

**The incidence of work-related ill-health as reported  
to The Health and Occupation Research (THOR)  
network by physicians in the Republic of Ireland  
between 2005 and 2021.**

**Annual Report**

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## TABLE OF CONTENT

TABLE OF CONTENT.....	2
LIST OF TABLES.....	3
LIST OF FIGURES.....	4
GLOSSARY OF TERMS.....	5
MAIN MESSAGES.....	6
Summary Of Cases Reported To THOR-ROI.....	7
EXECUTIVE SUMMARY.....	8
1 INTRODUCTION.....	10
2 METHODS.....	11
3 RESULTS.....	13
3.1 PARTICIPATION.....	13
3.2 OVERVIEW OF 2021 CASE REPORTS.....	14
3.3 INCIDENCE RATES AND TRENDS IN INCIDENCE RATES.....	18
3.4 OCCUPATIONAL SKIN SURVEILLANCE (EPIDERM): 2005-2021.....	24
3.4.1 DIAGNOSES.....	24
3.4.2 AGE AND SEX.....	24
3.4.3 INDUSTRY AND OCCUPATION.....	26
3.4.4 SUSPECTED AGENTS.....	27
3.5 SURVEILLANCE OF WORK-RELATED AND OCCUPATIONAL RESPIRATORY DISEASE (SWORD): 2005-2021.....	29
3.5.1 DIAGNOSES.....	29
3.5.2 AGE AND SEX.....	30
3.5.3 INDUSTRY AND OCCUPATION.....	30
3.5.4 SUSPECTED AGENTS.....	32
3.6 OCCUPATIONAL PHYSICIANS REPORTING ACTIVITY (OPRA): 2007-2021.....	35
3.6.1 DIAGNOSES.....	35
3.6.2 AGE AND SEX.....	37
3.6.3 INDUSTRY AND OCCUPATION.....	37
3.6.4 SUSPECTED AGENTS.....	39
3.6.5 SYMPTOM ONSET.....	42
3.7 THE HEALTH AND OCCUPATION RESEARCH NETWORK IN GENERAL PRACTICE (THOR-GP): 2015-2021.....	45
3.7.1 OVERVIEW.....	45
4 DISCUSSION.....	47
APPENDIX.....	51
Dissemination.....	51
ACKNOWLEDGMENTS.....	52
REFERENCES.....	53

## LIST OF TABLES

Table 1: Number of physicians, cases and nil returns reported by scheme in 2020 and 2021 .....	14
Table 2: Number of cases / diagnoses reported to SWORD-ROI, EPIDERM-ROI, OPRA-ROI and THOR-GP-ROI, 2021 .....	15
Table 3: Annual average 'crude' and 'adjusted' incidence rates per 100,000 persons employed of work-related skin and respiratory disease reported by dermatologists and chest physicians to SWORD and EPIDERM in the Republic of Ireland (2005-2021).....	22
Table 4: Average annual percentage change in reported cases in work-related illness as reported by occupational physicians to OPRA, 2007-2021 .....	22
Table 5: Number and type of diagnoses reported by dermatologists to EPIDERM-ROI (2005-2021)....	24
Table 6: Age and sex of contact dermatitis diagnoses in EPIDERM-ROI (2005-2021) .....	25
Table 7: Most frequently reported agents* for contact dermatitis, reported by dermatologists to EPIDERM-ROI (2005-2021) – number of cases and (percentage of total cases) .....	28
Table 8: Number and type of diagnoses reported by chest physicians to SWORD (2005-2021) in the Republic of Ireland .....	29
Table 9: Suspected agents associated with cases of work-related respiratory disease most frequently reported to SWORD-ROI, (2005-2021).....	33
Table 10: Number and type of cases / diagnoses reported by occupational physicians to OPRA-ROI (2007-2021).....	36
Table 11: Proportions of musculoskeletal cases reported to OPRA-ROI (2007-2021) by task and movement.....	41
Table 12 Number and type of diagnoses reported by general practitioners to THOR-GP-ROI (2015-2021).....	46

## LIST OF FIGURES

Figure 1: Reports (cases and nil returns) in a) EPIDERM-ROI (2005-2021) b) SWORD-ROI (2005-2021) c) OPRA-ROI (2007-2021) and d) THOR-GP-ROI (2015-2021).....	19
Figure 2: Cases per active reporter* in a) EPIDERM-ROI (2005-2021) b) SWORD-ROI (2005-2021) c) OPRA-ROI (2007-2021) and d) THOR-GP-ROI (2015-2021).....	20
Figure 3: Relative risk by year (2021 estimate = 1), with 95% comparison intervals.....	23
Figure 4: Proportion of cases of contact dermatitis reported to EPIDERM-ROI by age group and sex (2005-2021).....	25
Figure 5: Proportion of cases of contact dermatitis reported to EPIDERM-ROI by Standard Industrial Classification (SIC), 2005-2021.....	26
Figure 6: Proportion of cases of contact dermatitis reported to EPIDERM-ROI by Standard Occupational Classification (SOC), 2005-2021 .....	27
Figure 7: Proportion of cases of respiratory disease reported to SWORD-ROI by Standard Industrial Classification (SIC), 2005-2021.....	31
Figure 8: Proportion of cases of respiratory disease reported to SWORD-ROI by Standard Occupational Classification (SOC), 2005-2021 .....	32
Figure 9: Proportion of cases of work-related ill-health reported to OPRA-ROI by age and sex, 2007-2021.....	37
Figure 10: Proportion of cases of work-related ill-health reported to OPRA-ROI by Standard Industrial Classification (SIC), 2007-2021.....	38
Figure 11: Proportion of cases of work-related ill-health reported to OPRA-ROI by Standard Occupational Classification (SOC), 2007-2021 .....	39
Figure 12: Proportion of actual cases of mental ill-health reported to OPRA-ROI by precipitating event, 2007-2021.....	40
Figure 13: Time lapse between month of symptom onset and reporting month for actual cases of work-related anxiety / depression and other work stress reported to OPRA-ROI (2007-2021).....	43
Figure 14: Time lapse between month of symptom onset and reporting month for actual cases of work-related upper limb disorders and spine / neck / back disorders reported to OPRA-ROI (2007-2021).	44

## **GLOSSARY OF TERMS**

**EPIDERM** - The EPIDERM scheme began in the UK in 1993 and collects reports of cases of occupational skin disease from consultant dermatologists.

**EPIDERM-ROI** - The EPIDERM-ROI scheme began in 2005 and collects reports of cases of occupational skin disease from consultant dermatologists within the Republic of Ireland.

**HSA** - The Republic of Ireland Health and Safety Authority.

**HSE** - The UK Health and Safety Executive.

**OPRA** - The Occupational Physicians Reporting Activity scheme began in the UK in 1996 and collects reports of work-related disease from occupational physicians employed in the public sector and private sector. OPRA reports are not confined to a particular disease category.

