

# Background Quality Report

Work-related ill health statistics based on reports by General Practitioners to THOR-GP

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## Introduction

This report assesses the quality of the annual statistics of newly diagnosed work-related ill health in Great Britain based on cases reported by general practitioners (GPs) to THOR-GP (The Health and Occupation Research network for General Practitioners). THOR-GP has been operating from the Centre for Occupational and Environmental Health (COEH) in the University of Manchester since June 2005. The aims of THOR-GP are to estimate the incidence and incidence rate of work-related ill health in Great Britain (GB) and to monitor their trends over time. Information from THOR-GP will contribute to the evidence base for developing strategy to prevent work-related ill health. The information can also help occupational health professionals to improve the identification, diagnosis, and management of work-related ill health cases similar to those reported.

The purpose of this document is to provide users with an assessment of the quality of the statistical outputs from THOR-GP according to a common definition of quality in the European Statistical System, which includes relevance, accuracy, reliability, timeliness, punctuality, coherence, comparability, accessibility and clarity. To produce and update this quality report is to meet our obligation to comply with the UK Statistics Authority (UKSA) Code of Practice for Official Statistics ([www.statisticsauthority.gov.uk/assessment/code-of-practice/](http://www.statisticsauthority.gov.uk/assessment/code-of-practice/)), particularly Principle 4, Practice 2 which states:

“Ensure that official statistics are produced to a level of quality that meets users’ needs, and that users are informed about the quality of statistical outputs, including estimates of the main sources of bias and other errors, and other aspects of the European Statistical System definition of quality.”

## Background of THOR-GP

THOR-GP is one of the reporting schemes in The Health and Occupation Research network (THOR) which is a national surveillance of work-related illness in clinical settings in the UK. (See [www.population-health.manchester.ac.uk/epidemiology/COEH/research/thorgp/](http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thorgp/))

Since June 2005, around 250 General Practitioners (GPs) per year have been reporting voluntarily of newly diagnosed work-related ill health on a monthly basis to THOR-GP.

Participating GPs report electronically, through a password protected online web portal, ill health cases that in their judgment are caused or made worse by patients work activities. For each case reported, GPs also provide data on:

- age
- gender
- diagnosis/symptom
- time of the symptom onset
- occupation
- industry
- work-related causes
- certified sick-leave days due to the illness, and;
- clinical referrals

The annual reported incidence, incidence rate and incidence trends can be further analysed according to these data dimensions if the number of cases available for analysis is sufficiently large. All information collected is anonymous. No identifiable information about a patient will be reported to THOR-GP.

The reported cases in THOR-GP are grouped into the following ill health categories for analyses

- Musculoskeletal and subcategories by anatomical site
- Mental ill-health and subcategories of diagnosis

- Skin
- Respiratory
- Other diagnoses

Further analyses can be conducted according to the following data dimensions

- Patient characteristics (age, gender, broad region of residence, occupation)
- Workplace and job characteristics (occupation and industry)
- Causes (suspected causal agents for respiratory and skin conditions, possible causal tasks and movements for musculoskeletal disorders and precipitating events for mental ill health)
- Clinical information and outcomes (date of symptom onset, days of certified sickness absence, and onward clinical referrals)

### Annual reported incidence

The annual incidence of work-related ill health reported in THOR-GP is estimated based on the number of new cases reported by GPs in a month. At the beginning, all participating GPs were reporting every month of the year (core reporting). In 2007, a small proportion (2%) of GPs, who were newly recruited to the scheme started to report for one randomly allocated month per year (sample reporting). The proportion of GPs in sample reporting increased from 12% in 2009 to 78% in 2010. All participating GPs have been in sample reporting since 2011. Cases reported by sample reporters are multiplied by 12 and added to the cases reported by core reporters to obtain an annual estimated total (See: [www.hse.gov.uk/statistics/calculation-thor-gp-data.pdf](http://www.hse.gov.uk/statistics/calculation-thor-gp-data.pdf), provided by the University of Manchester).

