specific data show large variations in LINH, fitted GPRN data is considered to be the best choice.

4.2.32. Alcoholic liver disease (K70)[44]

Alcoholic liver disease is the major cause of liver disease in Western countries, arising from the excessive ingestion of alcohol by chronic heavy drinkers. In the group of alcoholic liver diseases, alcoholic fatty liver and hepatitis can be cured, whereas fibrosis, sclerosis and cirrhosis cannot. For alcoholic hepatic failure and unspecified diseases outcome is uncertain. The indicator to be presented for alcoholic liver disease is period prevalence. As 80% of hospital discharge diagnoses in this group consist of cirrhosis, prevalence should preferably be operationalized as lifetime prevalence. Due to the available data however (see below), year prevalence is presented.

Possible sources
As patients with alcoholic liver disease mostly first will contact the general practitioner, GPRN data would be qualified as possible source. However, the GPRN/ICPC classification system does not allow a more specific selection than 'liver disease, not specified'. Therefore, the only possible source is the Hospital Discharge Register, probably representing only a small portion of all persons with alcoholic liver disease. Another limitation is that HDR only allows the estimation of year prevalence.

Classification
For this Eurostat pilot data on ICD-10 code K70 is requested. From the Hospital Discharge Register, ICD-9-CM-codes 571.0-571.3 were used.

Period Prevalence (year)

Crude Rates
In table 4.2.32.1. the prevalence of alcoholic liver disease per 10,000 Dutch inhabitants is presented.

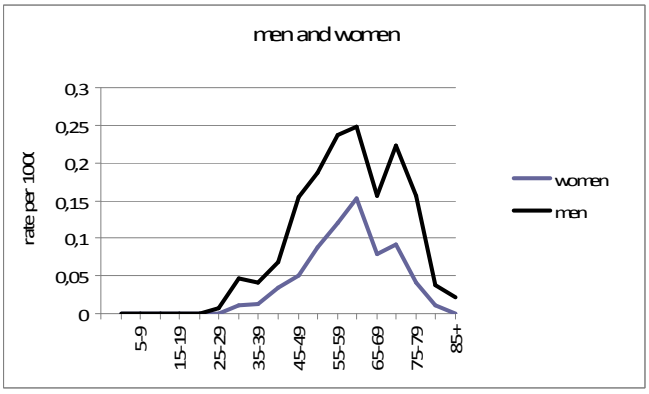
Table 4.2.32.1. Crude prevalence rates of alcoholic liver disease per 10,000 persons in the average Dutch population, 2007.

	men	women
HDR	0.9	0.4

Although women are twice as susceptible as men to alcohol related liver disease, year prevalence is higher in men. This is the result of men more often being chronic heavy drinkers.

Age and sex specific prevalence rates are shown in figure 4.2.32.1.

Figure 4.2.32.1. Age and sex specific prevalence of alcoholic liver disease in 2007, per 1000 persons per year, based on the hospital discharge register.



Conclusion
It is not clear what proportion of patients with alcohol related liver disease is treated in hospital. For the moment however, HDR is the best and single available source.

4.2.33. Diseases of liver other than alcoholic (K71-K77)[45]

This group of diseases consists of a variety of disorders, including toxic liver disease, hepatic failure and chronic hepatitis (as far as not elsewhere classified), fibrosis and cirrhosis of the liver, and (inflammatory) liver diseases and liver disorders that are not classified elsewhere.
The indicator to be presented for these nonalcoholic liver diseases is period prevalence. This might be best operationalized as life time prevalence (as at least some of these liver diseases are chronic conditions). However, with HDR as the only source available, it is decided to present year prevalence instead.

Possible sources
Although patients with liver disease initially will present at the general practitioner, the GPRN classification system has no more detailed coding possibility than 'liver disease, not specified'. Therefore, the only available source is the Hospital Discharge Register.

Classification
For this Eurostat pilot data on ICD-10 codes K71-K77 are requested. From the Hospital Discharge Register, ICD-9-CM-codes 570, 571.4-571.9 and 572-573 were used.

Period Prevalence (lifetime)

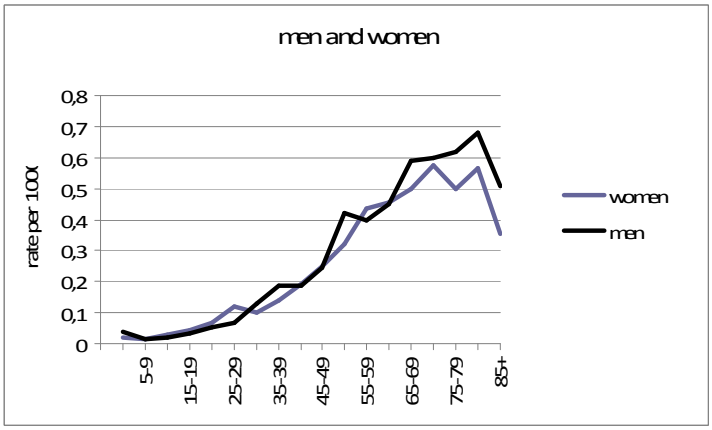
Crude Rates
In table 4.2.33.1. the prevalence of nonalcoholic liver disease per 10,000 Dutch inhabitants is presented.

Table 4.2.33.1. Crude prevalence rates of nonalcoholic liver disease per 10,000 persons in the average Dutch population, 2007.

	men	women
HDR	2,3	2,3

Age and sex specific prevalence rates are shown in figure 4.2.33.1.

Figure 4.2.33.1. Age and sex specific prevalence of nonalcoholic liver disease in 2007, per 1000 persons per year, based on the hospital discharge register.



Conclusion
It is not clear which proportion of patients with liver disease not related to alcohol are treated in hospital. For the moment however, HDR is the best and single available source.

4.2.34. Cholelithiasis (K80)[46]

Gallstones (cholelithiasis) are crystalline concretions formed within the gallbladder by accretion of bile components.

The indicators to be reported for cholelithiasis are:
- Period prevalence, defined as year prevalence, because cholelithiasis may not cause complaints for years and can be treated, i.e. by removing the gallbladder

Possible sources
In The Netherlands, cholelithiasis is first presented in primary care. Gallstones that generate attacks may need surgery (cholecystectomy) or other treatment. Therefore GPRN and HDR data are a relevant source.

Possible sources are:
- LINH
- Hospital Discharge Register.

Classification
For this Eurostat pilot data on ICD-10 code K80 is requested. ICPC-code D98 (cholecystitis/cholelithiasis) however also encodes for ICD K81-K83 (cholecystitis, other diseases of the gallbladder, other diseases of biliary tract), and K87 (disorders of gallbladder, biliary tract and pancreas in diseases classified elsewhere). The definition of ICPC-1 code D98 therefore is therefore too broad. From hospital discharge data however, 75% of the ICD-10 codes K80-K83 diagnoses appears to be K80. It is expected that at the GP, the ratio K80/K81-K83 will be much higher, so ICPC-1 code D98 is considered to be a good definition to use. ICD-9-CM code 574 fully covers the requested ICD-10 code.

Period prevalence (year)

Crude Rates
In table 4.2.34.1. the prevalence of cholelithiasis per 10,000 Dutch inhabitants is presented.

Table 4.2.34.1. Crude prevalence rates of cholelithiasis per 10,000 persons in the average Dutch population, 2007.

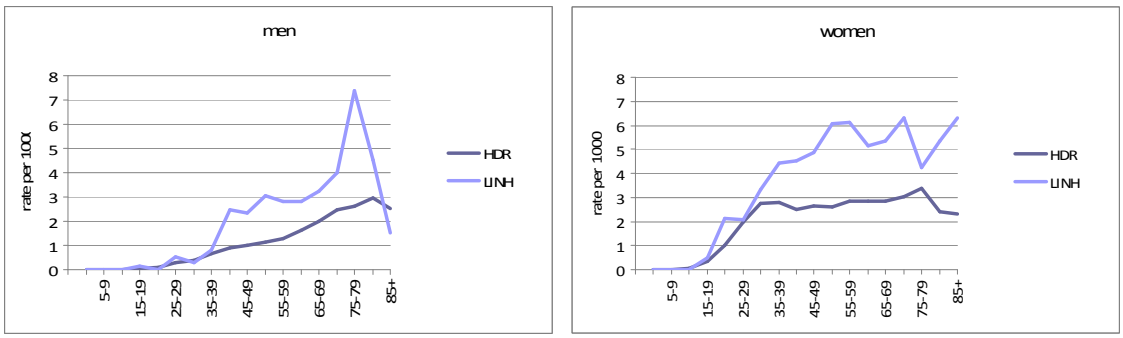
	men	women
LINH	17	36
Hospital Discharge Register	8	20

Combination of registrations
Using 2004 data, the number of cases with cholelithiasis found in the LINH population is increased with 15% by linking with the HDR (see 3.2.3.2 and Annex 5), Due to the relatively poor recent coverage of HDR however, calculations can not be repeated for 2007.

Prevalence based on LINH is higher than based on HDR, confirming the assumption that not every gall stone needs treatment in hospital. The number of hospital admissions however is significant. As illustrated by the combination of registers from 2004, a relatively small proportion of patients in hospital is not registered as such by the general practitioner.

Age and sex specific incidence rates are shown in figure 4.2.34.1.

Figure 4.2.34.1. Age and sex specific prevalence of cholelithiasis, based on LINH and HDR; per 1000 persons per year, 2007.



Incidence

Crude Rates
In table 4.2.34.2. the incidence of cholelithiasis per 10,000 Dutch inhabitants is presented.

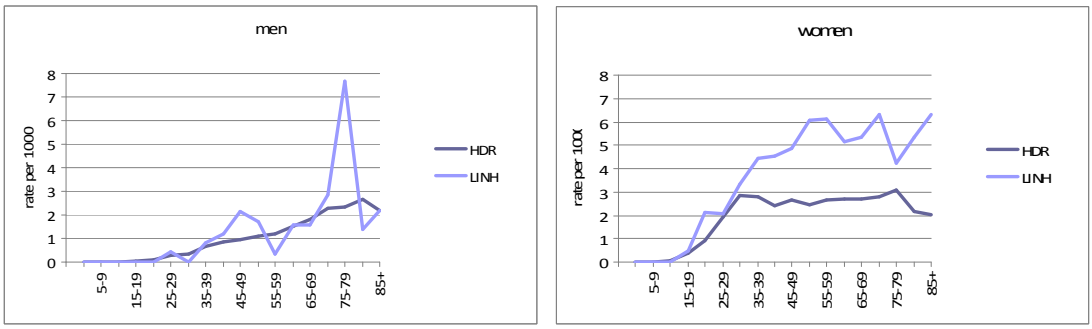
Table 4.2.34.2. Crude incidence rates of cholelithiasis per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	10	26
Hospital Discharge Register	8	19

In men, incidence rates of LINH and HDR are quite similar. Women are more susceptible to gall stones, and the difference between HDR and LINH in women is bigger. New patients generally suffer several attacks before hospitalization, and this may be the case more in women than in men.

Age and sex specific incidence rates are shown in figure 4.2.34.2.

Figure 4.2.34.2. Age and sex specific incidence of cholelithiasis, based on LINH and HDR; per 1000 persons per year, 2007.



Conclusion
As about 15% of patients with cholelithiasis in hospital are not registered as such in LINH, the combination of registers may be the best source to measure prevalence. However, as this combination is not available for 2007, LINH is a good alternative.
For incidence, LINH may be the best source as many patients (especially women) showing up for the first time at the general practitioner are not hospitalized in the same year.

XII Diseases of the skin and subcutaneous tissue

4.2.35. Dermatitis and eczema (L20-L30)[47]

The term eczema is broadly applied to a range of persistent skin conditions. Eczema is a form of dermatitis. Most prevalent are atopic eczema and contact dermatitis. Atopic eczema is due to a hypersensitivity reaction (similar to an allergy) in the skin, which leads to long-term inflammation of the skin. It is most common in infants, many people outgrow it by early adulthood. Contact dermatitis (both allergic and irritant) is considered curable, provided the offending substance can be avoided and its traces removed from one's environment.

The indicator to be reported for dermatitis and eczema is period prevalence, defined as year prevalence, as treatments exist to control the symptoms by reducing inflammation and relieving itching or by avoiding the offending substance.

Possible sources
In The Netherlands, dermatitis and eczema is mostly managed in primary care.

Possible sources are:
- Fitted GPRNs (but presently available only for either dermatitis or eczema), including LINH
- LINH (including multiple year analysis)
- HIS.

Classification
For this Eurostat pilot data on ICD-10 code L20-L30 are requested. This range is best covered by ICPC-codes S86-S89 and D05, leaving uncovered L26 (dermatitis exfoliativa), L27.0/L27.1 (generalized and localized skin eruptions due to drugs and medicaments taken internally), L28 (Lichen simplex chronicus and prurigo), L29 (Pruritus), and some parts of L30 (other and unspecified dermatitis).

In the HIS, respondents indicated whether they suffered from 'chronic eczema' in the last 12 months before the interview.

Period prevalence (year)

Crude Rates
In table 4.2.35.1. the prevalence of dermatitis and eczema per 10,000 Dutch inhabitants is presented. For fitted GPRNs, no data were available for the best selection of classification codes required (see classification). Therefore, results of fitted GPRNs are presented in the table but are not included in the figures.

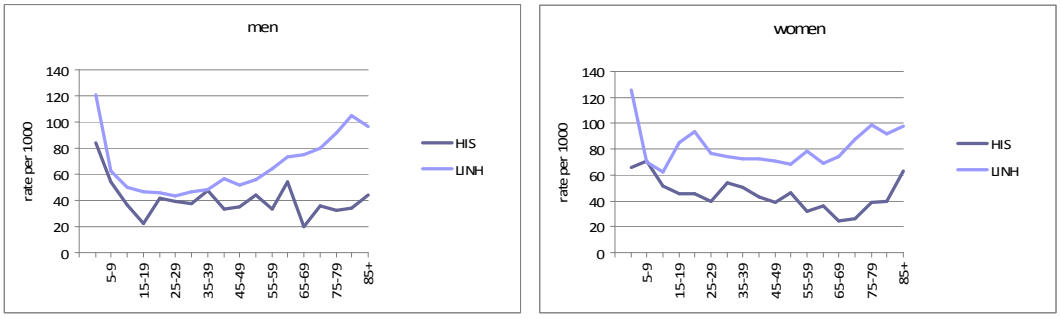
Table 4.2.35.1. Crude prevalence rates of dermatitis and eczema per 10,000 persons in the average Dutch population, 2007 (HIS: 2006-2008).

	men	women
Fitted GPRNs (atopic dermatitis/eczema), ICPC S87	176	208
Fitted GPRNs (contact dermatitis/other eczema), ICPC S88	430	604
LINH, ICPC S87+S88	499	675
LINH, ICPC S86+S87+S88+S89+D05	616	792
HIS (2006-2008)	412	454

Prevalence rates based on LINH show that limitation to ICPC-codes S87 and S88, as (separately) available for fitted GPRNs, causes a 15% lower prevalence than with the preferred combination of codes. As the overlap of subjects with both atopic and contact dermatitis is not known, fitted GPRN data for S87 and S88 are not aggregated to facilitate comparison with LINH or HIS.
Prevalence based on the Health Interview Survey is lower than based on LINH, focussing only on chronic eczema.

Age and sex specific prevalence rates for HIS and LINH are shown in figure 4.2.35.1.

Figure 4.2.35.1. Age and sex specific prevalence of dermatitis and eczema, based on LINH and HIS; per 1000 persons per year, LINH: 2007, HIS: 2006-2008.



Conclusion
As most cases of dermatitis and eczema are treated by the GP, LINH is the preferred data source to measure prevalence. HIS data are limited to 'chronic eczema', leaving unclear how this is interpreted by the respondents. Data from fitted GPRNs will supply acceptable data in the future, when the best preferred selection of classification codes is available.

4.2.36. Psoriasis (L40)[48]

Psoriasis is a chronic recurring condition that varies in severity. Psoriasis is typically a lifelong condition. There is currently no cure, but various treatments can help to control the symptoms. Controlling the signs and symptoms requires lifelong therapy.

The indicator to be reported for psoriasis is period prevalence, defined as lifetime prevalence, due to the chronic nature of the disease.

Possible sources
In The Netherlands, psoriasis is mostly managed in primary care.

Possible sources are:
- LINH (including multiple year analysis)
- Fitted GPRNs (however, data not available)
- HIS.

Classification
For this Eurostat pilot data on ICD-10 code L40 is required. This ICD-10-code is fully covered by ICPC-code S91. In the HIS, respondents indicate whether they presently suffer from 'psoriasis' or have suffered from it in the last 12 months.

<u>Period prevalence (lifetime)</u>

Crude Rates
In table 4.2.36.1. the prevalence of psoriasis per 10,000 Dutch inhabitants is presented.

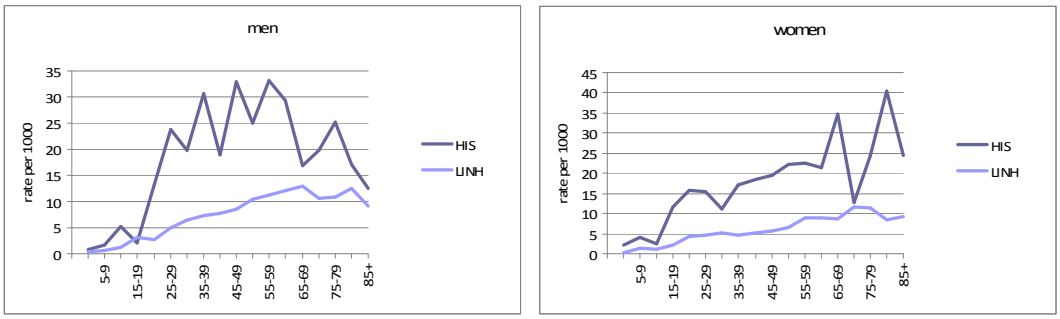
Table 4.2.36.1. Crude prevalence rates of psoriasis per 10,000 persons in the average Dutch population, 2007 (HIS: 2006-2008).

	men	women
LINH	69	56
LINH multiple years		
Base	77	70
Two years	109	104
Three years	134	126
HIS 2006-2008	189	166

Prevalence estimates based on the health interview survey is higher than estimates based on LINH. As psoriasis is a clear diagnosis that probably is not subject to different interpretations, prevalence based on HIS may be realistic. As it is a recurrent disease, patients may not visit the general practitioner every year. The increase in prevalence once patients are followed for two or three years illustrates this.

Age and sex specific prevalence rates are shown in figure 4.2.36.1.

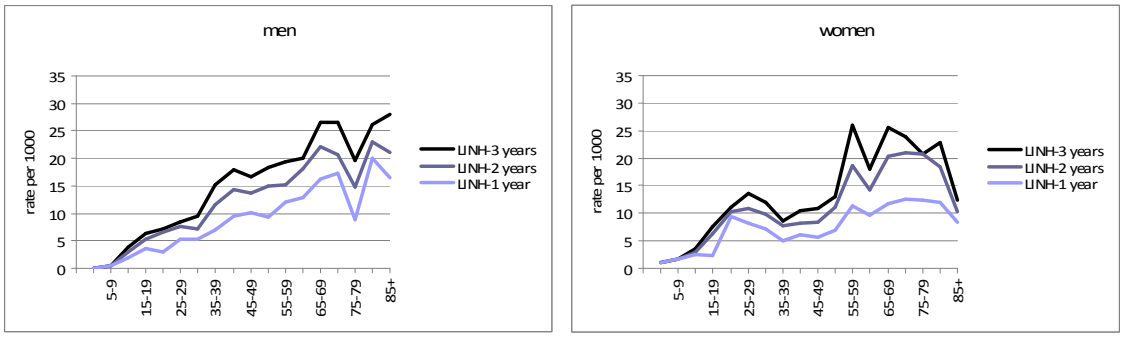
Figure 4.2.36.1. Age and sex specific prevalence of psoriasis, based on LINH and HIS; per 1000 persons per year, LINH: 2007, HIS: 2006-2008.



Multiple year LINH

Results counting persons with one or more GP contacts relating to psoriasis in one, two or three years are shown in figures 4.2.36.2. As base values for the LINH subpopulation suitable for three year follow-up differ from the full LINH population, these figures are presented separately. It can be concluded that each extra year of observation importantly augments the estimation of life time prevalence.

Figure 4.2.36.2. Age and sex specific prevalence of psoriasis in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion
As most cases of psoriasis are treated by the GP, LINH may be a good data source to measure prevalence, especially when following LINH-patients for three years. However, psoriasis will show up intermittently so patients may not attend the GP for several years. Therefore, HIS data may be the best possible source for this disease despite the necessity to pool data from three years. In the future, fitted-GPRN data will be available.

Chapter XIII. Diseases of the musculoskeletal system and connective tissue

4.2.37. Rheumatoid arthritis (M05, M06)[49]

Rheumatoid arthritis is a chronic, systemic inflammatory disorder that may affect many tissues and organs, but principally attacks synovial joints. It is considered to be a systemic autoimmune disease.

The indicator to be reported for rheumatoid arthritis is period prevalence, defined as lifetime prevalence, as there is no known cure for rheumatoid arthritis, although many different types of treatment can alleviate symptoms and/or modify the disease process.

Possible sources
In The Netherlands, rheumatoid arthritis is mostly diagnosed and treated by a rheumatologist, although the general practitioner generally will be notified.

Possible sources are:
- Fitted GPRNs (excluding LINH)
- LINH (including multiple year analysis)
- Hospital Discharge Register HDR
- HIS.

Classification
For this Eurostat Morbidity Pilot, data on ICD-10 codes M05 (Seropositive rheumatoid arthritis)and M06 (Other rheumatoid arthritis) are requested. This ICD-10-code is covered by ICPC-code L88, but L88 also includes juvenile arthritis (ICD-10 M08) and ankylosing spondylitis (Bekhterev's disease) (ICD-10 M45). In the HIS, respondents

indicate whether they suffer from 'chronical inflammation of the joints (inflammational rheuma, chronical rheuma, rheumatoid arthritis)' or have suffered from it in the last 12 months before the interview. In the HDR, ICD-9-CM 714 was used, fully covering the required codes.

Period prevalence (lifetime)

Crude Rates
In table 4.2.37.1. the prevalence of rheumatoid arthritis per 10,000 Dutch inhabitants is presented.