**OPRA-ROI** - The OPRA-ROI scheme began in 2007 and collects reports of cases of work-related ill-health from occupational physicians within the Republic of Ireland.

**SWORD** - The Surveillance of Work-related and Occupational Respiratory Disease scheme began in the UK in 1989 and collects reports of cases of occupational respiratory disease from consultant respiratory physicians.

**SWORD-ROI** - The SWORD-ROI scheme began in 2005 and collects reports of cases of occupational respiratory disease from consultant respiratory physicians within the Republic of Ireland.

**THOR** - The Health and Occupation Research network which runs several surveillance schemes for work-related disease including EPIDERM, SWORD and OPRA.

**THOR-ROI** - The Health and Occupation Research network in the Republic of Ireland, which includes EPIDERM-ROI, SWORD-ROI, OPRA-ROI and THOR-GP-ROI. THOR-ROI began in 2005.

**THOR-GP** - The THOR-GP scheme began in the UK in 2005 and enables general practitioners to report cases of work-related ill-health seen in a general practice setting. All THOR-GP reporters have a diploma in occupational medicine.

**THOR-GP in the ROI** - THOR-GP in the ROI began in 2015 and enables general practitioners with an interest in occupational medicine to report cases of work-related ill-health seen in a general practice setting.

## MAIN MESSAGES

- This is the latest annual report, including data collected during 2021, summarising results from The Health and Occupation Research network in the Republic of Ireland (THOR-ROI).
- THOR-ROI comprises of four surveillance schemes collecting data on incident cases of work-related illness (WRI) in the Republic of Ireland; SWORD-ROI (chest physicians), EPIDERM-ROI (dermatologists), OPRA-ROI (occupational physicians - OPs) and THOR-GP-ROI (general practitioners - GPs).
- The COVID-19 pandemic crisis and the interruptions it caused made 2020 and 2021 challenging years. Following the relaxation of the lockdown in 2020 there was an increase in THOR-ROI reporter activity, though case numbers remained slightly below normal.
- In 2021, 27 occupational physicians, 20 general practitioners, 12 dermatologists and 9 chest physicians participated in THOR-ROI.
- A total of 100 cases were reported in 2021 (OPs: 60, dermatologists: 23, chest physicians: 17, and GPs: 0). In total, the number of reported incident cases between 2005 and 2021 is 2867 (OPs: 1998, dermatologists: 557, chest physicians: 274, GPs: 38).
- Dermatologist reported (2005-2021) predominantly contact dermatitis (CD) cases (98%), with majority of all reported cases reports being female (56% of CD cases) and a mean age (all CD cases) of 37 years. Frequently reported industries/occupations were manufacturing (process operatives), healthcare (nurses), and personal service occupations (hairdressers and beauty therapist). Most frequently reported agents were rubber, wet work, preservatives, and nickel.
- Asthma was the largest category of cases reported by chest physician (2005-2021) (33%). The majority of all reported cases reports was male (84%), and the mean age (all cases) was 57 years. Frequently reported industries/occupations were construction (labourers) and manufacturing, with isocyanates, ill-defined fumes/gases and cement/plaster/masonry dust being the most frequently reported agents.
- OP case reports (2007-2021) were predominantly mental ill-health (53%) and musculoskeletal (33%) with smaller proportions of skin (8%), respiratory (2%) and 'other' WRI (4%). The majority (77%) of cases were reported in health and social care (mainly nurses and nurse auxiliaries) with a significant proportion also reported in transport (bus drivers) (11%).
- The 20 GPs participating in THOR-GP-ROI have reported 38 cases since the scheme commenced data collection in 2015; musculoskeletal cases were reported most frequently (17 cases).
- A total of 33 case reports attributed to SARS-CoV-2 virus have been reported by OPs and GPs to THOR-ROI between 2020 and 2021, with majority of the cases having a diagnosis of long-covid (53%), followed by post-covid (29%) or active covid-19 infection (18%). All cases worked in the health and social care industrial sector, with nurses (45%) and nurse auxiliaries (21%) being the most frequently reported occupations. However, these results should be interpreted with caution as some industry sectors such as health and social care may have better provision of occupational health services than other industry sectors.
- Trend analysis in the number of OPRA-ROI case reports suggests an overall decrease in the number of case reports of total WRI of approximately 5% per year between 2007 and 2021. No trends analyses were conducted based on the other reporting schemes.

## SUMMARY OF CASES REPORTED TO THOR-ROI

Disease group	Reporting physicians	Number of cases		
		2021 (n)	2005 <sup>a</sup> -2021 (n)	(%)
<b>Skin</b>	Dermatologists	23	557	19%
	Occupational physicians	4	174	6%
	General practitioners	0	5	<1%
<b>Respiratory</b>	Chest physicians	17	274	10%
	Occupational physicians	10	48	2%
	General practitioners	0	1	<1%
<b>Musculoskeletal</b>	Occupational physicians	16	679	24%
	General practitioners	0	17	<1%
<b>Mental ill-health</b>	Occupational physicians	14	1039	36%
	General practitioners	0	8	<1%
<b>Other</b>	Occupational physicians	23	83	3%
	General practitioners	0	7	<1%
<b>Total cases</b> <sup>b, c</sup>	<b>All physicians</b>	<b>100</b>	<b>2867</b>	

<sup>n</sup> Number of cases; % Proportion of cases from the total number of cases reported between 2005 and 2021.

<sup>a</sup> 2007 for occupational physicians; 2015 for general practitioners

<sup>b</sup> a case may have been assigned to more than one disease group (for example, musculoskeletal and mental ill-health)

<sup>c</sup> Totals may have increased from previous reporting due to the submission of late cases.

## **EXECUTIVE SUMMARY**

**BACKGROUND:** Chest physicians, dermatologists, occupational physicians (OPs) and general practitioners (GPs) voluntarily report cases of work-related illness (WRI) to the four surveillance schemes, which comprise The Health and Occupation Research (THOR) network in the Republic of Ireland (THOR-ROI). This report describes the cases of WRI reported to THOR-ROI in the latest full calendar year (2021) and provides a summary of results based on all case reports since the commencement of the different schemes (2005 for dermatologists and chest physicians; 2007 for OPs; 2015 for GPs).

**METHODS:** Physicians have been and are continuously recruited to THOR-ROI with assistance from the scheme's champions and relevant societies within the ROI. Participating physicians are asked to provide anonymised information of incident cases seen during their reporting period. Cases reported to THOR-ROI were analysed by age, sex, occupation/industry, suspected causal agent and symptom onset. Incidence rates and trends in number of case reports were estimated for selected reporter groups/diagnoses, using a 'multi-level' statistical model to investigate the relative number of reported cases over time whilst taking into account other factors that might influence the trend (such as the number of reporting physicians and the number of people employed).