For example, in 2014, all participating GPs were sample reporters. In total, 146 out of 218 GPs had responded to THOR-GP. Together, they have reported 165 actual cases in individual reporting month. These have generated an estimated 1,980 cases of work-related ill health in 2014. Most of the cases were musculoskeletal disorders (47%) and mental ill health cases (34%). A small proportion of the cases were skin diseases (9%) and respiratory conditions (4%).

Reported incidence in 2014:

1,980 estimated cases = 165 actual cases in a randomly allocated month x 12

### Incidence rate

The incidence rate is calculated using the estimated number of new cases of work-related ill health reported by participating GPs in THOR-GP in a year (the numerator) divided by the number of employed persons covered by the participating GPs clinical practices in that year (the denominator). The incidence rates per 100,000 persons per year are calculated by dividing the numerator by the denominator and multiplying by 100,000 (See: [www.hse.gov.uk/statistics/calculation-thor-gp-data.pdf](http://www.hse.gov.uk/statistics/calculation-thor-gp-data.pdf), provided by the University of Manchester).

The incidence rate per 100,000 = numerator / denominator x 100,000

#### *The numerator*

The numerator is based on the estimated annual reported cases described above but is adjusted for the response rates. For example, the estimated number of new cases of work-related ill health reported in 2014 was 1,980 with a response rate of 67%. The total estimated cases that expected to be reported with 100% response rate would be 2,955 (1,980/0.67).

#### *The denominator*

The denominator is the population at risk, which should be the same population as the population where the ill health cases are reported. The THOR-GP denominator is, therefore based on the patient population covered by the participating GPs' clinical practices. Further information on the characteristics of the patient population in terms of their employment rate and population distribution

by age, gender, industry and occupation is obtained indirectly from the census data of the relevant area. This is done by linking the GP clinic postcodes to the relevant census geographical areas of similar population size of an average GP clinic (5,000-6,000 persons).

Firstly, the size of the patient population is obtained from the published data on the number of patients registered in GP clinics where at least one of the GPs in the clinics is taking part in the THOR-GP reporting. THOR-GP has previously investigated and found participating GPs carried out on average 17% of the clinical sessions in their clinics. Therefore, the total size of the patient population is multiplied by 17% to give the size of the patient population covered by participating GPs in the scheme.

Secondly, as the numerator is the number of cases of work-related ill health in workers seen in GP clinics, the denominator should also be restricted to the employed population. The proportion of employed workers for each geographic area that relevant to the THOR-GP clinics was estimated from 2011 census data. And these estimated proportions of employed were then applied to the corresponding patient population of the THOR-GP clinics. The number of employed for the denominator was calculated indirectly.

Thirdly, the characteristics of the denominator population, in terms of the population distribution by age, gender and industry and occupation are obtained from the relevant census population, assuming that the distribution in the census data will be the same as that in the GP clinical practice population. This is to enable calculation of specific incidence rates by industry and occupation.

#### *Adjustment for the incidence rates*

The THOR-GP patient population may have different industry distribution than the overall GB population. In order to account for this difference in the estimate of the incidence rates that can represent the GB population, the THOR-GP incidence rate has been standardised according to the proportion distribution by industry in GB workforce according to the Labour Force Survey data in the relevant year. However, the adjustment has hardly changed the overall incidence rate in GB.

Further discussion on the accuracy and reliability of the incidence rate calculation is available in the later sections of this document.

#### Incidence trends

THOR-GP data are used to estimate trends of reported incidence of work-related ill health overall and for work-related skin disease, musculoskeletal disorders and mental ill health where the number of cases per year is large enough to carry out the analyses. Multi-level models are used for the trend analysis, which is to take into account the changes in the numbers and characteristics of the reporters, changes in the underlying total working population in the UK each year, seasonal effects and other reporting behaviours of the physicians that may affect the incidence trends. The latest trend analysis has covered the reports in 2006-2014. See: [www.hse.gov.uk/statistics/pdf/thortrends15.pdf](http://www.hse.gov.uk/statistics/pdf/thortrends15.pdf), provided by the University of Manchester.

