

# **The Health and Occupation Research (THOR) network Annual Report**

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<http://www.coeh.man.ac.uk/thor>

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Dear Friend/colleague,

Please find enclosed the THOR annual report for 2021, presenting an overview of cases reported to the 4 schemes in the previous year. 2020 was an unusual and difficult year for all of us. This is also reflected in the results of THOR, with fewer reports to the different THOR reporting schemes compared to previous years. This is not surprising given the impact the pandemic has had on our lives and continues to have. The current year will hopefully be somewhat better in terms of active reporters, although I expect that we are still below the reporting levels of previous years. This is partly because the THOR team has yet to return to the office (although we anticipate going back to campus very soon), and hence we haven't been able to send out any reporting cards and process any cards that were sent to us by post. However, I hope that all of you are now used to reporting online!

I hope that you have been enjoying the seminar series over the last year; we have had very positive feedback so far and the seminars continue to attract large numbers of delegates. As a THOR reporter, you will have access to the recordings of all these seminars, so if you missed any of them or would like to see a seminar again, just login to THOR reporting site, with your username and password. The link to the seminar series is: <https://coeh.manchester.ac.uk/thor/seminars/>. We will continue with our seminar programme in the new academic year, and we have some very exciting and interesting talks in the pipeline, including talks based on the THOR reporting scheme. Please see any future announcements.

We are currently in the final stages of negotiations with HSE for continued funding for data collection for 2022 and 2023. Following the signing of the contract, we aim to embark on a number of activities to try to increase the number of active reporters to THOR and also to try to recruit new reporters. We may want to talk to some of you to find out how we can make participation in THOR as attractive as possible to you and new recruits. As part of these activities, we will be launching a new website very soon.

So, although I suspect that the COVID-19 pandemic will continue to affect all of us in one way or another for quite some time, I am also very excited to continue this important work with you and colleagues at the Health and Safety Executive.

If you have any questions or comments on this report or on any other THOR related matter, please contact me at [martie.j.van-tongeren@manchester.ac.uk](mailto:martie.j.van-tongeren@manchester.ac.uk) or my colleague Dr Ireny Iskandar at [ireny.iskandar@manchester.ac.uk](mailto:ireny.iskandar@manchester.ac.uk).

With best wishes

A handwritten signature in blue ink, appearing to read 'Martie van Tongeren', with a long horizontal flourish extending to the right.

**Martie van Tongeren**  
**Professor of Occupational and Environmental Health**

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## SUMMARY

Physicians reported 462 actual (2024 estimated) cases of work-related ill-health (WRIH) to The Health and Occupation Research (THOR) network in 2020. Occupational physicians (OPs) reported 40%; dermatologists reported 22%; chest physicians reported 31% and general practitioners (GPs) reported 7% of the total number of estimated cases. In comparison, 1086 (5244) cases were reported in 2019, with OPs having reported 34%; dermatologists reported 25%; chest physicians reported 35% and GPs reported 5%. This decrease in reporting in 2020 is probably largely due to the COVID-19 pandemic crisis and the interruptions that it caused.

For work-related respiratory disease, non-malignant pleural disease was reported by chest physicians most frequently (36%), followed by mesothelioma (23%) and pneumoconiosis (20%). Asthma and COVID-19 (including long COVID) were the most often reported respiratory disease by OPs (51% and 23%, respectively). Like 2019, the industry sectors reported most frequently by chest physicians were construction (35%) and manufacturing (33%). OPs reported cases predominantly from health and social care (80%) in 2020. OPs reported cases predominantly from this sector in 2019 also, though the percentage was lower (58%).

Skin cases reported to EPIDERM and OPRA in 2020 were predominantly contact dermatitis (88% and 80%, respectively). In terms of industry sector, cases were reported most frequently from health and social care sector for EPIDERM (28%), and all cases reported for OPRA were also from this sector. This sector was also reported most frequently in 2019 by dermatologists (27%) and OPs (74%).

For musculoskeletal disorders, hand/wrist/arm and lumbar spine/trunk disorders were the most frequent anatomical sites reported by OPs (28% and 26%, respectively). For GPs lumbar spine/trunk disorders were the most frequently reported musculoskeletal disorder (27%), followed by hand/wrist/arm and ankle/foot (both 20%). The industry sectors reported by OPs most frequently for musculoskeletal disorders were health and social care (32%) and public administration and defence (23%). These two sectors were also reported most frequently in 2019 (health and social care: 26%; public administration and defence: 18%), along with transportation and storage (18%). In contrast, GPs reported musculoskeletal cases predominantly from the public administration and defence sector (54%), followed by manufacturing and the retail trade (both 15%). This differs to 2019, which had manufacturing as the most frequently reported sector (26%), followed by transportation and storage (15%).

In terms of mental ill-health, work-related stress continues to be the diagnostic category reported most often by OPs (47%) and GPs (60%), followed by anxiety and depression (OPRA: 39%; THOR-GP: 27%). The most reported mental ill-health cases were employed in the health and social care sector for both schemes (OPRA: 48%; THOR-GP: 36%). This was also the most reported sector for mental ill-health in 2019 (OPRA: 57%; THOR-GP: 23%).

Due to the Covid-19 pandemic crisis, reporting was reduced in 2020 compared to previous years. Hence, comparison of incidence in WRIH with previous years is not recommended.

## 1. BACKGROUND

The Health and Occupation Research (THOR) network is hosted by the Centre for Occupational and Environmental Health (COEH) at the University of Manchester, and collects data on work-related ill-health (WRIH) and its determinants throughout the UK and (since 2005) the Republic of Ireland (ROI). THOR is (partially) funded by the two regulators of health and safety: the Health and Safety Executive (HSE) in the UK and the Health and Safety Authority (HSA) in the ROI. The network comprises a number of health surveillance schemes that utilise voluntarily submitted, medically certified data on WRIH. The Surveillance of Work-Related and Occupational Respiratory Disease (SWORD) is the longest running scheme and was set up for occupational and respiratory physicians in 1989. At present, there are four schemes in operation enabling different groups of physicians to report cases - SWORD (chest physicians), EPIDERM (dermatologists), OPRA (occupational physicians) and THOR-GP (general practitioners).

The clinical specialist schemes (SWORD and EPIDERM) continue to provide estimates of the incidence of occupational disease in the UK based on medical specialist diagnoses. These data inform the national agenda and provide a resource for applied occupational health epidemiology and other research provide informing participating physicians. In addition, since 2005, THOR collects data and conducts research on the burden of work-related sickness absence. THOR remains one of the main sources of statistical information with which the HSE (and other agencies) determine their priorities and work programs on occupational health. For work-related respiratory and skin diseases, SWORD and EPIDERM are the HSE's preferred data source in the UK.

This report describes the cases of WRIH reported to THOR (UK only) in the latest full calendar year (2020).

## 2. METHODS

Participating physicians were asked to provide anonymised case reports of incident cases seen during their reporting month that they believe to have been wholly or partly caused or aggravated by work. All physicians report either every month ('core' reporters) or for one randomly assigned month per year ('sample' reporters). Reporters are requested to give information on diagnosis, age, gender, geographical location, occupation, industry and suspected agent(s). The occupation and industry are coded using the Standard Occupational Classification (SOC) and the Standard Industrial Classification (SIC), respectively. Suspected agents are coded using in-house coding schemes developed in conjunction with the Health and Safety Executive (HSE) in the UK. All coding is undertaken independently by two researchers, and any discrepancies are reconciled by a third person.

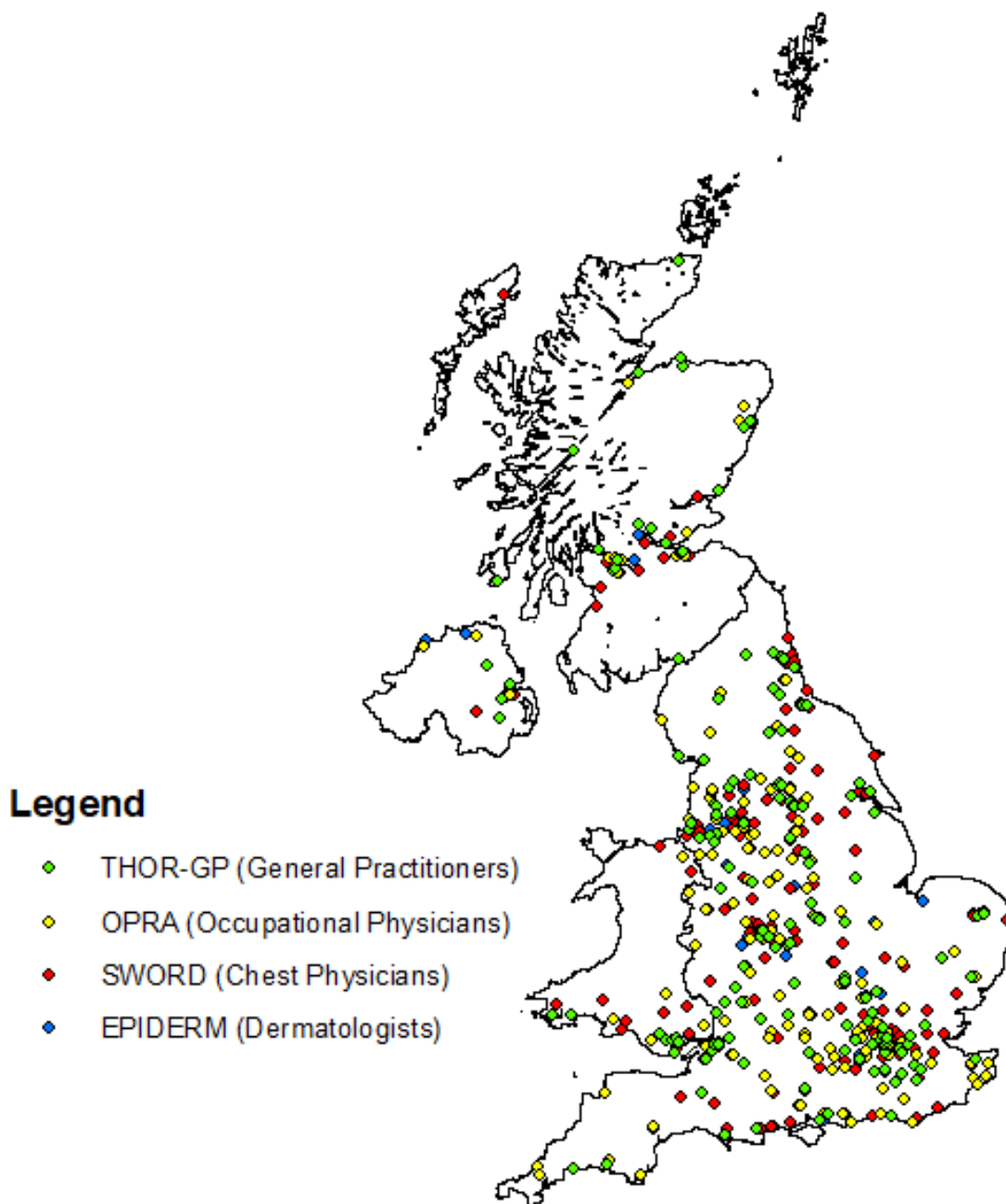
Physicians reporting to EPIDERM are requested to assign their case to one or more of the following major sub-groups: contact dermatitis (CD), contact urticaria (CU), folliculitis/acne, infection, mechanical dermatoses, nail disorders, neoplasia, and 'other dermatoses' (with the ability to specify the diagnosis if the latter is chosen). Similarly, the sub-groups for chest physician reporting to SWORD are occupational asthma, inhalation accidents, allergic alveolitis, bronchitis/emphysema, infectious disease, non-malignant pleural disease (NMPD), mesothelioma, lung cancer, pneumoconiosis, and 'other respiratory disease'. Physicians reporting to OPRA and THOR-GP (who can return case details for all types of occupational ill-health) record the diagnosis which is subsequently coded using the International Classification of Disease 10<sup>th</sup> Revision (ICD-10) so that comparisons can be made between reporting schemes. Two new categories were introduced for cases of COVID-19 reported to THOR: COVID-19 and long COVID. Reporters are free to report COVID-19 cases under either the "respiratory" or "other" category.

Cases of occupational disease reported to EPIDERM, SWORD, OPRA and THOR-GP for 2020 have been extracted from the databases and analysed using the statistical package SPSS V25.0.

### 3. RESULTS

#### 3.1 PARTICIPATION

Approximately 791 physicians were enrolled<sup>1</sup> in THOR in the UK during 2020. Figure 1 shows the location of the various groups of THOR reporters (chest physicians, dermatologists, occupational physicians, general practitioners).<sup>2</sup>



**Figure 1: Location of THOR reporters (2020).**

<sup>1</sup> The number of reporters enrolled in the scheme per month, calculated as an average across 12 months.

<sup>2</sup> A dot may reference multiple physicians in the same area.



Response rates for THOR take into account submission of cases of WRIH seen in the reporting month and nil returns, i.e. when reporters have not seen any cases of WRIH in their reporting month. Due to the COVID-19 pandemic crisis, response rates in 2020 were low compared to 2019 (Figure 2 and 3). Table 1 provides an overview of the number of reporters per scheme and number of actual and estimated cases reported for the period Jan-Dec 2020 compared with Jan-Dec 2019 and shows that, probably largely due to the pandemic, the number of cases reported was lower in 2020 compared to 2019.