**RESULTS:** The 68 physicians enrolled in THOR-ROI in 2021 (27 OPs, 20 GPs, 12 dermatologists and 9 chest physicians) reported 100 cases (116 diagnoses). In comparison, 109 (121 diagnoses) and 93 (103 diagnoses) cases were reported in 2019 and 2020, respectively. The slight decrease in reporting in 2020 and 2021 is probably largely due to the COVID-19 pandemic crisis and the interruptions that it caused. Of the 100 cases reported to THOR-ROI in 2021, 60 cases were reported by OPs, 17 were reported by chest physicians, and 23 were reported by dermatologists. GPs reported no cases to THOR-GP ROI in 2021. This brings the total number of cases reported between 2005 and 2021 to 2867 (dermatologists: 557, chest physicians: 274, OPs: 1998, GPs: 38 case reports). Trend analysis in the number of case reports (based on reports to OPRA-ROI) suggest an overall decrease in the number of case reports of total WRI of approximately 5% per year between 2007 and 2021.



**CONCLUSION:** THOR-ROI continues to provide the best overall source of data relating to medically attributed occupational disease incidence in the ROI, with 2867 cases reported since the inception of the schemes. The COVID-19 pandemic crisis and the interruptions it caused made 2020 and 2021 challenging years. Nevertheless, following the relaxation of the lockdown in 2020 there was an increase in THOR-ROI reporter activity, though case numbers remained slightly below normal. With continued funding and increased enrolment and participation in the schemes, and the promotion of THOR in the ROI, case numbers will increase year on year. This would enable further detailed analyses of data by the various determinants of risk e.g., causal agent, precipitating event (mental ill-health) and task/movement (musculoskeletal).

## **1 INTRODUCTION**

The Health and Occupation Research (THOR) network in the Republic of Ireland (THOR-ROI) comprises of 4 surveillance schemes enabling different groups of physicians to voluntarily report cases of work-related illness (WRI).<sup>1,2</sup> These are SWORD (chest physicians), EPIDERM (dermatologists), OPRA (occupational physicians) and THOR-GP (general practitioners). SWORD and EPIDERM both started data collection in the ROI in 2005, OPRA commenced in 2007, whilst THOR-GP commenced data collection in January 2015. The ROI schemes are based on the analogous well-established UK wide schemes.<sup>3-7</sup>

This report describes the cases of work-related illness (WRI) reported to SWORD, EPIDERM, OPRA and THOR-GP in the ROI during the previous calendar year (2021) and since reporting commenced. This builds on previous reports submitted annually to the ROI Health and Safety Authority (HSA) since 2006.<sup>8-20</sup>

## 2 METHODS

The methodology behind THOR has been described previously in detail. In brief, participating physicians report new cases of work-related disease seen in their clinic. All ROI physicians report via our online web form and either report every month ('core' reporters – EPIDERM; SWORD and OPRA) or for one randomly assigned month per year ('sample' reporters – THOR-GP). Reporters are requested to give information on diagnosis, age, sex, 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.<sup>21,22</sup> Suspected agents are coded using in-house coding schemes developed in conjunction with the Health and Safety Executive (HSE) in the UK (Appendix 1 and 2). 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 physicians 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 causes of occupational ill-health) record the diagnosis which is subsequently coded using the International Classification of Disease 10<sup>th</sup> Revision (ICD-10)<sup>23</sup> so that comparisons can be made between reporting schemes.

Cases of occupational disease reported to EPIDERM, SWORD and OPRA by physicians in the ROI from 2005 to 2021 have been extracted from the databases and analysed using the statistical package SPSS V25.0.

Annual average incidence rates (per 100,000 employed) of dermatologist and chest physician reported WRI were estimated based on a previously published methodology.<sup>23</sup> In brief, numerators were adjusted

for participation (the proportion of physicians participating in SWORD and EPIDERM) and response (the proportion of participants actively responding by either returning cases or declaring 'I have nothing to report this month') whilst the denominator was the total number of persons employed from 2005-2021 obtained from the ROI National Household Survey.<sup>24</sup> Both 'unadjusted' (no adjustment for participation and response) and 'adjusted' (adjustment for participation and response) rates are presented. Incidence rates were calculated for total work-related skin disease, CD, total work-related respiratory disease, asthma, and asbestos related diseases. The numbers of actual case reports in other diagnostic sub-groups were too low to accurately determine meaningful incidence rates. Incidence rates based on OP data were not calculated because it was not possible to accurately determine the population covered by OPs (access to an OP within the ROI is biased towards the public sector and larger employers).

Analyses of trends in number of reported cases over time (total, mental ill-health, musculoskeletal and skin) were investigated based on reports to OPRA. The number of cases reported to other schemes (SWORD, EPIDERM, THOR-GP) and for other diagnoses was not sufficient to permit meaningful time trend analysis. The STATA software command `xtnbreg` was used to fit longitudinal, negative binomial (i.e. over-dispersed) Poisson models with random effects.<sup>25</sup> In these models, the dependent variable was the number of actual cases, including zeros, per reporter per month; the main 'covariate' is calendar time. The aim of the analysis is to estimate the relationship between annual ROI number of reported cases and time, after adjusting for potential confounders. Numbers of cases might vary from year to year solely because of changes in the size of the ROI working population. Therefore, estimated population sizes for each year were included in the model as an 'offset'; this feature means that the model estimates change in rates, not changes in case counts. Apart from 'calendar time', the other variables included in the regression models as covariates were 'season' and 'first month as a new reporter' as these are factors that can influence the reported incidence levels.

Changes in number of reported cases were estimated in two different ways:

- 1) 'non-parametric' approach: the model contained separate indicator variables for different years. In the current analyses, 2021 was taken as the reference year and the percentage increase

or decrease in number of reported cases to 2021 was estimated. These analyses had no in-built assumptions about the pattern of change over time.

2) 'parametric' approach with a continuous time variable measured on a scale of years. The statistical models for these analyses assumed that the percentage change from one year to the next is a constant throughout the relevant period.

An ethics application for the renewal of ethics for data collection by THOR in the Republic of Ireland from the Ethics Committee of the Public Health Research Ethics Committee of The Royal College of Physicians of Ireland and the Irish College of General Practitioners has been submitted and is awaiting approval.