Further discussion on the accuracy and reliability of the incidence trends estimate is available in the later sections of this document.

More information on the standard outputs from THOR-GP can be found ([www.hse.gov.uk/statistics/tables/index.htm#thor](http://www.hse.gov.uk/statistics/tables/index.htm#thor))

THOR-GP is one of the data sources of work-related ill health in Great Britain. Information on other data sources can be found in ([www.hse.gov.uk/statistics/sources.htm](http://www.hse.gov.uk/statistics/sources.htm)).

# Assessment of statistics against quality dimensions and principles

## Relevance

***This dimension covers the degree to which the statistical product meets user need in both coverage and content.***

The total number of participating GPs has been around 250 per year. They comprise approximately 1% of all GPs in Great Britain. They are mostly recruited from GPs who have graduated from the distance learning diploma course in occupational medicine, run from COEH in the Manchester University. THOR-GP also recruits GPs from other sources such as members of the Society of Occupational Medicine. About 30% of the GPs approached have agreed to take part and among them about 70% have responded in their assigned reporting month, either reported cases or declared 'I have nothing to report this month'. By design, THOR-GP reporters are not a random sample of GPs and may not be representatives of all GPs in GB. However, mapping of the location of the THOR-GP reporters has shown they are based in clinics throughout GB.

When presenting the annual statistics on the estimated incidence and incidence rates, statistics based on data collected in the latest year (i.e. publishing 2014 statistics in Oct 2015) are compared with the average of the previous three years (i.e. publishing annual average of 2012-2014 in Oct 2015) to give more stable estimates.

(See: [www.hse.gov.uk/statistics/tables/index.htm#thor](http://www.hse.gov.uk/statistics/tables/index.htm#thor))

THOR-GP statistics are compared with relevant statistics produced from other data sources, such as the self-reported work-related ill health collected from the Labour Force Survey, to give a more complete picture for particular types of work-related ill health or for specific industries. More information is available on how THOR-GP statistics are used in the special analyses of work-related ill health.

- Use of THOR-GP statistics in analyses of work related ill health by industry:  
[www.hse.gov.uk/statistics/industry/agriculture/](http://www.hse.gov.uk/statistics/industry/agriculture/)  
[www.hse.gov.uk/statistics/industry/construction/](http://www.hse.gov.uk/statistics/industry/construction/)  
[www.hse.gov.uk/statistics/industry/manufacturing/](http://www.hse.gov.uk/statistics/industry/manufacturing/)  
[www.hse.gov.uk/statistics/industry/healthservices/](http://www.hse.gov.uk/statistics/industry/healthservices/)
- Use of THOR-GP statistics in analyses of work related ill health by type of ill health:  
[www.hse.gov.uk/statistics/causdis/stress/](http://www.hse.gov.uk/statistics/causdis/stress/)  
[www.hse.gov.uk/statistics/causdis/musculoskeletal/](http://www.hse.gov.uk/statistics/causdis/musculoskeletal/)  
[www.hse.gov.uk/statistics/causdis/asthma/](http://www.hse.gov.uk/statistics/causdis/asthma/)  
[www.hse.gov.uk/statistics/causdis/dermatitis/](http://www.hse.gov.uk/statistics/causdis/dermatitis/)

To ensure these statistics meet the needs of the users, their relevance are reviewed through different ways. The following are some of the approaches.

- There is a user engagement website where a feedback form is available for users to provide their views and suggestions on the range of statistical outputs provided. See: [www.hse.gov.uk/statistics/about/engagement/](http://www.hse.gov.uk/statistics/about/engagement/)
- Users' views on ways to improve data collection, analysis and information dissemination are sought when THOR-GP information is provided in response to users ad hoc information requests
- There is a popular electronic email bulletin service (eBulletin service) which provides regular information to users, and reminding them of forthcoming releases and other relevant key events. Through this service, user views are sought periodically on specific issues or areas of development.