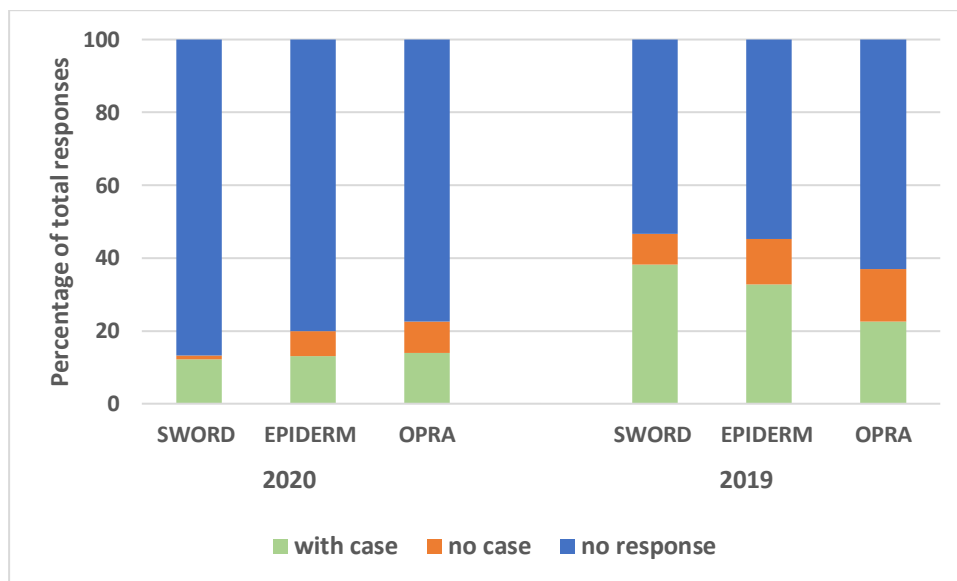


Figure 2: Response rates by scheme for core reporters (2020 and 2019)

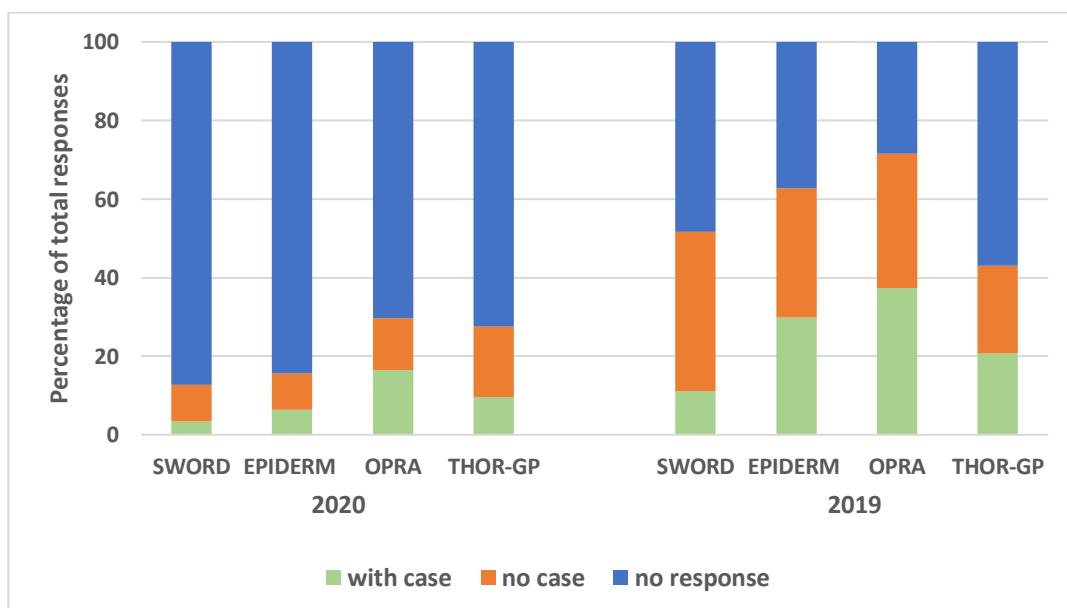


Figure 3: Response rates by scheme for sample reporters (2020 and 2019)

**Table 1: Number of physicians and actual and estimated cases reported by scheme (Jan – Dec 2020/2019)**

	Jan-Dec 2020		Jan-Dec 2019	
	Average number of physicians	Actual cases (estimated)	Average number of physicians	Actual cases (estimated)
OPRA	167	183 (1305)	181	369 (3009)
EPIDERM	123	101 (332)	126	274 (1099)
SWORD	347	144 (353)	345	384 (1077)
THOR-GP	154	34*	166	59*
<b>TOTAL</b>	<b>791</b>	<b>462 (2024)</b>	<b>818</b>	<b>1086 (5244)</b>

\*Only actual cases are presented for THOR-GP.

The following sections provide the results by major diagnostic category: respiratory cases reported to SWORD, OPRA and THOR-GP; skin cases reported to EPIDERM, OPRA and THOR-GP; musculoskeletal cases reported to OPRA and THOR-GP and mental ill-health cases reported to OPRA and THOR-GP.

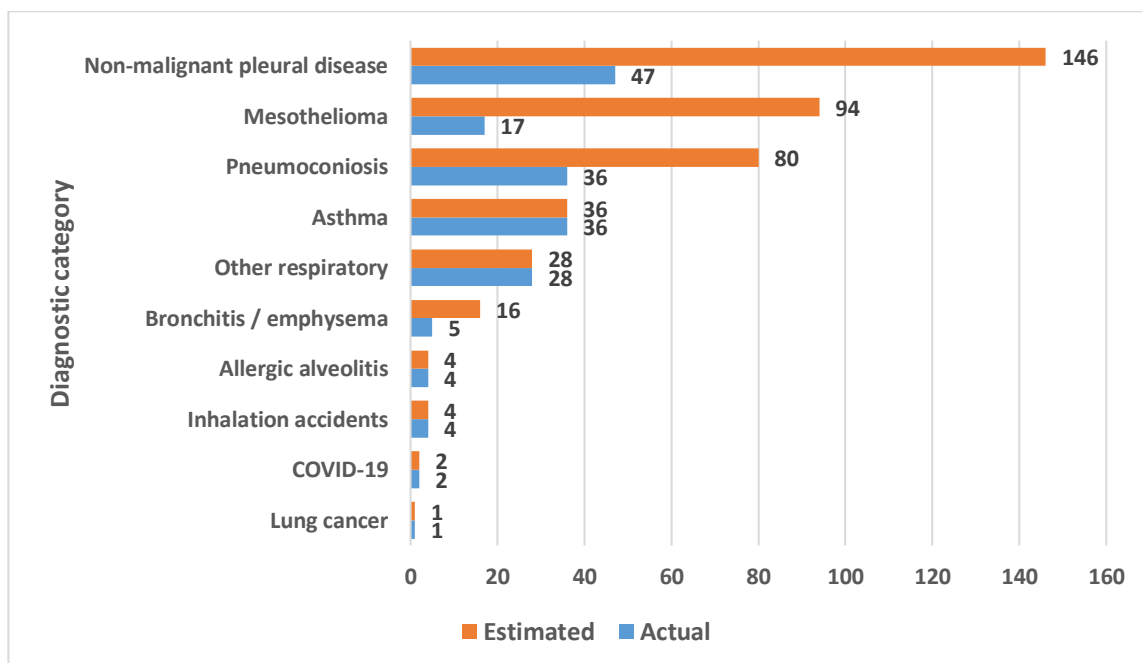
### 3.2 RESPIRATORY

Work-related respiratory disease cases are reported to THOR by chest physicians (SWORD), and by OPs and GPs to OPRA and THOR-GP, respectively. In total, 168 actual (476 estimated) cases of respiratory disease were reported to THOR in 2020. Schematically, 144 actual cases (353 estimated) reported by chest physicians to SWORD (86%), 21 actual cases (120 estimated) by OPs (13%) and 3 actual cases by GPs (1%). The actual and estimated cases by diagnostic category reported by chest physicians in 2020 are provided in Figure 4. Non-malignant pleural disease was reported most frequently (36%), followed by mesothelioma (23%), pneumoconiosis (20%) and asthma (9%)<sup>3</sup>. There were two cases (0.5%) of COVID-19 reported by chest physicians in 2020<sup>4</sup>. For the respiratory cases reported to the other THOR schemes, OPs reported asthma (51%), COVID-19/long COVID (23%), ‘other’ respiratory disease (17%) comprising rhinitis and anaphylactic reaction, and, lastly, bronchitis/emphysema (8%). For the COVID-19/long COVID category, eight cases were COVID-19 infection and three cases were long COVID. OPs are free to report the covid cases under either “respiratory” or “other” category, thus all eight cases of covid-19 infection were reported under the

<sup>3</sup> Percentages calculated from the total number of diagnoses of respiratory disease reported by physicians.

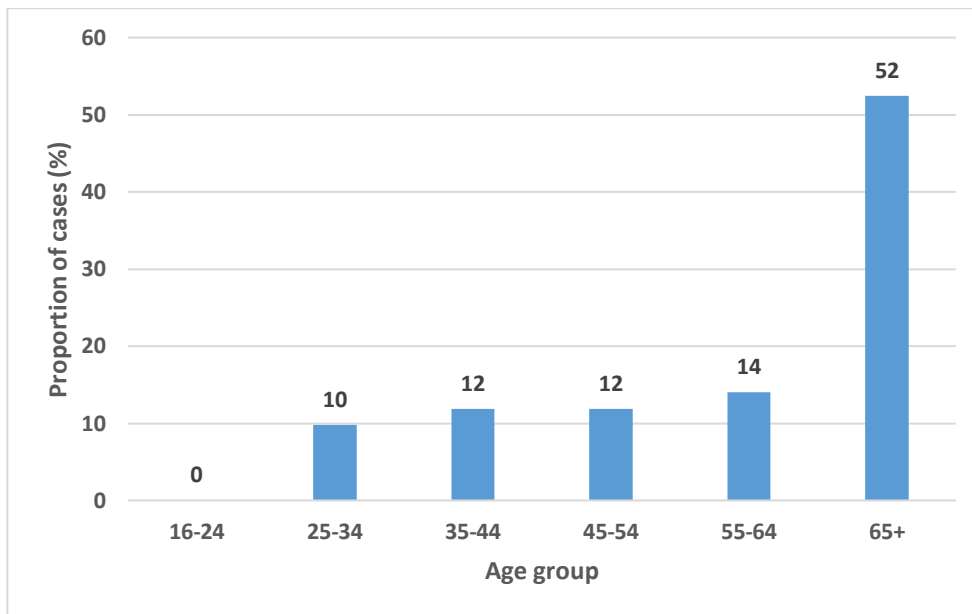
<sup>4</sup> All cases of COVID-19 were reported by chest physicians under the ‘infectious disease’ category.

“respiratory” category, two of the long covid cases were reported under the “other” diagnosis category and one long covid case was reported under the “respiratory” category. GPs reported asthma for two cases (two diagnoses) and COVID-19 infection for one case (one diagnosis).



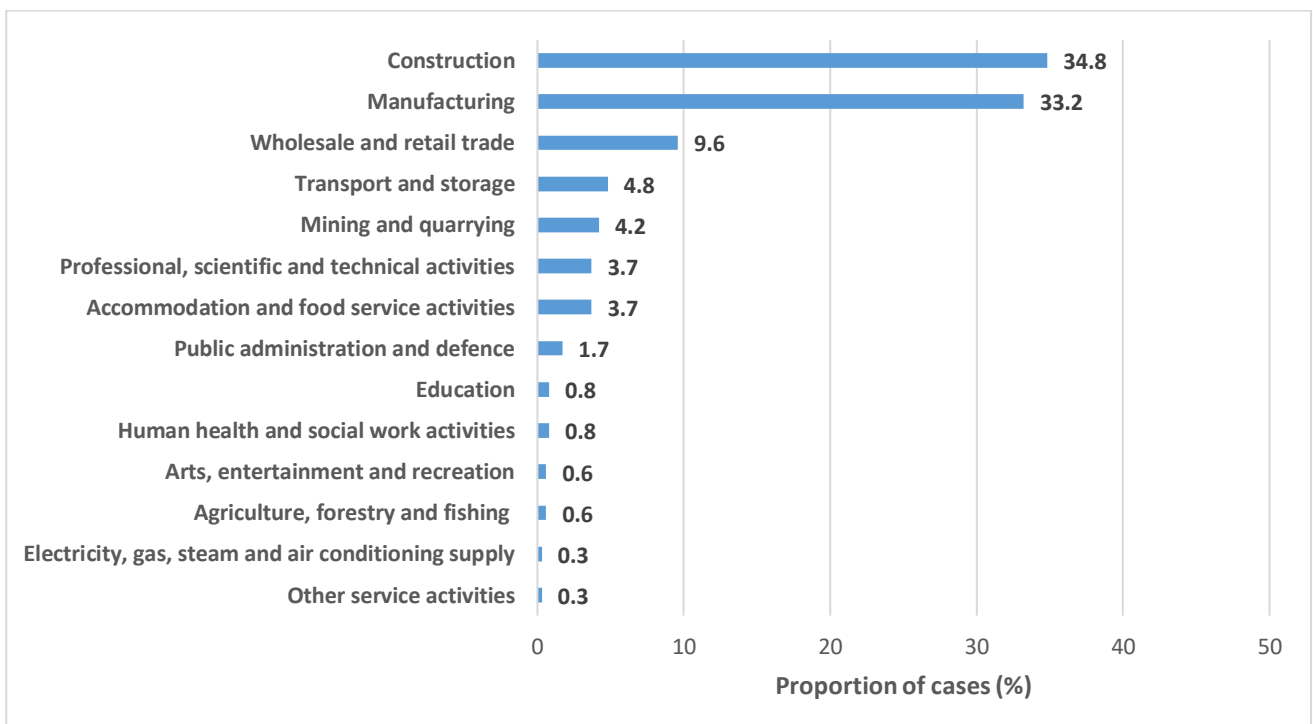
**Figure 4: Actual and estimated cases of work-related respiratory cases by diagnostic category reported to SWORD (2020).**

The mean age of the cases reported to SWORD was 61 years (range 26-97 years). Figure 5 shows the proportion of cases reported by age group for SWORD. The mean age of the cases reported to OPRA is 46 years (range 23-57 years), with a mean age of 44 years (range, 32-54 years) for those reported to THOR-GP. In total, 81% of the respiratory cases returned to SWORD in 2020 were male. Cases of respiratory disease reported to OPRA were 67% female and 33% male, and of the three respiratory cases reported to THOR-GP in 2020, two were female, the other being male.