### **3 RESULTS**

#### **3.1 PARTICIPATION**

Similar to 2019 and 2020, a total of 68 physicians (27 OPs, 20 GPs, 12 dermatologists and 9 chest physicians) were enrolled in THOR-ROI in 2021. Of the 12 dermatologists, 3 (25%) actively participated in 2021 (i.e., returned a web form at least once either containing cases or declaring 'I have nothing to report this month'), with nine dermatologists actively participating during 2005-2021. Of the nine chest physicians, 3 (33%) actively reported in 2021. Overall, 7 chest physicians have actively participated during 2005-2021. Of the 27 OPs enrolled in OPRA-ROI, 5 (19%) actively participated in 2021, with 22 OPs actively participating during 2007-2021. Of the 20 GPs enrolled in THOR-GP-ROI in 2021, 2 (10%) actively participated in 2021, with 14 GPs actively participating during 2015-2021. In comparison to 2019 and 2020, there was a slight decrease in the proportion of physicians actively participating in THOR-ROI in 2021.

### 3.2 OVERVIEW OF 2021 CASE REPORTS

Reporters to THOR-ROI returned 100 cases and 30 nil returns in 2021. The number of cases, nil returns and participating physicians for 2021 compared to the 2020 are presented in Table 1.

**Table 1: Number of physicians, cases and nil returns reported by scheme in 2019, 2020 and 2021.**

	January - December 2021			January - December 2020*			January - December 2019*		
	Physicians	Cases	Nil returns	Physicians	Cases	Nil returns	Physicians	Cases	Nil returns
<b>OPRA</b>	27	60	17	27	40	24	26	80	33
<b>EPIDERM</b>	12	23	10	12	23	21	13	14	18
<b>SWORD</b>	9	17	1	9	31	0	10	12	0
<b>THOR-GP</b>	20	0	2	20	3	3	20	3	3

\*Totals may have increased from previous reporting due to the submission of late cases.

The 100 cases reported to THOR-ROI in 2021 comprised of 60 cases reported by OPs to OPRA-ROI, 17 respiratory cases reported by chest physicians to SWORD-ROI, and 23 skin cases reported by dermatologists to EPIDERM-ROI. No cases were reported by general practitioners to THOR-GP-ROI in 2021 (Table 2).

**Table 2: Number of cases / diagnoses reported to SWORD-ROI, EPIDERM-ROI, OPRA-ROI and THOR-GP-ROI, 2021**

	<b>Diagnosis</b>	<b>SWORD-ROI</b>	<b>EPIDERM-ROI</b>	<b>OPRA-ROI</b>	<b>THOR-GP-ROI<sup>a</sup></b>
<b>Skin disease</b>	Contact dermatitis	/	23	3	0
	Urticaria	/	0	0	0
	Other skin	/	0	1	0
	Total skin diagnoses	/	23	4	0
	Total skin cases	/	23	4	0
<b>Respiratory disease</b>	Asthma	4	/	0	0
	Inhalation accidents	0	/	0	0
	Alveolitis	1	/	0	0
	Bronchitis	1	/	0	0
	Infection	0	/	5 <sup>c</sup>	0
	Non-malignant pleural disease	5	/	0	0
	Mesothelioma	2	/	0	0
	Lung cancer	1	/	0	0
	Pneumoconiosis	1	/	0	0
	Other respiratory disease	4	/	5 <sup>c</sup>	0
	Total respiratory diagnoses	19	/	10	0
	Total respiratory cases	17	/	10	0
<b>Mental ill-health</b>	Anxiety and depression	/	/	6	0
	Post-traumatic stress disorder	/	/	2	0
	Other work stress	/	/	8	0
	Adjustment disorder	/	/	1	0
	Other mental ill-health	/	/	0	0
	Total mental ill-health diagnoses	/	/	17	0
	Total mental ill-health cases <sup>b</sup>	/	/	14	0
<b>Musculoskeletal disorders</b>	Upper limb	/	/	12	0
	Spine/back	/	/	4	0
	Lower limb	/	/	2	0
	Other musculoskeletal	/	/	2	0
	Total musculoskeletal diagnoses	/	/	20	0
	Total musculoskeletal cases <sup>b</sup>	/	/	16	0
<b>Other work-related illness</b>	Total other diagnosis	/	/	23 <sup>d</sup>	0
	Total other cases	/	/	23	0
<b>Total diagnoses</b>		<b>19</b>	<b>23</b>	<b>74</b>	<b>0</b>
<b>Total cases<sup>b</sup></b>		<b>17</b>	<b>23</b>	<b>60</b>	<b>0</b>

<sup>a</sup> GPs report on a 'sample' basis for only 1 randomly assigned month per calendar year

<sup>b</sup> A case may have been assigned to more than one disease group (for example, musculoskeletal and mental ill-health)

<sup>c</sup> All 10 cases of respiratory disease reported by OPs to OPRA-ROI had a diagnosis of either active COVID-19 infection (respiratory infection) or long covid-19/post covid-19 ('other' respiratory diseases).

<sup>d</sup> 21 of the 23 cases of 'other' work-related illness were cases diagnosed with either covid-19, post covid-19 or long covid-19.

All 23 of the cases reported to EPIDERM-ROI had a diagnosis of CD (13 diagnosed as allergic, 7 as irritant and 3 as allergic and irritant). The industry and occupation of cases were reported in:

- Health and social care (3 cases): nurse (2 cases); doctor (1 case)
- Agriculture (1 case): agriculture worker (1 case)
- Manufacturing (4 cases): engineer (1 case); engineering technician (1 case); process operator (2 cases)
- Construction (2 cases): labourer (1 case); brick layer (1 case).
- Retail trade; except of motor vehicles and motorcycles (4 cases): shop assistant (2 cases); florist (1 case); jeweller (1 case).
- Hotel and restaurants (4 cases): chef (2 cases); waitress (1 case); shop assistant (1 case)
- Professional, scientific and technical activities (1 case): clothes designer (1 case)
- Other service activities (4 cases): nail technician (1 case); hairdresser (3 cases).

In total, 21 groups of agents were associated with the 23 reported cases. These included preservatives (8 times), plants (6 times), methacrylate esters (4 times) and other acrylics and acrylates (twice), rubber chemicals and materials (4 times), water and wet work (3 times), nickel and its compounds (3 times), cobalt and its compounds (twice), food (vegetables/fruits) (twice) and food additives/flavouring (twice), hairdressing materials (twice), p-phenylene diamine (PPD) (twice), and the following all cited once: protective clothing and equipment, dyes and pigments, soaps and detergents, sterilising and disinfecting agents, cement, plaster and masonry, chromium and its compound, other unspecified metals, epoxy resins and organic peroxide.

The 17 cases (19 diagnoses) reported to SWORD-ROI included the following:

- 4 cases of occupational asthma: (all due to irritation),
- 1 case of bronchitis,



- 1 case of alveolitis,
- 5 cases of non-malignant pleural disease (predominantly plaques),
- 2 cases of mesothelioma,
- 1 case of pneumoconiosis,
- 1 case of lung cancer,
- 4 'other' respiratory diseases (diagnosed as silicosis, asbestosis, pleural rounded atelectasis, and occupational bronchitis)

The most frequently reported industry sector for the 17 cases was construction (53%), followed by manufacturing (29%). The most frequently reported occupation was labourer in construction (24%), followed by electrical engineer/electrician (18%) and general operative in manufacturing (18%). The following 7 groups of agents were associated with the 17 cases of work-related respiratory disease: asbestos (9 times), chlorine (3 times), and each of the following cited once – silica, ill-defined fumes and gases, wood and wood dust, organic waste and other creatures (pigeons).