## Accuracy and reliability

***This dimension covers, with respect to the statistics, their proximity between an estimate and the unknown true value.***

### Using criteria and guidance

There are predefined case report criteria in THOR-GP. The cases for report should be new cases seen for the first time by the participating GPs in the assigned reporting month and during the course of their clinical practice, and in their judgement are work-related (i.e. caused or aggravated by work). Guidelines for reporting are provided to GPs through the same website as the THOR-GP electronic reporting. The online reporting site is also linked to the sites for Continuing Professional Development resources for GPs.

See: [www.population-health.manchester.ac.uk/epidemiology/COEH/research/thorgp/](http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thorgp/)

### Assessment of work relatedness

There are uncertainties in deciding whether an ill health in an individual is work-related. The level of certainty on work attribution may vary widely across different types of ill health. The reporting has therefore relied on the GPs' judgement on work-relatedness of the ill health cases according to the balance of probability (whether the ill health is more likely than not caused by work activities). One of the strengths of THOR-GP is that all participating GPs are trained at the postgraduate level in occupational medicine. Furthermore, examples that may indicate work-attribution are provided to guide GPs in their assessments, such as whether the ill health would have occurred in the absence of work-exposure, whether work exposure was a major contributing factor and whether the patient has pre-existing illnesses in which work conditions made a substantial difference to severity.

### Incidence rate calculation - THOR-GP specific denominator

For the THOR-GP annual statistical outputs between 2006 and 2012, Labour Force Survey data has been used as the denominator to calculate incidence rate of work-related ill health in GB. This is to assume that the reporters in THOR-GP and their reporting, in terms of the number and type of ill health reported, are representative of all GPs in GB and the patients they see are representative of the whole GB population. These assumptions are unlikely to hold true. Currently only 1% of GPs in GB are participating in THOR-GP. THOR-GP team has conducted extensive research work to develop a new denominator data for THOR-GP.

The new denominator is used in the calculation of the incidence rates in the latest annual statistical outputs of the 2013 and 2014 cases. The new denominator is based on the patient population of working age and in employment that are covered by the general clinical services of the participating GPs. The construction of the new denominator is more comparable to the way numerator data are collected and therefore should improve the accuracy of the incidence rate calculation in THOR-GP (See: [www.hse.gov.uk/statistics/calculation-thor-gp-data.pdf](http://www.hse.gov.uk/statistics/calculation-thor-gp-data.pdf)).

Using the new THOR-GP specific denominator to calculate the incidence rate uses a fewer number of assumptions but it still needs to make adjustment for a number of factors that are based on a number of assumptions. Some of these adjustments that are affecting both the numerator and the denominator are assessed as follows.

In the calculation of the numerator, the estimated annual reported cases are adjusted directly for the response rates. This is to assume the non-responding GPs would report the same number and the type of work-related ill health as those who responded. Currently, there is no evidence to support this assumption. On the other hand, this assumption is unlikely to hold true in the voluntary reporting system where non-responding physicians are actively chased up for a response. This may over estimate the numerator and therefore the incidence rate.

In the calculation of the denominator, the total size of the patient population was scaled down to estimate the specific population covered by participating GPs in the scheme. This was based on the estimate that, on average, 17% of the clinical sessions were carried out by the participating GPs in the clinics. However, this approach may underestimate the size of the denominator and therefore overestimate the incidence rate, because the patients seen by different GPs within a clinic could be overlapped.

In addition, the number of GPs and the size of the patient population may vary amongst clinics. The general application of the overall 17% coverage to all clinics may give lower weight to the characteristics of the patient population, in terms of the distribution by age, gender, industry and occupation, for the smaller size clinics and higher weight for the large size clinics.