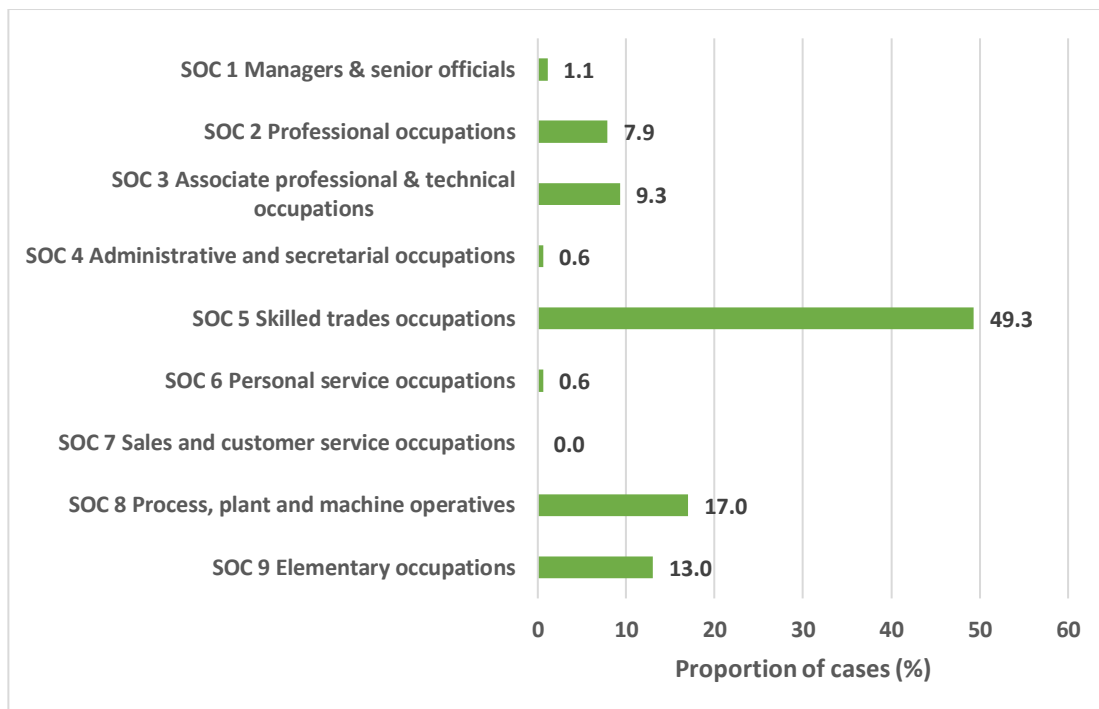
**Figure 5: Proportion of actual cases of work-related respiratory disease by age group reported to SWORD (2020).**

The industry sectors for cases reported to SWORD are provided in Figure 6. The most frequently reported sectors for 2020 were construction and manufacturing. Cases of work-related respiratory disease reported to OPRA were employed in health and social care (80%), education (10%) and agriculture, forestry and fishing (10%) in 2020. The three respiratory cases reported by GPs were in public administration and defence (one case) and health and social care (two cases).



**Figure 6: Proportion of estimated cases of work-related respiratory disease by industry sector reported to SWORD (2020).**

The proportions of respiratory cases by major occupational grouping (SOC) are provided in Figure 7 for SWORD cases. Occupations within SOC group 5, skilled trades, were reported most frequently; and the most frequently reported specific occupation within the SOC 5 group were carpenters and joiners (10%).

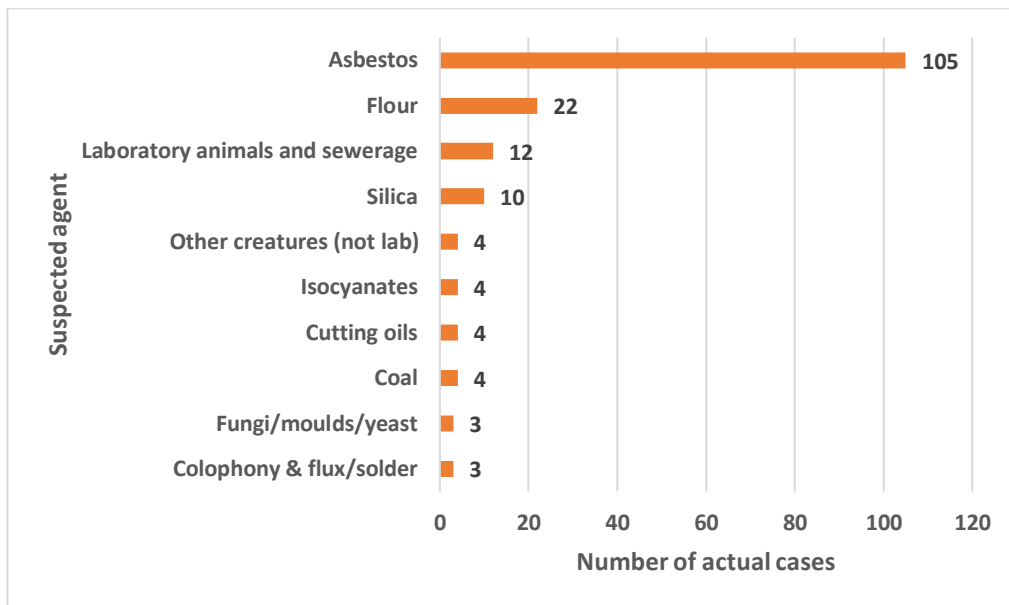


**Figure 7: Proportion of estimated cases of work-related respiratory disease reported to SWORD by major occupational grouping (2020).**

Respiratory disease cases reported in OPRA were employed in personal service occupations (43%), professional occupations (17%), associate professional & technical occupations (11%), process, plant and machine operatives (10%), elementary occupations (10%) and administrative and secretarial occupations (10%). The three cases reported to THOR-GP comprised a police officer, a nurse and a medical technician.

Physicians can report up to three suspected agents for each case of work-related respiratory disease reported to THOR. Figure 8 provides the most frequently reported suspected agents for returns by chest physicians to SWORD based on actual cases. Asbestos was associated most frequently (52% of reported agents) with the reported cases.<sup>5</sup> Other agents, including flour (11% of reported agents), laboratory animals (6%) and silica (5%) were reported with much lower frequency.

<sup>5</sup> Percentages calculated from the total number of suspected agents reported by physicians.



**Figure 8: Most frequently reported suspected agents for work-related respiratory cases (actual) reported to SWORD (2020).**

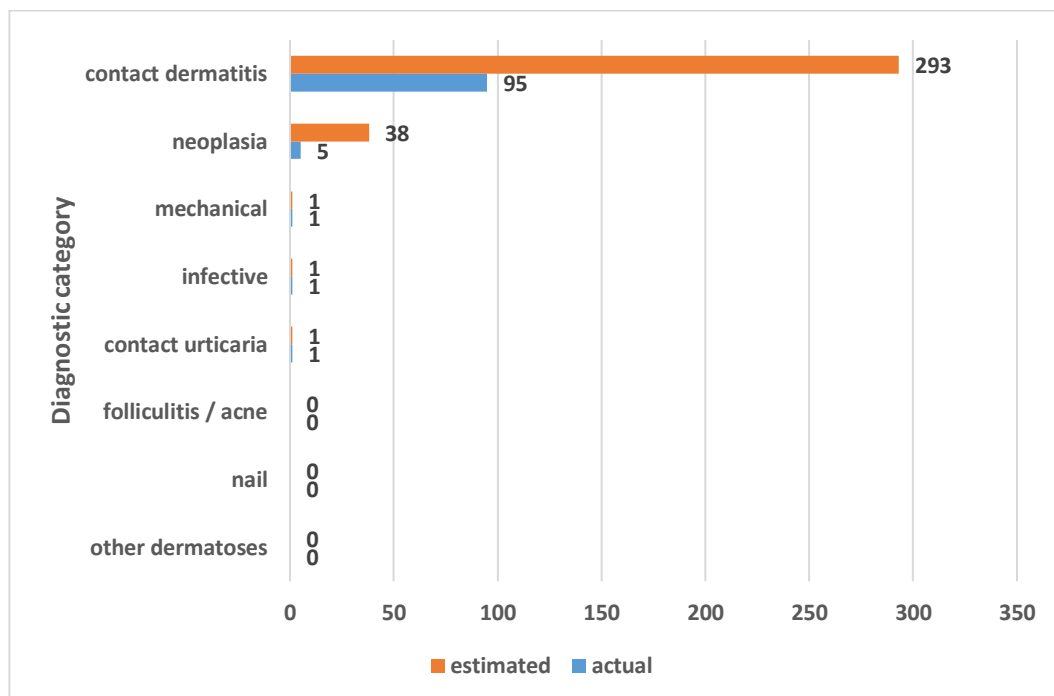
The suspected agents reported for the cases of respiratory disease to OPRA were SARS-CoV-2 virus (43%), protective clothing and other personal protective equipment (PPE) (29%), plants (5%), colophony and flux/solder (5%), sterilising and disinfecting agents (5%) and other unspecified chemicals (5%). Of the three respiratory cases reported to THOR-GP, one was attributed to smoke, one to SARS-CoV-2 virus and one did not have a suspected agent.

### 3.3 SKIN DISEASE

A total of 123 actual (464 estimated) cases of work-related skin disease were reported to THOR in 2020 by dermatologists to EPIDERM, OPs to OPRA and GPs to THOR-GP. Dermatologists reported 82% of the skin cases in 2020 (101 actual, 332 estimated), with the largest proportion of diagnoses reported as contact dermatitis (88%) followed by neoplasia (11%).<sup>6</sup> Figure 9 shows the actual and estimated cases reported by dermatologists in 2020. OPs reported 19 actual (129 estimated) cases of skin disease to OPRA in 2020, with 80% of diagnoses reported as “contact dermatitis”, 10% as other dermatoses (of which, one case was diagnosed as angioedema, one as worsening of pre-existing keratosis pilaris and one as exacerbation of eczematized palmer psoriasis), 8% of diagnoses were reported as folliculitis/acne, and 2% were reported as contact urticaria. GPs reported three cases of

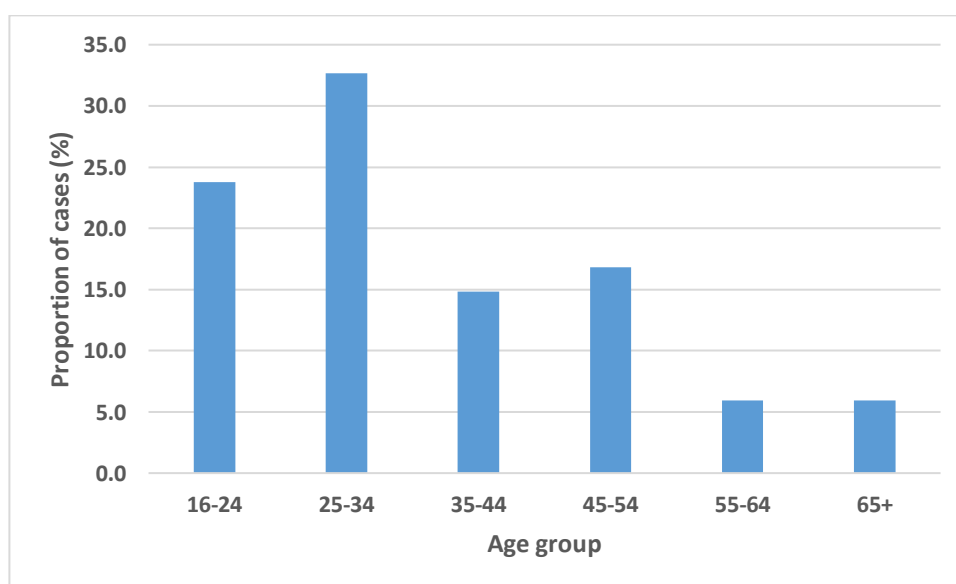
<sup>6</sup> Percentages calculated from the total number of diagnoses of skin disease reported by physicians.

skin disease to THOR-GP in 2020. Of these, two cases were diagnosed as contact dermatitis, and one case was diagnosed as a burn.