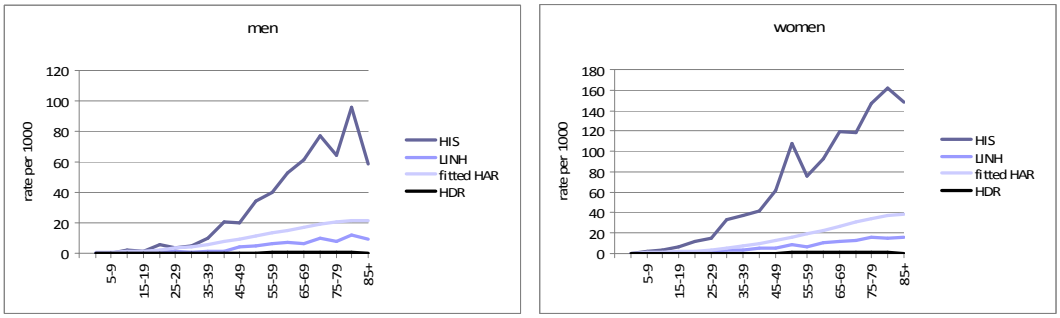
Table 4.2.37.1. Crude prevalence rates of rheumatoid arthritis per 10,000 persons in the average Dutch population, 2007 (HIS: 2006-2008).

	men	women
Fitted GPRNs	78	122
LINH	31	56
LINH multiple years		
Base	36	63
Two years	52	88
Three years	63	110
HDR	2	5
HIS (2006-2008)	223	552

Estimates of prevalence based on fitted GPRNs are more than twice as high as those based on LINH. As rheumatoid arthritis is often treated by the rheumatologist, patients may not contact the general practitioner for years. This causes underestimation in contact-based GPRNs. In the fitted GPRNs, problem-based GPRNs were included. Prevalence based on HIS is much higher, but it is plausible that respondents are not familiar with the exact diagnosis of rheumatoid arthritis. It is clear that patients with rheumatoid arthritis generally are not hospitalized.

Age and sex specific prevalence rates are shown in figure 4.2.37.1.

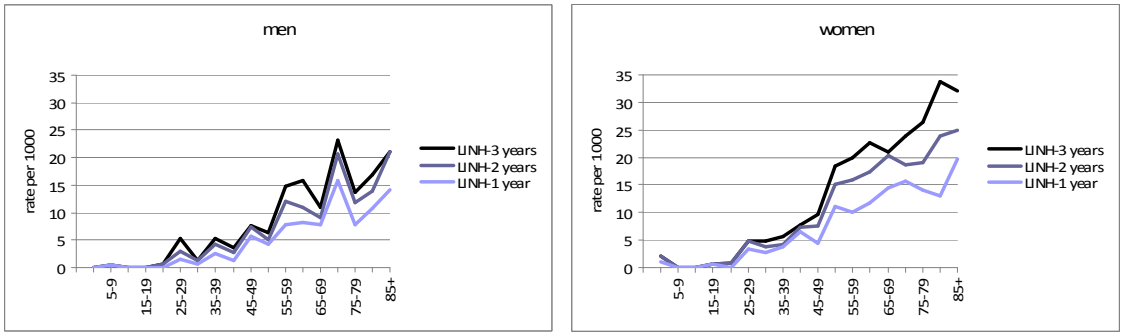
Figure 4.2.37.1. Age and sex specific prevalence of rheumatoid arthritis, based on fitted GPRNs, LINH, HDR and HIS; per 1000 persons per year, 2007 (HIS: 2006-2008).



Multiple year LINH

Results counting persons with one or more GP contacts relating to rheumatoid arthritis in one, two or three years are shown in figures 4.2.37.2. As base values for the LINH subpopulation suitable for three year follow-up differ from the full LINH population, these figures are presented separately. It can be concluded that each extra year of observation importantly improves the estimation of life time prevalence.

Figure 4.2.37.2. Age and sex specific prevalence of rheumatoid arthritis in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion

Rheumatoid arthritis is a chronic disease, diagnosed and managed by the rheumatologist. Therefore, problem-oriented GPRNs may have a better view on the number of prevalent cases than episode-oriented GPRNs. Three-year follow-up of patients in LINH would be a good proxy in case fitted GPRNs are not available. Weighting of the multiple year LINH population may decrease the selection bias in this group (see 3.2.2.3).
Prevalence is three to five times higher in the HIS. It is unlikely that so many patients are unknown in the problem-based GPRNs. It might be due to respondents misunderstanding the definition of rheumatoid arthritis.

4.2.38. Arthrosis (M15-M19)[50]

Arthrosis or osteoarthritis, degenerative arthritis or degenerative joint disease, is a group of mechanical abnormalities involving degradation of joints. Treatment generally involves a combination of exercise, lifestyle modification, and analgesics. Also, joint replacement surgery may be used to improve the quality of life.

The indicator to be reported for arthrosis is period prevalence, defined as lifetime prevalence, because arthrosis cannot be cured.

Possible sources
In the Netherlands, arthrosis is mostly diagnosed and managed by primary care or the rheumatologist. Joint replacements of course will be carried out in hospital.

Possible sources are:
- Fitted GPRNs (excluding LINH, as contact with the general practitioner may be sporadic as there is no specific treatment possible).
- LINH (including multiple year analysis)
- HDR
- HIS.

Classification
For this Eurostat pilot data on ICD-10 codes M15-M19 are required. These ICD-10-codes are covered by ICPC-code L89-L91, but these also encode for ICD-10-code M13 (other *arthritis*). In the HDR, ICD-9-CM 715 was used. In the HIS, respondents indicate whether they suffer from 'arthrosis or osteoarthritis of hip or knee' or have suffered from it in the last 12 months.

<u>Period prevalence (lifetime)</u>

Crude Rates
In table 4.2.38.1. the prevalence of arthrosis per 10,000 Dutch inhabitants is presented.

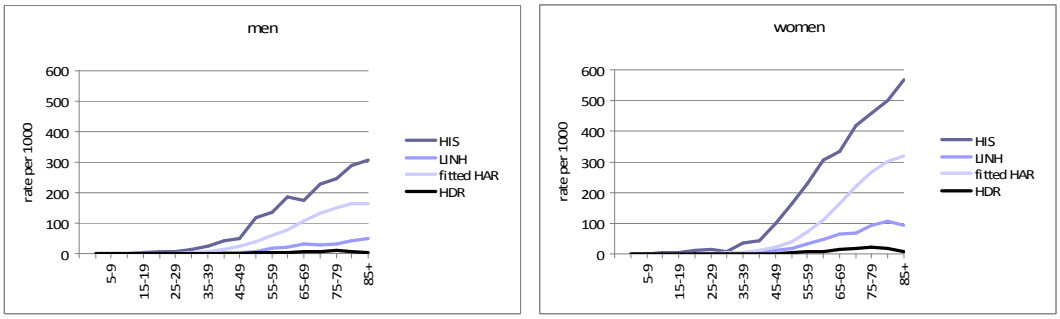
Table 4.2.38.1. Crude prevalence rates of arthrosis per 10,000 persons in the average Dutch population, 2007 (HIS: 2006-2008).

	men	women
Fitted GPRNs	328	564
LINH	84	213
LINH multiple years		
Base	93	220
Two years	145	340
Three years	186	436
HDR	21	40
HIS 2006-2008	688	1318

Estimates of prevalence based on fitted GPRNs are much higher than those based on LINH. As arthrosis is often treated by the rheumatologist or orthopedist patients may not contact the general practitioner every year. In the fitted GPRNs, only problem-based GPRNs were included and is considered the best source.
Prevalence based on HIS is much higher, but it is plausible that respondents are not familiar with the exact diagnosis of arthrosis. Low prevalence rates based on HDR are expected, as patients with arthrosis will be hospitalized particularly for joint replacement operations.

Age and sex specific prevalence rates are shown in figure 4.2.38.1.

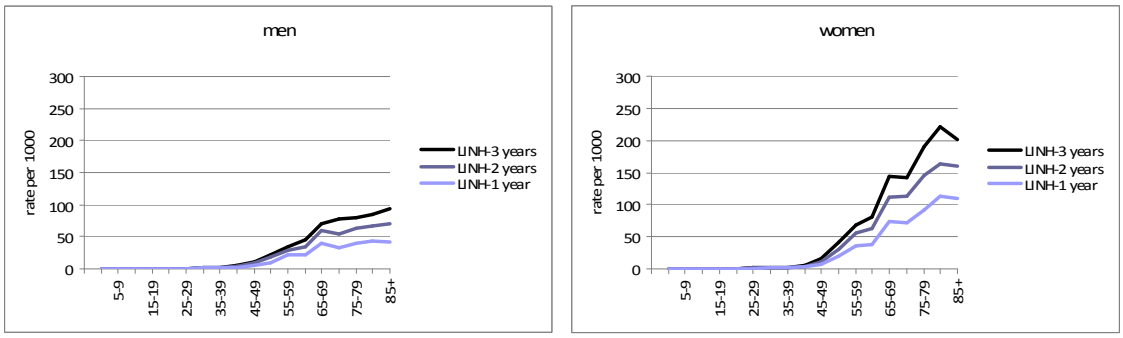
Figure 4.2.38.1. Age and sex specific prevalence of arthrosis, based on fitted GPRNs, LINH, HDR and HIS; per 1000 persons per year, 2007 (HIS: 2006-2008).



Multiple year LINH
Results counting persons with one or more GP contacts relating to arthrosis in one, two or three years are shown in figures 4.2.38.2. As base values for the LINH subpopulation suitable for three year follow-up differ from the full LINH population, these figures are

presented separately. It can be concluded that each extra year of observation importantly improves the estimation of life time prevalence.

Figure 4.2.38.2. Age and sex specific prevalence of arthrosis in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion
Arthrosis is a chronic disease, managed by the the rheumatologist but the GP is generally notified. Problem-oriented GPRNs, included in the fitted GPRNs, may have a better view on the number of prevalent cases than episode-oriented GPRNs. Even three-year follow-up of patients in LINH does not come close to the number of patients form fitted GPRNs. Prevalence is two to three times higher in the HIS. As most patients need some treatment, it is unlikely that so many are missed by the GP. It may be due to respondents misunderstanding the definition of arthrosis.

4.2.39. Systemic connective tissue disorders (M30-M36) [51].

In systemic connective tissue disorders, unlike arthritis, inflammation may occur throughout the body: in eyes, blood vessels, skin, muscles and internal organs like heart, lungs, kidneys and liver. Examples of systemic diseases are: Systemic lupus erythematosus (SLE), Sjögren's syndrome, scleroderma, polymyositis, polymyalgia rheumatica (muscular rheumatism), and vasculitis.

The indicators to be reported for systemic connective tissue disorders is period prevalence. Most of the diseases included cannot be cured, only symptoms are treated, so life time prevalence would be the indicator of choice.

Possible sources
In the Netherlands, systemic connective tissue disorders are managed both in primary care and hospital, during outpatient clinic visits. GPRNs would be a relevant source. However, in the GP classification system ICPC, systemic connective tissue disorders are included in 'other diseases of the cardiac system' (K99) and 'other diseases of the locomotor system' (L99) and cannot be distinguished.
Due to these classification problems, the only available soured is the Hospital Discharge Register.

Possible sources are:

- Hospital Discharge Register.

Classification

For this Eurostat pilot data on ICD-10 codes M30-M36 are required. These ICD-10-codes are translated in ICD-9-CM-codes 136.1, 279.4, 446, 710, 725, 728.5.

Period prevalence (lifetime)

Crude Rates

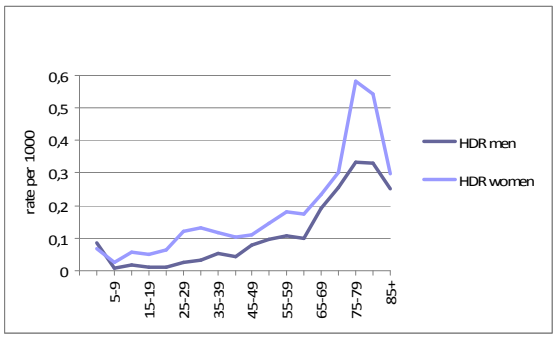
In table 4.2.39.1. the prevalence of systemic connective tissue disorders per 10,000 Dutch inhabitants is presented.

Table 4.2.39.1. Crude prevalence rates of systemic connective tissue disorders per 10,000 persons in the average Dutch population, 2007.

	men	women
HDR	0.8	1.5

Age and sex specific prevalence rates are shown in figure 4.2.39.1.

Figure 4.2.39.1. Age and sex specific prevalence of systemic connective tissue disorders, based on HDR; per 1000 persons per year, 2007.



Conclusion

The only available source of data for systemic connective tissue disorders is HDR. However, HDR only provides year prevalence and most patients will be treated at the general practitioner or at during outpatient visits in the hospital. Therefore, no 'best choice' is available for systemic connective tissue disorders.

4.2.40. Spondylopathies and other dorsopathies (incl. low back pain) (M45-M54) [52].

Spondylopathies and other dorsopathies (incl. low back pain), further mentioned as dorsopathies, are a collection of neck and back problems with miscellaneous or unknown causes and pathological processes.
The indicator to be reported for dorsopathies is period prevalence. This indicator is defined as year prevalence, as subjects may recover of the most common dorsopathies.

Possible sources
In The Netherlands, dorsopathies are managed primarily in primary care. Therefore GPRN data (both fitted and LINH) are a relevant source. Also, patients may refer directly to the physiotherapist without contacting the GP. As patients treated by the physiotherapist may no longer contact the GP, multiple year LINH may trace lost cases.
Also, the Health Interview Survey (HIS) includes a question about serious or long-lasting illness of the back (including hernia).

Possible sources are:
- Fitted GPRNs (including LINH)
- LINH (including multiple year analysis)
- HIS.

Classification
For this Eurostat pilot data on ICD-10 codes M45-M54 are required. It appears to be quite difficult to select a combination of ICPC-codes that covers these ICD-10-codes. The best combination of ICPC-codes: L01-L03, L83-L84 and L86 does not include M45 (ankylosing spondylitis (Bekhterev's disease), M46.3 (infection of intervertebral disc (pyogenic)), M46.4 (discitis, unspecified), M46.5 (other infective spondylopathies) and M54.1 (radiculopathy). On the other hand, also M43.3 (recurrent atlantoaxial dislocation with myelopathy), M43.4 (other recurrent atlantoaxial dislocation), M43.6 (torticollis), M43.0 (spondylolysis), M43.1 (spondylolisthesis), M43.5 (other recurrent vertebral dislocation), S33.5 (sprain of ligaments of lumbar spine), S33.7 (sprain and strain of other and unspecified parts of lumbar spine and pelvis) are included outside the required span of codes.

<u>Period prevalence (year)</u>

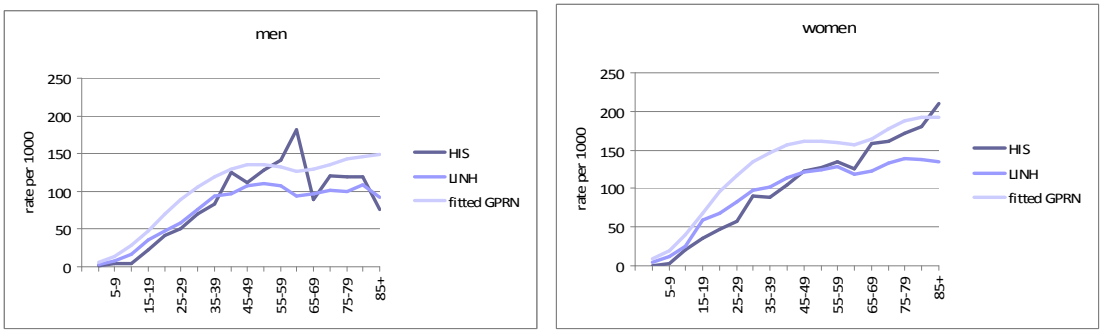
Crude Rates
In table 4.2.40.1. the prevalence of dorsopathies per 10,000 Dutch inhabitants is presented.

Table 4.2.40.1. Crude prevalence rates of dorsopathies per 10,000 persons in the average Dutch population, 2007 (HIS: 2006-2008).

	men	women
Fitted GPRNs	968	1248
LINH	728	931
LINH multiple years		
Base	791	990
Two years	1342	1671
Three years	1843	2305
HIS (2006-2008)	807	925

Age and sex specific prevalence rates are shown in figure 4.2.40.1.

Figure 4.2.40.1. Age and sex specific prevalence of dorsopathies, based on fitted GPRNs, LINH and HIS; per 1000 persons per year, 2007 (HIS 2006-2008).

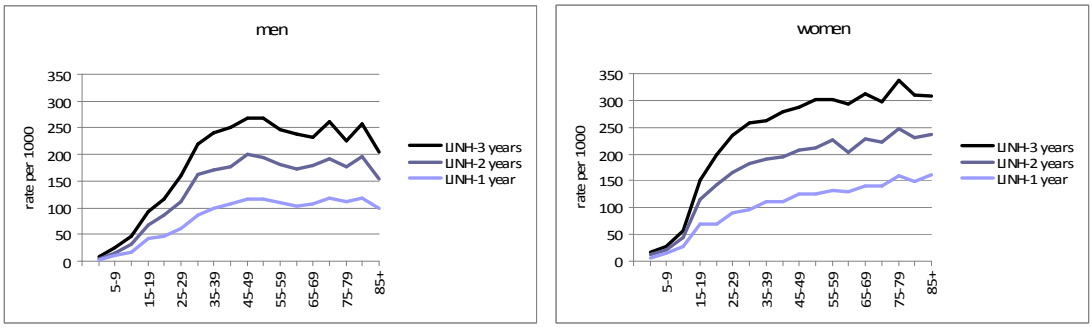


Multiple year LINH

Results counting persons with one or more GP contacts relating to dorsopathies in one, two or three years are shown in figures 4.2.40.2. As base values for the LINH subpopulation suitable for three year follow-up differ from the full LINH population, these figures are presented separately. It can be concluded that each extra year of observation importantly augments the number of cases found. However, as dorsopathies may be cured this does not necessarily indicate a better estimation of prevalence.

Prevalence based on HIS and one-year LINH are below those based on fitted GPRNs. In fitted GPRNs, both episode and problem-based GPRNs are included, probably giving a better estimation of patients with longer lasting dorsopathies that are treated by physiotherapists. Analysis of multiple year LINH shows that each extra year included increases the number of prevalent cases substantially, possibly because many patients are counted that no longer suffer dorsopathies.

Figure 4.2.40.2. Age and sex specific prevalence of dorsopathies in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion
As fitted GPRNs include both episode and problem-based GPRNs, they are the preferred source to estimate prevalence of dorsopathies. LINH (one year) may underestimate prevalence by missing patients treated by physiotherapists, whereas multiple year LINH may overestimate prevalence by including patients that no longer suffer from dorsopathy.

4.2.41. Osteoporosis (M80-M82) [53].

Osteoporosis is a disease of bones that leads to an increased risk of fracture. The indicator to be reported for osteoporosis is period prevalence. This indicator is defined as lifetime prevalence, because osteoporosis cannot be cured.

Possible sources
Generally, patients with osteoporosis are treated by the GP. However, contact-based GPRNs such as LINH may miss prevalent cases that formerly had a fracture as a result of osteoporosis and do not contact the GP for osteoporosis every year.
GPRN data (both fitted and LINH) are a relevant source, as well as the Hospital Discharge Register.

Possible sources are:
- Fitted GPRNs (excluding LINH)
- LINH (including multiple year analysis)
- HDR.

Classification
For this Eurostat pilot data on ICD-10 codes M80-M82 are required, covered completely with ICPC-1 code L95 and ICD-9-CM 733.0.

<u>Period prevalence (lifetime)</u>

Crude Rates
In table 4.2.41.1. the prevalence of osteoporosis per 10,000 Dutch inhabitants is presented.

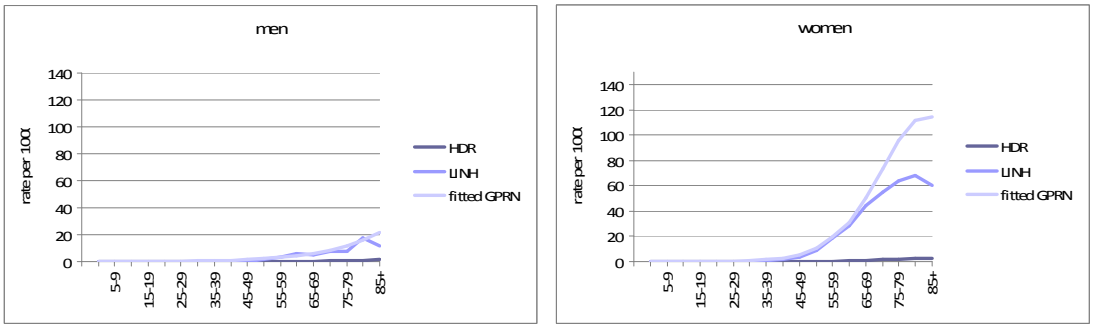
Table 4.2.41.1. Crude prevalence rates of osteoporosis per 10,000 persons in the average Dutch population, 2007.

	men	women
Fitted GPRNs (excluding LINH)	22	184
LINH	19	137
LINH multiple years		
Base	27	191
Two years	33	230
Three years	36	259
HDR	1	4

Crude prevalence rates confirm that osteoporosis is treated predominantly in primary care, and that the disease is especially prevalent in women.

Age and sex specific prevalence rates are shown in figure 4.2.41.1.

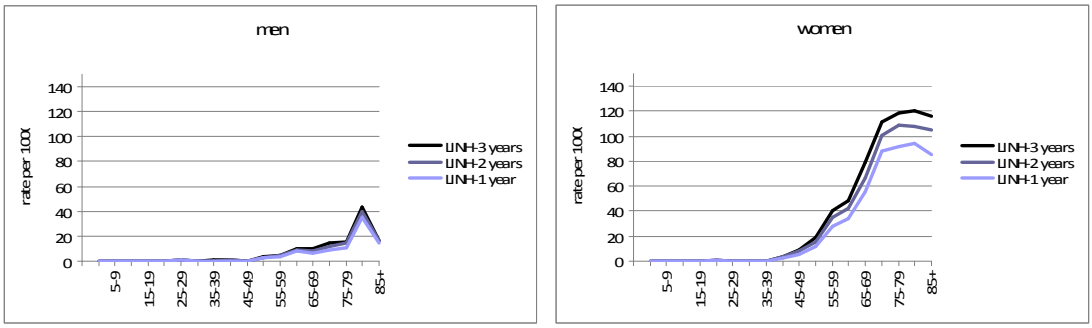
Figure 4.2.41.1. Age and sex specific prevalence of osteoporosis, based on fitted GPRNs, LINH and HDR; per 1000 persons per year, 2007.



Multiple year LINH

Results counting persons with one or more GP contacts relating to osteoporosis in one, two or three years are shown in figures 4.2.41.2. As base values for the LINH subpopulation suitable for three year follow-up differ from the full LINH population, these figures are presented separately. It can be concluded that two extra years of observation importantly augment the number of cases found. The LINH-population limited to those patients that can be followed consecutively for three years have higher levels of osteoporosis than the original LINH population. Additional weighting in future analyses may resolve this bias.