#### Incidence trends – effects of changing reporting frequency

There are considerable uncertainties in the interpretation of the overall incidence trends in THOR-GP over the past nine years (2006-2014) because the changes in reporting methods, in particular the large increase in the proportion of sample reporting from 12% in 2009 to 78% in 2010 and the inconclusiveness in the assessment of reporter fatigue. Further discussion on the possible impact of these changes in the assessment of the incidence trends is available in the later section of this document on “comparability over time”.

#### Days of certified sickness absence

When reporting a case of work-related ill health, the reporter also provides the number of sick leave days certified to the patient during the consultation if the patient is taking sick leave. However, the initial number of days certified might not include all of the sick-leave days associated with the case. Therefore, the absence data are audited on an annual basis. This involves contacting the GPs who have certified the initial sick-leave days to review retrospectively the total leave days of the patient in a year because of the reported ill health and if the patient had returned to work. The previous audits carried out before September 2013 among a sample of GPs have covered 25% of all the sickness absence cases. The audits found that the initially certified sick-leave days were consistently to be about 44% of the total sick-leave days in a year. Therefore, the initial number of sick days reported has been factored up to account for the 56% estimated under-reporting of sickness absence days.

#### Accuracy in data input, coding, analysis and result publication

Processes have been put in place to systematically check data accuracy in THOR-GP. For example, input mask, validation rules and validation text are used to improve accuracy in the data input stage. If the initial information provided by reporters is not clear or insufficient, they will be contacted to clarify.

All data are coded by two trained staff and any differences reconciled by a third, more senior staff member. Raw data are coded according to standard coding scheme. For example, GPs are asked to provide diagnostic information for each reported case. The diagnosis is coded according to the International Classification of Diseases (ICD10), which then is grouped to one of the ill health categories used in the specialist physicians reporting in THOR. The THOR-GP ill health categories are listed in the Background section of this report. Other standard coding schemes include Standard Occupational Classification (SOC), Standard Industrial Classification (SIC), and standard codes for Government Official Regions (GOR). Coding systems for classification of suspected causal agents, task/movements and precipitating events have been developed and updated within THOR and HSE. Occasionally, there will be a need to dual code data for a specific period due to changes in the SIC and SOC classification system in order to address issues of continuity and to determine the impact of this change on the data quality. For example, change in the SIC coding system from SIC2000 to SIC2007 in 2010.

Any unexpected increase or decrease of incidence observed in a certain occupation, industry or related to certain suspected agents are checked to ensure the changes are not artificially caused by coding errors or coding inconsistencies. Furthermore, the preparation of the annual submission of THOR-GP statistics to HSE for the annual Health and Safety Statistics releases also include consistency check and making

corrections to earlier years data arising from late reporting of cases or from on going data cleaning. Since the signing of the data sharing agreement between HSE and the University of Manchester, HSE has been able to access to a sub-set of non-identifiable micro-data from THOR-GP. HSE can assess statistically the accuracy and consistency of the THOR-GP data which are submitted annually for contributing to the publication of the Health and Safety Statistics every year.

Due to the sample reporting, the estimated number of cases in Great Britain are based on a few actual number of cases reported. Therefore, it will be unreliable to draw conclusions on proportions or rates based on small numbers when, for example, the number of cases or rates broken down by type of ill health and industry sectors.

## Timeliness and punctuality

***Timeliness refers to the time gap between publication and the reference period. Punctuality refers to the gap between planned and actual publication dates.***

Updated work-related ill health statistics based on data collected in THOR-GP are published annually, in October each year, as part of Health and Safety Statistics release. The publication is about 10 months after the end of the data collection period. For example, all cases reported by GPs during the calendar year of 2014 are published in October 2015. The processes to produce the annual release of Health and Safety Statistics, including THOR-GP statistics are well-established and therefore, have not resulted in a delay to release in recent years.