The 74 diagnoses (60 cases) reported to OPRA-ROI in 2021 were predominantly 'other' WRI (31%), followed by musculoskeletal (27%) and mental ill-health (23%), with smaller proportions of respiratory (14%), and skin ill-health (5%).

A total of 23 cases of 'other' WRI were reported by OPs in 2021 to OPRA-ROI. One case was diagnosed with 'assault at work', one case was diagnosed with flare of sarcoid and asthma, fatigue, headache, and brain fog due to an infection with SARS-CoV-2 virus; the remaining 21 cases were diagnosed with either covid-19, post covid-19 or long covid-19. These 23 cases were all working in the human health and social care sector; with frequently reported occupations with this industry sector being nurses (48%), nursing auxiliaries (17%) and managers (17%).

In terms of the 20 diagnoses reported by OPs for the 16 musculoskeletal ill-health cases, upper limb was the most frequently reported diagnosis (60%), followed by spine / neck / back problems (20%), lower limb disorders (10%) and other musculoskeletal problems (10%). The majority of these 2021 musculoskeletal cases were from the health and social care sector (94%); with frequently reported

occupations within this industry sector being nurses (50%) and nursing auxiliaries (25%). The most frequently reported tasks included accidents (42%), materials manipulation (32%) and heavy lifting/ carrying/ pushing/ pulling (16%); while accidents (42%) and materials handling (42%) were the most frequently reported movements.

The most frequently reported industry sector for the 14 mental ill-health cases (17 diagnoses) was health and social care (93%) with frequently reported occupations within this industry sector being nurses (14%) and doctors (14%). The types of events reported as associated with these cases included factors intrinsic to the job (41%, including workload/demand [35%], and organisational factors [6%]); interpersonal relationships (35%, including bullying/sexual harassment [12%], and difficulties with co-workers/managers [12%]); traumatic events (12%, including violence at work / verbal abuse / sexual assault); and physical working environment (12%, including risks to self from environmental factors such as chemicals, infection, radiation etc.).

Ten respiratory cases were reported by OPs in 2021 to OPRA-ROI. Five cases were diagnosed as a respiratory infection with SARS-CoV-2 virus, while the remaining five cases were diagnosed as “other” respiratory disorder (post covid-19 or long covid-19). These 10 cases were all working in the human health and social care sector with frequently reported occupations with this industry sector being nurses (30%), nursing auxiliaries (20%) and managers (20%).

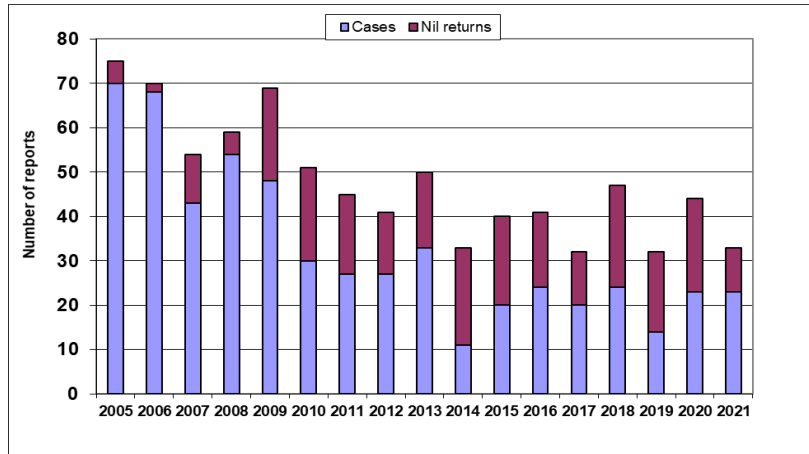
Four skin cases were reported by OPs in 2021 to OPRA-ROI, three were diagnosed as CD and one case was diagnosed as “other” skin disorder (trauma to wrist causing plaque psoriasis). All cases were from the health and social care sector (three nurse auxiliaries and one nurse). The agents associated with the skin cases were cited as gloves, high temperature/high humidity, friction/trauma, wet work, and sterilising and disinfecting agents. General practitioners reported no cases of WRI in 2021.

### **3.3 INCIDENCE RATES AND TRENDS IN INCIDENCE RATES**

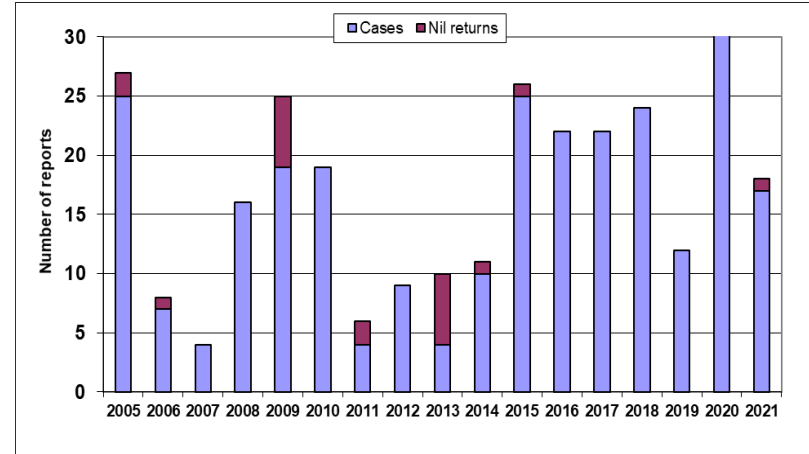
The number of reports received for EPIDERM-ROI, SWORD-ROI, OPRA-ROI, and THOR-GP-ROI by year are shown in Figure 1, whilst Figure 2 shows the cases per active reporter per year.