Figure 4.2.41.2. Age and sex specific prevalence of osteoporosis in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Conclusion
The preferred source to estimate prevalence of osteoporosis are fitted GPRNs, with three-year LINH as a second best.

Chapter XIV. Diseases of the genitourinary system

4.2.42. Glomerular and renal tubulo-interstitial diseases (N00-N08, N10-N16)) [54]

The most common glomerular diseases are glomerulonephritis and glomerulosclerosis, and the most prevalent renal tubulo-interstitial disease is acute or chronic tubulo-interstitial nephritis. Many conditions with a variety of genetic and environmental are responsible for these diseases, and the progress of the disease is diverse.

The indicator to be reported for glomerular and renal tubulo-interstitial diseases is period prevalence, but because of the diversity of conditions it is difficult to chose for either year of lifetime prevalence. For this pilot, we chose to present lifetime prevalence.

Possible sources
In the Netherlands, glomerular and renal tubulo-interstitial diseases are managed both in primary care and hospital. Therefore GPRNs and HDR data are relevant sources.

Possible sources are:
- Fitted GPRNs: might be a good source, but are not available for this item, but can be available in the future.
- LINH including multiple-year analysis
- Hospital Discharge Register.
- Combination of LINH and HDR.

Classification
For this Eurostat pilot data on ICD-10 codes N00-N08 and N10-N16 are requested. ICPC U70 (Pyelonephritis/pyelitis) translates in N10-N12, N15.1, and N15.9. ICPC U88 (Glomerulonephritis/nefrose) covers N00-N05, N07-N08, N14, N15.0, N15.8, and N16). The combination of U70 and U88 covers the required ICD-codes with the exception of

N13 (obstructive and reflux uropathy). However, addition of ICPC-1 U99 to cover ICD-10 N13 would on the other hand include a broad range of N-codes not included in the required ICD-10 codes. Therefore, ICPC U70 and U88 are considered to be the best selection.

Period Prevalence (lifetime)

Crude Rates
In table 4.2.42.1. the prevalence of glomerular and renal tubulo-interstitial diseases per 10,000 Dutch inhabitants is presented.

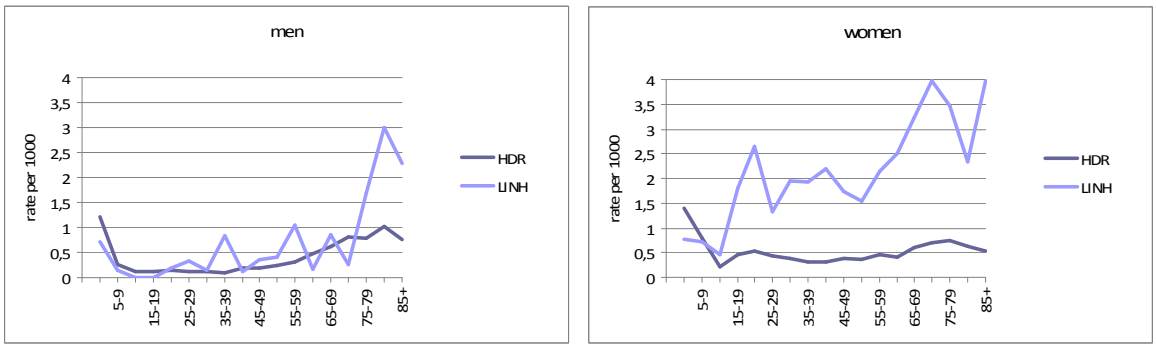
Table 4.2.42.1. Crude prevalence rates of glomerular and renal tubulo-interstitial diseases per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	5	20
LINH multiple years		
Base	5	22
Two years	9	39
Three years	12	52
Hospital Discharge Register	3	5

Prevalence rates show that these diseases are not very common. In LINH, the prevalence found in women is much higher than in men. However, in HDR, the sex difference is much smaller. This may be due to the fact that pyelonephritis, which is more prevalent in women, generally is treated on an outpatient basis and is less frequently seen in hospital.

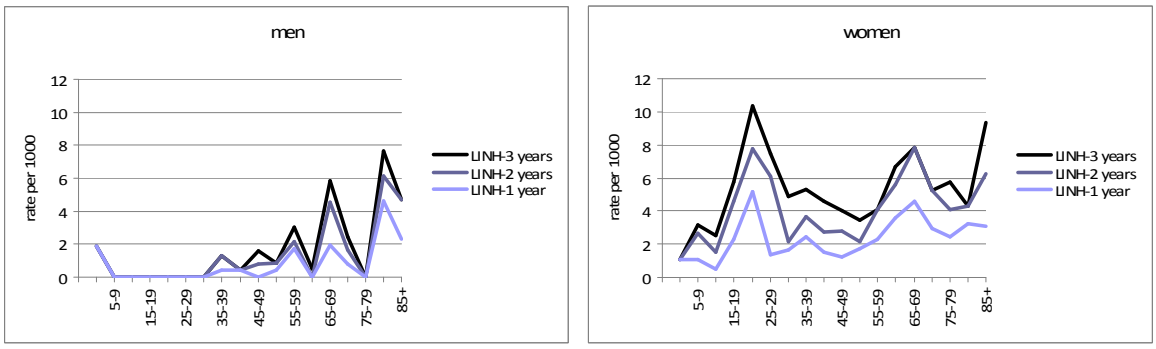
Age and sex specific incidence rates are shown in figure 4.2.42.1.

Figure 4.2.42.1. Age and sex specific prevalence of glomerular and renal tubulo-interstitial diseases, based on LINH and HDR; per 1000 persons per year, 2007.



Multiple year LINH
Results counting persons with one or more GP contacts relating to glomerular and renal tubulo-interstitial diseases in one, two or three years are shown in figures 4.2.42.2. As base values for the LINH subpopulation suitable for three year follow-up differ from the full LINH population, these figures are presented separately. It can be concluded that two extra years of observation importantly improves the estimation of life time prevalence.

Figure 4.2.42.2. Age and sex specific prevalence of glomerular and renal tubulo-interstitial diseases in 2007, based on observation of the same patients in LINH during one, two or three years; per 1000 persons per year.



Combination of registrations.
Using 2004 data, the number of cases found in the LINH population is increased with 25-30% by linking with the HDR. Overlap between cases found in HDR and LINH is small. Due to the relatively poor recent coverage of HDR however, calculations can not be repeated for 2007. It is assumed that quality of HDR will increase in the near future.

Conclusion
For glomerular and renal tubulo-interstitial diseases prevalence in LINH with two extra years follow-up is the preferred data source. In the future, combination of LINH with HDR will be the best choice.

4.2.43. Renal failure (N17-N19))[55]

Renal failure (formerly called renal insufficiency) describes a medical condition in which the kidneys fail to adequately filter toxins and waste products from the blood. The two forms are acute (acute kidney injury) and chronic (chronic kidney disease). A number of other diseases or health problems may cause either form of renal failure to occur. Acute kidney injury may be cured, whereas chronic kidney disease generally cannot.

The indicator to be reported for renal failure is period prevalence, but because of the diversity of conditions it is difficult to choose either year of lifetime prevalence. However, only data on year prevalence are available.

Possible sources
Due to classification problems, the only available source in The Netherlands, is the Hospital Discharge Register. The ICPC system, used by general practitioners, does not allow to specify renal failure.

Classification
For this Eurostat pilot data on ICD-10 codes N17-N19 are requested. In the ICPC-1 classification system, ICPC-code U99 covers N17-N19 but also many other renal diseases, as mentioned before the reason GPRNs were not considered potential sources. ICD-9-CM codes 583.6-583.7 and 584-586 fully cover the required ICD-10 codes.

Period Prevalence (lifetime)

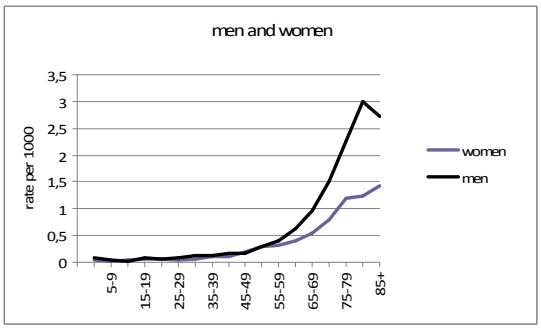
Crude Rates
In table 4.2.43.1. the prevalence of glomerular and renal tubulo-interstitial diseases per 10,000 Dutch inhabitants is presented.

Table 4.2.43.1. Crude prevalence rates of renal failure per 10,000 persons in the average Dutch population, 2007.

	men	women
Hospital Discharge Register	4	3

Age and sex specific incidence rates are shown in figure 4.2.43.1.

Figure 4.2.43.1. Age and sex specific prevalence of renal failure, based on LINH and HDR; per 1000 persons per year, 2007.



Conclusion
For renal failure prevalence in HDR is the best and only available data source. In the future, a combination of HDR and COD could be considered to be a good source, depending on the overlap between the approximately 1450 annual deaths and 5400 hospitalizations for this disease.

4.2.44. Urolithiasis (N20-N23)[56]

Urolithiasis is the condition where urinary calculi are formed in the urinary tract.

The indicators to be reported for urolithiasis are:
- Period prevalence, defined as year prevalence, because urolithiasis can be cured by drinking a lot or by breaking the stones i.e. by ultrasound.
- Incidence by person

Possible sources
In The Netherlands, urolithiasis is mostly managed in primary care. Sometimes, admission to a hospital is required. Therefore GPRNs and HDR data are a relevant source.

Possible sources are:
- Fitted GPRNs (available for future analyses)
- LINH
- Hospital Discharge Register.
- Combination of LINH and HDR.

Classification
For this Eurostat pilot data on ICD-10 codes N20-N23 are requested. ICPC-code U95 (urolithiasis) encodes for ICD N20-22, U14 (Kidney symptom/complaint) for N23.
The requested ICD-10 codes are covered by ICD-9-CM codes 592, 594 and 788.0.

Period prevalence (year)

Crude Rates
In table 4.2.44.1. the prevalence of urolithiasis per 10,000 Dutch inhabitants is presented.

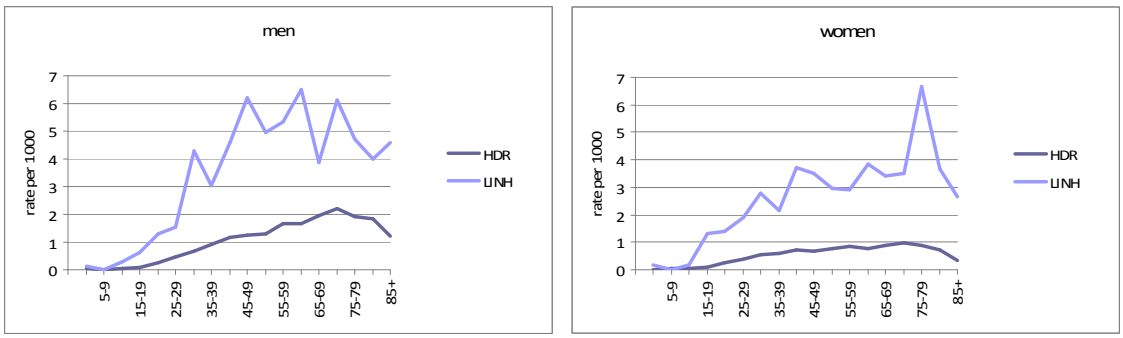
Table 4.2.44.1. Crude prevalence rates of urolithiasis per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	33	25
Hospital Discharge Register	9	5

Prevalence rates confirm urolithiasis being treated in primary care predominantly.

Age and sex specific incidence rates are shown in figure 4.2.44.1.

Figure 4.2.44.1. Age and sex specific prevalence of urolithiasis, based on LINH and HDR; per 1000 persons per year, 2007.



Incidence by person

Crude Rates
In table 4.2.44.2. the incidence of urolithiasis per 10,000 Dutch inhabitants is presented.

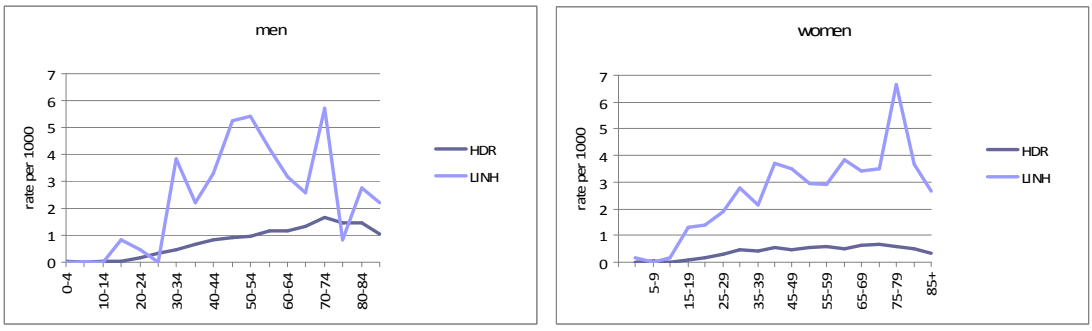
Table 4.2.44.2. Crude incidence rates of urolithiasis per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	24	18
Hospital Discharge Register	7	4

As in prevalence, rates show that most new cases of urolithiasis are diagnosed at the general practitioner.

Age and sex specific incidence rates are shown in figure 4.2.44.2.

Figure 4.2.44.2. Age and sex specific incidence of urolithiasis, based on LINH and HDR; per 1000 persons per year, 2007.



Combination of registrations.
Using 2004 data, the number of cases with urolithiasis found in the LINH population is increased with 15% by linking with the HDR. Overlap between cases found in HDR and LINH is small. Due to the relatively poor recent coverage of HDR however, calculations can not be repeated for 2007.

Conclusion
As most cases of urolithiasis are treated by the GP, LINH is the preferred data source for both incidence and prevalence, whereas linkage to hospital discharge register could add a substantial number of cases as soon as it recovers its coverage. Data of fitted GPRNs may also be a good source, but are not available yet.

4.2.45. All morbidity due to injury, poisoning and certain other consequences of external causes (S00-T98) [57]

The indicators to be reported for all morbidity due to injury, poisoning and certain other consequences of external causes are:

- Prevalence, defined as year prevalence, as the results of those injuries are acute events and can mostly be cured.
- Incidence by episode

Classification

For this Eurostat pilot data on ICD-10 codes S00-T98 are requested which is translated in ICD-9-CM codes 800-999. The requested ICD-10 codes are fully covered.

Period prevalence (year)

Possible sources

Morbidity due to injury, poisoning and certain other consequences of external causes is partly managed in hospitals. A possible source is the Hospital Discharge Register.

A part of morbidity due to injury, poisoning and certain other consequences of external causes is treated in the emergency departments. The ISS (Injuries Surveillance System) is a source that records information about all patients who are treated at the Emergency Departments of Dutch hospitals. The approximately 14 hospitals that participate in ISS form a representative sample of the general and teaching hospitals in the Netherlands. Based upon this sample a reliable estimate can be made of the total number of accident-related emergency visits of all Dutch hospitals. In ISS only data about external causes are available, not the injuries that are the results of the external causes. No numbers about all morbidity treated in emergency departments are available from this source.

Morbidity due to injury, poisoning and certain other consequences of external causes can also be treated by the GP. However the GP coding system does not allow coding by cause, so GPRNs are not a possible source.

The available possible source is:

- HDR

Crude rates

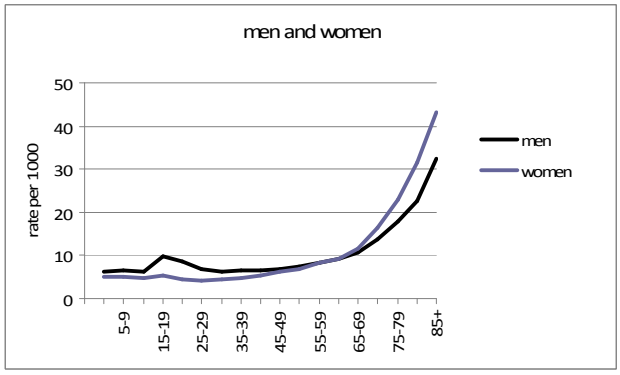
In table 4.2.45.1. the prevalence of all morbidity due to injury, poisoning and certain other consequences of external causes per 10,000 Dutch inhabitants is presented.

Table 4.2.45.1. Crude prevalence rates of all morbidity due consequences of external causes per 10,000 persons in the average Dutch population, 2007.

	men	women
HDR	85	86

The prevalence in men and women are almost similar. Age and sex specific rates are shown in figure 4.2.45.1.

Figure 4.2.45.1. Age and sex specific prevalence of all morbidity due to consequences of external causes based on HDR; per 1000 persons per year, 2007



Combination of registrations
Additional linking of HDR with COD increases the prevalence with 4 percent (see 3.2.3.1 and Annex 4).

Incidence by episode

The available possible source is:

- HDR

Crude rates

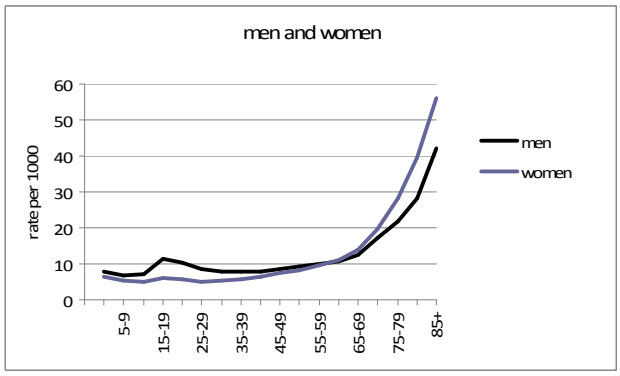
In table 4.2.45.2. the incidence by episode of all morbidity due to injury, poisoning and certain other consequences of external causes per 10,000 Dutch inhabitants is presented.

Table 4.2.45.2. Crude incidence per episode of all morbidity due to consequences of external causes per 10,000 persons in the average Dutch population, 2007.

	men	women
HDR	101	103

Age and sex specific rates are shown in figure 4.2.45.2.

Figure 4.2.45.2. Age and sex specific incidence of all morbidity due to consequences of external causes, based on HDR; episodes per 1000 persons per year, 2007



For the incidence by episode rates based on HDR, all discharges of inpatient cases and day cases in 2007 were counted. This is another definition than used for the incidence by person rates of the HDR (see 3.2.1). It assumes that every discharge marks a different acute event (episode), and is not a re-admission of patients who had previous morbidity due to injury, poisoning and certain other consequences of external causes. This may lead to some overestimation of the actual episodes.

The HDR incidences are slightly higher than the HDR year prevalences, which indicates that some persons have more than one admission for morbidity due to injury, poisoning and certain other consequences of external causes in a year. Whether these are new events or re-admissions is not clear.

Conclusion

For the prevalence estimate and the incidence estimate the HDR is the only available source. However, the HDR only covers a limited part of the cases of morbidity due to external causes as there are no data available of the emergency departments and general practitioners.

For now no best source can be indicated to make an estimate of the prevalence and incidence by episode for all morbidity due to injury, poisoning and certain other consequences of external causes.

4.2.46. Intracranial injury (S06) [58]

The indicators to be reported for intracranial injury are:

- Prevalence, defined as year prevalence, as intracranial injury is an acute event.
- Incidence by episode

Classification

For this Eurostat pilot data on ICD-10 code S06 is requested. ICPC N79 translates only in S06.0. ICPC N80 could be included, which covers codes S06.1-S06.9. On the other hand, addition of ICPC N80 include a broad range of S-codes which were not requested (S02.0, S02.1, S02.9, S08 and S09). Therefore N79 is chosen as the best selection.

The ICD-9-CM codes included are 800.1-800.4, 800.6-800.9, 801.1-801.4, 801.6-801.9, 803.1-803.4, 803.6-803.9, 804.1-804.4, 804.6-804.9, 850-854 and do fully cover ICD-10 code S06.

Period prevalence (year)

Possible sources

The requested ICD-10 codes for intracranial injury cover both concussions and more severe injuries as brain injury and epidural haemorrhage. Intracranial injury can be managed in primary care, outpatient departments, as well in hospitals. Possible sources are:

- HDR
- LINH

Multiple years LINH are not included as no cases of earlier years should be included in the prevalence estimate as prevalence here is defined as year prevalence.

As in ISS only the external causes of injuries of patients treated in emergency departments are coded and not the actual injuries, ISS is not a possible source for intracranial injury.

Crude rates

In table 4.2.46.1. the prevalence of intracranial injury per 10,000 Dutch inhabitants is presented.

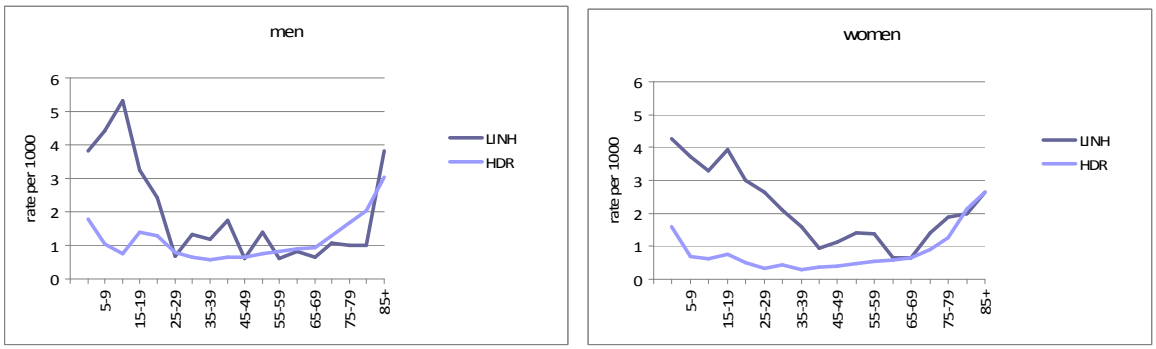
Table 4.2.46.1. Crude prevalence rates of intracranial injury per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	19	21
HDR	10	7

LINH gives the highest prevalence estimates, the rates are both for men and women higher than those of the HDR.

Age and sex specific rates are shown in figure 4.2.46.1.

Figure 4.2.46.1. Age and sex specific prevalence of intracranial injury, based on LINH and HDR; per 1000 persons per year, 2007



Combination of registrations
Using 2004 data, the number of cases found in the LINH population is increased with 70% by linking with the HDR (see 3.2.3.2 and Annex 5). When applying this factor on the 2007 LINH figures presented here, the LINH-HDR prevalence rate would be about 33 per 10,000 men and 36 per 10,000 women. Many patients are treated in the hospital for intracranial injury without intervention of the GP. Additional linking with COD increases the prevalence with only 1 percent.

Linking COD to the HDR increases the prevalence estimates with 4 percent (see 3.2.3.1 and Annex 4).