**Figure 9: Actual and estimated skin cases by diagnostic category reported to EPIDERM (2020).**

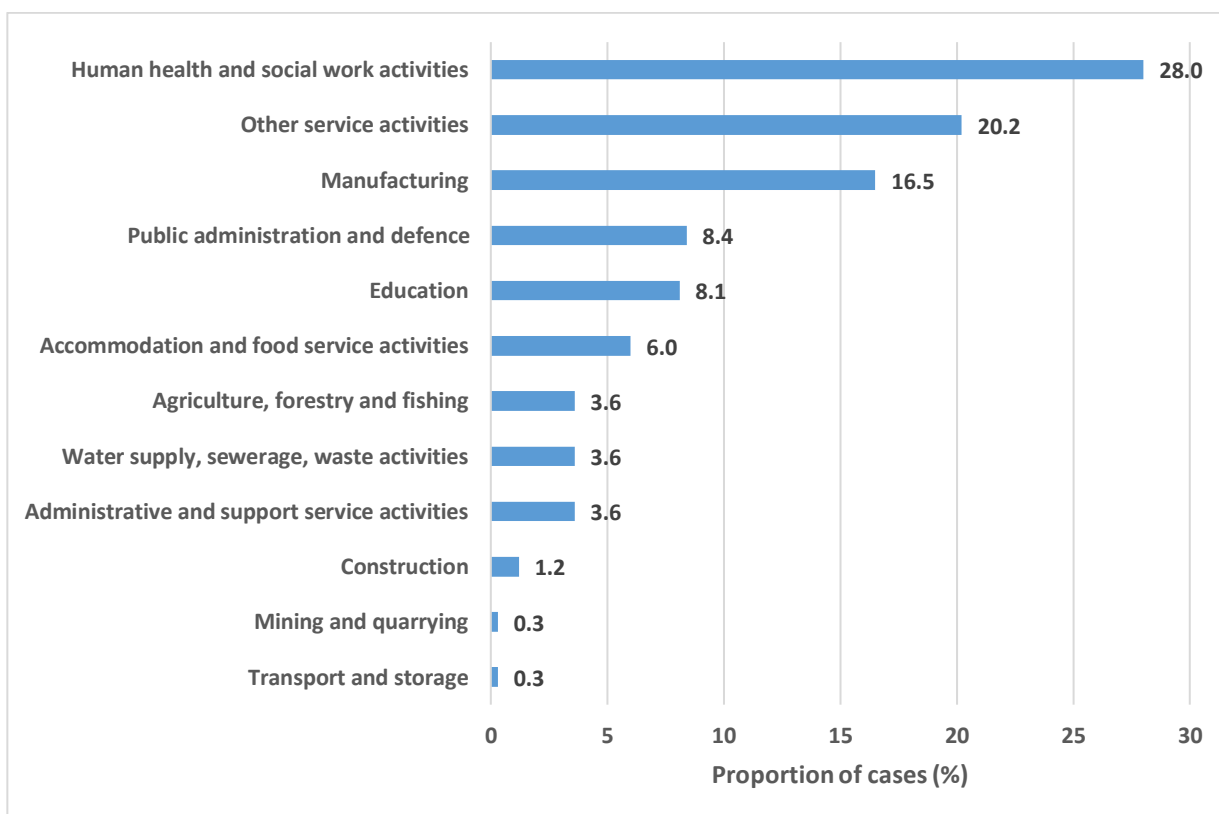
The reported mean age of the cases reported to EPIDERM was 37 years old (range 17-88 years). Figure 10 shows the proportion of cases reported by age group (EPIDERM 2020). For skin disease cases reported to OPRA, the mean age was 40 years old (range 19-58 years), and for GP reported cases, the mean age was older at 56 years old (range 44-65 years).



**Figure 10: Proportion of actual cases of work-related skin disease by age group reported to EPIDERM (2020).**

Cases of skin disease reported to EPIDERM were 69% female and 31% male. Cases reported to OPRA were 89% female and 11% male, and of the three cases reported to THOR-GP, one was female and two male.

Cases reported by consultant dermatologists to EPIDERM were mostly employed in health and social care (28%), other service activities (20%) and manufacturing (17%) (Figure 11). All skin disease cases reported by OPs were employed in the health and social care sector. The industries reported for the three GP reported skin cases were the manufacturing (two cases), and hospitality (one case).

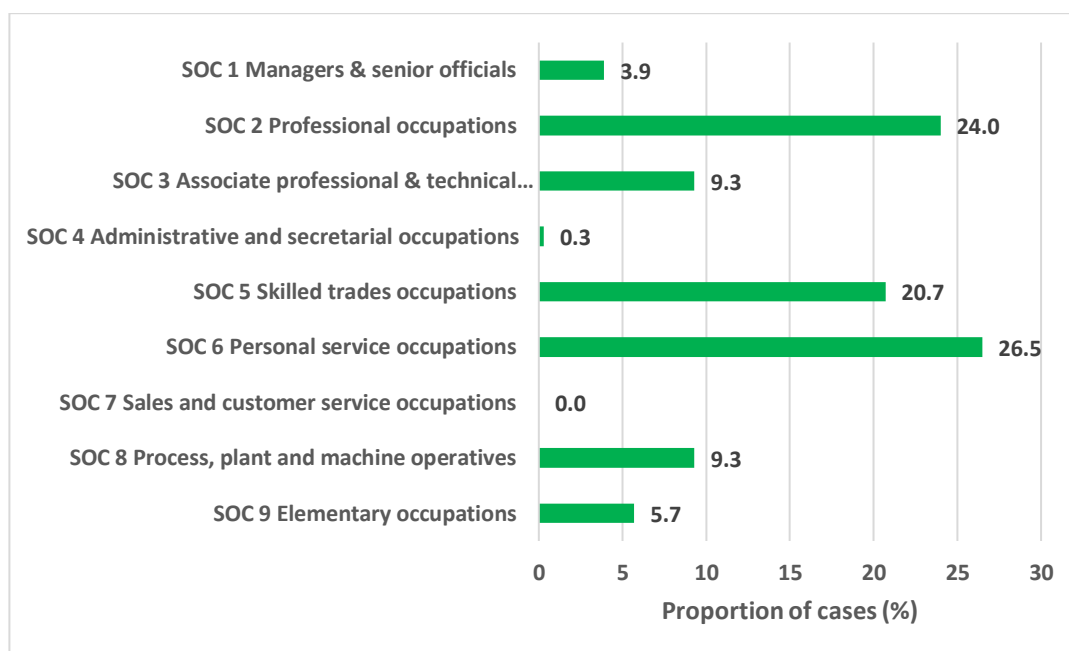


**Figure 11: Proportion of estimated cases of work-related skin disease by industry sector reported to EPIDERM (2020).**

The proportion of skin cases by major occupational grouping (SOC) reported by dermatologists to EPIDERM are provided in Figure 12. The largest proportion of cases were coded to SOC group 6 (personal service occupations), followed by SOC 2 (professional occupations), and the specific occupations most frequently reported by dermatologists were beauticians and related occupations (15%). The highest proportion of skin cases reported by OPs to OPRA were SOC 6 (personal service occupations) (67%). This group were predominantly nursing auxiliaries and assistants and included a mortuary assistant. Other SOC categories reported by OPs were associate professional and technical



occupations (19%), professional occupations (13%), elementary occupations (1%) and managers and senior officials (1%). The occupations for the three GP skin cases, comprised a welder, a food process operative and a kitchen and catering assistant.



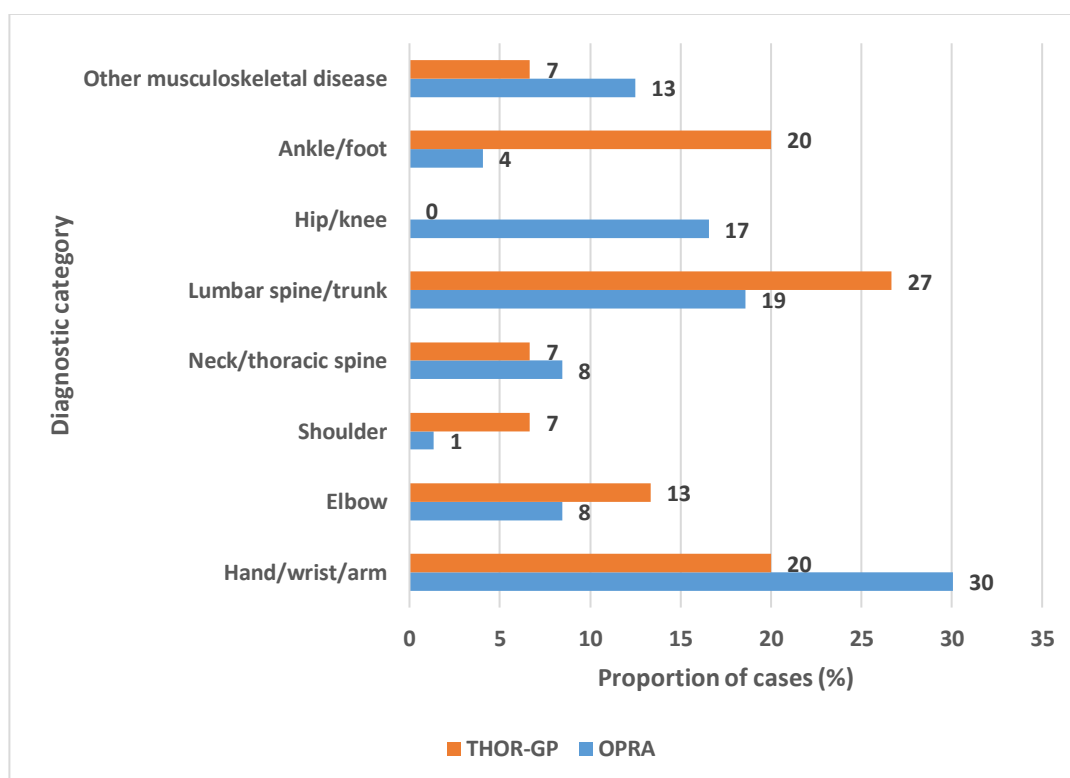
**Figure 12: Proportion of estimated cases of work-related skin disease by major occupational grouping reported to EPIDERM (2020).**

Physicians can report up to six suspected agents for each case of skin disease reported to THOR. The most frequently suspected agent for skin disease cases reported to EPIDERM was water/wet work/washing/washing up (13%)<sup>7</sup>. The other most frequently reported agents were soaps and detergents (9%), methacrylate esters (9%), protective clothing and personal protective equipment (excluding gloves) (7%), preservatives (6%) and sterilising and disinfecting agents (6%). The most frequently reported agent reported to OPRA was water/wet work/washing up (39%), followed by sterilising and disinfecting agents (23%), protective clothing and PPE (excluding gloves) (23%), soaps and detergents (8%), gloves (4%) and denatonium benzoate (4%). The suspected agents reported to THOR-GP were bleach, soaps and detergents, natural rubber latex, gloves, and burns caused by hot work (all one case).

<sup>7</sup> Percentages calculated from the total number of suspected agents for skin disease reported by physicians.

### 3.4 MUSCULOSKELETAL

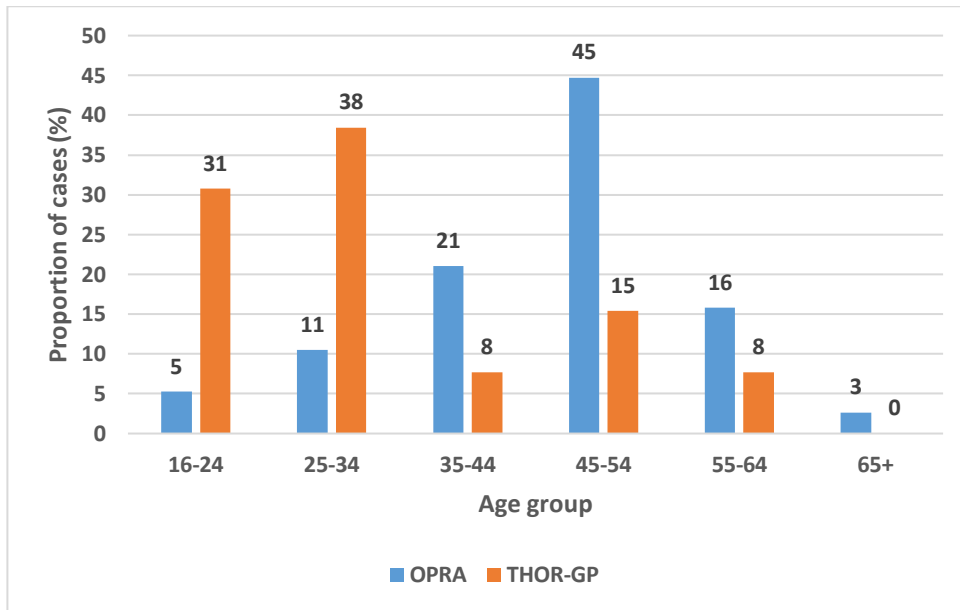
Cases of work-related musculoskeletal disorders are recorded in OPRA and THOR-GP. In 2020, a total of 51 actual (271 estimated) cases of musculoskeletal disorders were reported; 38 actual (258 estimated) cases reported by OPs and 13 actual cases reported by GPs. Figure 13 shows the proportion of actual cases by diagnostic category reported to OPRA and THOR-GP. Hand/wrist/arm and lumbar spine/trunk disorders were the most frequently reported anatomical site for OPs (28% and 26%, respectively), and lumbar spine/trunk disorders were the most frequently reported anatomical sites for GPs (27%), followed by hand/wrist/arm and ankle/foot (both 20%).<sup>8</sup>



**Figure 13: Proportion of cases of work-related musculoskeletal disorders by diagnostic category reported to OPRA (estimated) and THOR-GP (actual) (2020).**

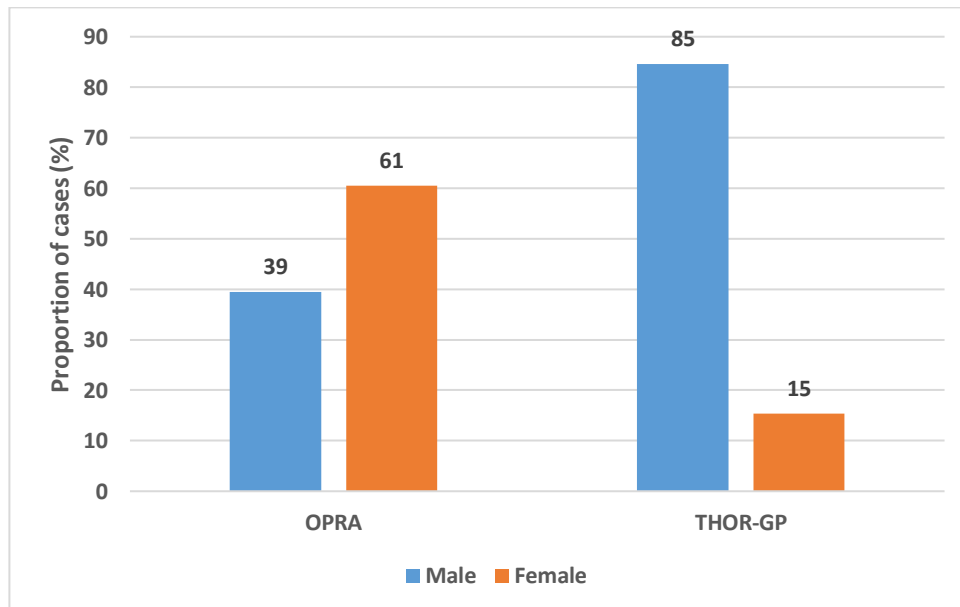
The proportion of musculoskeletal cases by age group reported to both schemes is provided in Figure 14. The mean age of the cases reported to OPRA was 46 years (range 21-66 years) and the mean age of the cases reported to THOR-GP was 33 years (range 19-57 years).