**Figure 1: Reports (cases and nil returns) in a) EPIDERM-ROI (2005-2021) b) SWORD-ROI (2005-2021) c) OPRA-ROI (2007-2021) and d) THOR-GP-ROI (2015-2021)**

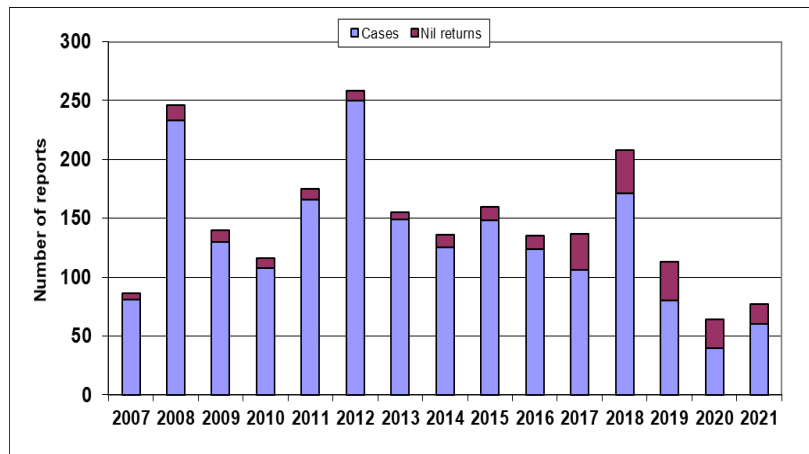
**a) EPIDERM-ROI (Dermatologists)**



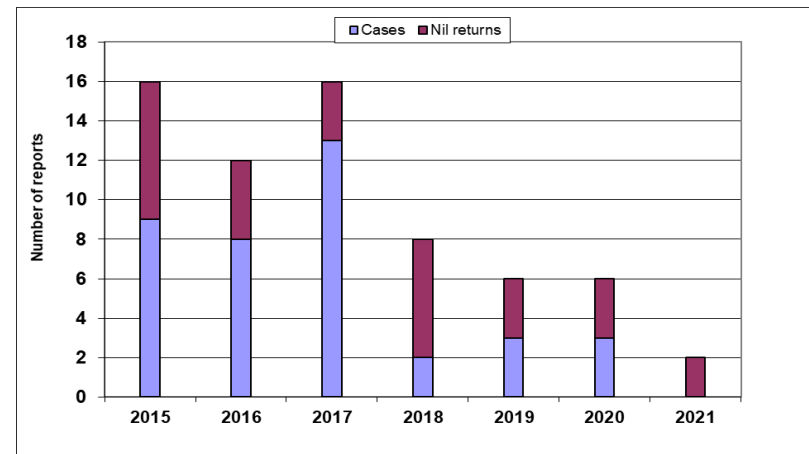
**b) SWORD-ROI (Chest physicians)**



**c) OPRA-ROI (Occupational physicians)**

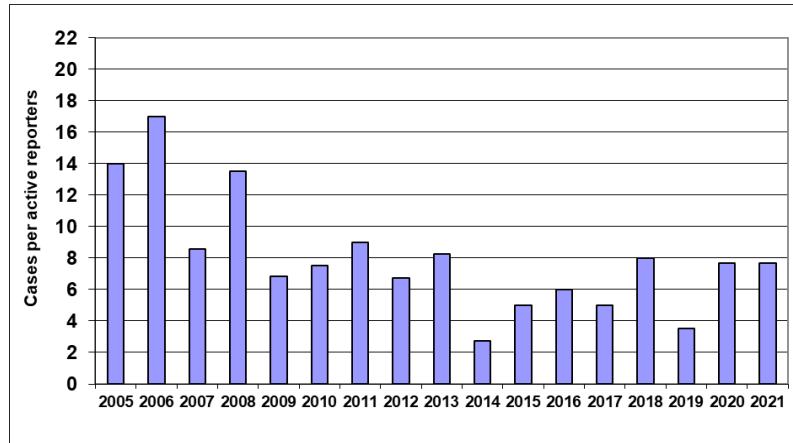


**d) THOR-GP-ROI (General practitioners)**

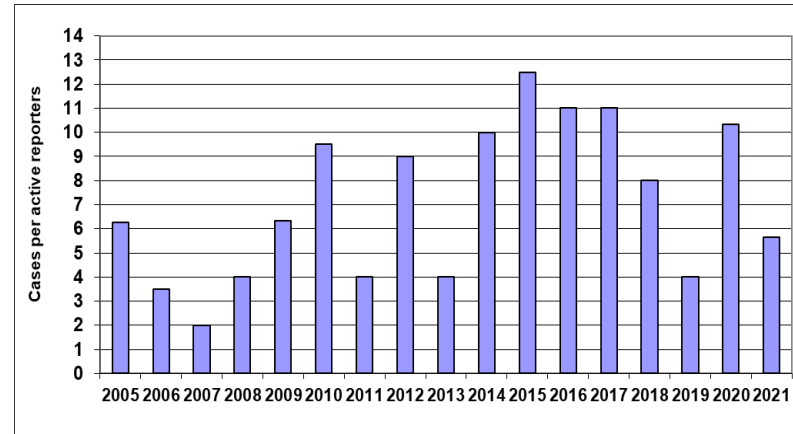


**NOTE: Scale differences**

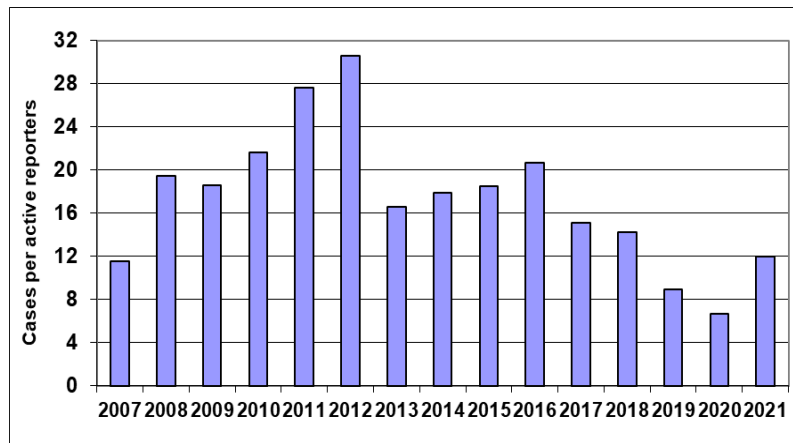
**Figure 2: Cases per active reporter\* in a) EPIDERM-ROI (2005-2021) b) SWORD-ROI (2005-2021) c) OPRA-ROI (2007-2021) and d) THOR-GP-ROI (2015-2021)**



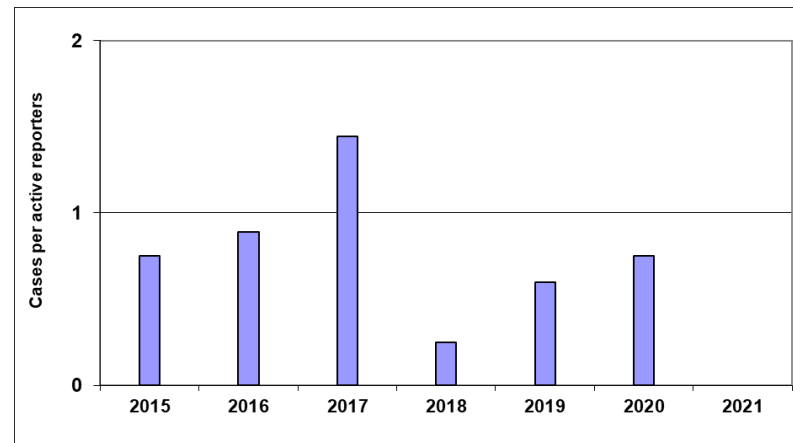
**a) EPIDERM-ROI (Dermatologists)**



**b) SWORD-ROI (Chest physicians)**



**c) OPRA-ROI (Occupational physicians)**



**d) THOR-GP-ROI (General practitioners)**

\*An active reporter is defined as someone who returns a case report or responds 'I have nothing to report' in a calendar year. \*\* The number of cases per active reporters can be less than one when the number of active reporters, that is reporters who reported cases or nil returns ('I have nothing to report' responses), is greater than the number of cases. NOTE: Scale differences.