<u>Incidence by episode</u>

Possible sources:

- LINH
- HDR

Crude rates

In table 4.2.46.2. the incidence by episode of intracranial injury per 10,000 Dutch inhabitants is presented.

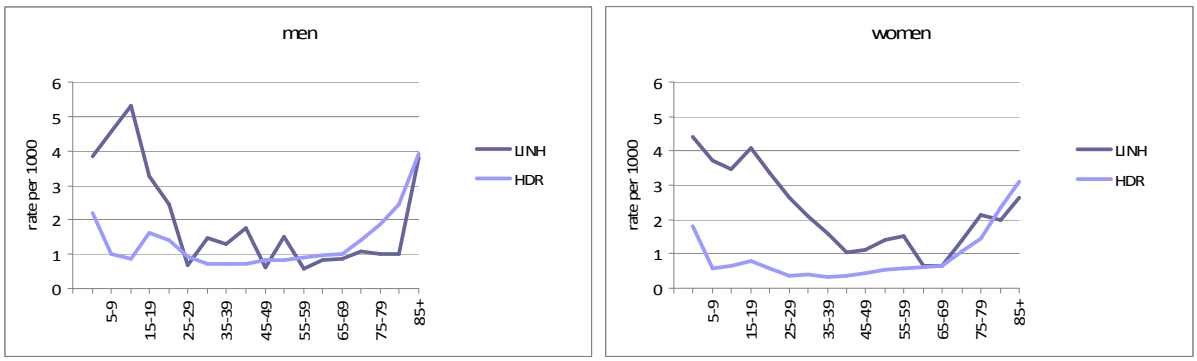
Table 4.2.46.2. Crude incidence by episode of intracranial injury per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	20	22
HDR	11	8

LINH shows the highest incidence estimates, the rates are both in men and women higher than those of the HDR.

Age and sex specific rates are shown in figure 4.2.46.2.

Figure 4.2.46.2. Age and sex specific incidence by episode of intracranial injury, based on LINH and HDR; per 1000 persons per year, 2007



For the incidence by episode rates based on HDR, all discharges of inpatient cases and day cases in 2007 were counted. This is another definition than used for the incidence by person rates of the HDR (see 3.2.1). It assumes that every discharge marks a different acute event (episode), and is not a re-admission of patients who suffered from intracranial injury earlier. This may lead to some overestimation of the actual episodes. The HDR incidences are slightly higher than the HDR year prevalences, which indicates that some persons have more than one admission for intracranial injury in a year. Whether these are new events or re-admissions is not clear.

In future it may be possible to link the incident cases of LINH with the discharges in the HDR. This linkage is not yet worked out but may be a possible source in the coming years.

Conclusion
A linkage between LINH and HDR substantially increases the prevalence estimates. LINH probably covers cases that are not present in the HDR (maybe concussions) and HDR includes cases that are not present in LINH (maybe more severe cases). LINH together with the HDR is the best source to estimate the prevalence of intracranial injury, but numbers of this linkage are not available for 2007, because of the incomplete HDR-registration in recent years. Only estimates can be made (see above). In the morbidity tables (see Annex 6) only these estimated totals are given, without age-specific data.
For the incidence by episode a linkage of LINH with the HDR could possibly be a good source. This linkage is not yet done but may be worked out in the future.
LINH gives also higher incidence estimates than data of HDR only. So in the absence of better alternatives, LINH is the best available source to calculate the incidence of intracranial injury.

4.2.47. Fracture of femur (S72) [59]

The indicators to be reported for fracture of femur are:

- Prevalence, defined as year prevalence, as a fracture of femur is an acute event.
- Incidence by episode

Classification

For this Eurostat pilot data on ICD-10 code S72 is requested. The ICPC code L75 used for LINH estimates fully covers this ICD-10 code, as do the ICD-9-CM codes 820-821, which are used for the HDR estimates.

Period prevalence (year)

Possible sources

In the Netherlands, fracture of femur is mostly managed in hospital and after that in home care, nursing homes and rehabilitation centres. Possible sources are:

- LINH
- HDR

Crude rates

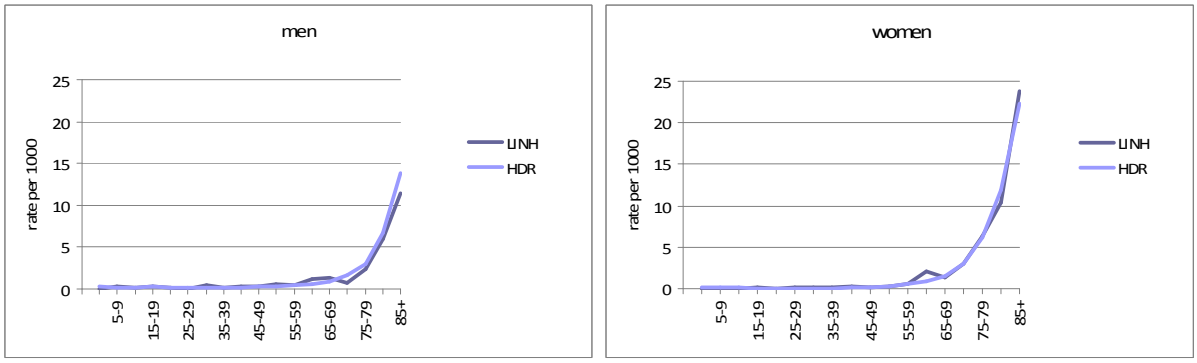
In table 4.2.47.1. the prevalence of fracture of femur per 10,000 Dutch inhabitants is presented.

Table 4.2.47.1. Crude prevalence rates of fracture of femur per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	6	15
HDR	6	15

Both sources give the same prevalence estimates. Age and sex specific rates are shown in figure 4.2.47.1.

Figure 4.2.47.1. Age and sex specific prevalence of fracture of femur, based on LINH and HDR; per 1000 persons per year, 2007



Combination of registrations

In the table and figures above the prevalence rates based on LINH and HDR are the same. However a linkage of LINH with the HDR (2004 data) shows that the prevalent persons in LINH partly differ from those in the HDR and that a combination of both sources substantially increases LINH prevalence with 86% (see 3.2.3.2 and Annex 5). Additional linking with COD increases the prevalence with only 2 percent.

When only the HDR is linked with COD, the HDR prevalence also increases with 2% (see 3.2.3.1 and Annex 4).

Maybe in LINH also older cases, who had a fracture of femur in the previous year, are counted in the year prevalence, because they were reported to the GP after surgery or during rehabilitation treatment. It is not clear whether the cases that are still rehabilitating from the surgical intervention should be counted in the year prevalence or not. In the LMR only the acute cases are reported. It depends on the definition of the year prevalence which source is preferred. Should only the patients with an actual fracture in 2007 be counted or also the cases with a fracture in earlier years but who are still are treated for the results of the fracture?

For this report the year prevalence of fracture of femur is considered to include only the acute events, i.e. the persons who had a fracture of femur in the reporting year.

<u>Incidence by episode</u>

Possible sources:

- LINH
- HDR

Crude rates

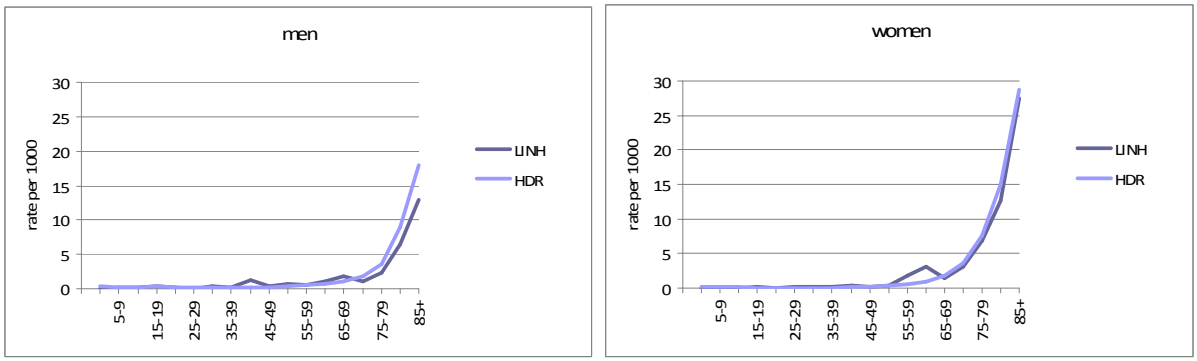
In table 4.2.47.2. the incidence by episode of fracture of femur per 10,000 Dutch inhabitants is presented.

Table 4.2.47.2. Crude incidence by episode of fracture of femur per 10,000 persons in the average Dutch population, 2007.

	men	women
LINH	8	19
HDR	7	17

As with the prevalences, the incidence rates in LINH and HDR are almost similar. Like with the prevalences, it is not clear whether some old cases are included in LINH. Age and sex specific rates are shown in figure 4.2.47.2.

Figure 4.2.47.2. Age and sex specific incidence of fracture of femur, based on LINH and HDR; per 1000 persons per year, 2007



For the incidence by episode rates based on HDR, all discharges of inpatient cases and day cases in 2007 were counted. This is another definition than used for the incidence by person rates of the HDR (see 3.2.1). It assumes that every discharge marks a different acute event (episode), and is not a re-admission of patients who had a previous fracture. This may lead to some overestimation of the actual episodes.

In the future more advanced analyses may be performed to calculate the incidence by episode of fracture of femur, by linking the HDR with COD, and by linking LINH with HDR.

Conclusion

Given the serious nature of femur fracture, hospitalisation is mostly necessary. Therefore, HDR seems to give the best estimates for the year prevalence of the acute cases of fracture of femur. Linkage with COD provides some additional cases, but in 2004 this increased the prevalence by only 2 percent. Linkage with COD is therefore not considered to be very important, and the HDR as sole source is also considered to be a good source.

Also for the incidence by episode estimates, HDR is considered to be the best available source.

4.2.48. Poisoning by drugs, medicaments and biological substances and toxic effects of substances chiefly non medicinal as to source (T36-T65) [60]

The indicators to be reported are:

- Prevalence, defined as year prevalence, as these are mainly acute events
- Incidence by episode

Classification

For this Eurostat pilot data on ICD-10 codes T36-T65 are requested, which is translated into ICD-9-CM codes 960-989 in the HDR. This fully covers the requested ICD-10 codes.

Period prevalence (year)

Possible sources

In the Netherlands poisoning by drugs, medicaments and biological substances and toxic effects of substances chiefly non medicinal as to source, is mostly managed in hospitals. A possible source is:

- HDR

A possible source is also ISS, treatments in emergency departments are reported in this register. However only the external causes are coded in ISS and not the actual injuries, so ISS is not a possible source for poisoning.

Also, a part of the poisoning cases , especially the less severe cases, are treated by the GP but these are not as such registered in the GPRNs, so the GPRNs are not a possible data source either.

Crude rates

In table 4.2.48.1. the prevalence of poisoning per 10,000 Dutch inhabitants is presented.

Table 4.2.48.1. Crude prevalence rates of poisoning per 10,000 persons in the average Dutch population, 2007.

	men	women
HDR	4	7

Age and sex specific rates are shown in figure 4.2.48.1.

Figure 4.2.48.1. Age and sex specific prevalence of poisoning, based on HDR; per 1000 persons per year, 2007

Combination of registrations
Additional linking of the HDR data with COD increases the prevalence with 5 percent (see 3.2.3.1 and Annex 4).

Incidence by episode

Possible sources:

- HDR

Crude rates

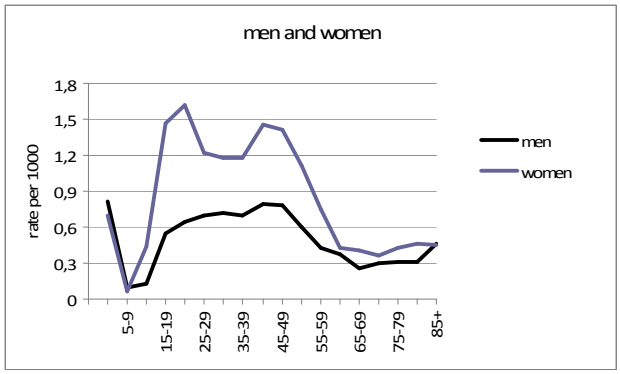
In table 4.2.48.2. the incidence by episode of poisoning per 10,000 Dutch inhabitants is presented.

Table 4.2.48.2. Crude incidence by episode of poisoning per 10,000 persons in the average Dutch population, 2007.

	men	women
HDR	5	9

Age and sex specific rates are shown in figure 4.2.48.2.

Figure 4.2.48.2. Age and sex specific incidence by episode of poisoning, based on HDR; per 1000 persons per year, 2007



For the incidence by episode rates based on HDR, all discharges of inpatient cases and day cases in 2007 were counted. This is another definition than used for the incidence by person rates of the HDR (see 3.2.1). It assumes that every discharge marks a different acute event (episode), and is not a re-admission of patients who suffered from poisoning earlier. This may lead to some overestimation of the actual episodes. The HDR incidences are slightly higher than the HDR year prevalences, which indicates that some persons have more than one admission for poisoning in a year. Whether these are new events or re-admissions is not clear.

Conclusion
For poisoning by drugs, medicaments and biological substances and toxic effects of substances chiefly non medicinal as to source, HDR is the only available data source to determine the prevalence and incidence in 2007. Linkage of HDR with COD can be a relevant source in future. However, as a substantial part of the cases of poisoning will probably be treated in emergency departments only, and no injury and poisoning data are available of these departments, no best source is available at the moment for prevalence and incidence estimates.

4.2.49. Morbidity due to different external causes [A, B, C, D, E, F, G]

The indicators to be reported for morbidity due to different external causes are:

- Prevalence, defined as year prevalence, as these external causes for morbidity are acute events.
- Incidence by episode

Classification

The types of external causes resulting in morbidity included in the Eurostat morbidity shortlist are listed in table 4.2.49.1. The ICD-9 codes in the regular published Dutch statistics based on the HDR do not always correspond exactly to the requested ICD-10 codes, as shown in the table.

Table 4.2.49.1. External causes included in this report, their requested ICD 10 codes and the selection of ICD-9-CM codes available.

	ICD-10 codes requested	ICD-9-CM codes selected:
A. All morbidity due to external causes (injuries, poisonings, etc.)	V01-Y89	E800-E999 (codes requested fully covered)
B. Land transport accidents	V01-V89	E800-E848 codes requested fully covered, but also: V00:pedestrian conveyance accidents V90-V99:water, air, space and other

		transport accidents
C. Accidental falls	W00-W19	E880-E888 codes requested fully covered, but also: X59: exposure to unspecified factors
D. Accidental poisoning	X40-X49	E850-E869 E924.1 is missing but should also be included (accident caused by caustic and corrosive substances), part of X49.
E. Intentional self harm (incl. suicidal attempt)	X60-X84	E950-E959 (codes requested fully covered)
F. Assault	X85-Y09	E960-E969 ICD-9 code E969 should be excluded: late effects of injury purposely inflicted by other person
G. Complications of medical and surgical care	Y40-Y66, Y69-Y84	No selection available Required selection: E870-879, E930-E949

Period prevalence (year)

Possible sources

As morbidity due to external causes is mostly managed in hospitals, a possible source is HDR.

A part of morbidity due to external causes is treated in the emergency departments of hospitals. The ISS (Injuries Surveillance System) is a source that records information about all patients who are treated at the Emergency Departments of Dutch hospitals. In ISS data about the cause of an accident and the circumstances in which it occurred are recorded based on inquiries made about the patient. The approximately 14 hospitals that participate in ISS form a representative sample of the general and teaching hospitals in the Netherlands. Based upon this sample a reliable estimate can be made of the total number of accident-related emergency visits of all Dutch hospitals (see 3.4). ISS is not a possible source for the prevalence as only incidence by episode is available in this source.

A part of the morbidity which is the result of external causes, especially the less severe cases, is treated by the GP. However the GP coding system does not allow coding by cause, so GPRNs are also not a possible source.

Remarks concerning different external causes

- Accidental falls (C): Both severe falls and minor falls are included. Results from those falls can vary from mild to severe injuries.
- Intentional self harm (E): In the requested ICD 10 codes for intentional self harm both the suicides as well as the suicidal attempts and self-inflicted injuries are included.
- As the ICD-10 codes for 'complications of medical and surgical care' (G; see Classification) do not correspond to the ICD-9-CM codes used in the regularly published statistics of Statistics Netherlands which are based on the HDR, there are no numbers for the HDR available. In the future, analyses can be performed on the HDR with the correct ICD-9-CM codes. As probably this diagnosis is mostly determined during a hospital admission, the HDR could be an important source in the future.

Crude rates

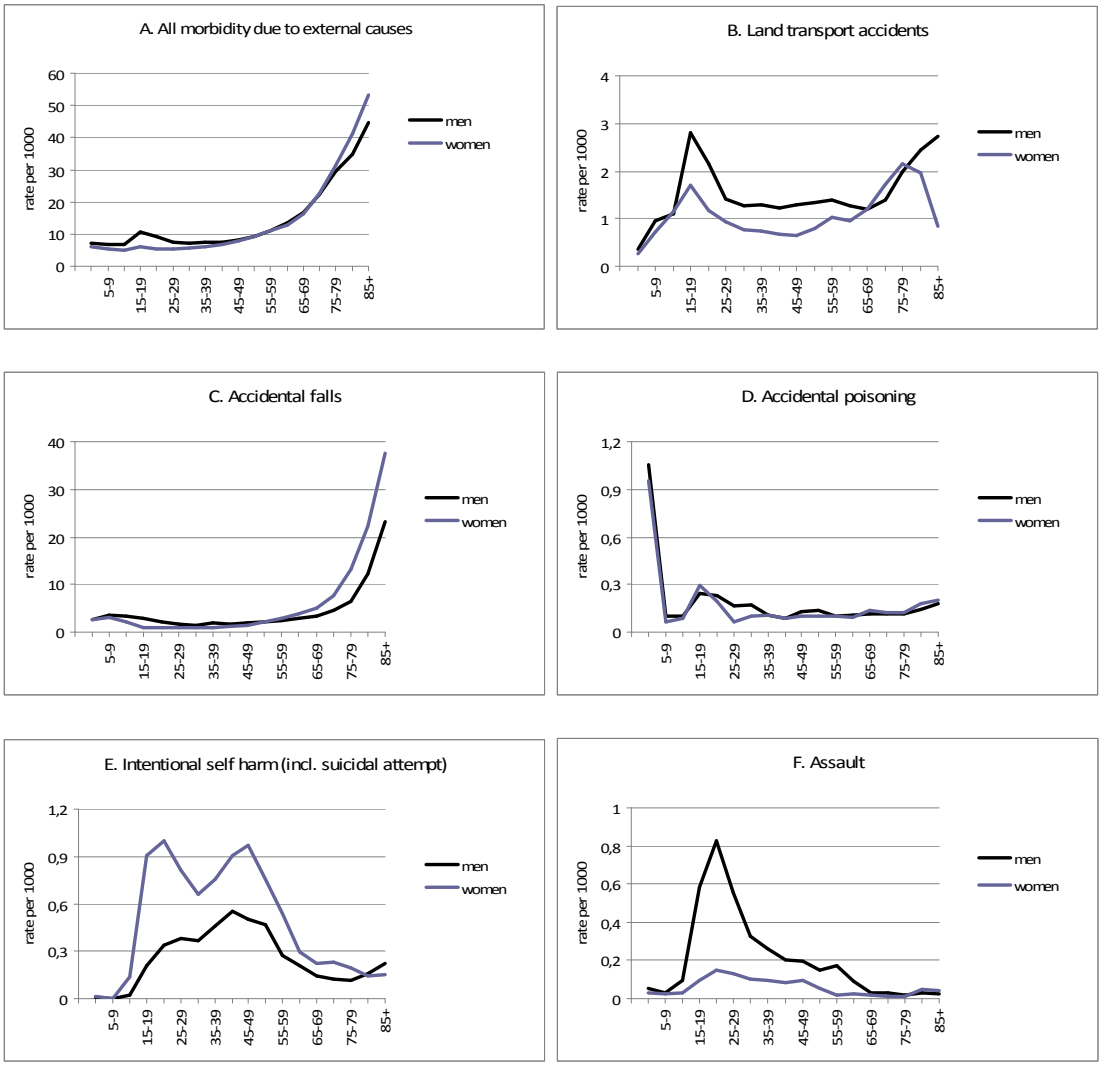
In table 4.2.49.2. the prevalence of morbidity due to different external causes per 10,000 Dutch inhabitants is presented, based on the HDR.

Table 4.2.49.2. Crude prevalence rates of morbidity due to different external causes in the HDR per 10,000 persons in the average Dutch population, 2007.

	men	women
A. All morbidity due to external causes (injuries, poisonings, etc.)	108	111
B. Land transport accidents	14	10
C. Accidental falls	30	40
D. Accidental poisoning	2	2
E. Intentional self harm (incl. suicidal attempt)	3	5
F. Assault	2	1
G. Complications of medical and surgical care	-	-

Age and sex specific rates are shown in figure 4.2.49.1.

Figure 4.2.49.1. Age and sex specific prevalence of morbidity due to different external causes, based on the HDR; per 1000 persons per year, 2007



In the hospitals the ICD-9-CM classification system is used. As some of the used ICD-9-CM codes are more limited or broader than the ICD-10 codes requested, the HDR numbers can slightly overestimate or underestimate the prevalence in hospitals (see earlier section 'Classification').

Combination of registrations

The HDR can be linked to the COD to make better estimates of the prevalence of diseases (see 3.2.3.1). In table 4.2.49.3. results from the linkage of the HDR with COD for morbidity due to external causes is shown.

Table 4.2.49.3. Increase of the prevalence estimate of HDR after linkage with COD, 2004	
A. All morbidity due to external causes (injuries, poisonings, etc.)	2%
B. Land transport accidents	3%
C. Accidental falls	1%
D. Accidental poisoning	6%
E. Intentional self harm (incl. suicidal attempt)	19%
F. Assault	8%
G. Complications of medical and surgical care	1%

Particularly the prevalence estimate of intentional self harm is substantially higher after linkage with COD. As also the succeeded suicides are included in the requested ICD-10 codes, linkage with COD is very relevant here. When we apply the 19% additional fatal cases found in 2004 on the 2007 HDR data, the prevalence rises from 2.9 to 3.4 per 10,000 in men, and from 5.5 to 6.6 per 10,000 in women.

Conclusion
The HDR is the only available source for prevalences of the different external causes (excluding 'complications of medical and surgical care'). The prevalence estimates will generally underestimate the real prevalence, as not all patients with morbidity due to external causes are hospitalized. The ISS register of emergency departments of hospitals would be a better source, but is not person-based and therefore not suitable to derive prevalences. The GP registers do not have information on external causes. Therefore, for now, in general no best source is available to estimate the prevalence of morbidity due to external causes. However, for intentional self harm it is shown that the incidence estimate based on the HDR is only slightly lower than the incidence based on ISS (see next section), which indicates that for this external cause almost all cases are hospitalized or are fatal cases. Therefore we have selected the HDR combined with COD as best source for the prevalence of intentional self harm.