## Accessibility and clarity

***Accessibility is the ease with which users are able to access the data, also reflecting the format in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the metadata, illustrations and accompanying advice.***

### Accessibility

The annual publication of the THOR-GP statistics is presented in tables and is accessible via the HSE website. See: ([www.hse.gov.uk/statistics/tables/index.htm#thor](http://www.hse.gov.uk/statistics/tables/index.htm#thor))

THOR-GP statistics are also used in special analyses of specific types of ill health and of particular industry sectors. Results of these analyses and the associated commentaries are presented as summaries. These are accompanied with more detail PDF documents that are also accessible via the HSE website. These statistics web pages will be updated at least annually. Please see the links provided under the section - "Relevance" on the use of THOR-GP statistical outputs in analyses of specific ill health and of industry.

THOR-GP statistics are also accessible through ad hoc information requests. The research team in the University of Manchester has also published many research papers using the THOR-GP data in peer-reviewed scientific journals. A list of their publications can be found in [www.population-health.manchester.ac.uk/epidemiology/COEH/research/publications/](http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/publications/)

### Clarity

Clear guidelines for reporting cases of work-related ill-health by GPs are published on the THOR-GP web page via the COEH, the University of Manchester, website, which also illustrate the type and scope of data collected from GPs. See: [www.population-health.manchester.ac.uk/epidemiology/COEH/research/thorgp/report\\_cases\\_guidelines.pdf](http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thorgp/report_cases_guidelines.pdf).

Patient Information Sheet about THOR-GP has been developed and for participating GPs to use to explain to patients'. The Patient Information Sheet is also published on the THOR-GP web page ([www.population-health.manchester.ac.uk/epidemiology/COEH/research/thorgp/](http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thorgp/))

## Confidentiality, transparency and security

THOR-GP is run from COEH, the University of Manchester. Statistical outputs from THOR-GP contribute to National Official Statistics and are published through HSE. There are procedures and policies in place to ensure sound confidentiality, security and transparent practices in the publication of the statistics. A Confidentiality Policy (which also covers data security) is available on the HSE website: [www.hse.gov.uk/statistics/about/confidentiality.htm](http://www.hse.gov.uk/statistics/about/confidentiality.htm)

To ensure transparency of data release, any revisions to our publications are handled in accordance with the Department's revisions policy, which is published on the statistics section of the HSE web site. This gives details on the circumstances of when a revision might take place, as well as a log of past revisions: [www.hse.gov.uk/statistics/about/revisions/index.htm](http://www.hse.gov.uk/statistics/about/revisions/index.htm). These statistics also comply with the UK Statistics Authority Code of Practice on release protocols. In particular, pre-release access to the data is strictly controlled. The Policy can be viewed at [www.hse.gov.uk/statistics/about/index.htm](http://www.hse.gov.uk/statistics/about/index.htm)

To avoid the possible risk of disclosing personal information through statistical outputs, disclosure control, often using the method of aggregation than suppression, is implemented where deemed necessary, especially where small counts are involved (e.g. <5 actual cases).

## Coherence and comparability

***Coherence is the degree to which data which have been derived from different sources or methods but refer to the same topic are similar. Comparability is the degree to which data can be compared over time and domain.***

### Coherence

THOR-GP study uses methods developed from other, more long standing clinical based reporting schemes within THOR date back more than 20 years. The methods have been tested and are continuously improved. THOR-GP data form an important part of the overall picture of work-related ill health in Great Britain. In most cases, THOR-GP data are complementary rather than directly comparable with other relevant data sources.

External comparisons have been made between self-reported work-related ill health (SWI) as part of the Labour Force Survey and the ill health cases reported by GPs (See: [www.hse.gov.uk/research/rrpdf/rr954.pdf](http://www.hse.gov.uk/research/rrpdf/rr954.pdf)). These two sources of data represent two different but important perspectives of work-related ill health. Cases reported in the SWI survey are based on individuals' perceptions of their health conditions and the associated work attribution. However, evidence based on review of a sample of reports from SWI suggested that these individuals' perceptions are broadly reliable (See: [www.hse.gov.uk/research/rrpdf/rr970.pdf](http://www.hse.gov.uk/research/rrpdf/rr970.pdf)). On the other hand, cases reported in THOR-GP are clinically assessed by GPs who are trained in occupational medicine. SWI may cover cases that are not considered severe enough to see a GP whereas THOR-GP may capture cases that have not been recognised to be work-related by patients themselves. However, as GPs are usually the first contact of workers with work-related ill health to seek medical care, the two data sources are closely related. Therefore, the two data sources should be complementary with each other.