<sup>8</sup> Percentages calculated from the total number of diagnoses of musculoskeletal disorders reported by physicians.



**Figure 14: Proportion of actual cases of musculoskeletal disorders by age group reported to OPRA and THOR-GP (2020).**

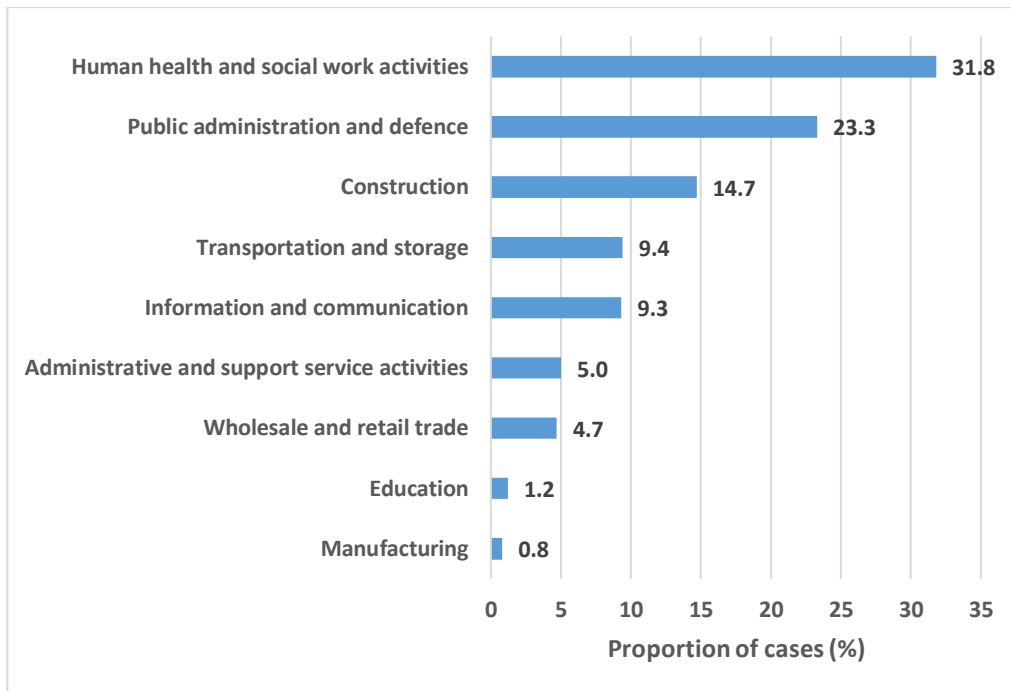
Of the musculoskeletal cases reported to OPRA, 39% were male and 61% female. For THOR-GP cases, 85% were male and 15% female (Figure 15).



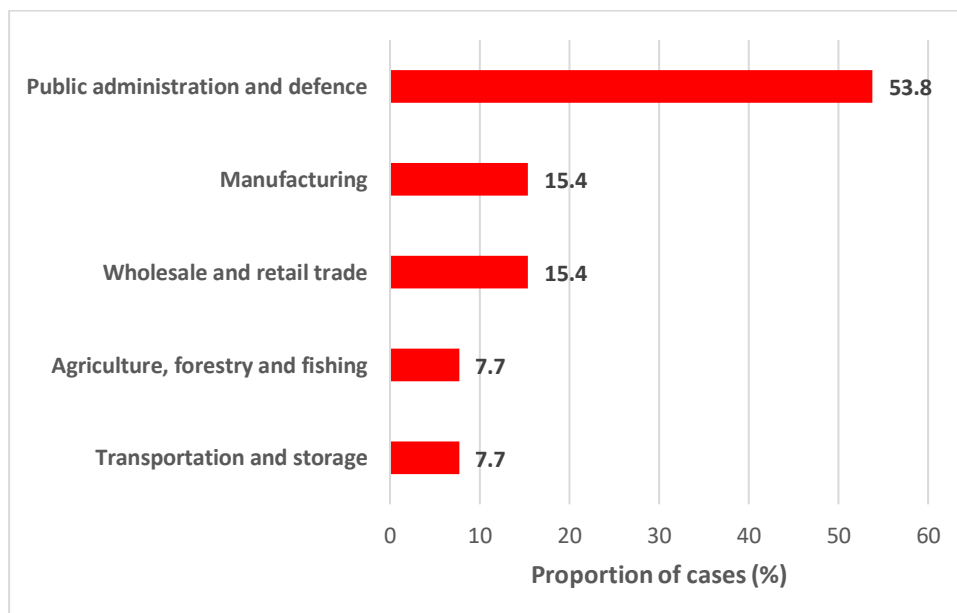
**Figure 15: Proportion of actual cases of musculoskeletal disorders by gender reported to OPRA and THOR-GP (2020).**

Figures 16 and 17 provide the proportion of cases of work-related musculoskeletal disorders by industry sectors reported to OPRA and THOR-GP in 2020. The industry sector most frequently reported by OPs was health and social care (32%), followed by public administration and defence (23%), and construction (15%). In contrast, cases reported by GPs, public administration and defence

was reported most frequently (54%), followed by manufacturing (15%), and wholesale and retail trade (15%).



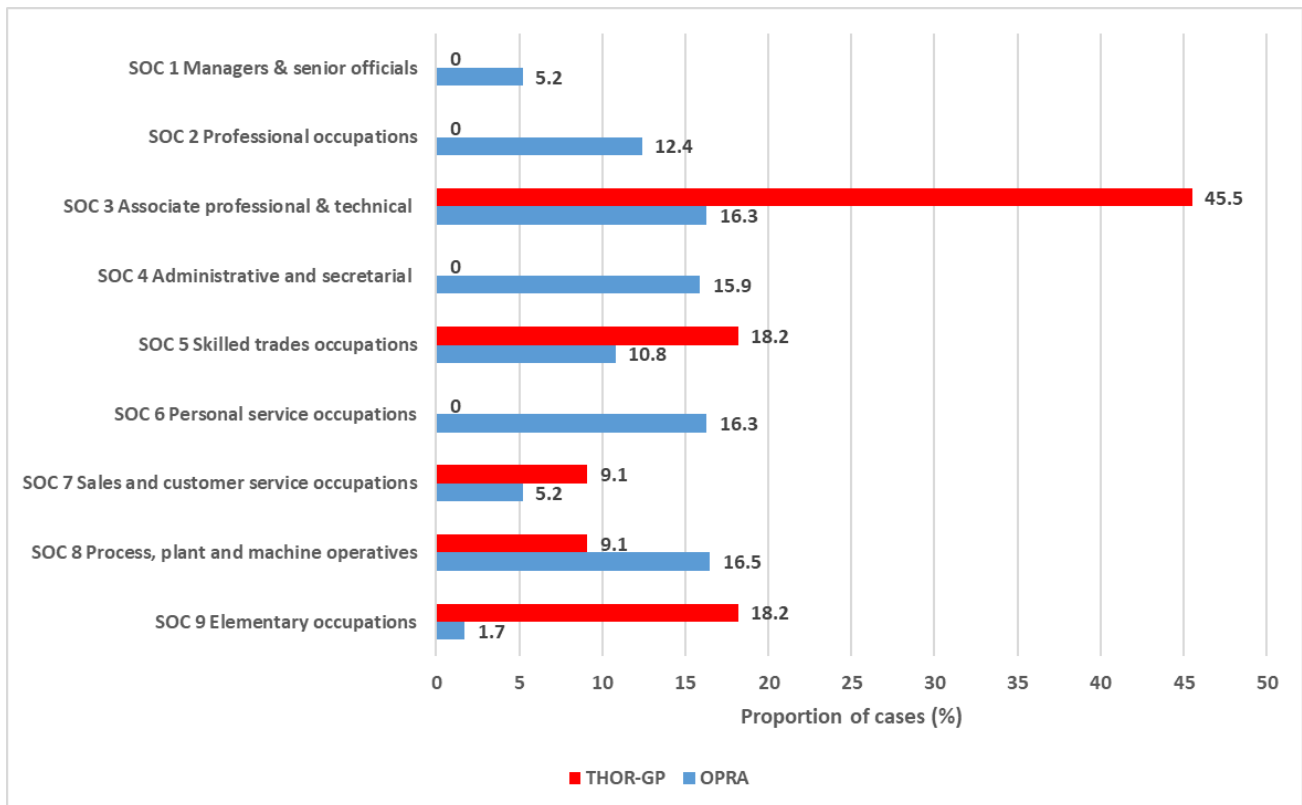
**Figure 16: Proportion of estimated cases of work-related musculoskeletal disorders by industry sectors reported to OPRA (2020).**



**Figure 17: Proportion of actual cases of work-related musculoskeletal disorders by industry sectors reported to THOR-GP (2020).**

The proportion of musculoskeletal cases reported to OPRA and THOR-GP by major occupational grouping is provided in Figure 18a. The largest proportion of estimated cases reported by OPs were

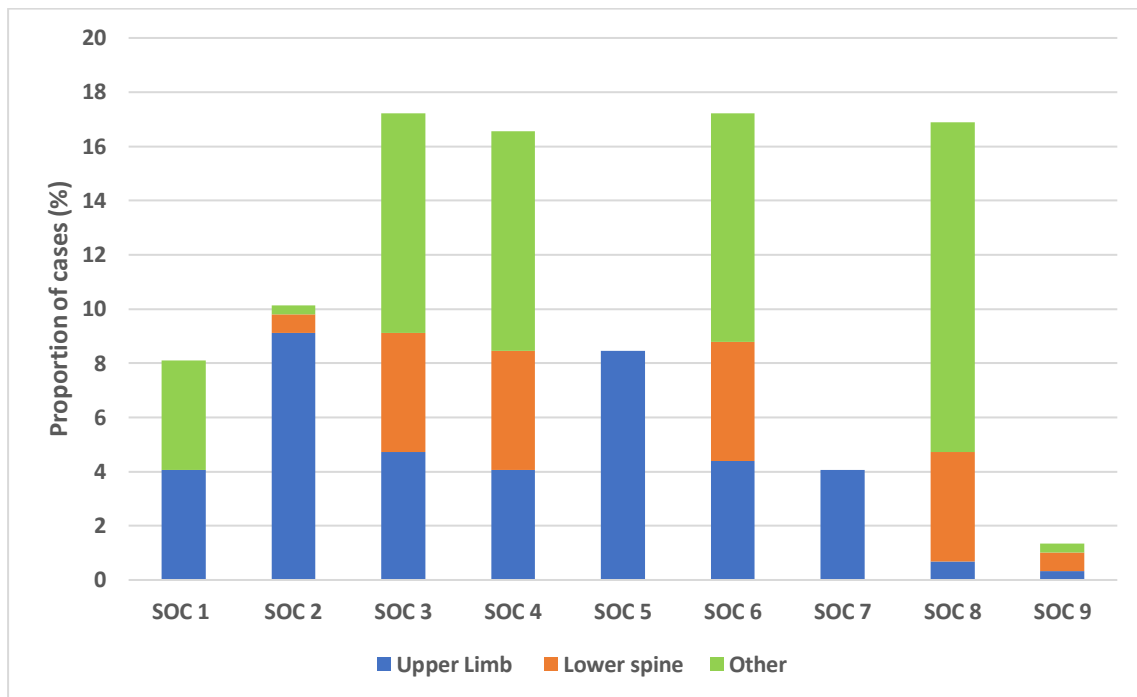
in associate professional and technical occupations (19%), personal service occupations (15%), and process, plant and machine operatives (15%). The most frequently reported occupation was nursing auxiliaries and assistants (10%). For actual cases reported by GPs, the largest proportion were also from associate professional and technical (54%), and the most frequently reported occupation were non-commissioned officers (NCOs) and other ranks (54%).