For the prevalence estimate of 'complications of medical and surgical care', HDR could also be a relevant source, but due to different definitions used in the regular Dutch statistics, no prevalence data are now available. These can however be made available in future.

Incidence by episode

Possible source:

For all the different morbidity items due to external causes except 'all morbidity', ISS is a possible source.

HDR is a possible source for all items, but does not cover the non-hospitalised cases. For 'all morbidity due to external causes', intentional self harm and assault HDR data with correct translations are available. As mentioned earlier the ICD-10 codes for land transport accidents, accidental falls, accidental poisoning and 'complications of medical and surgical care' do not correspond to the ICD-9-CM codes used in the regular published Dutch statistics based on the HDR. Therefore no numbers for the HDR are available for the incidence by episode of these external causes. In the future analyses can be performed on the HDR with the correct ICD-9-CM codes

Crude rates

In table 4.2.49.4. the incidence by episode of morbidity due to different external causes per 10,000 Dutch inhabitants is presented.

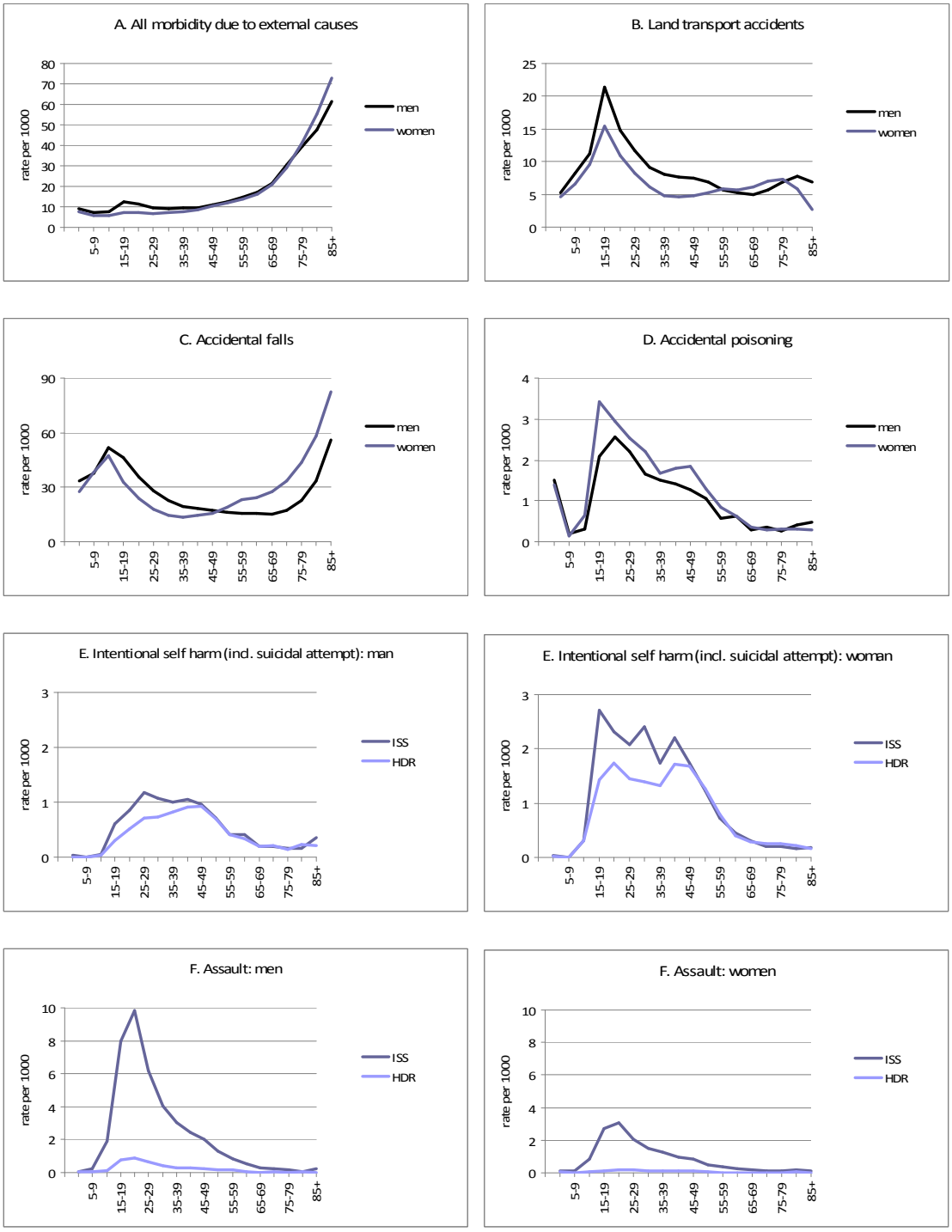
Table 4.2.49.4. Crude incidence by episode of morbidity due to different external causes per 10,000 persons in the average Dutch population, 2007.

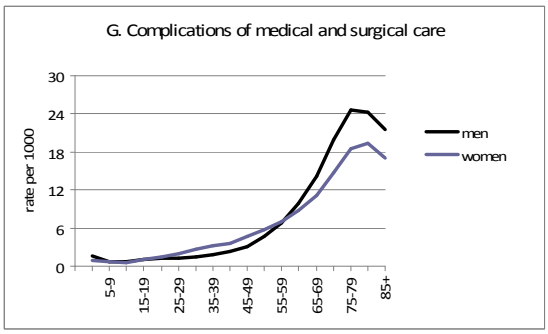
	Source	men	women
A. All morbidity due to external causes (injuries, poisonings, etc.)	HDR	136	140
B. Land transport accidents	ISS	89	68
C. Accidental falls	ISS	263	268
D. Accidental poisoning	ISS	12	14
E. Intentional self harm (incl. suicidal attempt)	HDR	5	9
	ISS	6	12
F. Assault	HDR	3	1
	ISS	27	10
G. Complications of medical and surgical care	ISS	49	54

The numbers of the ISS are a yearly average over 2005-2009.

Age and sex specific rates are shown in figure 4.2.49.2.

Figure 4.2.49.2. Age and sex specific incidence by episode of morbidity due to different external causes, based on HDR and ISS; per 1000 persons per year, 2007





For the incidence by episode rates based on HDR, all discharges of inpatient cases and day cases in 2007 were counted. This is another definition than used for the incidence by person rates of the HDR (see 3.2.1). It assumes that every discharge marks a different acute event (episode), and is not a re-admission of patients who previously had morbidity due to the same external cause. The incidence by episode is likely to be somewhat overestimated by this approach.

The HDR incidences are slightly higher than the HDR year prevalences, which indicates that some persons have more than one admission for the selected external cause in a year. Whether these are new events or re-admissions is not clear.

Conclusion
For the incidence estimate of 'all morbidity due to external causes' the HDR is the only source available. As not all patients with morbidity due to external causes are hospitalized but most of them will end up in emergency departments of hospitals the ISS seems to be a better alternative. But unfortunately, the diagnoses V01-Y89 are in this source not available. Therefore, at this moment no best source is available to estimate the incidence by episode of 'all morbidity due to external causes'.

For the incidence by episode of land transport accidents, accidental falls, accidental poisoning and 'complications of medical and surgical care', ISS is the only and best data source available. HDR data can be made available in future, but will underestimate the real incidences, with the possible exception of 'complications of medical and surgical care'.

Also for the incidence by episode of intentional self harm and assault, although numbers are available of HDR, ISS is chosen as the best data source, because it also covers non-hospitalized cases. For intentional self harm the incidences based on HDR are only slightly lower than those of ISS. In future, when HDR incidences can be linked to COD, HDR-COD could be a possible alternative source for intentional self harm incidence.

4.3 Summary of data sources used

In this chapter an attempt has been made to indicate a best data source for the estimation of incidence and/or prevalence, for each of the approximately 60 diseases and conditions on the morbidity shortlist. For most diseases, it proved to be possible to appoint a best source, and often also a second best. For other diseases it could be concluded that with the currently available data, it was not possible to deliver results, but

that these data would be available without too much effort in the future. Finally, there were a few diseases for which the currently available sources in the Netherlands cannot produce a result and that such is also unlikely in the near future. This concerns conditions where the requested ICD codes could not to be selected from the most appropriate data sources for providing the best estimates, as the ICPC coding system used in these (GP) data sources was not specific enough.

Whenever a disease-specific register was available, this was usually the best source. This was the case for tuberculosis, cancer, and HIV/AIDS. Incidence and prevalence of disorders that primarily are seen by GPs are best reflected in GP registers. In chronic diseases and other diseases that have a duration of more than one year, the combined registers of general practitioners using a problem list are generally preferred, especially for diseases for which the patient will not contact the GP annually. If these figures were not available, sometimes it was a good alternative to follow patients in the contact-based GP registration LINH for two or three years. In short-term illnesses, or chronic conditions for which the patient contacts the GP at least once a year, the contact-based GP records were appropriate. It that case, mostly data from fitted GPRNs were considered the best choice, although also data from LINH could be used.
For various disorders it was shown that combining the GP register with the Hospital Discharge Register provided significant numbers of additional prevalent cases. As the HDR coverage was too low for the reference year 2007, these analyses were performed for an earlier year. Since it is expected that the coverage of HDR will improve in the coming years, for future data this combination of registers is a good solution. This is also the case for the combination of HDR with the Causes of Death register which in some cases also can provide better estimates. For diseases that almost always lead to hospitalization, HDR is a good source. For some diseases HDR prevalence and incidence data are also available for 2007, as for the regular hospital statistics of CBS methods were developed to correct for the lack of coverage of the HDR.

For each of the diseases, Template 3 (Annex 3) shows the relevant sources used and the best choice. For each best source, incidence and prevalence estimates are presented in the Morbidity tables (Annex 6).

Chapter 5. Conclusions and recommendations

In this Netherlands Pilot project on Morbidity Statistics, CBS and RIVM, in a cooperative effort, have worked through and have evaluated the process of providing morbidity statistics for the diseases of the European diagnosis-specific morbidity shortlist.
Finding suitable data on diagnosed morbidity, reaching consensus about the 'best' source of data for each disease and for each prevalence and incidence measure, and dealing with the methodological issues that were encountered, turned out to be a challenging and worthwhile journey.

Prevalence and incidence estimates could be worked out for almost all diseases of the morbidity shortlist. However, it was also shown that different sources often resulted in large differences in the estimates. Combined with the fact that the health systems and the available data sources differ between the European countries, it is therefore expected that international harmonization of morbidity statistics will not be reached easily. Based on the results of this pilot project, we have summarized the main conclusions in this chapter, followed by some recommendations to advance the comparability of future international statistics on diagnosed morbidity.

Conclusions

Netherlands pilot results

Out of the 106 disease-measure combinations of the morbidity shortlist 98 times a best source could be identified. For 8 disease-measure combinations no suitable source was presently available. The latter was mainly due to coding problems: the requested ICD codes could not be translated into codes used in the most appropriate data source. And for the external causes of morbidity the most suitable data source does not have prevalence data.

From Based on results of the Netherlands pilot it can be concluded that whenever available, nation wide registers of specific diseases are the best sources for morbidity statistics. In the Netherlands, suitable registers are available for cancer, tuberculosis and HIV/Aids.
Due to the Dutch health care system with a general practitioner as gatekeeper of health care, general practitioner registration data are the best source of the majority of the other diseases of the shortlist. Though a nationwide General Practitioners Registration Network (GPRN) does not exist, in most cases a suitable selection of episode and/or contact based GP registrations could be made, on the basis of which national data could be extrapolated by model fitting. These fitted GPRN data were often selected as 'best source'.
For diseases where patients contact the GP at least once a year, the contact-based GPRN LINH generally is a preferred source, as it is the largest GPRN and data are readily available. For curable diseases such as asthma that generally have a duration of a number of years and do not require at least one GP visit per year, the analyses of one or two extra (previous) years in LINH can sometimes complete complement the estimate with cases not seen by the GP in the reporting year. For a number of diseases multiple year LINH data proved to be a possible alternative for fitted data of several GPRNs. LINH

microdata could also be linked to hospital discharge register and causes of death data for additional case finding, which significantly improved the estimates for some diseases (e.g. cataract, cholelithiasis, intracranial injury).
For diseases where patients generally will be hospitalized, hospital discharge register data are a good source. Through linkage at individual level with causes of death data, prevalence and incidence estimates can sometimes be improved. This is especially important for diseases that can lead to death prior to hospitalization (e.g. acute myocardial infarction).
The linkage studies that were carried out in this pilot turned out to be an asset for the further development of morbidity statistics.
For incidences of morbidity due to external causes, the Dutch injuries surveillance sentinel network proved to be a good data source. For some mental health disorders data of an epidemiological study were selected as best source. The national Health Interview Survey was occasionally selected as a possible source, e.g. for psoriasis.

Problems encountered

Definition of incidence and prevalence
The main problem encountered was a lack of specification of the exact data to be delivered. It was not always evident how incidence, period prevalence and point prevalence had to be defined. Each of these measures may require a different approach in curable diseases of short duration, curable or intermittent diseases with a duration of several years, or incurable diseases. In general, it was concluded that period prevalence should be defined as year prevalence for diseases of short duration, and as lifetime prevalence for incurable diseases. For curable diseases of longer duration year prevalence was used, but based on mostly episode-based general practitioners data or a few years follow-up of a contact-based GPRN.
Sometimes it was difficult to decide about curability: some items on the morbidity shortlist consist of a group of diseases with different perspectives and durations, such as ischaemic heart diseases and glomerular and renal tubulo-interstitial diseases. Also it is sometimes debatable when a disease can be considered as cured. For example cataract: is a person still a prevalent case after replacement of the affected lens? And is a person who had cancer in childhood prevalent for the rest of his life?
For acute diseases with a short duration, period (year) prevalence does not seem to add much to the incidence by episode measure (e.g. in the case of pneumonia, and external causes of morbidity). Also, it is not always clear why the requested indicator is incidence by person and not incidence by episode, and vice versa.

Definition of diseases in the morbidity shortlist
For some (groups of) less prevalent diseases it was difficult to obtain the required selection of ICD-codes in the most appropriate (GPRN) data source. This was for example the case with alcoholic liver disease, diseases of liver other than alcoholic and systemic connective tissue disorders. The only source that could be used in these cases was the hospital discharge register, while this was not the most appropriate one, at least not as sole source of data.
In some cases the definition of the disease group included both severe and milder forms (e.g. intracranial injury), which makes it more difficult to select a suitable data source as the different diseases are usually seen by different health care providers.

Lack of data
Although suitable data are available in the Netherlands for the majority of diseases of the shortlist, there is no recent data source for diagnosis-specific data of the population of nursing homes. For some diseases that often require prolonged stays in nursing homes, such as dementia, these data are necessary to correct the estimates for the morbidity in this specific population, especially in the older age groups.
Another limitation of the Dutch data is the present incomplete coverage of the hospital discharge register, which hampers the possibilities for record linkage. It is however expected that this data source will be complete again in the future. Furthermore, new data sources of hospital care and mental health care have become available, which can be linked at individual level in the near future, and thus can possibly become important sources for deriving morbidity statistics in the Netherlands.

Recommendations

Definition of incidence and prevalence
For future data collections it is recommended to make more precise definitions of the prevalence and incidence measures required for each item in the morbidity shortlist.
As the sources of diagnosed morbidity are often registers of patients having health care contacts (contact-based registers), it might be advisable to also practically define the prevalence and incidence measures in terms of health care contacts. Prevalence could e.g. be defined as the number of persons that had contact with the health care system for the particular disease in the reporting year (year prevalence), or in the last *x* years up to the reporting year. The latter can also be used for approximating lifetime prevalence. And incidence by person could be defined as the number of persons that had contact with the health care system in the reporting year, and did not have previous contacts for the same disease in the past *x* years. By defining the desired number of years of measurement (x) for each indicator and disease, it is expected that the international comparability of the outcome data will be improved. In general a very specific definition is desired of the data to be provided.

Choice of indicators
For some diseases, especially diseases with short duration, the types of indicators to be delivered could be reconsidered. For instance in the case of pneumonia and external causes of morbidity, it is not clear what the value is of period prevalence as an indicator.

Age and sex specific data
In the Morbidity tables (Annex 6), absolute numbers were requested for age- and sex specific data. However, this does not facilitate direct cross-country comparisons, whereas relative rates would do. Moreover, when the sample size of a data source is small, the absolute numbers suggest a higher level of precision than justified. For future data collections it is therefore recommended to present relative rates only, and to give the population size for each data source, which enables the user to judge the stability of the estimates.

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Annexes

Annex 1: Template 1: List of all potential data sources inventoried – Assessment criteria

Annex 2: Template 2: Broad description and evaluation of the data sources inventoried.

Annex 3: Template 3: Disease specific overview of potential data sources

Annex 4: Period prevalence per 10.000 persons in 2004 of selected diseases after linkage of Hospital Discharge Register with Causes of Death Register

Annex 5: Period prevalence per 10.000 persons in 2004 of selected diseases after linkage of GP-register LINH with Hospital Discharge Register and Causes of Death Register

Annex 6: Morbidity tables

Annex 7: Sources, population sizes and reference population

ANNEX 1

Template 1: List of all potential data sources inventoried – Assessment criteria

Main data sources								
Nr	**Name of the source**	**Relevance**	**Accuracy**	**Timeliness & punctuality**	**Accessibility & clarity**	**Comparability (geographical and over time)**	**Coherence**	**General assessment/ source kept**
1	Fitted GPRNs	5	3	3	3	3	3	4
2	LINH	4	3	4	4	3	4	4
3	Hospital Discharge Register (HDR)	3	4	4	5	4	4	3
4	Netherlands Cancer Registry	5	5	4	4	4	4	5
5	Netherlands Tuberculosis Register	4	5	5	5	4	4	4
6	SOAP	3	2	4	4	3	3	3
7	Dutch HIV/AIDS Monitoring Register	5	4	5	5	5	5	5
8	Injuries Surveillance System (ISS)	3	3	4	3	3	3	3
9	CMR-Sentinels (Influenza)	4	3	4	4	3	4	4
10	OSIRIS	3	5	4	4	3	3	3
Secondary / complementary data sources								
Nr	**Name of the source**	**Relevance**	**Accuracy**	**Timeliness & punctuality**	**Accessibility & clarity**	**Comparability (geographical and over time)**	**Coherence**	**General assessment/ source kept**
1	Health Interview Survey (HIS)	2	3	5	5	4	4	3
2	Nemesis-2 Mental Health Study	3	3	2	3	3	4	3
3	Causes of Death Register (for supplementary case –finding only; COD)	2	5	5	5	5	4	3
4	CVZ Drug Register	3	4	4	3	4	4	3

Template 1 provides a general overview of the potential data sources which could be used to work out the required measurements. Each source is assessed according to different criteria which are explained in details in "chapter 6 - Statistical quality" of the principles and guidelines. Each criteria should be graded from 1 to 5; **1 meaning poor and 5 very good**

ANNEX 2

Metadata of data sources inventoried (according to Eurostat template no. 2) are presented in a separate document. The following templates are included:

1. Netherlands Cancer Registry (NKR)
2. Netherlands Tuberculosis Register (NTR)
3. Netherlands Information Network of General Practice (LINH)
4. Continuous Morbidity Registration – Nijmegen (CMR-Nijmegen)
5. Registration Network of General Practitioners Associated with Leiden University (RNUH-LEO)
6. General Practice Registration Network Limburg (RNH)
7. Transition Project
8. Hospital Discharge Register (HDR)
9. Causes of Death register (COD)
10. CVZ drug register
11. NEMESIS
12. Continuous Registration of Morbidity – Sentinels (CMR)
13. Continuous Quality of Life Survey - Health interview survey (HIS)
14. Dutch Injury Surveillance System (ISS)
15. Electronic notification system Osiris (Osiris)
16. Dutch HIV/AIDS monitoring foundation (SHM)
17. Electronic notification system SOAP (SOAP)

ANNEX 3

Template 3:Disease specific overview of potential data sources

GPRN reference no	
1	CMR-Nijmegen
2	Transition Project
3	RNH
4	LINH
5	RNUH-LEO-contact
6	RNUH-LEO-problemlist

fc	ICD-10 codes requested are fully covered
X	estimate worked out, best source
/	estimate worked out, not best source
-	estimate not worked out
0	estimate not worked out, best source

Shortlist group number	**Diseases in the shortlist**	**ICD10 codes requested**	**ICD10 codes covered**	**Used translation in other classification**			**Prevalence**			**Incidence**			**Remarks**
				ICPC-1 (fitted GPRN, LINH)	*ICD-9-CM (HDR)*	*other*	*Type of measure (lifetime, year or point prevalence)*	*Potential datasources*	*Best source(s)*	*Type of measure (incidence by episode or by person)*	*Potential datasources*	*Best source(s)*	
	I Certain infectious and parasitic diseases												
1	Tuberculosis	A15-A19, B90	A15-A19, B90, J65, O98		010.0-018.9		**year**	NTR	x	**by episode**	NTR	x	prevalence deduced
2	Sexually transmitted diseases (STD)	A50-A64	A50-A54, A59, A60, A63.0 A51-A57, A59, A60, A63.0	X70, X71, X73, X90, X91, Y70, Y71, Y72, Y76			**year**	LINH	/	**by episode**	LINH STI centres	/ /	
3	Viral hepatitis (incl. hepatitis B)	B15-B19	fc B15, B16, B17.1, B18.0, B18.1	D72			**year**	LINH	x	**by episode**	LINH obligatory notification (OSIRIS)	x /	
4	Human immunodeficiency virus disease	B20-B24,	fc fc	B90			**lifetime** **point**	LINH SHM SHM	/ x x	**by episode**	LINH SHM	/ x	
	II Neoplasms												
5	All malignant neoplasms (cancer)	C00-C97	C00-C96, excluding C77-C79 n.a.			 ever had cancer?	**lifetime**	NKR HIS	x /	**by person**	NKR	x	prevalence based on data of only one regional cancer centre
6	Malignant neoplasm of oesophagus	C15	fc				**lifetime**	NKR	x	**by person**	NKR	x	
7	Malignant neoplasm of stomach	C16	fc				**lifetime**	NKR	x	**by person**	NKR	x	
8	Malignant neoplasm of colon, rectum and	C18-C21	fc				**lifetime**	NKR	x	**by person**	NKR	x	
9	Malignant neoplasm of trachea, bronchus	C33, C34	fc				**lifetime**	NKR	x	**by person**	NKR	x	
10	Malignant melanoma of skin	C43	fc				**lifetime**	NKR	x	**by person**	NKR	x	
11	Mesothelioma	C45	fc				**lifetime**	NKR	x	**by person**	NKR	x	
12	Malignant neoplasm of breast	C50	fc				**lifetime**	NKR	x	**by person**	NKR	x	
13	Malignant neoplasm of cervix uteri	C53	fc				**lifetime**	NKR	x	**by person**	NKR	x	
14	Malignant neoplasm of uterus other than	C54, C55	fc				**lifetime**	NKR	x	**by person**	NKR	x	
15	Malignant neoplasm of ovary	C56	fc				**lifetime**	NKR	x	**by person**	NKR	x	
16	Malignant neoplasm of prostate	C61	fc				**lifetime**	NKR	x	**by person**	NKR	x	
17	Malignant neoplasm of bladder	C67	fc				**lifetime**	NKR	x	**by person**	NKR	x	
18	Leukaemia and other malignant neoplasms	C81-C96	fc				**lifetime**	NKR	x	**by person**	NKR	x	