In a broad sense, THOR-GP and SWI should give a similar picture of the incidence of work-related ill health in GB. The differences in the case distribution by age, occupation and industry could probably be explained by differences in data collection methods, case report criteria, the variations in the underlying population and the different perspectives between individual perceptions in self-reporting and physicians' assessment in clinical based reporting. For example, in both data sources, musculoskeletal disorders (MSDs) and mental ill health made up most of the cases. Musculoskeletal disorders are most frequently reported in THOR-GP while mental ill health cases are most frequently reported in SWI. Cases of work-related mental ill health comprise the highest proportion of Working Days Lost (WDL) for both studies. [www.hse.gov.uk/research/rrpdf/rr954.pdf](http://www.hse.gov.uk/research/rrpdf/rr954.pdf)

The incidence rate calculation in THOR-GP has used the newly developed denominator specifically for the scheme. Based on the above review of the two data sources in the hierarchy of the data collection, the incidence rate derived from THOR-GP will not be higher than the rates from the self-reported work-related ill

health (SWI) in general. However, large differences in the rate estimates have been observed between the two data sources.

Since the complete change of reporting from “Core” to “Sample” in 2011, the estimated incidence rates based on THOR-GP reporting have been higher than that based on SWI, although the difference has reduced greatly in 2014, following a reduction in the number of cases reported in THOR-GP in that year. The generally higher estimates in THOR-GP is in contrast to the expectation that the ill health cases seen by GPs would generally be a subset of all self-reported cases, though one would argue that THOR-GPs trained in occupational medicine may recognise on average more cases than typical GPs. Nevertheless, the incidence rate estimate in THOR-GP was based on a small number of cases. Many assumptions were made in the process of extrapolating/multiplying up the small number of cases reported in a year to estimate the incidence rate in that year. For example, in 2014, 146 out of 218 GPs who took part in the THOR-GP had responded. In total, they have reported 165 actual cases. These cases were then extrapolated to estimate an incidence rate of 1,728/100,000 in 2014 in GB. Without further information on the degree of uncertainty of the estimate, it is difficult to know whether the estimated rate could reflect the reality of the disease occurrence in GB population.

However, the estimated distribution of the employed workers (denominator) and the associated ill health incidents (numerator) by industry and occupation are reasonable consistent in THOR-GP. Therefore, the relative incidence rate ratios by industry and occupation instead of the estimated incidence rates have been use in this year’s annual statistics publication.

#### Comparability across domain

Statistical outputs from THOR-GP are presented side by side with statistics produced from other data sources, such as the self-reported ill health data collected from the Labour Force Survey to give a more complete picture of the occurrence of particular types of work-related ill health in Great Britain. Suitable commentaries are provided to assist the interpretation. (See: [www.hse.gov.uk/statistics/causdis/asthma/](http://www.hse.gov.uk/statistics/causdis/asthma/) ; [www.hse.gov.uk/statistics/causdis/dermatitis/](http://www.hse.gov.uk/statistics/causdis/dermatitis/))

#### Comparability over time

Many internal and external factors can influence the year on year comparability of the statistical outputs from THOR-GP. Some of the external factors may include the increase in awareness of the work-related ill health of both patients and GPs, and the changes of health care seeking behaviours. On the other hand, some of the internal factors may include the changes in data collection methods, reporting frequency, coding practices of the raw data and reporting behaviours of the GPs (i.e. the possible reporter fatigue over time and harvesting cases at the start of reporting).