**Figure 18a: Proportion of cases of work-related musculoskeletal disorders by major occupational grouping reported to OPRA and THOR-GP (2020).**

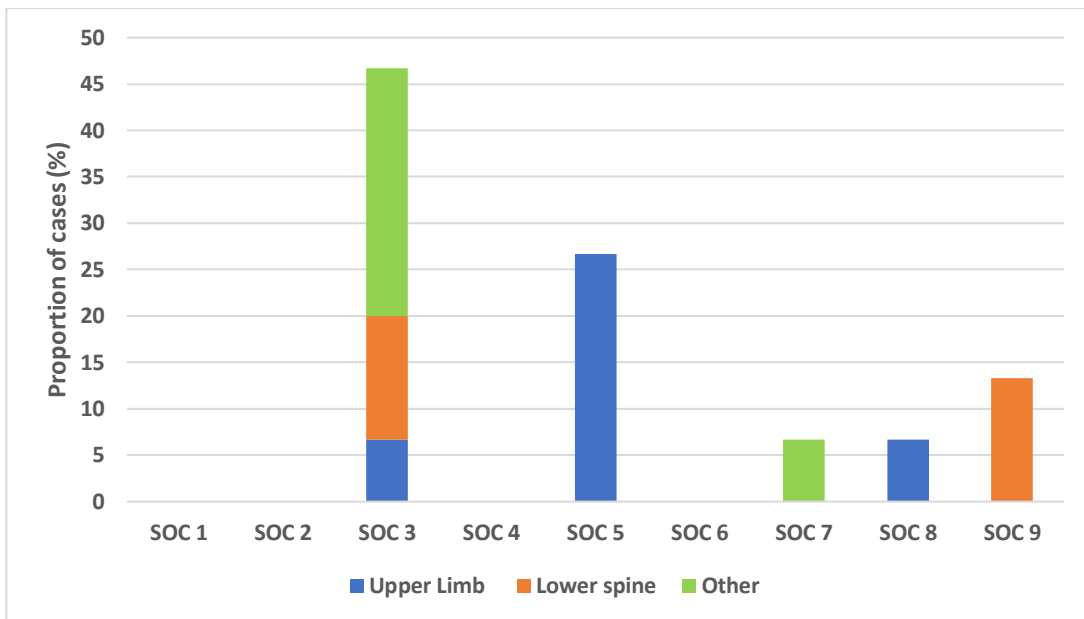
The proportion of musculoskeletal OPRA cases by anatomical site are grouped into the nine SOC categories (Figure 18b). The most frequently reported cases of upper limb disorders (hand/wrist/arm, elbow, shoulder) were from the SOC 2, professional occupations (9%), followed by skilled trades (8%). The most frequently reported cases of lower spine disorders were from the SOC 3 (associate professional & technical), SOC 4 (administrative and secretarial), SOC 6 (personal service occupations) and SOC 8 (process, plant and machine operatives) groups (all 4%). Lastly, the most frequently reported disorders from ‘other’ sites (neck/thoracic, hip/knee, ankle/foot and ‘other’) were from the SOC 8 group, process, plant and machine operatives (12%).

The proportion of musculoskeletal THOR-GP cases by anatomical site and SOC group are provided in Figure 18c. The most frequently reported cases of upper limb disorders were from the SOC 5 group, skilled trades (26%). The reported cases of lower spine disorders were from both SOC 3 (associate professional & technical) and SOC 9 (elementary occupations) (both 13%), and the most frequently reported cases of 'other' disorders were from the SOC 3 group, associate professional & technical (26%).



**Figure 18b: Proportion of estimated cases of work-related musculoskeletal disorders by major occupational grouping reported to OPRA (2020) and grouped by anatomical site.**

The anatomical sites are grouped into the following three categories:- 1. *upper limb*: hand/wrist/arm, elbow, shoulder; 2. *lower spine*: lumbar spine/trunk; 3. *other*: neck/thoracic, hip/knee, ankle/foot and 'other' diagnoses. The SOC groups are as follows: SOC 1: managers & senior officials, SOC 2: professional occupations, SOC 3: associate professional & technical, SOC 4: administrative and secretarial, SOC 5: skilled trades occupations, SOC 6: personal service occupations, SOC 7: sales and customer service occupations, SOC 8: process, plant and machine operatives, SOC 9: elementary occupations.

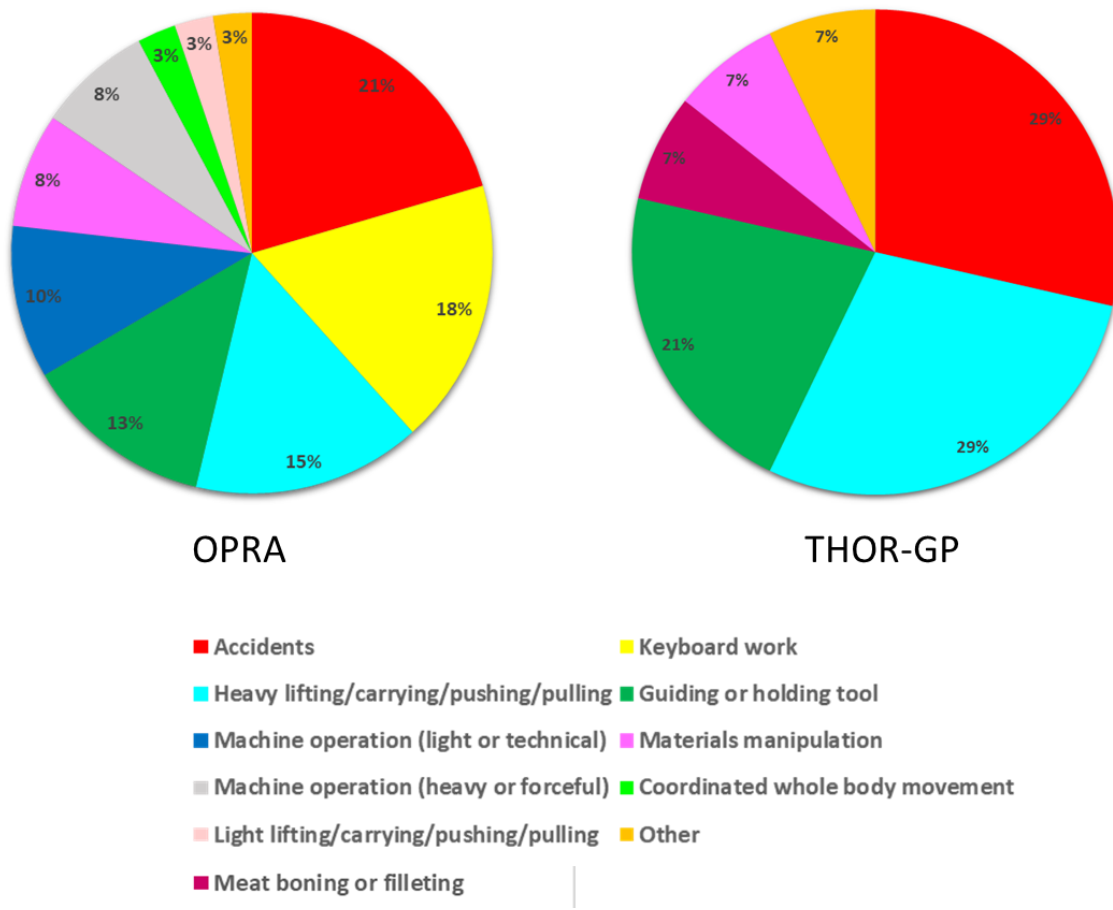


**Figure 18c: Proportion of estimated cases of work-related musculoskeletal disorders by major occupational grouping reported to THOR-GP (2020) and grouped by anatomical site.**

The anatomical sites are grouped into the following three categories:- 1. *upper limb*: hand/wrist/arm, elbow, shoulder; 2. *lower spine*: lumbar spine/trunk; 3: *other*: neck/thoracic, hip/knee, ankle/foot and 'other' diagnoses. The SOC groups are as follows: SOC 1: managers & senior officials, SOC 2: professional occupations, SOC 3: associate professional & technical, SOC 4: administrative and secretarial, SOC 5: skilled trades occupations, SOC 6: personal service occupations, SOC 7: sales and customer service occupations, SOC 8: process, plant and machine operatives, SOC 9: elementary occupations.

For cases of work-related musculoskeletal disorders reported to THOR, we ask the physicians to record the tasks and movements that are associated with each case. Figure 19 shows the proportion of tasks reported to OPRA and THOR-GP in 2020. The most frequently reported entry in the task variable to OPRA was accidents (21%), followed by keyboard work (18%).<sup>9</sup> Accidents and heavy lifting, carrying, pulling or pushing were the most frequently reported entries to the THOR-GP task variable (38% and 25%, respectively), followed by guiding or holding tool (19%).

<sup>9</sup> Percentages calculated from the total number of tasks for musculoskeletal disorders reported by physicians.



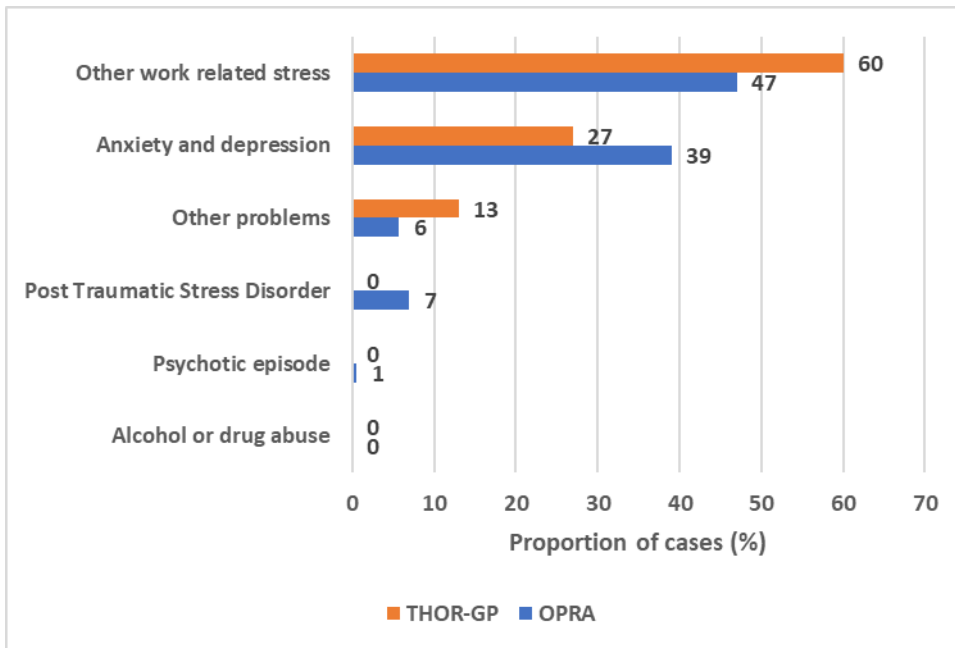
**Figure 19: Percentage of reported tasks for cases of work-related musculoskeletal disorders reported to OPRA and THOR-GP (2020).**

### 3.5 MENTAL ILL-HEALTH

Cases of work-related mental ill-health are reported to OPRA and THOR-GP. In 2020, a total of 117 actual (799 estimated) cases of work-related mental ill-health disorders were reported; 106 actual (788 estimated) cases reported by OPs and 11 actual cases reported by GPs. Figure 20 shows the proportion of cases by major diagnostic category for both schemes; other work-related stress (OPRA 47% and THOR-GP 60%) and anxiety/depression (OPRA 39% and THOR-GP 27%) are the most frequently reported work-related mental ill-health disorders by both OPs and GPs.<sup>10</sup>

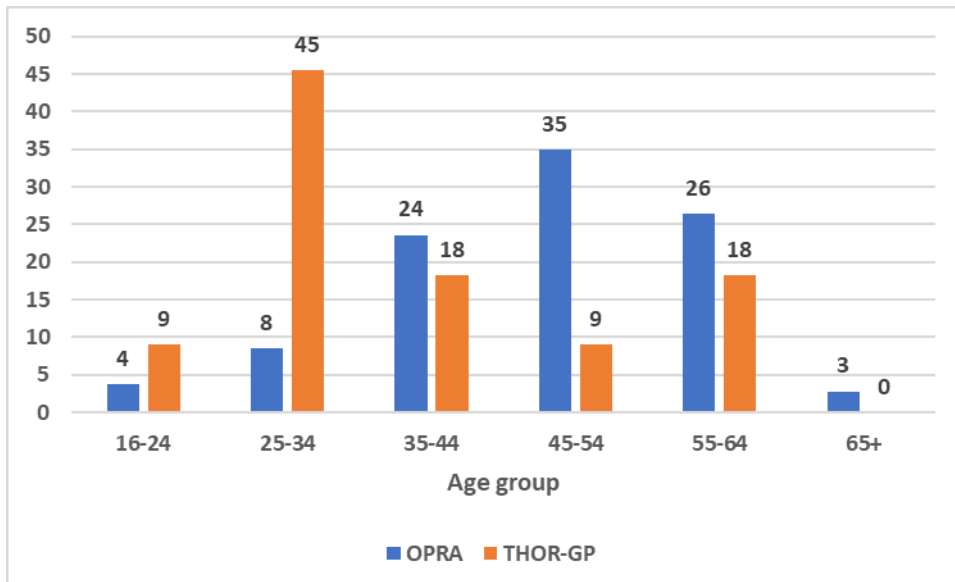
<sup>10</sup> Percentages calculated from total number of diagnoses for work-related mental ill-health reported by physicians.