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Shortlist group number	**Diseases in the shortlist**	**ICD10 codes requested**	**ICD10 codes covered**	**Used translation in other classification**			**Prevalence**			**Incidence**			**Remarks**
				ICPC-1 (fitted GPRN, LINH)	*ICD-9-CM (HDR)*	*other*	*Type of measure (lifetime, year or point prevalence)*	*Potential datasources*	*Best source(s)*	*Type of measure (incidence by episode or by person)*	*Potential datasources*	*Best source(s)*	
	III Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism **IV Endocrine, nutritional and metabolic diseases**												
19	Diabetes mellitus	E10-E14	fc fc fc fc fc fc fc	T90 T90 T90	250	suffered from diabetes ATC A10	**lifetime** **point**	fitted GPRNs (1,2,3,4,6) LINH LINH-multiple year (2 yr) HIS CVZ Drug register Combination LINH HDR fitted GPRNs (1,2,3,4,6) LINH	X / (X) / / - X /	**by person**	fitted GPRNs (1,2,3,4,6) LINH	x /	
	V Mental and behavioural disorders												
20	Dementia (incl. Alzheimer's disease)	F00-F03, G30	fc fc	P70 P70			**lifetime**	fitted GPRNs (1,2,3,6) LINH LINH (multiple year)	x / /				data lack information on dementia diagnoses in nursing homes
21	Mental and behavioural disorders due to use of alcohol (incl. alcohol dependence)	F10	F10.1, F10.2			DSM-IV: 305.00, 303.90	**year**	NEMESIS-2	x				limited age range (18-64)
22	Mental and behavioural disorders due to use of psychoactive substances other than alcohol and tobacco (incl. drug dependence)	F11-F16, F18, F19	F11.1/2, F12.1/2, F13.1/2, F14.1/2, F15.1/2, F16.1/2, F18.1/2, F19.1/2			DSM-IV: 305.10-305.9	**year**	NEMESIS-2	x				limited age range (18-64)
23	Schizophrenia	F20-F29	F20, F21, F22.0, F22.8/9, F20, F21, F22.0, F22.8/9,	P72 P72 and P98			**lifetime**	fitted GPRNs (1,2,3,6) LINH LINH-multiple year (3 yr)	/ / x				
24	Depression and other affective disorders	F30-F39	F30-F39, F41.2, F53.0	P73 and P76		at least 2 weeks very depressed or down	**year**	LINH HIS	x /				
25	Anxiety disorders	F40, F41	F40, F41 except F41.2	P74 and P79		at least 2 weeks very afraid or concerned	**year**	LINH HIS	x /				
26	Eating disorders	F50	F50.0/4	T06			**year**	LINH	x				

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0	estimate not worked out, best source

Shortlist group number	**Diseases in the shortlist**	**ICD10 codes requested**	**ICD10 codes covered**	**Used translation in other classification**			**Prevalence**			**Incidence**			**Remarks**
				ICPC-1 (fitted GPRN, LINH)	*ICD-9-CM (HDR)*	*other*	*Type of measure (lifetime, year or point prevalence)*	*Potential datasources*	*Best source(s)*	*Type of measure (incidence by episode or by person)*	*Potential datasources*	*Best source(s)*	
	VI Diseases of the nervous system												
27	Parkinson's disease	G20	G20-G22 G20-G22 fc	N87 N87	 332		**lifetime**	fitted GPRNs (1,2,3,4,6) LINH LINH (Multiple year) Combination LINH, HDR, COD	x / / -				data lack information on Parkinson diagnoses in nursing homes
28	Multiple sclerosis	G35	fc fc fc fc	N86 N86 N86	 340		**lifetime**	fitted GPRNs (1,2,3,4,6) LINH LINH (Multiple year) HDR Combination LINH, HDR	x / -				
29	Epilepsy	G40, G41	fc fc	N88 N88			**year**	fitted GPRNs (1,2,3,6) LINH LINH (Multiple year)	x / /				
30	Migraine and other headache syndromes	G43, G44	G43, G44 (excluding G44.3, G44.4 and G44.8)	N89, N90, N02		migraine or frequent serious headache	**year**	LINH LINH (Multiple year) HIS	X / /				
	VII Diseases of the eye and adnexa												
31	Cataract	H25, H26,	fc fc fc fc	F92 F92 F92	 366 366		**year**	fitted GPRNs (1,3) LINH HDR Combination LINH, HDR	/ / / 0				
32	Glaucoma	H40, H42	fc fc fc fc	F93 F93 F93 F93	 365		**lifetime**	fitted GPRNs (1,2,3,6) LINH LINH (multiple year) Combination LINH, HDR	X / / -				

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Shortlist group number	**Diseases in the shortlist**	**ICD10 codes requested**	**ICD10 codes covered**	**Used translation in other classification**			**Prevalence**			**Incidence**			**Remarks**
				ICPC-1 (fitted GPRN, LINH)	*ICD-9-CM (HDR)*	*other*	*Type of measure (lifetime, year or point prevalence)*	*Potential datasources*	*Best source(s)*	*Type of measure (incidence by episode or by person)*	*Potential datasources*	*Best source(s)*	
	VIII Diseases of the ear and mastoid process												
33	Hearing loss	H90, H91	H90, H91, H83.3	H84-H86			**lifetime**	fitted GPRNs (1,3)	X	n.a.			
			fc	H84, H86				LINH	/				
								LINH (multiple year)	/				
	IX Diseases of the circulatory system												
34	Hypertensive diseases	I10-I13, I15	fc	K86-K87			**lifetime**	LINH	/	**n.a.**			
			fc	K86-K87				LINH-multiple year (3 yr)	X				
						'high blood pressure'		HIS	/				
35	Ischaemic heart diseases	I20-I25	fc	K74-K76			**lifetime**	fitted GPRNs (1,3,6)	X	**n.a.**			
			fc	K74-K76				LINH	/				
			fc	K74-K76				LINH (multiple year)	/				
			fc		410-414			HDR	/				
			fc		410-414			Combination LINH, HDR, COD	-				
			fc		410-414			Combination HDR, COD	-				
36	Acute myocardial infarction	I21, I22	I21, I22, I23, I24.1	K75			**year**	LINH	/	**by person**	LINH	/	
			fc		410			HDR	/		HDR	/	
						'acute myocardial infarction'		HIS	/				
			I21, I22, I23, I24.1	K75	410			Combination LINH, HDR, COD	-				
			fc		410			Combination HDR, COD	0		Combination HDR, COD	-	
											Fitted GPRN (1,2,3,4,5)	X	
37	Heart failure	I50	fc	K77			**lifetime**	Fitted GPRN (1,2,3,4,6)	X	**n.a.**			
			fc	K77				LINH	/				
			fc	K77				LINH (multiple year)	/				
			fc		428			HDR	/				
			fc	K77	428			Combination LINH, HDR, COD	-				
38	Cerebrovascular diseases	I60-I69	I60-I64	K90			**lifetime**	Fitted GPRN (1,3,6)	X	**by person**	Fitted GPRN (1,2,3,4,6)	X	Data lack information on cerebrovascular diseases in
			I60-I64	K90				LINH	/		LINH	/	
			I60-I64	K90				LINH (multiple year)	/				
			fc		430-434, 436-			HDR	/		HDR	/	
						Ever stroke/ cerebrovascular		HIS	/				
			fc		430-434, 436-			Combination HDR, COD	-		Combination HDR, COD	-	

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/	estimate worked out, not best source
-	estimate not worked out
0	estimate not worked out, best source

Shortlist group number	**Diseases in the shortlist**	**ICD10 codes requested**	**ICD10 codes covered**	**Used translation in other classification**			**Prevalence**			**Incidence**			**Remarks**
				ICPC-1 (fitted GPRN, LINH)	*ICD-9-CM (HDR)*	*other*	*Type of measure (lifetime, year or point prevalence)*	*Potential datasources*	*Best source(s)*	*Type of measure (incidence by episode or by person)*	*Potential datasources*	*Best source(s)*	
	X Diseases of the respiratory system												
39	Influenza	J09-J11	J10-J11 acute influenza-like infection	R80		acute influenza-like infections, that meet the Pel criteria'	**n.a.**			**by episode**	LINH CMR-Dutch Sentinel General Practice Network	/ X	
40	Pneumonia	J12-J18	J12-J18, J10.0, J11.0, A48.1 J12-J18, J10.0, J11.0, A48.1	R81 R81	 480-486		**year**	 LINH HDR	 X /	**by episode**	Fitted GPRN (1,2,4,6) LINH HDR	X X /	
41	Asthma	J45, J46	fc fc fc	R96 R96 R96			**year**	Fitted GPRN (1,2,4,5) LINH LINH-multiple year (2 yr)	/ / X	**by person**	Fitted GPRN (1,2,4,5) LINH	X /	
42	Chronic lower respiratory diseases other than **XI Diseases of the digestive system**	J40-J44, J47	J41-J44, J47 J41-J44, J47 J41-J44, J47 fc fc	R91, R95 R91, R95 R91, R95 R91, R95	 490-492, 494, 496 490-492, 494, 496		**lifetime**	Fitted GPRN (1,2,3,4,6) LINH LINH-multiple year (2 yr) HDR LINH-HDR combination	X / (X) / -	**by person**	Fitted GPRN (1,2,3,4,6) LINH HDR	X X /	
43	Gastric and duodenal ulcer (peptic ulcer)	K25-K28	K25-K28, E16.4 K25-K28, E16.4 K26	D85, D86 D85, D86	 531-534		**year**	Fitted GPRN (1,2,4,5) LINH HDR	X / /	**n.a.**			
44	Alcoholic liver disease	K70	fc		571.0-571.3		**lifetime**	HDR	X	**n.a.**			only year prevalence available
45	Diseases of liver other than alcoholic	K71-K77			570, 571.4-571.9 and 572-573		**lifetime**	HDR	X	**n.a.**			only year prevalence available
46	Cholelithiasis **XII Diseases of the skin and subcutaneous tissue**	K80	K80-K83, K87 fc fc	D98	 574 574		**year**	LINH HDR LINH-HDR combination	X / -	**by person**	LINH HDR LINH-HDR combination	X / -	
47	Dermatitis and eczema	L20-L30	L20 L23-25, L27 (part), L30 L20-L25, L27 (part), L30	S87 S88 S86-S89, D05		 Chronic eczema	**year**	Fitted GPRN (1,2,4,5) Fitted GPRN (1,2,4,5) LINH HIS	/ / X /	**n.a.**			
48	Psoriasis	L40	fc fc fc	S91 S91		 suffer from 'psoriasis'	**lifetime**	LINH LINH (multiple year) HIS	/ / X	**n.a.**			

GPRN reference no	
1	CMR-Nijmegen
2	Transition Project
3	RNH
4	LINH
5	RNUH-LEO-contact
6	RNUH-LEO-problemlist

fc	ICD-10 codes requested are fully covered
X	estimate worked out, best source
/	estimate worked out, not best source
-	estimate not worked out
0	estimate not worked out, best source

Shortlist group number	Diseases in the shortlist	ICD10 codes requested	ICD10 codes covered	Used translation in other classification			Prevalence			Incidence			Remarks
				ICPC-1 (fitted GPRN, LINH)	*ICD-9-CM (HDR)*	*other*	*Type of measure (lifetime, year or point prevalence)*	*Potential datasources*	*Best source(s)*	*Type of measure (incidence by episode or by person)*	*Potential datasources*	*Best source(s)*	
	XIII Diseases of the musculoskeletal system and connective tissue												
49	Rheumatoid arthritis	M05, M06	M05,M06,M08,M45 M05,M06,M08,M45 M05,M06,M08,M45 fc not clear	L88 L88 L88	714	chronical inflammation of the joints	**lifetime**	Fitted GPRN (1,3,5) LINH LINH-multiple year (3 yr) HDR HIS	X / (X) / /	**n.a.**			
50	Arthrosis	M15-M19	M13, M15-M19 M13, M15-M19 M13, M15-M19 fc not clear	L89-L91 L89-L91 L89-L91	715	arthritis or osteoarthritis of hip or knee	**lifetime**	Fitted GPRN (1,3,6) LINH LINH (multiple year) HDR HIS	X / / / /	**n.a.**			
51	Systemic connective tissue disorders	M30-M36			136.1, 279.4,		**lifetime**	HDR	/	**n.a.**			
52	Spondylopathies and other dorsopathies (incl. low back pain)	M45-M54	M43, M46-M54 (excl 46.3, 46.4, 46.6, 54.1), S33.5, S33.7 M43, M46-M54 (excl 46.3, 46.4, 46.6, 54.1), S33.5, S33.7 M43, M46-M54 (excl 46.3, 46.4, 46.6, 54.1), S33.5, S33.7 not clear	L01-L03, L83-L84,L86 L01-L03, L83-L84,L86 L01-L03, L83-L84,L86		long lasting illness of the back	**year**	Fitted GPRN (2,4,6) LINH LINH-multiple year HIS	X / / /	**n.a.**			
53	Osteoporosis	M80-M82	fc fc fc fc	L95 L95 L95	733.0		**lifetime**	Fitted GPRN (1,2,6) LINH LINH-multiple year HDR	X / / /	**n.a.**			
	XIV Diseases of the genitourinary system												
54	Glomerular and renal tubulo-interstitial diseases	N00-N08, N10-N16	N00-N08, N10-12, N14-N16 N00-N08, N10-12, N14-N16	U70 and U88 U70 and U88	580-582, 583.0-583.4, 583.8-583.9, 590.0-590.2, 590.8-590.9, 591, 593.3-593.5, 593.7		**lifetime**	LINH LINH-multiple year (3 yr) HDR Combination LINH-HDR	/ X / -	**n.a.**			
55	Renal failure	N17-N19			583.6-583.7, 584-586		**lifetime**	HDR	X	**n.a.**			
56	Urolithiasis	N20-N23	U95, U14		592, 594, 788.0		**year**	LINH HDR Combination LINH-HDR	X / -	**by person**	LINH HDR	X /	

GPRN reference no	
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fc	ICD-10 codes requested are fully covered
X	estimate worked out, best source
/	estimate worked out, not best source
-	estimate not worked out
0	estimate not worked out, best source

Shortlist group number	**Diseases in the shortlist**	**ICD10 codes requested**	**ICD10 codes covered**	**Used translation in other classification**			**Prevalence**			**Incidence**			**Remarks**
				ICPC-1 (fitted GPRN, LINH)	*ICD-9-CM (HDR)*	*other*	*Type of measure (lifetime, year or point prevalence)*	*Potential datasources*	*Best source(s)*	*Type of measure (incidence by episode or by person)*	*Potential datasources*	*Best source(s)*	
	XIX Injury, poisoning and certain other consequences of external causes												
57	All morbidity due to injury, poisoning and certain other consequences of external causes	S00-T98	fc		800-999		**year**	HDR	/	**by episode**	HDR	/	Incidence is number of discharges
			fc		800-999			Combination HDR, COD	-				
58	Intracranial injury	S06	fc		800.1-800.4, 800.6-800.9, 801.1-801.4, 801.6-801.9, 803.1-803.4, 803.6-803.9, 804.1-804.4, 804.6-804.9, 850-854		**year**	HDR	/	**by episode**	HDR	/	Incidence is number of discharges
			S06.0	N79				LINH	/		LINH	X	
			S06.0 (LINH)	N79	800.1-800.4, 800.6-800.9, 801.1-801.4, 801.6-801.9, 803.1-803.4, 803.6-803.9, 804.1-804.4, 804.6-804.9, 850-854			Combination LINH, HDR	0				
			fc		800.1-800.4, 800.6-800.9, 801.1-801.4, 801.6-801.9, 803.1-803.4, 803.6-803.9, 804.1-804.4, 804.6-804.9, 850-854			Combination HDR, COD	-				
59	Fracture of femur	S72	fc		820-821		**year**	HDR	X	**by episode**	HDR	X	Incidence is number of discharges
			fc	L75				LINH	/		LINH	/	
			fc	L75	820-821			Combination LINH, HDR, COD	-				
			fc		820-821			Combination HDR, COD	-				
60	Poisoning by drugs, medicaments and biological substances and toxic effects of substances	T36-T65	fc		960-989		**year**	HDR	/	**by episode**	HDR	/	Incidence is number of discharges
			fc		960-989			Combination HDR, COD	-				

GPRN reference no	
1	CMR-Nijmegen
2	Transition Project
3	RNH
4	LINH
5	RNUH-LEO-contact
6	RNUH-LEO-problemlist

fc	ICD-10 codes requested are fully covered
X	estimate worked out, best source
/	estimate worked out, not best source
-	estimate not worked out
0	estimate not worked out, best source

Shortlist group number	**Diseases in the shortlist**	**ICD10 codes requested**	**ICD10 codes covered**	**Used translation in other classification**			**Prevalence**			**Incidence**			**Remarks**
				ICPC-1 (fitted GPRN, LINH)	*ICD-9-CM (HDR)*	*other*	*Type of measure (lifetime, year or point prevalence)*	*Potential datasources*	*Best source(s)*	*Type of measure (incidence by episode or by person)*	*Potential datasources*	*Best source(s)*	
	XX External causes of morbidity and mortality												
A	All morbidity due to external causes (injuries, poisonings, etc.)	V01-Y89	fc fc		E800-E999 E800-E999		**year**	HDR Combination HDR, COD	/ -	**by episode**	HDR	/	Incidence is number of discharges
B	Land transport accidents	V01-V89	V0, V01-V89, V90-V99 fc		E800-E848 E800-E829	'Traffic accident'	**year**	HDR Combination HDR, COD	/ -	**by episode**	ISS	X	
C	Accidental falls	W00-W19	W00-W19, X59 W00-W19, X59		E880-E888 E880-E888	'Accidental fall'	**year**	HDR Combination HDR, COD	/ -	**by episode**	ISS	X	
D	Accidental poisoning	X40-X49	X40-X49, excluding parts of X49 encoded by ICD-9 924.1		E850-E869	Missing E924.1 'Poisoning'	**year**	HDR Combination HDR, COD	/ -	**by episode**	ISS	X	
E	Intentional self harm (incl. suicidal attempt)	X60-X84	fc		E950-E959 E950-E959	'Automulilation'	**year**	HDR Combination HDR, COD	/ 0	**by episode**	HDR ISS	X	Incidence is number of discharges
F	Assault	X85-Y09	X85-Y09; Y871 X85-Y09; Y871		E960-E969 E960-E969	'Violence injury'	**year**	HDR Combination HDR, COD	/ -	**by episode**	HDR ISS	X	Incidence is number of discharges
G	Complications of medical and surgical care	Y40-Y66, Y69-Y84	fc		E870-E879, E930-E949	'Medical complications hospital admission'	**year**	Combination HDR, COD	-	**by episode**	ISS	X	

ANNEX 4

Period prevalence per 10.000 persons in 2004 of selected diseases after linkage of Hospital Discharge Register with Causes of Death Register

Shortlist group number	Diseases in the shortlist	Weighted population	Using primary causes of death			Using primary and secondary causes of death		
			HDR	COD	HDR+ COD	HDR	COD	HDR+ COD
35	Ischemic heart disease	16.325.345	-	-	-	42,6	11,7	52,1
36	Acute myocardial infarction	16.325.345	12,9	6,1	17,9			
38	Cerebrovascular diseases	16.325.345	-	-	-	16,4	9,2	22,2
57	All morbidity due to injury, poisoning and certain other consequences of external causes	16.325.345	-	-	-	77,2	5,3	80,6
58	Intracranial injury	16.325.345	-	-	-	7,1	0,5	7,4
59	Fracture of femur	16.325.345	-	-	-	10,4	0,8	10,6
60	Poisoning by drugs, medicaments and biological substances and toxic effects of substances chiefly nonmedicinal as to source	16.325.345	-	-	-	5,8	0,3	6,1
A	All morbidity due to external causes (injuries, poisonings, etc.)	16.325.345	103,8	3,2	105,9	-	-	-
B	Land transport accidents	16.325.345	11,3	0,5	11,7	-	-	-
C	Accidental falls	16.325.345	31,2	0,7	31,5	-	-	-
D	Accidental poisoning	16.325.345	1,5	0,1	1,6	-	-	-
E	Intentional self harm (incl. suicidal attempt)	16.325.345	4,5	1,0	5,4	-	-	-
F	Assault	16.325.345	1,3	0,1	1,4	-	-	-
G	Complications of medical and surgical care	16.325.345	-	-	-	42,6	0,4	43,0

For the HDR the principal diagnosis is used, except for the external causes of diseases, which are only coded as secondary diagnoses in the HDR. For the COD register results are presented for primary causes of death only, or for primary and secundary causes of death. Diseases 57-60 are registered as secundary causes of death only.

ANNEX 5

Period prevalence per 10.000 persons in 2004 of selected diseases after linkage of GP-register LINH with Hospital Discharge Register and Causes of Death Register

For the HDR principal and secondary diagnoses were used, and for the COD register primary and secondary causes of death.