The annual average incidence rate for dermatologist reported skin disease in the ROI was 1.6 per 100,000 employed, per year (Table 3). After adjusting for 'non-participation' and 'non-response', this increased to an estimate of 15.7 per 100,000 employed. For chest physicians in the ROI, the annual average incidence rate of total respiratory disease was 0.8 per 100,000 employed per year, rising to 20.2 per 100,000 employed, per year, after adjusting for 'non-participation' and 'non-response'.

Analyses of trends in number of reported cases based on OP reports to OPRA-ROI suggest an (overall) statistically significant decrease of approximately 5% - 6% per year between 2007 and 2021 in number of reported cases for total WRI, mental ill-health, musculoskeletal disease, and skin disease between 2007 and 2021 (Table 4). The number of cases reported to other schemes (SWORD, EPIDERM, THOR-GP) and for other diagnoses reported to OPRA was not sufficient to permit meaningful time trend analysis. The graphs showing relative rates by year (Figure 3) suggest that there may not be a linearly declining trend in the incidence of work-related disease over time and that the incidence in total work-related disease appears to be stable during the last number of years.

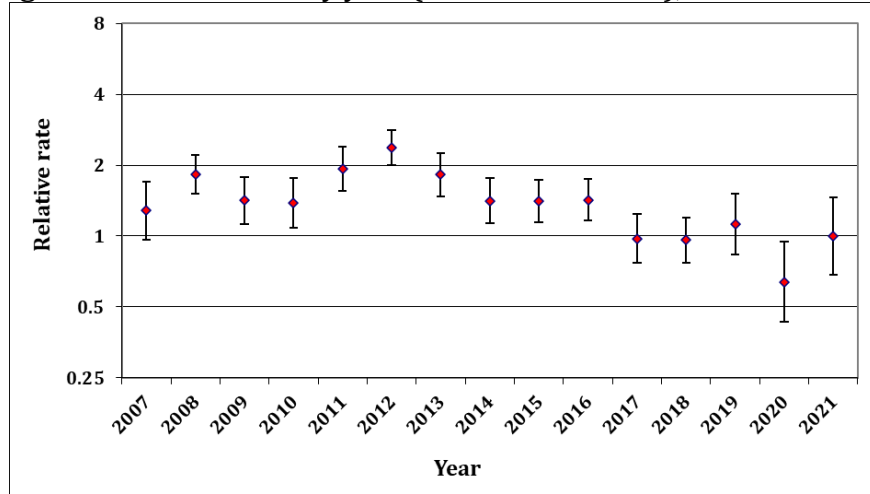
**Table 3: Annual average ‘crude’ and ‘adjusted’ incidence rates per 100,000 persons employed of work-related skin and respiratory disease reported by dermatologists and chest physicians to SWORD and EPIDERM in the Republic of Ireland (2005-2021)**

	Annual, average incidence rate per 100,000 employed	
	‘Crude’	‘Adjusted’
<b>Respiratory (chest physicians)</b>		
All	0.8	20.2
Asthma	0.3	6.6
Asbestos related	0.2	6.7
<b>Skin (dermatologists)</b>		
All	1.6	15.7
Contact dermatitis	1.6	15.1

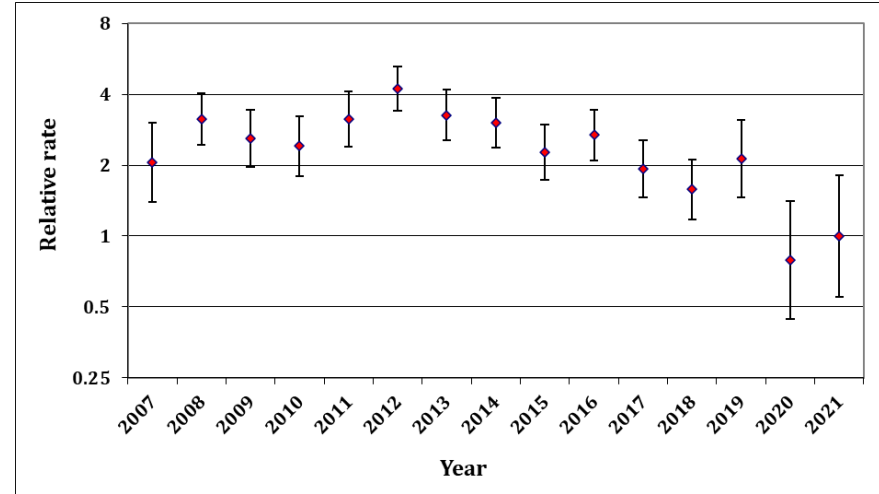
**Table 4: Average annual percentage change in reported cases in work-related illness as reported by occupational physicians to OPRA, 2007-2021**

	ESTIMATED % CHANGE (95% CONFIDENCE INTERVAL)
Total work-related illness	-4.6 (-6.1, -3.0)
Mental ill-health	-4.9 (-6.9, -2.9)
Musculoskeletal	-6.1 (-8.5, -3.6)
Skin	-5.6 (-9.7, -1.2)

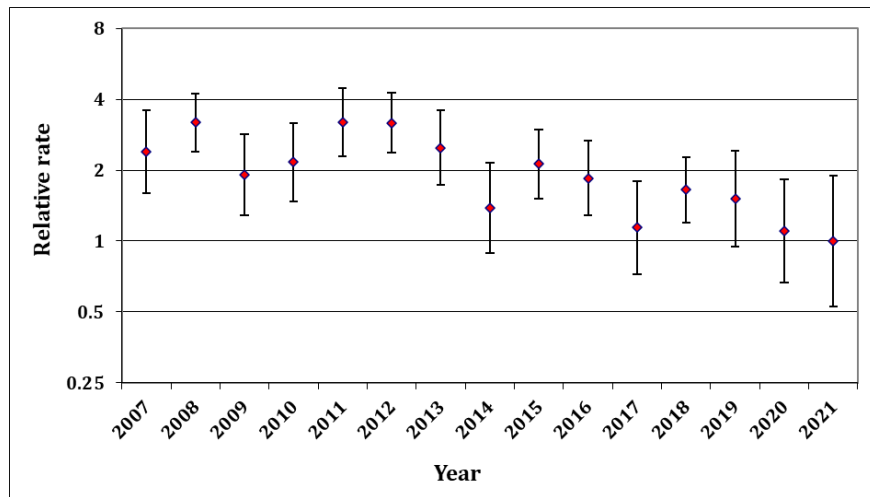
**Figure 3: Relative risk by year (2021 estimate = 1), with 95% comparison intervals**