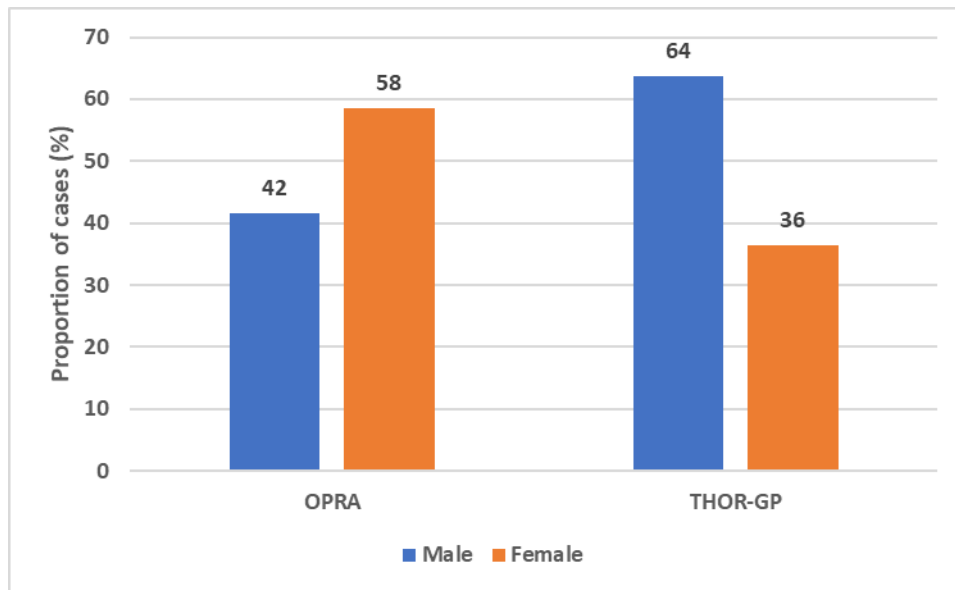
**Figure 20: Proportion of cases of work-related mental ill-health by diagnostic category reported to OPRA (estimated) and THOR-GP (actual) (2020).**

The proportion of actual cases of mental ill-health by age group for both schemes is provided in Figure 21. The mean age of the cases reported to OPRA is 47 years (range 20-65 years) and for GP reported cases, the mean age is younger at 37 years (range 19-56 years).



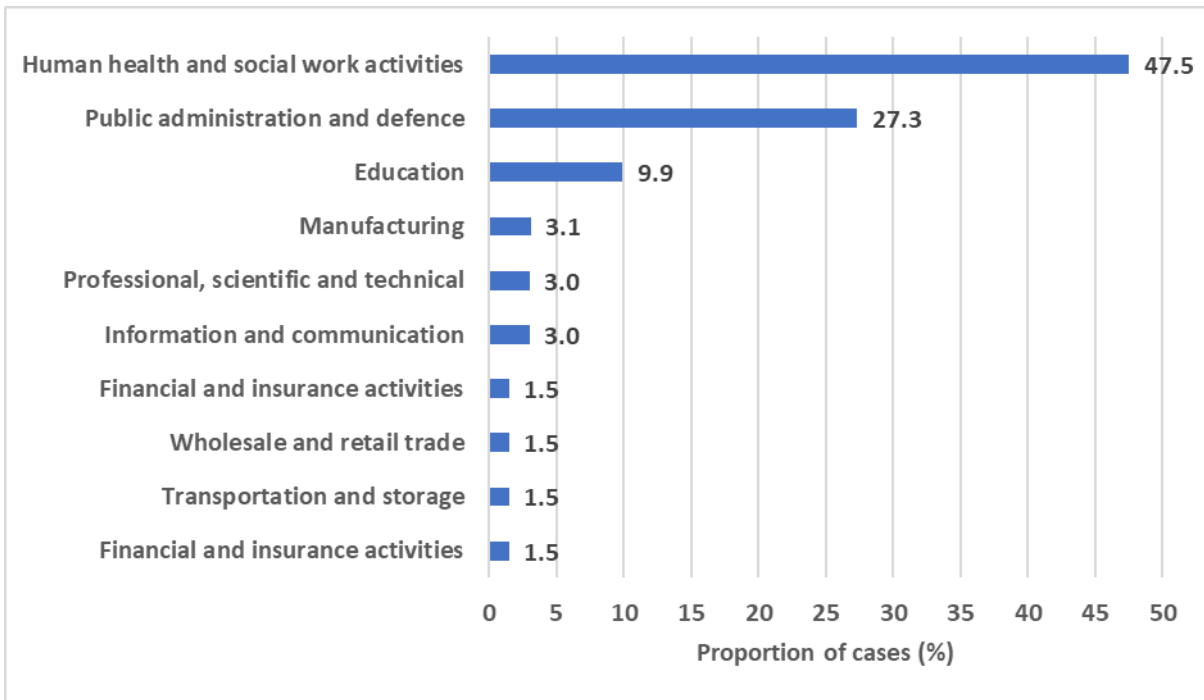
**Figure 21: Proportion of actual cases of work-related mental ill-health by age group reported to OPRA and THOR-GP (2020).**

In terms of the gender breakdown of the mental ill-health cases, a higher proportion of cases were females for OPRA (OPRA 58%; GP 36%) and males for THOR-GP (OPRA 42%; GP 64%) (Figure 22).



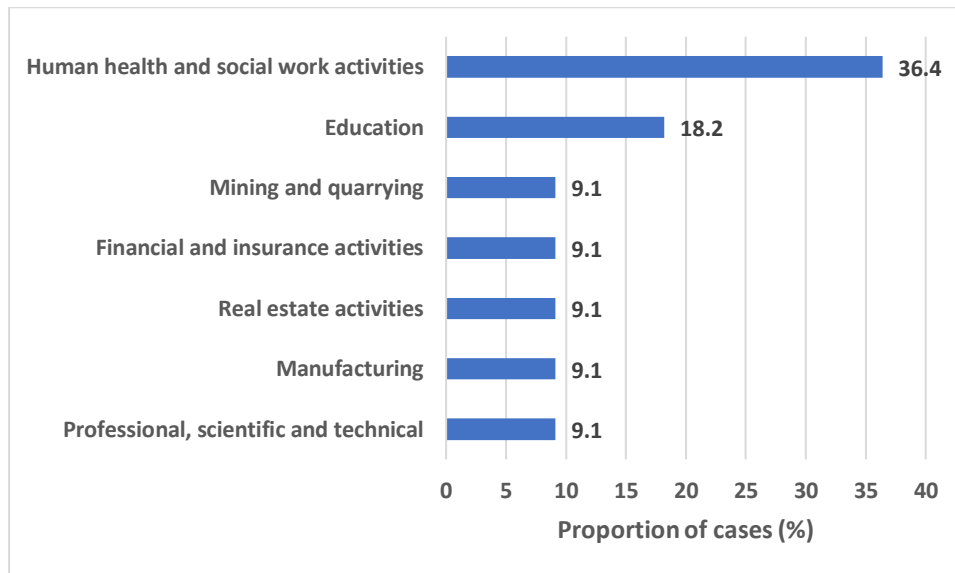
**Figure 22: Proportion of actual cases of work-related mental ill-health by gender reported to OPRA and THOR-GP (2020).**

The proportions of mental ill-health cases reported by OPs to OPRA by industry sector are provided in Figure 23. The most frequently reported sector was health and social care (48%) followed by public administration and defence (27%) and education (10%).



**Figure 23: Proportion of estimated cases of work-related mental ill-health by industry sector reported to OPRA (2020).**

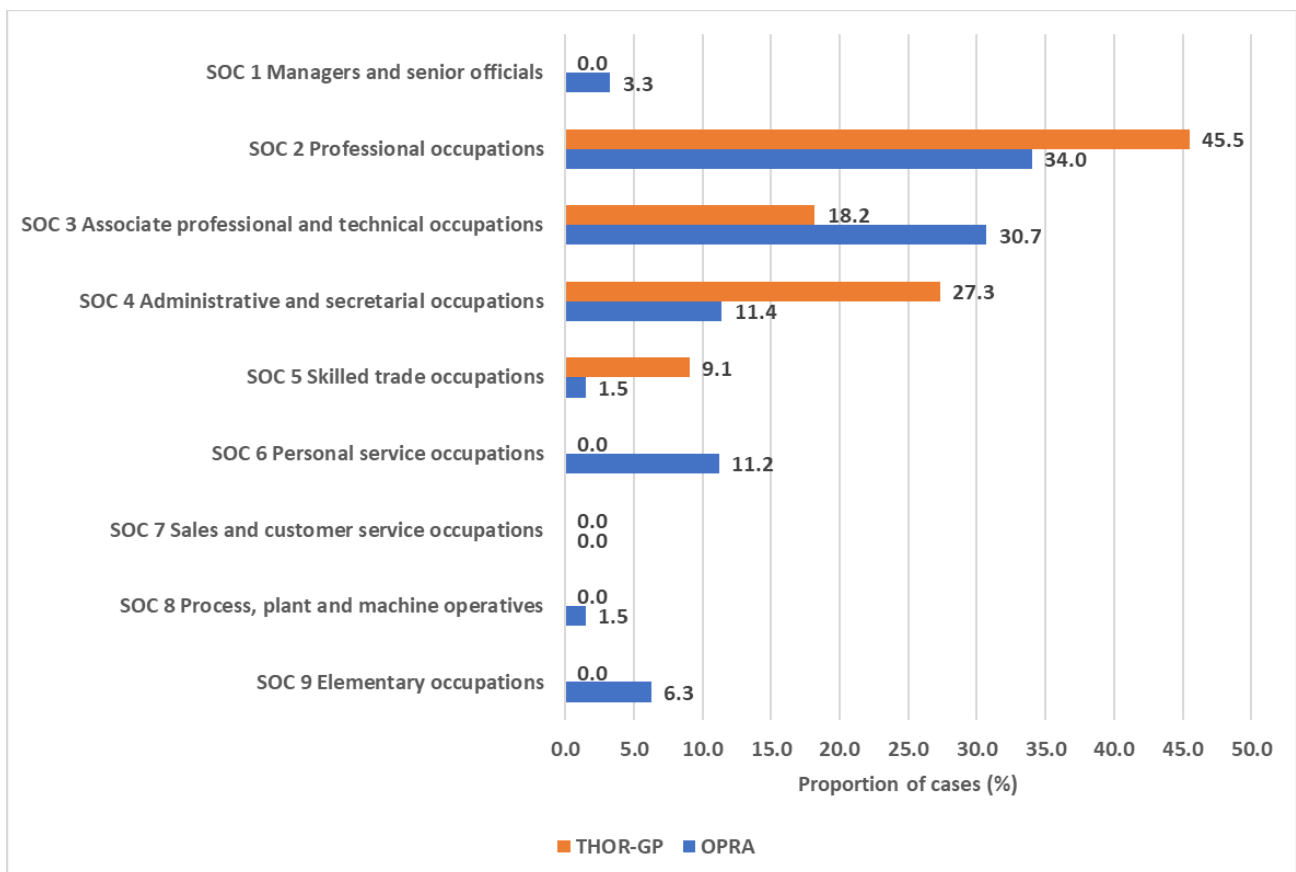
For GP reported mental ill-health cases, health and social care was the most frequently reported sector (36%), followed by education (18%) (Figure 24).



**Figure 24: Proportion of actual cases of work-related mental ill-health by industry sector reported to THOR-GP (2020).**

The proportion of work-related mental ill-health cases by major occupational grouping for cases reported by OPs and GPs is shown in Figure 25. Professional occupations (SOC 2), made up the largest proportion (34%) of estimated cases reported by OPs, followed by associate professional and

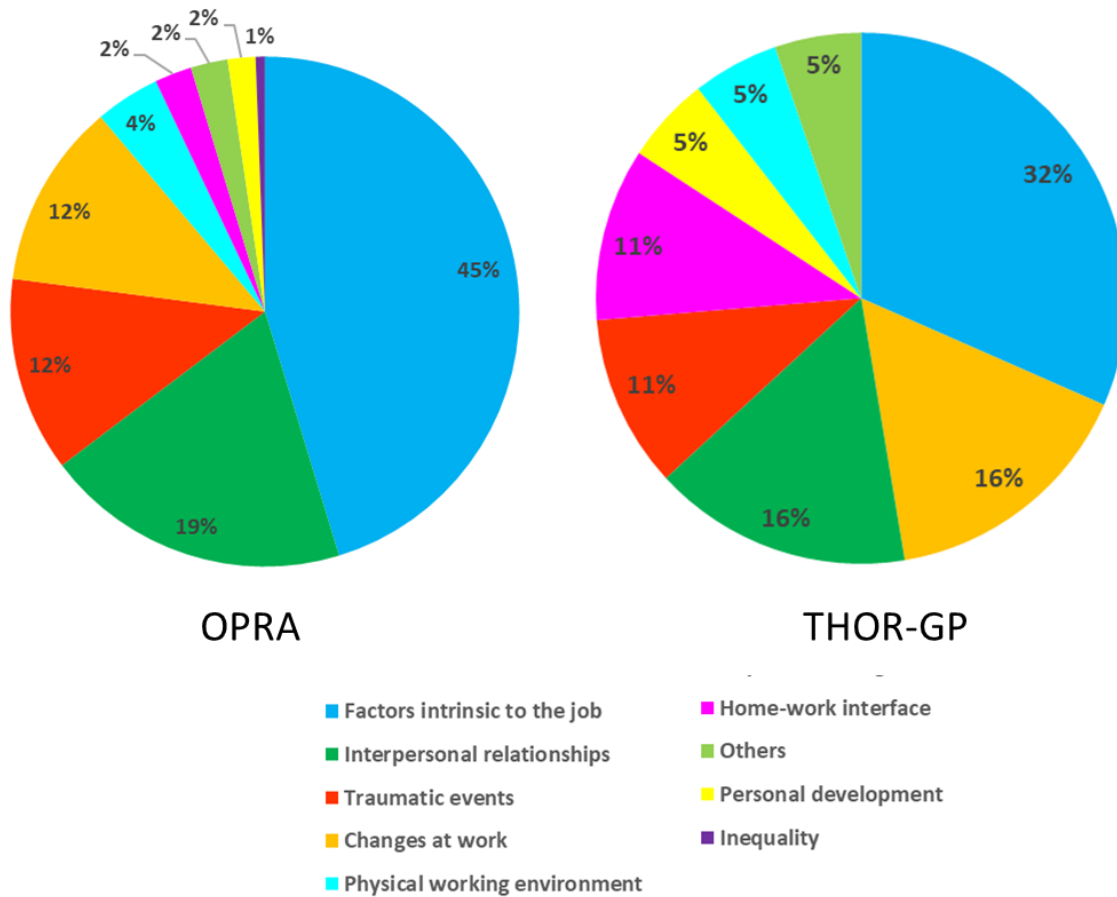
technical occupations (31%). The most frequently reported occupations were police officers (18%), nurses (13%) and medical practitioners (12%). For mental ill-health cases reported by GPs, professional occupations (SOC2) comprised the largest proportion of actual cases (46%), followed by administrative and secretarial occupations (SOC4) (27%). The most frequently reported occupation was nurses (27%).