Shortlist group number	Diseases in the shortlist		2002-2004			2003-2004			2004		
		LINH-population	LINH	LINH+HDR	LINH+HDR+COD	LINH	LINH+HDR	LINH+HDR+COD	LINH	LINH+HDR	LINH+HDR+COD
19	Diabetes mellitus	83.538	477	487	488	452	462	463	418	427	429
27	Parkinson	83.538	19	21	21	16	18	19	13	14	15
28	Multiple sclerosis	83.538	9	12	12	8	10	10	7	8	8
31	Cataract	83.538	94	209	209	68	153	153	39	87	87
32	Glaucoom	83.538	50	53	53	37	38	38	24	25	25
35	Ischaemic heart diseases	83.538	395	434	439	343	377	383	278	303	309
36	Acute myocardial infarction	83.538	93	116	120	78	96	100	61	72	76
37	Heart failure	83.538	176	190	192	153	165	166	122	130	133
38	Cerebrovascular diseases	83.538	105	123	125	89	105	107	68	79	81
42	Chronic lower respiratory diseases other than asthma (incl. COPD)	83.538	292	308	310	251	265	266	197	206	208
46	Cholelithiasis	83.538	67	80	80	48	58	58	27	34	34
48	Psoriasis	83.538	119	119	119	97	97	97	66	66	66
49	Reumatoide artritis	83.538	107	110	110	84	87	88	58	60	60
50	Artrose	83.538	361	388	388	272	295	295	174	187	187
54	Glomerular and renal tubulo-interstitial diseases	83.538	38	48	48	27	35	35	15	19	19
56	Urolithiasis	83.538	82	90	90	57	63	63	31	35	35
58	Intracranial injury	83.538	58	92	92	37	62	62	19	33	33
59	Fracture of femur	83.538	27	51	51	20	37	38	12	22	22

ANNEX 6

Diagnosis-specific morbidity statistics in tables (Morbidity tables)

Diagnosis-specific morbidity statistics

Chapter I Certain infectious and parasitic diseases

Country:	The Netherlands
Year:	2007

See also sheet 'Explanations'

	Incidence by episode			**all ages**	**all ages**	**all ages**	age groups, absolute number*																	
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
1	Tuberculosis	A15-A19, B90	males	1	1	548	18	6	5	38	36	51	53	51	53	41	38	32	28	25	20	27	17	9
			females	0	0	412	7	6	6	33	32	44	47	31	32	25	23	20	18	22	19	19	14	14
2	Sexually transmitted diseases (STD)	A50-A64	males																					
			females																					
3	Viral hepatitis (incl. hepatitis B)	B15-B19	males	6	6	4,662	124	70	0	318	369	254	228	453	1,086	308	634	490	251	77	0	0	0	0
			females	6	6	4,906	128	71	0	401	339	577	498	861	447	621	481	0	249	159	74	0	0	0
4	Human immunodeficiency virus disease (HIV/AIDS)	B20-B24, Z21	males	1	1	937	2	3	0	12	54	101	123	186	172	115	74	47	20	20	5	2	1	0
			females	0	0	216	1	1	0	5	29	39	37	33	33	17	8	5	3	2	2	0	1	0

	Period prevalence			**all ages**	**all ages**	**all ages**	age groups, absolute number*																	
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
1	Tuberculosis	A15-A19, B90	males		1	586																		
			females		1	449																		
2	Sexually transmitted diseases (STD)	A50-A64	males																					
			females																					
3	Viral hepatitis (incl. hepatitis B)	B15-B19	males	5	6	4,505	124	70	0	318	369	254	228	377	1,086	308	634	409	251	77	0	0	0	0
			females	6	6	4,828	128	71	0	401	339	577	498	861	447	544	481	0	249	159	74	0	0	0
4	Human immunodeficiency virus disease (HIV/AIDS)	B20-B24, Z21	males	10	9	7,554	60	22	24	146	776	1,425	1,673	1,496	906	486	277	192	26	26	15	4	0	0
			females	4	3	2,790	58	12	8	221	504	687	582	325	173	101	57	35	19	8	0	0	0	0

	Point prevalence			**all ages**	**all ages**	**all ages**	age groups, absolute number*																	
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
1	Tuberculosis	A15-A19, B90	males																					
			females																					
2	Sexually transmitted diseases (STD)	A50-A64	males																					
			females																					
3	Viral hepatitis (incl. hepatitis B)	B15-B19	males																					
			females																					
4	Human immunodeficiency virus disease (HIV/AIDS)	B20-B24, Z21	males	9	9	7,502	60	22	24	146	776	1,425	1,669	1,488	898	477	272	182	22	24	14	3	0	0
			females	4	3	2,776	58	12	8	221	504	687	582	323	170	93	56	35	19	8	0	0	0	0

* provision of data by age is voluntary; please provide absolute number; if absolute number cannot be provided, please provide crude rates (using Eurostat population data).

core data

data not requested for this diagnosis-measure combination

Diagnosis-specific morbidity statistics

Chapter II Neoplasms

Country:	The Netherlands
Year:	2007

See also sheet 'Explanations'

	Incidence by person			**all ages**	**all ages**	**all ages**	age groups, absolute number*																	
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
5	All malignant neoplasms (cancer)	C00-C97	males	49	57	46,728	85	76	59	116	174	254	364	552	840	1,382	2,417	4,137	6,733	7,214	7,588	7,012	4,591	3,134
			females	40	52	43,035	77	67	66	104	149	333	535	1,065	1,799	2,802	3,829	4,289	5,440	4,933	4,972	4,647	4,219	3,709
6	Malignant neoplasm of oesophagus	C15	males	1	2	1,375	0	0	0	0	0	0	0	6	16	42	100	191	240	221	190	185	133	51
			females	0	1	501	0	0	0	0	0	0	1	1	3	10	28	38	60	69	77	70	71	73
7	Malignant neoplasm of stomach	C16	males	1	2	1,265	0	0	0	0	0	0	4	8	23	38	63	100	147	212	193	211	151	115
			females	1	1	755	0	0	0	0	1	9	5	16	19	35	40	53	81	78	84	128	110	96
8	Malignant neoplasm of colon, rectum and anus	C18-C21	males	7	8	6,596	0	0	0	0	2	5	19	44	94	179	358	529	1,000	1,018	1,133	1,088	715	412
			females	5	7	5,682	0	0	2	1	3	9	13	47	92	164	292	457	642	689	817	887	869	698
9	Malignant neoplasm of trachea, bronchus and lung	C33, C34	males	7	8	6,729	0	0	0	2	0	3	6	31	48	142	339	619	975	1,121	1,279	1,190	700	274
			females	4	5	4,047	0	0	0	1	2	5	5	26	88	247	420	522	680	593	604	464	270	120
10	Malignant melanoma of skin	C43	males	2	2	1,816	2	0	1	10	17	31	49	96	143	176	189	191	271	208	157	136	82	57
			females	2	3	2,253	0	3	1	15	43	71	116	184	246	211	221	212	234	189	168	148	101	90
11	Mesothelioma	C45	males	0	1	435	0	0	0	0	0	0	0	0	1	7	16	37	65	91	99	71	30	18
			females	0	0	71	0	0	0	0	0	0	1	0	0	1	5	8	9	6	13	12	11	5
12	Malignant neoplasm of breast	C50	males	0	0	92	0	0	0	0	0	0	0	1	2	8	4	9	14	17	12	9	10	6
			females	13	16	13,005	0	0	0	2	11	66	179	437	857	1,419	1,742	1,538	1,712	1,439	1,245	769	806	783
13	Malignant neoplasm of cervix uteri	C53	males	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			females	1	1	699	0	0	0	0	2	36	62	96	105	71	74	66	37	31	31	36	26	26
14	Malignant neoplasm of uterus other than cervix	C54, C55	males	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			females	2	2	1,915	0	0	0	0	1	2	5	3	26	59	141	271	369	317	220	207	181	113
15	Malignant neoplasm of ovary	C56	males	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			females	1	1	1,203	1	0	5	3	8	14	9	21	33	77	105	142	188	154	135	146	90	72
16	Malignant neoplasm of prostate	C61	males	10	12	9,559	0	0	0	0	0	0	0	3	13	60	282	847	1,711	2,006	1,979	1,513	758	387
			females	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Malignant neoplasm of bladder	C67	males	2	3	2,172	0	0	0	0	0	0	2	5	11	53	86	136	261	301	378	384	343	212
			females	1	1	667	0	0	0	0	0	1	3	3	8	13	44	43	60	68	109	109	108	98
18	Leukaemia and other malignant neoplasms of lymphoid and haematopoietic tissue	C81-C96	males	4	5	4,020	40	48	34	46	53	46	70	87	134	195	284	384	462	474	543	565	376	179
			females	3	4	3,045	41	26	26	32	44	50	38	71	93	147	196	241	355	307	373	408	349	248

	Period prevalence			**all ages**	**all ages**	**all ages**	age groups, absolute number*																	
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
5	All malignant neoplasms (cancer)	C00-C97	males	273	318	258,887	293	616	791	1,228	1,550	1,993	2,964	4,780	6,295	8,828	12,364	19,961	32,196	37,210	41,133	40,163	28,272	18,249
			females	300	388	322,263	264	564	707	905	1,119	1,822	3,282	7,337	12,977	19,510	28,027	35,650	41,963	36,859	36,572	35,795	29,981	28,931
6	Malignant neoplasm of oesophagus	C15	males	4	4	3,545	0	0	0	0	0	0	5	16	42	117	288	423	588	555	560	475	329	145
			females	1	2	1,471	0	0	0	0	5	0	1	1	8	15	67	128	202	206	230	221	206	180
7	Malignant neoplasm of stomach	C16	males	5	6	4,811	0	0	0	0	0	5	19	34	75	198	229	395	541	772	741	785	578	437
			females	2	3	2,892	0	0	0	6	6	14	15	31	56	111	128	199	228	316	311	540	503	428
8	Malignant neoplasm of colon, rectum and anus	C18-C21	males	42	49	40,089	0	0	6	11	8	42	59	240	451	922	1,621	2,916	5,216	6,115	7,238	6,859	5,127	3,259
			females	32	47	39,048	0	0	2	18	14	29	77	231	481	769	1,448	2,847	4,071	4,432	5,605	6,549	6,126	6,352
9	Malignant neoplasm of trachea, bronchus and lung	C33, C34	males	20	24	19,673	0	0	0	2	6	8	21	88	163	340	893	1,674	2,638	3,195	3,786	3,680	2,184	995
			females	12	16	12,911	5	0	0	1	18	15	29	57	198	679	1,382	1,560	2,029	1,734	1,991	1,796	1,009	407
10	Malignant melanoma of skin	C43	males	18	21	16,878	2	5	7	39	86	195	317	911	1,134	1,491	1,673	1,988	2,391	2,092	1,703	1,387	896	562
			females	26	31	25,508	5	19	12	71	227	416	766	1,725	2,180	2,538	2,615	2,804	3,051	2,120	2,132	1,928	1,579	1,318
11	Mesothelioma	C45	males	1	1	1,061	0	0	0	0	0	0	0	0	6	23	27	77	156	216	259	180	82	35
			females	0	0	170	0	0	0	0	0	0	1	0	0	6	11	19	26	30	31	24	17	5
12	Malignant neoplasm of breast	C50	males	1	1	674	0	0	0	0	0	0	5	6	18	13	43	100	111	65	86	63	97	67
			females	138	174	144,901	0	0	0	2	27	196	717	2,300	5,713	9,935	15,782	19,316	21,634	17,610	15,983	14,024	11,267	10,395
13	Malignant neoplasm of cervix uteri	C53	males	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			females	11	13	10,858	0	0	0	0	7	116	292	999	1,424	1,707	1,633	1,250	984	589	565	514	401	375
14	Malignant neoplasm of uterus other than cervix	C54, C55	males	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			females	16	22	18,412	0	0	0	0	1	2	10	34	131	324	749	1,690	2,936	3,085	3,013	2,550	1,994	1,892
15	Malignant neoplasm of ovary	C56	males	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			females	8	10	8,399	1	0	22	20	68	74	63	210	280	514	741	1,079	1,316	1,110	1,019	830	665	387
16	Malignant neoplasm of prostate	C61	males	77	93	75,341	0	0	0	0	0	0	0	3	39	210	1,046	3,631	9,052	13,058	15,520	15,665	10,592	6,525
			females	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Malignant neoplasm of bladder	C67	males	14	17	14,037	0	0	6	6	0	0	2	31	48	160	357	952	1,592	1,893	2,473	2,590	2,318	1,611
			females	3	5	3,819	0	0	0	0	5	1	8	18	29	78	121	161	377	478	606	660	665	610
18	Leukaemia and other malignant neoplasms of lymphoid and haematopoietic tissue	C81-C96	males	30	34	27,361	123	307	481	565	601	486	706	933	1,230	1,606	1,962	2,624	3,193	3,323	3,358	2,807	2,004	1,050
			females	21	27	22,231	93	282	338	348	418	430	625	750	887	1,081	1,407	1,845	2,378	2,463	2,417	2,594	2,174	1,701

* provision of data by age is voluntary; please provide absolute number; if absolute number cannot be provided, please provide crude rates (using Eurostat population data).

core data

data not requested for this diagnosis-measure combination

Diagnosis-specific morbidity statistics

Chapters IV Endocrine, nutritional and metabolic diseases and V Mental and behavioural disorders

Country:	The Netherlands
Year:	2007

See also sheet 'Explanations'

	Incidence by person			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
19	Diabetes mellitus	E10-E14	males	41	46	37,514	194	128	111	132	178	287	517	1,096	1,883	2,839	3,864	5,165	5,604	4,793	4,089	3,227	2,075	1,332
			females	33	41	33,942	146	97	84	100	138	226	409	853	1,451	2,215	3,021	4,016	4,402	3,953	3,733	3,470	2,858	2,768
20	Dementia (incl. Alzheimer's disease)	F00-F03, G30	males																					
			females																					
21	Mental and behavioural disorders due to use of alcohol (incl. alcohol dependence)	F10	males																					
			females																					
22	Mental and behavioural disorders due to use of psychoactive substances other than alcohol and tobacco (incl. drug dependence)	F11-F16, F18, F19	males																					
			females																					
23	Schizophrenia	F20-F29	males																					
			females																					
24	Depression and other affective disorders	F30-F39	males																					
			females																					
25	Anxiety disorders	F40, F41	males																					
			females																					
26	Eating disorders	F50	males																					
			females																					

	Period prevalence			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
19	Diabetes mellitus	E10-E14	males	401	455	368,773	256	440	805	1,196	1,544	2,197	3,658	7,410	13,083	21,235	32,333	49,178	56,608	54,257	49,806	39,633	23,507	11,625
			females	348	463	383,097	241	507	876	1,177	1,411	1,889	2,963	5,644	9,651	15,721	24,173	37,578	45,489	48,698	53,021	53,660	44,396	36,003
20	Dementia (incl. Alzheimer's disease)	F00-F03, G30	males	23	27	22,015	17	5	2	2	9	41	60	61	54	64	113	284	663	1,481	3,083	5,013	5,646	5,416
			females	30	57	47,358	17	5	2	2	12	55	80	79	68	80	138	344	815	1,945	4,528	8,682	12,489	18,018
21	Mental and behavioural disorders due to use of alcohol (incl. alcohol dependence)	F10	males (18-65)	736	667	354,056				38,044	78,354	64,192	35,676	54,496	28,780	24,759	15,711	6,896	7,148					
			females (18-65)	253	224	117,072				18,928	26,022	18,647	7,905	12,687	3,144	4,575	7,850	17,314	0					
22	Mental and behavioural disorders due to use of psychoactive substances other than alcohol and tobacco (incl. drug dependence)	F11-F16, F18, F19	males (18-65)	192	172	91,272				12,174	10,723	26,248	8,944	15,989	6,059	3,095	3,151	3,459	1,430					
			females (18-65)	172	160	83,479				2,227	29,901	9,324	4,743	7,910	3,144	9,128	9,420	3,463	4,219					
23	Schizophrenia	F20-F29	males	30	30	24,330	0	757	1,431	1,610	1,422	2,626	2,724	2,771	2,902	1,790	1,682	1,904	721	699	692	0	404	196
			females	29	33	27,171	0	0	725	562	2,073	2,010	278	2,604	2,236	2,998	1,959	2,217	1,786	1,217	2,125	1,632	1,207	1,542
24	Depression and other affective disorders	F30-F39	males	130	143	115,772	0	139	216	1,194	4,055	4,145	7,066	10,263	12,417	12,863	14,738	14,709	12,026	6,009	5,420	4,982	3,488	2,042
			females	262	294	243,795	0	71	287	3,049	8,227	12,186	14,728	24,381	23,095	28,431	26,146	24,230	18,239	15,624	13,298	11,429	10,595	9,780
25	Anxiety disorders	F40, F41	males	61	64	52,123	187	557	1,298	955	3,041	3,299	4,407	6,339	5,510	4,930	5,388	5,066	4,176	2,542	1,782	1,210	1,053	383
			females	115	122	100,675	64	212	1,221	2,487	5,767	8,148	7,684	10,685	10,207	11,186	9,704	9,097	6,549	5,899	4,383	3,008	3,038	1,337
26	Eating disorders	F50	males	0	0	231	0	0	0	80	0	0	76	75	0	0	0	0	0	0	0	0	0	0
			females	8	8	6,282	0	0	359	1,203	1,187	1,010	783	502	447	233	401	83	0	0	0	0	74	0

	Point prevalence			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
19	Diabetes mellitus	E10-E14	males	364	410	331,259	63	312	694	1,064	1,366	1,911	3,141	6,314	11,200	18,396	28,469	44,013	51,004	49,465	45,717	36,406	21,431	10,294
			females	318	422	349,155	95	410	792	1,077	1,272	1,663	2,553	4,791	8,200	13,506	21,152	33,562	41,087	44,745	49,288	50,189	41,537	33,235
20	Dementia (incl. Alzheimer's disease)	F00-F03, G30	males																					
			females																					
21	Mental and behavioural disorders due to use of alcohol (incl. alcohol dependence)	F10	males																					
			females																					
22	Mental and behavioural disorders due to use of psychoactive substances other than alcohol and tobacco (incl. drug dependence)	F11-F16, F18, F19	males																					
			females																					
23	Schizophrenia	F20-F29	males																					
			females																					
24	Depression and other affective disorders	F30-F39	males																					
			females																					
25	Anxiety disorders	F40, F41	males																					
			females																					
26	Eating disorders	F50	males																					
			females																					

* provision of data by age is voluntary; please provide absolute number; if absolute number cannot be provided, please provide crude rates (using Eurostat population data).

core data

data not requested for this diagnosis-measure combination

Diagnosis-specific morbidity statistics

Chapters VI Diseases of the nervous system, VII Diseases of the eye and adnexa and VIII Diseases of the ear and mastoid process

Country:	The Netherlands
Year:	2007

See also sheet 'Explanations'

	Period prevalence			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
27	Parkinson's disease	G20	males	15	18	14,252	16	8	5	5	5	8	14	34	74	162	362	849	1,493	2,171	2,828	2,939	2,100	1,178
			females	10	15	12,438	10	5	3	3	3	5	9	21	47	103	228	531	943	1,451	2,104	2,590	2,377	2,003
28	Multiple sclerosis	G35	males	5	6	4,673	2	6	15	36	72	139	255	468	637	716	702	658	469	265	141	64	21	6
			females	13	14	11,818	5	15	39	92	189	367	665	1,184	1,586	1,786	1,735	1,602	1,147	675	395	209	89	39
29	Epilepsy	G40, G41	males	73	75	60,818	1,241	2,424	3,401	3,878	3,678	3,531	3,642	4,451	4,716	4,783	4,817	5,181	4,570	3,504	2,745	2,036	1,318	904
			females	69	73	60,314	1,101	2,186	3,070	3,517	3,413	3,345	3,458	4,145	4,359	4,476	4,515	4,832	4,302	3,477	3,017	2,638	2,192	2,271
30	Migraine and other headache syndromes	G43, G44	males	83	86	69,988	0	697	3,390	4,617	3,871	3,975	4,938	6,792	8,614	8,473	7,924	6,047	3,675	2,465	2,376	1,423	329	383
			females	254	257	212,762	64	988	5,169	12,676	15,690	15,936	16,507	21,943	29,205	26,412	22,136	15,795	10,695	8,290	4,978	3,383	1,630	1,266
31	Cataract	H25, H26, H28	males		68																			
			females		110																			
32	Glaucoma	H40, H42	males	53	61	49,683	85	87	95	118	151	221	367	714	1,190	1,847	2,801	4,510	5,813	6,646	7,539	7,587	5,902	4,009
			females	48	70	57,635	69	72	78	97	128	192	323	621	1,034	1,631	2,479	3,964	5,161	6,204	7,786	9,230	9,190	9,376
33	Hearing loss	H90, H91	males	412	460	373,008	1,140	2,417	4,165	5,727	6,379	7,045	8,313	11,636	14,439	17,676	22,379	31,673	37,617	40,773	45,354	46,601	39,165	30,508
			females	272	377	312,283	833	1,780	3,011	4,075	4,548	5,022	5,813	7,826	9,460	11,520	14,373	19,963	23,738	26,995	33,326	40,754	44,829	54,415

* provision of data by age is voluntary; please provide absolute number; if absolute number cannot be provided, please provide crude rates (using Eurostat population data).

core data

data not requested for this diagnosis-measure combination

Diagnosis-specific morbidity statistics

Chapters IX Diseases of the circulatory system and X Diseases of the respiratory system

Country:	The Netherlands
Year:	2007

See also sheet 'Explanations'

	Incidence by episode			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standardised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
34	Hypertensive diseases	I10-I13, I15	males																					
			females																					
35	Ischaemic heart diseases	I20-I25	males																					
			females																					
36	Acute myocardial infarction	I21, I22	males																					
			females																					
37	Heart failure	I50	males																					
			females																					
38	Cerebrovascular diseases	I60-I69	males																					
			females																					
39	Influenza	J09-J11	males	146	142	115,099	18,633	7,008	4,991	5,763	5,195	5,726	7,039	8,694	9,489	6,975	7,306	8,014	5,594	4,246	3,559	3,031	2,473	1,363
			females	146	143	118,412	17,786	6,699	4,761	5,512	5,078	5,711	7,040	8,559	9,239	6,874	7,221	7,873	5,551	4,422	4,103	4,115	4,298	3,570
40	Pneumonia	J12-J18	males	90	95	77,109	6,902	5,365	1,731	1,751	645	1,184	1,519	4,528	4,191	4,467	3,566	6,701	4,593	6,394	5,865	7,331	5,463	4,912
			females	87	98	80,822	7,079	5,011	1,364	1,685	763	1,658	1,850	4,159	5,662	3,651	5,053	6,368	6,964	5,102	4,829	5,338	5,631	8,654
41	Asthma	J45, J46	males																					
			females																					
42	Chronic lower respiratory diseases other than asthma	J40-J44, J47	males																					
	(incl. COPD)		females																					