Extensive work has been carried out by the Manchester research team to investigate impact of reporter fatigue, which manifested by, for example, the increase of blank return in association with the length of the participation time. Although there is some evidence of reporter fatigue amongst the core group GPs who had been reporting for every month per year in the past, there is insufficient evidence of fatigue amongst the sample reporters who are reporting for one randomly allocated month per year.

Furthermore, work has also been carried out to investigate the impact of the change reporting frequency from reporting every month of the year (core reporting) to reporting for one randomly assigned month per year (sample reporting) on the estimate of incidence. The reasons for a three-fold increase in the number of cases reported per month in sample reporting compared to core reporting are still largely unclear, for example, to what extent the large difference is due to core reporter under-reporting or sample reporters over-reporting but the disparity is thought to be artifactual.

The latest trend analysis has been carried out for THOR-GP data collected in 2011-2014 where consistent sample reporting method has been used. The analysis suggested an overall downward trend in the

estimated incidence of work-related ill-health with an estimated annual average decrease of -14.6% (95% CIs: -21.2, -7.5). However, this large annual reduction might not reflect the real change in the population.

The largest drop (~21%) in incidence rate was observed in the most recent year (2014) where reporting guidance was strengthened to prevent GPs reporting prevalent cases to THOR-GP. This might have reduced the total number of cases reported to the scheme. The new guidance was implemented after a THOR-GP survey in 2013 which found that about 23% of the cases reported to the scheme might have been prevalent cases rather than incident cases. Furthermore, the 15% average annual reduction was estimated from the trend analysis model where a systematic trend (i.e. linear reduction) throughout the study period (2011-2014) was assumed. This assumption may not be valid for the THOR-GP data. Therefore, the estimated THOR-GP trends have not been used in this year's annual statistics. Further investigation is required to understand the potential factors that have caused this reduction other than the real decrease in ill health occurrence in GB population.

Since April 2010, the Standard Industrial Classification system SIC 2007 to group industry data has replaced the previous SIC 2003. While the majority of the changes can be done by simple electronic conversion from one code to another, the conversion of others are less straightforward. However, the impact of this change on the statistical outputs is minor. Further information about the industry coding is available from the webpage: [www.hse.gov.uk/statistics/industry/sic2007.htm](http://www.hse.gov.uk/statistics/industry/sic2007.htm).

## Summary of strengths and weaknesses

### Strengths

- Reported cases are clinically assessed by general practitioners (GPs) who have been trained at the postgraduate level in occupational medicine
- Cases are reported according to predefined criteria
- It collects information on all types of work-related ill health seen in GP clinics throughout GB
- It collects not only the information on diagnosis/symptom and the associated occupation and industry, but also the information on suspected work-related causes, certified sick leave days and clinical referrals which are not available from other data sources
- It allows the estimations of incidence rates and trends for broad ill health categories in GB
- It uses methods developed from other, more long-standing clinical based reporting schemes and the quality of the data collected are continuously assessed and improved
- It compliments other sources of data of work-related ill health at the national level
- All information collected is anonymous. No identifiable information about a patient is collected

### Weaknesses

- Only a small number of GPs (1% of all GPs in GB) are reporting for one randomly assigned month per year with an average response rate of 70%. The incidence rate and trend analyses are often based on a small number of cases reported. The incidence rate estimates may be subject to wide random variations and response bias
- It captures work-related ill health cases seen in GP consultations and therefore provide an estimate of a portion of the total burden of work-related ill health
- The estimated incidence rates and trends are influenced by patients' healthcare seeking behaviours and reporting behaviours of the GPs and are sensitive to methodology changes
- The estimates of incidence rates and trends are based on many assumptions and subject to uncertainties which prevent drawing firm conclusions

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A revisions policy and log can be seen at [www.hse.gov.uk/statistics/about/revisions/](http://www.hse.gov.uk/statistics/about/revisions/)

Additional data tables can be found at [www.hse.gov.uk/statistics/tables/](http://www.hse.gov.uk/statistics/tables/).

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