**Figure 25: Proportion of cases of work-related mental ill-health by major occupational grouping reported to OPRA (estimated) and THOR-GP (actual) (2020).**

Physicians can report up to three precipitating events for each case of work-related mental ill-health reported to THOR. OPs recorded 170 precipitating events for the 106 cases and GPs recorded 19 events for the 11 cases reported in 2020 (Figure 26). For both reporting schemes, ‘factors intrinsic to the job’, which includes events associated with workload, demand, work schedule, poor management and responsibilities was reported most frequently (OPs 45%; GPs 32%) followed by ‘interpersonal relationships’ for OPRA, which includes bullying and difficult working relationships (19%) and ‘changes at work’ for THOR-GP, which includes organisational changes and changes of work content (16%), in addition to interpersonal relationships (16%).<sup>11</sup>

<sup>11</sup> Percentages calculated from the total number of precipitating events for mental ill-health reported by physicians.



**Figure 26: Proportion of precipitating events associated with work-related mental ill-health cases reported to OPRA and THOR-GP (2020).**

### 3.6 OTHER WORK-RELATED ILL-HEALTH

In addition to the diagnostic categories outlined above, OPs and GPs can report other cases of work-related ill-health to THOR. There have been six actual (61 estimated) cases of ‘other’ work-related diseases reported to OPRA and six actual cases reported to THOR-GP. The diagnoses for OPRA included abdominal pain (one case), type 1 hypersensitivity reaction (two cases), conjunctivitis (one case), diffuse brain injury (one case) and headache (one case). The diagnoses for THOR-GP included non-freezing cold injury, mouth ulcers, headache, abdominal pain, concussion and collapse (all one case).

The mean age of the ‘other’ cases reported to OPRA was 40 years (range 28-63 years) and the mean age of the cases reported to THOR-GP was 31 years (range 21-40 years). Of the ‘other’ cases reported to OPRA, one case was male and five cases were female. Of the ‘other’ cases reported to THOR-GP, one case was female and five cases were male.

The industry sector most frequently reported by OPs was health and social care (four cases), followed by public administration and defence (one case) and information and communication (one case). Whereas for cases reported by GPs, public administration and defence was reported (three cases), professional, scientific and technical activities (one case) and information and communication (one case). The SOC 4 group, administrative and secretarial occupations, made up the largest proportion of estimated cases reported by OPs (three cases), followed by the associate professional and technical occupations (SOC 3) (two cases) and professional occupations (SOC 2) (one case). The reported occupations were nurses, laboratory technicians, medical secretaries, records clerk and assistants, NCO and other ranks and other administrative occupations (all one case). The 'other' cases reported by GPs were SOC group 3, associate professional and technical occupations (three cases), SOC 2 group, professional occupations (two cases) and SOC 4 group, administrative and secretarial occupations (one case). The reported occupations were NCO and other ranks (three cases), IT consultant (two cases) and barrister (one case).

#### 4. DISCUSSION

This report provides an overview of the cases of WRIH reported to THOR in 2020. The average number of physicians enrolled on THOR has decreased slightly across all schemes in 2020, with a 3% decrease from the average number of reporters enrolled in 2019. Nonetheless, reporting to all the THOR schemes was significantly reduced in 2020, most likely due to the COVID-19 pandemic crisis. Compared to 2019, there was a 57% decrease in the number of actual cases of WRIH (61% for estimated cases) reported to THOR. Furthermore, there was a sharp increase in the percentage of 'no responses' for core reporters for all schemes (2019: 53-63%; 2020: 78-87%), and for sample reporters (2019: 28-57%; 2020: 70-87%). Coming out of the pandemic, we will make efforts to improve reporting rates to get back to pre-pandemic levels, as we continue to introduce new approaches to make reporting easier and more beneficial to physicians.

The percentage of case reports by scheme did not noticeably change in 2020 compared to 2019. OPs reported a further 6% of the total number of estimated cases compared with 2019; dermatologists reported 3% less than 2019; chest physicians reported 4% less; and GPs reported 2% more. As a result of the COVID-19 pandemic, we have introduced a new 'COVID-19/long-COVID' diagnosis category, which included 0.5% of cases reported by chest physicians and 7% of all respiratory cases. OPs

reported 23% of their respiratory cases as COVID-19/long COVID, and this might explain the modest 6% increase in OP reporting in 2020.

### *Respiratory*

With regards to respiratory disease cases reported to THOR in 2020, non-malignant pleural disease remains the most frequently reported disease to SWORD. This is not surprising, considering that asbestos was the most common suspected agent. Similar to 2019, the most frequently reported respiratory disease to OPRA was asthma. However, 23% of respiratory cases reported to OPRA in 2020 were COVID-19/long COVID, thus, this new category replaced 'other' as the second most frequently reported disease category.

Like 2019, the industry sectors reported most frequently by chest physicians were construction and manufacturing, with skilled trades the most frequently reported occupation. Again, this is likely due to the high levels of workplace asbestos exposures in construction and factories. Likewise, OPs reported cases predominantly from health and social care in both 2020 and 2019, though the percentage this year was much higher (2019: 58%; 2020: 80%). Moreover, nursing assistants and auxiliaries was the most frequent occupation reported by OPs in 2020, followed by laboratory technicians. This increase is likely due to the high number of cases of COVID-19 reported in clinical healthcare settings to OPRA (61% of actual cases reported from the healthcare sector were COVID/long covid).

### *Skin*

Contact dermatitis was the most frequently reported skin disease to EPIDERM and OPRA in both 2020 and 2019, thus remaining as the predominant skin disease reported to THOR. Industry sectors reported to EPIDERM in 2020 and 2019 were identical, with cases mostly employed in the health and social care sector, followed by other service activities and manufacturing sectors. All cases reported to OPRA in 2020 were from the health and social care sector. This contrasts with 2019, where cases were reported most frequently from the health and social care sector, but also from the public administration and defence, and manufacturing sectors.

Personal service occupations and professional occupations were the most frequently reported SOC categories to EPIDERM in 2020, with beauticians and related occupations being the most frequently reported occupation. This differs with 2019, when skilled trades were the most frequently reported SOC category and nurses was the most frequently reported occupation. Water/wet

work/washing/washing up was the most frequently reported suspected agent to EPIDERM, followed by soaps and detergents. This is not surprising considering that jobs within the personal care sector, like beauticians, require a high amount of exposure to water as well as soaps and shampoos during client care.

In 2020, a high proportion of skin cases reported by OPs were personal service occupations (67%), and predominantly comprised of nursing auxiliaries and assistants. The most frequently reported agents were water/wet work/washing up, followed by sterilising and disinfecting agents, PPE, soaps and detergents and gloves. The pandemic saw a rise in people washing their hands and using sterilisers and disinfectants. Therefore, it is possible that contact dermatitis increased in healthcare assistants during the COVID-19 pandemic due to more frequent hand washing, and the increased use of sterilisers and PPE. Interestingly, we did not identify a noticeable change in the level of reporting of the suspect agent water/wet work/washing up to EPIDERM, which includes handwashing (2019: 13%; 2020: 13%), and the suspect agent sterilising/disinfecting (2019: 4%; 2020: 6%). The same was shown for levels of reporting of water/wet work/washing up to OPRA (2019: 44%; 2020: 39%). However, there was a noticeable increase in reporting of sterilising/disinfecting in 2020 to OPRA (2019: 0%; 2020: 23%).

### *Musculoskeletal*

Like 2019, hand/wrist/arm and lumbar spine/trunk disorders were the most frequently reported anatomical site for OPs and GPs in 2020, though ankle/foot was also included as a frequently reported site in GPs in 2020. The industry sector most frequently reported by OPs was health and social care for both 2019 and 2020. In contrast, cases reported by GPs were predominantly from the public administration and defence, followed by manufacturing, and wholesale and retail trade. This contrasts with 2019, which comprised manufacturing, followed by transportation and storage.

The largest proportion of cases reported by OPs in 2020 were in the associate professional and technical occupations SOC category, followed by personal service occupations, with nursing auxiliaries and assistants being the most reported occupation. OPRA identified a high number of female cases in 2020 (39% male; 61% female), and this could be because most reports were from the healthcare sector which likely has a female predominant workforce.



We included a graph to show the proportions of disorders by anatomical site for each SOC category, reported to OPRA in 2020 (Figure 18b). The upper limb disorders were frequently reported in professional occupations which include teachers, researchers, engineers and healthcare professional such as nurses. This was followed by skilled trades, which tend to be the more physical jobs within construction. The lower spine disorders were equally reported in four SOC groups, without any noticeable pattern. The 'other' disorders, which comprised neck/thoracic, hip/knee, ankle/foot and 'other' diagnoses, were mostly reported in SOC 8 (process, plant and machine operatives), occupations which could be considered as 'active' rather than sedentary.

In contrast with OPRA, GPs reported a low number of female cases (85% male; 15% female) in 2020. Again, this in line with the type of SOC category and occupation that was most frequently reported to THOR-GP, because the largest SOC category was associate professional and technical, which fully comprised of NCOs and other ranks. It should also be noted that the peak age for OPRA was two decades higher than THOR-GP (OPRA: 45-54; THOR-GP: 25-34). This might be because all cases reported to THOR-GP in 2020 were employed in the military, and soldiers tend to be younger. In contrast, the age group proportions for the two schemes were closely matched the previous year. Furthermore, process, plant and machine operatives and skilled trades were reported most by OPs and GPs in 2019.

Many people were instructed to work from home over the COVID pandemic. Two OPRA cases were specifically reported as being a result of homeworking and poor ergonomic work set-up this year. Of which, one case reported muscular pain symptoms in the neck and spine, and headaches. The other case reported right shoulder and neck pain. In contrast, there were no reports to OPRA or THOR-GP in 2019 that specifically related to homeworking.

### *Mental ill-health*

Work-related stress and anxiety/depression continue to be the most frequently reported mental health disorders to both OPRA and THOR-GP. Like 2019, mental ill-health cases reported to OPRA in 2020 were mostly from the health and social care sector, followed by public administration and defence. The SOC category mostly reported to OPRA in both 2019 and 2020 were professional occupations (SOC 2). Police officers were the most frequently reported occupation in 2020 (18%), in contrast with 2019, when the most frequently reported occupations were nurses and medical practitioners, and only 3% of mental ill-health cases were police officers.

In both 2019 and 2020, GPs reported mental ill-health cases mostly from the health and social care sector, followed by the education sector. Although transportation and storage was the second most frequent sector to be reported in 2019, no cases were reported from this sector in 2020. GPs reported mostly professional occupations in 2020, which comprised predominantly of nurses. This compares to 2019, whereby GPs mostly reported cases of mental ill-health in administrative and secretarial occupations. This increase in mental ill-health in nursing could be due to work-related stress caused by the COVID-19 pandemic.

Like musculoskeletal, the peak age was higher for OPRA than THOR-GP (OPRA: 45-54; THOR-GP: 25-34). We were unable to provide a possible reason for this, however, as both schemes reported cases predominantly from the health and social care sector and the SOC 2 category, professional occupations.

## **Conclusion**

The importance of THOR as an existing UK resource on WRIH is well-established, with the database generating numerous outputs which help inform HSE and others to determine their priorities and work programmes on occupational health. It also acts as a sentinel scheme to identify any new causes of WRIH. The data detailed in this report are for 2020, a year dominated by the onset of the COVID-19 pandemic which led to unprecedented changes to many work practices and risks. Notable changes in reporting of WRIH have been shown in comparison to the preceding year, 2019. Moving forward, the four individual THOR schemes offer important sources of data collection essential for the monitoring of changes in workplace risks to health.

## **5. APPENDIX 1 – PUBLICATIONS**

**Mason HJ, Carder M, Money A, Evans G, Seed M, Agius R, van Tongeren M. Occupational Asthma and Its Causation in the UK Seafood Processing Industry. Ann Work Expo Health. 2020 Oct 8;64(8):817-825.**