	Incidence by person			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standardised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
34	Hypertensive diseases	I10-I13, I15	males																					
			females																					
35	Ischaemic heart diseases	I20-I25	males																					
			females																					
36	Acute myocardial infarction	I21, I22	males	18	20	16,426	0	0	2	7	25	75	192	479	856	1,252	1,608	2,043	2,180	1,927	1,803	1,652	1,296	1,027
			females	9	14	11,333	0	0	0	1	5	16	46	127	253	420	607	863	1,040	1,088	1,268	1,540	1,743	2,315
37	Heart failure	I50	males																					
			females																					
38	Cerebrovascular diseases	I60-I69	males	18	21	16,648	12	20	29	45	65	99	159	296	457	651	899	1,325	1,706	1,896	2,223	2,494	2,292	1,981
			females	15	22	18,427	10	15	22	34	51	79	128	234	358	516	714	1,047	1,362	1,592	2,070	2,743	3,236	4,216
39	Influenza	J09-J11	males																					
			females																					
40	Pneumonia	J12-J18	males																					
			females																					
41	Asthma	J45, J46	males	62	58	46,889	10,980	5,179	3,277	2,736	2,427	2,371	2,436	2,885	2,766	2,430	2,063	1,905	1,631	1,220	1,007	802	501	275
			females	67	64	52,884	7,041	3,943	2,897	2,763	2,800	3,065	3,405	4,200	4,138	3,757	3,209	2,899	2,428	1,810	1,542	1,327	954	703
42	Chronic lower respiratory diseases other than asthma	J40-J44, J47	males	25	29	23,138	236	95	57	54	63	96	173	384	716	1,196	1,828	2,764	3,365	3,237	3,070	2,663	1,862	1,280
	(incl. COPD)		females	24	30	24,562	169	82	58	61	81	135	254	563	1,026	1,668	2,392	3,272	3,591	3,125	2,760	2,313	1,652	1,359

	Period prevalence			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standardised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
34	Hypertensive diseases	I10-I13, I15	males	941	1,097	888,551	414	0	477	268	1,422	4,877	6,053	18,291	35,610	55,991	81,000	124,725	148,576	117,650	106,982	93,851	58,322	34,043
			females	1,083	1,432	1,185,569	0	0	0	844	3,317	4,689	11,399	23,440	40,991	66,450	96,728	123,650	148,005	147,208	148,540	142,926	121,659	105,722
35	Ischaemic heart diseases	I20-I25	males	484	557	451,097	1	5	16	48	137	391	1,138	3,441	8,097	16,126	28,793	50,263	65,194	70,399	72,117	64,131	43,924	26,876
			females	221	329	272,832	1	4	11	31	82	216	565	1,508	3,224	6,084	10,485	18,210	24,783	30,438	38,357	45,452	45,611	47,768
36	Acute myocardial infarction	I21, I22	males		23																			
			females		11																			
37	Heart failure	I50	males	76	87	70,747	114	96	87	91	100	128	194	359	602	1,000	1,716	3,258	5,104	7,244	10,400	13,566	14,018	12,668
			females	62	113	93,369	49	45	44	51	63	89	143	268	447	733	1,210	2,211	3,452	5,285	8,901	14,901	22,012	33,464
38	Cerebrovascular diseases	I60-I69	males	122	139	112,785	550	435	382	401	449	589	890	1,611	2,538	3,804	5,685	9,202	12,137	14,336	16,922	17,811	14,562	10,482
			females	92	137	113,334	383	305	267	283	325	436	661	1,174	1,837	2,785	4,165	6,707	8,955	11,198	14,740	18,434	19,467	21,211
39	Influenza	J09-J11	males																					
			females																					
40	Pneumonia	J12-J18	males	80	83	67,389	6,716	4,947	1,731	1,353	553	1,100	1,444	4,226	3,803	4,467	3,249	5,393	4,426	5,008	4,900	5,836	4,410	3,828
			females	78	87	71,827	6,697	4,517	1,364	1,364	763	1,514	1,850	3,801	4,843	3,340	4,411	5,541	5,803	4,703	4,086	5,038	4,594	7,599
41	Asthma	J45, J46	males	459	442	358,273	34,403	40,878	34,103	25,755	18,137	13,130	22,095	22,171	21,893	22,243	21,872	21,660	17,069	13,046	10,837	10,219	5,045	3,717
			females	524	523	432,908	19,466	20,821	28,020	29,527	29,442	24,117	23,910	31,254	36,519	35,473	29,386	26,602	26,539	19,952	18,184	14,456	8,449	10,792
42	Chronic lower respiratory diseases other than asthma	J40-J44, J47	males	189	216	175,154	540	628	813	1,037	1,210	1,494	2,031	3,295	4,741	6,671	9,581	15,165	19,855	23,299	26,997	26,879	19,453	11,465
	(incl. COPD)		females	146	188	155,603	777	538	464	518	655	983	1,671	3,247	5,372	8,186	11,576	16,506	18,671	18,632	19,181	18,745	15,701	14,181

* provision of data by age is voluntary; please provide absolute number; if absolute number cannot be provided, please provide crude rates (using Eurostat population data).

core data

data not requested for this diagnosis-measure combination

Diagnosis-specific morbidity statistics

Chapters XI Diseases of the digestive system and XII Diseases of the skin and subcutaneous tissue

Country:	The Netherlands
Year:	2007

See also sheet 'Explanations'

	Incidence by person			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
43	Gastric and duodenal ulcer (peptic ulcer)	K25-K28	males																				
			females																				
44	Alcoholic liver disease	K70	males																				
			females																				
45	Diseases of liver other than alcoholic	K71-K77	males																				
			females																				
46	Cholelithiasis	K80	males	9	10	8,200	0	0	0	0	0	201	0	534	790	1,370	977	193	799	557	794	1,621	181	183
			females	23	26	21,408	0	0	0	0	640	664	660	2,450	2,667	1,976	2,747	2,390	1,812	1,446	1,738	811	812	594
47	Dermatitis and eczema	L20-L30	males																				
			females																				
48	Psoriasis	L40	males																				
			females																				

	Period prevalence			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
43	Gastric and duodenal ulcer (peptic ulcer)	K25-K28	males	19	21	17,361	68	85	101	131	174	260	423	769	1,113	1,417	1,689	2,091	2,120	1,894	1,745	1,501	1,063	717
			females	13	17	13,956	49	60	71	92	124	189	309	549	784	1,000	1,179	1,431	1,447	1,347	1,367	1,386	1,267	1,304
44	Alcoholic liver disease	K70	males	1	1	718	0	0	0	0	0	3	24	27	45	98	108	131	124	56	62	33	5	2
			females	0	0	330	0	0	0	0	0	0	5	8	22	31	50	65	76	29	29	12	2	0
45	Diseases of liver other than alcoholic	K71-K77	males	2	2	1,901	16	6	11	16	26	32	66	120	124	154	242	220	227	212	166	130	90	42
			females	2	2	1,917	8	6	13	22	33	59	51	89	123	156	183	237	227	184	182	140	126	75
46	Cholelithiasis	K80	males	14	17	13,377	0	0	0	80	0	254	152	528	1,630	1,463	1,743	1,553	1,420	1,156	1,114	1,566	592	128
			females	32	36	29,758	0	0	0	241	1,018	1,010	1,708	2,797	2,906	3,030	3,449	3,308	2,570	1,993	2,006	1,203	1,185	1,337
47	Dermatitis and eczema	L20-L30	males	621	616	498,984	53,041	32,400	25,171	23,883	22,673	21,484	23,856	30,939	37,638	32,658	32,328	35,547	36,915	26,965	22,198	19,430	13,822	8,039
			females	799	792	656,136	52,360	34,655	30,012	41,800	45,034	37,712	37,923	45,750	46,861	43,890	38,978	42,589	34,405	27,501	27,711	27,820	20,449	20,686
48	Psoriasis	L40	males	177	189	152,892	376	829	2,591	1,066	6,535	11,724	10,309	19,869	12,496	20,618	14,343	18,436	14,189	5,944	5,386	5,124	2,129	925
			females	151	166	137,657	1,003	1,968	1,157	5,729	7,524	7,646	5,791	10,941	11,846	12,106	12,550	12,268	10,268	12,671	3,996	6,728	8,743	4,721

* provision of data by age is voluntary; please provide absolute number; if absolute number cannot be provided, please provide crude rates (using Eurostat population data).

core data

data not requested for this diagnosis-measure combination

Diagnosis-specific morbidity statistics

Chapters XIII Diseases of the musculoskeletal system and connective tissue and XIV Diseases of the genitourinary system

Country:	The Netherlands
Year:	2007

See also sheet 'Explanations'

	Incidence by person			**all ages**	**all ages**	**all ages**	age groups, absolute number*																	
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standardised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
49	Rheumatoid arthritis	M05, M06	males																					
			females																					
50	Arthrosis	M15-M19	males																					
			females																					
51	Systemic connective tissue disorders	M30-M36	males																					
			females																					
52	Spondylopathies and other dorsopathies (incl. low back pain)	M45-M54	males																					
			females																					
53	Osteoporosis	M80-M82	males																					
			females																					
54	Glomerular and renal tubulo-interstitial diseases	N00-N08, N10-N16	males																					
			females																					
55	Renal failure	N17-N19	males																					
			females																					
56	Urolithiasis	N20-N23	males	22	24	19,813	0	0	0	423	230	0	1,956	1,425	2,172	3,327	3,125	2,314	1,598	928	1,588	180	362	183
			females	16	18	14,555	164	0	0	435	427	332	1,816	525	2,096	790	1,569	996	806	1,240	1,545	811	609	396

	Period prevalence			**all ages**	**all ages**	**all ages**	age groups, absolute number*																	
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standardised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
49	Rheumatoid arthritis	M05, M06	males	71	78	63,421	241	386	573	848	1,161	1,638	2,401	3,864	5,038	5,902	6,580	7,680	7,325	6,140	5,263	4,158	2,652	1,572
			females	100	122	101,060	214	356	547	842	1,225	1,831	2,795	4,585	6,171	7,610	8,840	10,688	10,698	9,858	9,762	9,477	8,077	7,485
50	Arthrosis	M15-M19	males	288	328	265,610	7	22	61	161	379	881	2,058	4,981	9,419	15,288	22,663	33,682	38,661	37,835	36,211	30,749	20,377	12,175
			females	400	564	467,123	110	87	93	139	246	515	1,200	3,079	6,588	12,706	22,389	39,068	51,896	59,959	68,946	73,148	65,264	61,691
51	Systemic connective tissue disorders	M30-M36	males																					
			females																					
52	Spondylopathies and other dorsopathies (incl. low back pain)	M45-M54	males	911	968	783,951	2,958	6,991	14,055	24,622	34,306	44,186	55,619	77,482	86,188	84,869	77,382	73,382	61,293	45,501	37,064	28,930	18,079	11,045
			females	1,146	1,248	1,033,728	4,046	9,279	19,043	33,306	45,903	57,970	70,543	93,712	100,787	99,271	90,950	87,094	75,131	60,207	55,740	52,099	41,497	37,150
53	Osteoporosis	M80-M82	males	20	22	18,193	35	52	71	101	136	194	295	506	723	952	1,225	1,698	1,960	2,057	2,259	2,338	2,002	1,590
			females	127	184	152,671	36	39	47	67	105	193	399	935	1,868	3,443	5,953	10,539	14,732	18,412	23,132	26,388	24,245	22,140
54	Glomerular and renal tubulo-interstitial diseases	N00-N08, N10-N16	males	11	12	9,523	829	0	0	0	0	0	0	831	264	1,023	481	1,666	240	2,097	692	0	1,009	391
			females	50	52	42,698	442	1,562	1,208	2,812	4,976	3,685	2,502	3,386	2,981	2,498	1,959	2,217	3,317	2,920	1,653	1,632	966	1,982
55	Renal failure	N17-N19	males	3	4	3,113	35	21	13	39	27	42	60	75	116	111	167	222	316	350	418	480	394	228
			females	2	3	2,338	22	15	21	27	30	26	37	72	71	119	161	166	198	204	251	338	275	304
56	Urolithiasis	N20-N23	males	31	33	27,103	62	0	144	318	645	761	2,203	1,962	3,027	3,928	2,852	2,942	3,257	1,387	1,708	996	527	383
			females	22	25	20,548	64	0	72	642	678	937	1,423	1,362	2,384	2,175	1,684	1,571	1,907	1,275	1,114	1,880	815	563

* provision of data by age is voluntary; please provide absolute number; if absolute number cannot be provided, please provide crude rates (using Eurostat population data).

core data

data not requested for this diagnosis-measure combination

Diagnosis-specific morbidity statistics

Chapter XIX Injury, poisoning and certain other consequences of external causes

Country:	The Netherlands
Year:	2007

See also sheet 'Explanations'

	Incidence by episode			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standardised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
57	All morbidity due to injury, poisoning and certain other consequences of external causes	S00-T98	males																					
			females																					
58	Intracranial injury	S06	males	21	20	15,949	1,679	2,369	2,669	1,672	1,198	338	760	830	1,164	385	872	327	418	308	297	214	132	319
			females	23	22	17,946	1,850	1,835	1,651	2,006	1,611	1,298	1,067	1,004	671	699	802	827	332	239	446	602	445	563
59	Fracture of femur	S72	males	7	7	6,045	179	94	80	174	85	62	58	120	136	158	232	322	303	364	499	729	1,119	1,331
			females	10	17	14,227	90	51	46	41	28	24	23	28	62	88	236	341	452	648	1,148	2,117	3,239	5,565
60	Poisoning by drugs, medicaments and biological substances and toxic effects of substances chiefly nonmedicinal as to source	T36-T65	males																					
			females																					

	Period prevalence			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standardised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
57	All morbidity due to injury, poisoning and certain other consequences of external causes	S00-T98	males																					
			females																					
58	Intracranial injury	S06	males		33																			
			females		36																			
59	Fracture of femur	S72	males	6	6	5,203	134	91	81	162	82	53	43	107	106	163	195	257	319	303	444	619	887	1,156
			females	8	15	12,024	60	52	52	30	24	25	19	25	56	67	212	321	460	564	942	1,730	2,635	4,747
60	Poisoning by drugs, medicaments and biological substances and toxic effects of substances chiefly nonmedicinal as to source	T36-T65	males																					
			females																					

* provision of data by age is voluntary; please provide absolute number; if absolute number cannot be provided, please provide crude rates (using Eurostat population data).

core data

data not requested for this diagnosis-measure combination

Diagnosis-specific morbidity statistics

Chapter XX External causes of morbidity and mortality

Country:	The Netherlands
Year:	2007

See also sheet 'Explanations'

	Incidence by episode			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
A	All morbidity due to external causes (injuries, poisonings, etc.)	V01-Y89	males																					
			females																					
B	Land transport accidents	V01-V89	males																					
			females																					
C	Accidental falls	W00-W19	males																					
			females																					
D	Accidental poisoning	X40-X49	males																					
			females																					
E	Intentional self harm (incl. suicidal attempt)	X60-X84	males		3																			
			females		7																			
F	Assault	X85-Y09	males																					
			females																					
G	Complications of medical and surgical care	Y40-Y66, Y69-Y84	males																					
			females																					

	Period prevalence			**all ages**	**all ages**	**all ages**	age groups, absolute number*																
Shortlist group number	**Diseases in the shortlist**	**ICD10 codes**		**age-standar-dised rate per 10,000**	**crude rate per 10,000**	**absolute number**	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
A	All morbidity due to external causes (injuries, poisonings, etc.)	V01-Y89	males																					
			females																					
B	Land transport accidents	V01-V89	males	91	89	72.008	2.590	4.244	5.660	10.952	7.319	5.804	4.855	5.174	5.009	4.658	3.922	3.181	2.474	1.726	1.558	1.386	981	513
			females	70	68	56.329	2.187	3.193	4.657	7.522	5.294	4.038	3.244	3.011	3.029	3.000	2.955	3.224	2.658	2.271	2.214	2.028	1.280	524
C	Accidental falls	W00-W19	males	274	263	213.113	16.460	19.246	26.246	23.733	17.626	13.989	11.962	12.463	12.060	10.846	9.421	8.592	7.405	5.322	4.776	4.647	4.166	4.152
			females	258	268	222.259	12.941	18.702	22.787	16.047	11.433	8.903	7.767	8.633	9.351	9.593	10.833	12.555	11.508	10.076	10.510	11.992	12.600	16.028
D	Accidental poisoning	X40-X49	males	12	12	9.570	740	96	161	1.068	1.266	1.098	889	964	940	798	600	319	291	105	96	53	50	35
			females	15	14	11.853	653	71	309	1.671	1.433	1.257	1.179	1.060	1.157	1.135	733	460	298	136	94	83	67	57
E	Intentional self harm (incl. suicidal attempt)	X60-X84	males	6	6	4.918	20	4	25	309	424	584	578	638	699	603	406	229	197	71	55	32	20	26
			females	13	12	10.114	14	4	151	1.326	1.124	1.031	1.286	1.087	1.423	1.067	696	394	215	110	62	55	35	33
F	Assault	X85-Y09	males	28	27	21.850	40	128	975	4.065	4.868	3.086	2.175	1.940	1.619	1.253	767	469	244	105	62	32	7	16
			females	10	9	7.866	62	67	413	1.336	1.481	999	807	792	621	531	276	182	107	60	35	28	39	28
G	Complications of medical and surgical care	Y40-Y66, Y69-Y84	males	44	49	39.737	750	412	333	539	603	603	734	1.133	1.509	1.903	2.646	3.768	4.725	4.989	5.463	4.988	3.039	1.602
			females	44	54	44.617	454	318	285	500	689	979	1.444	2.023	2.359	2.912	3.274	3.830	4.179	4.075	4.684	5.118	4.196	3.296

* provision of data by age is voluntary; please provide absolute number; if absolute number cannot be provided, please provide crude rates (using Eurostat population data).

core data

data not requested for this diagnosis-measure combination

ANNEX 7

Sources, population sizes and Reference population																				
Source		**population sizes**	**Reference population**	**age (yr)**	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**50-54**	**55-59**	**60-64**	**65-69**	**70-74**	**75-79**	**80-84**	**85+**
LINH	prevalence	215654	period-cohort	men	7039	7429	6943	6445	5355	5850	6749	8510	8523	8211	7262	6752	6013	4664	3752	2977	1996	1308
				women	6552	7005	6660	6114	5671	6835	7204	8842	8636	8007	7095	6552	6004	4658	4268	3754	2999	3018
	3-year prevalence	61459	period-cohort	men	1056	2051	2100	1912	1388	1319	1694	2317	2507	2474	2394	2318	2089	1542	1208	1016	651	426
				women	945	1900	1980	1744	1160	1471	1844	2435	2590	2490	2324	2200	1950	1526	1343	1211	921	964
	incidence	85569	period-cohort	men	2743	2762	2555	2426	2143	2465	2884	3605	3349	3231	2946	2861	2515	1936	1403	1176	726	456
				women	2555	2564	2444	2257	2254	2968	3106	3623	3377	3148	2901	2721	2472	1797	1642	1392	1095	1072
Included in fitted GPRN:																						
CMR		9898	period-age	men	362	342	323	273	205	194	270	412	429	394	361	339	267	186	159	108	75	47
				women	307	350	325	298	276	240	323	449	429	458	345	334	257	175	202	151	122	113
Transitie		13269	period-age	men	340	445	433	434	399	315	355	458	498	542	497	455	406	250	206	176	137	109
				women	298	374	434	365	346	329	373	491	564	564	557	432	424	264	261	258	238	242
LINH	prevalence	312972	period-age	men	9594	10199	9431	9332	9091	9861	10623	13217	13004	12169	10538	9750	8240	6148	4932	3824	2549	1944
				women	8725	9408	8960	9057	10120	11102	11128	13092	12499	11448	10253	9290	8139	6348	5721	4962	4009	4266
LINH	incidence	115229	period-age	men	3709	3512	3179	3092	3386	4106	4492	5300	4694	4341	3830	3649	3082	2231	1625	1345	840	608
				women	3379	3239	3027	3072	3909	4714	4682	5057	4447	4076	3667	3423	2984	2191	1956	1661	1303	1426
RNH	prevalence	75436	period-age	men	1468	1910	2011	2212	2064	1861	1899	2484	2849	3067	3083	3213	2614	2023	1699	1239	740	326
				women	1418	1858	1878	2218	2045	1882	1957	2727	3020	3159	3215	2956	2539	2108	1865	1755	1195	879
RNH	incidence	76127	period-age	men	1474	1911	2026	2238	2103	1889	1865	2472	2833	3096	3116	3195	2749	2069	1727	1270	761	340
				women	1425	1857	1861	2260	2109	1906	1928	2687	2997	3194	3228	2995	2623	2162	1867	1787	1205	913
LEO	prevalence	32819	period-age	men	948	1080	1064	1012	961	1104	1138	1293	1416	1233	1114	1151	995	615	461	296	173	101
				women	925	988	930	985	977	1139	1215	1361	1365	1294	1142	1276	935	625	490	434	325	258
LEO	incidence	32995	period-age	men	1004	1073	1096	1053	948	1047	1136	1216	1376	1310	1078	1105	1095	623	474	299	170	101
				women	1008	1003	934	987	1000	1099	1186	1361	1361	1288	1163	1223	1028	660	483	440	312	255
Other sources:																						
HDR		15904076	period-cohort	men	514039	498179	509648	481630	479752	500253	631500	653237	626893	572464	550895	502942	361238	281980	217003	136998	90759	457723
				women	490872	475527	486596	469031	481475	504801	628236	639579	620291	567825	541557	498315	372393	319273	286047	228049	227078	0
HIS (2006-2008)		23544	period-age	men	848	891	743	600	526	623	683	863	927	893	830	847	716	550	416	318	168	63
				women	815	853	719	619	631	668	745	890	941	902	858	857	704	560	472	407	268	130
CMR-PEIL		135400	period-age	men	4530	4710	4620	4150	3980	4030	4350	5320	5400	5070	4640	4560	3780	2820	2200	1630	1000	580
				women	3840	4500	3920	3970	3890	4020	4350	5220	5260	4990	4580	4480	3750	2940	2560	2230	1980	1550
NEMESIS		6626	period-age	men				132	275	302	352	404	437	405	363	321	337					
				women				173	241	319	332	402	410	406	360	315	340					
National reference populations (see 3.8.2)																						
2007																						
Period-age		16381696		men	437714	517656	500776	513052	493538	494835	512744	642187	661379	632407	575411	551783	502196	359341	278540	211901	131403	83436
				women	417870	494424	478170	490528	480926	492831	512587	634068	643423	622772	569050	541816	497731	371303	317082	282266	222229	212331
Period-cohort		16381696		men	489269	515629	502764	511960	491493	495434	523246	647535	661930	626723	571865	555133	481808	350964	272675	203553	124380	73939
				women	467036	492942	479531	489648	480404	494158	523319	637513	644435	617669	565176	545394	478101	365512	314326	276396	216179	193668
2008																						
Period-age		16445593		men	480148	517098	501376	514869	499457	497049	508517	630898	657959	636022	577700	546917	510771	362123	278917	208617	127455	78347
				women	458494	493792	478484	492758	487851	493791	508184	624717	641278	626259	572067	538655	507168	374487	317356	278474	216438	201110
2005-2009																						
Period-age		16403696		men	491225	512862	506423	510873	495160	496544	534851	639007	660281	627051	573723	556933	476013	353477	274989	203118	125189	74081
				women	469233	489948	483201	488972	484746	494523	533855	628622	643699	617238	566474	547347	472648	368231	317068	275574	216604	193913