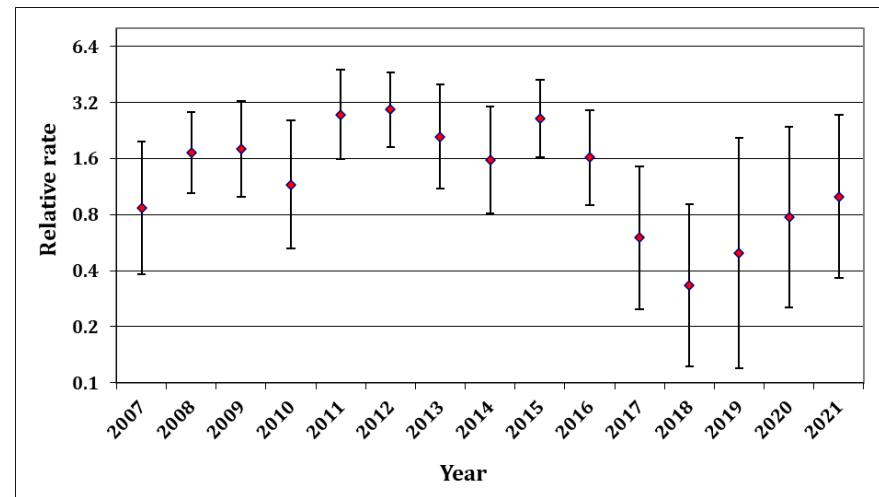
**a) Total work-related illness**



**b) Mental ill-health**



**c) Musculoskeletal**



**d) Skin**

\*Note change in y-axis scale to the logarithmic scale and scale differences

### 3.4 OCCUPATIONAL SKIN SURVEILLANCE (EPIDERM): 2005-2021

#### 3.4.1 DIAGNOSES

In total, 557 case reports were reported by dermatologists to EPIDERM-ROI between January 2005 and December 2021. These 557 case reports produced 549 diagnoses; 13 cases were not assigned a diagnosis (however, information on occupation, industry and suspected agent were provided). The most frequently reported skin diagnosis in the ROI was CD (98%) (Table 5).

**Table 5: Number and type of diagnoses reported by dermatologists to EPIDERM-ROI (2005-2021)**

	<b>Number (%)</b>
<b>Contact Dermatitis</b>	538 (98%)
• Allergic	• 305 (57%)
• Irritant	• 187 (35%)
• Mixed	• 45 (8%)
• Unclear	• 1 (<1%)
<b>Contact urticaria</b>	6 (1%)
<b>Folliculitis/acne</b>	0
<b>Infective</b>	1 (<1%)
<b>Mechanical</b>	0
<b>Nail</b>	3 (<1%)
<b>Neoplasia</b>	0
<b>Other dermatoses</b>	1 (<1%)
<b>Total cases</b>	<b>557</b>
<b>Total diagnoses</b>	<b>549* (100%)</b>

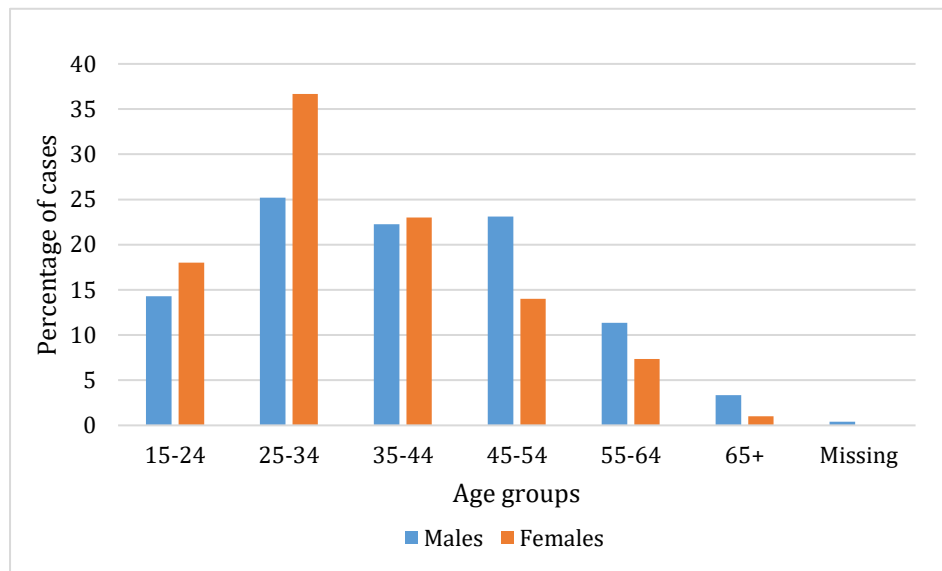
\*13 cases were not assigned a diagnosis. However, information on occupation, industry and suspected agent was provided

#### 3.4.2 AGE AND SEX

Overall (2005-2021) cases of CD in the ROI were most frequently reported in the 25–34 year age group for both males and females (Figure 4). More cases with reported CD were females (56%), and females were younger than males (mean age; females 35 years, males 40 years) (Table 6).



**Figure 4: Proportion of cases of contact dermatitis reported to EPIDERM-ROI by age group and sex (2005-2021)**



**Table 6: Age and sex of contact dermatitis diagnoses in EPIDERM-ROI (2005-2021)**

DIAGNOSIS	MALES	FEMALES	ALL
<b>Allergic CD</b>			
Number of diagnoses (%)	149 (49%)	156 (51%)	305 (100%)
Mean age (years)	41	36	39
Age range (years)	15-81	17-64	15-81
<b>Irritant CD</b>			
Number of diagnoses (%)	70 (37.4%)	116 (62.0%)	187 (100%)*
Mean age (years)	37	33	34
Age range (years)	16-65	19-77	16-77
<b>Mixed CD</b>			
Number of diagnoses (%)	18 (39.1%)	28 (60.9%)	46 (100%)**
Mean age (years)	40	40	40
Age range (years)	19-54	17-65	17-65
<b>All CD</b>			
Number of diagnoses (%)	237 (44.1%)	300 (55.9%)	538 (100%)*
Mean age (years)	40	35	37
Age range (years)	15-81	17-77	15-81

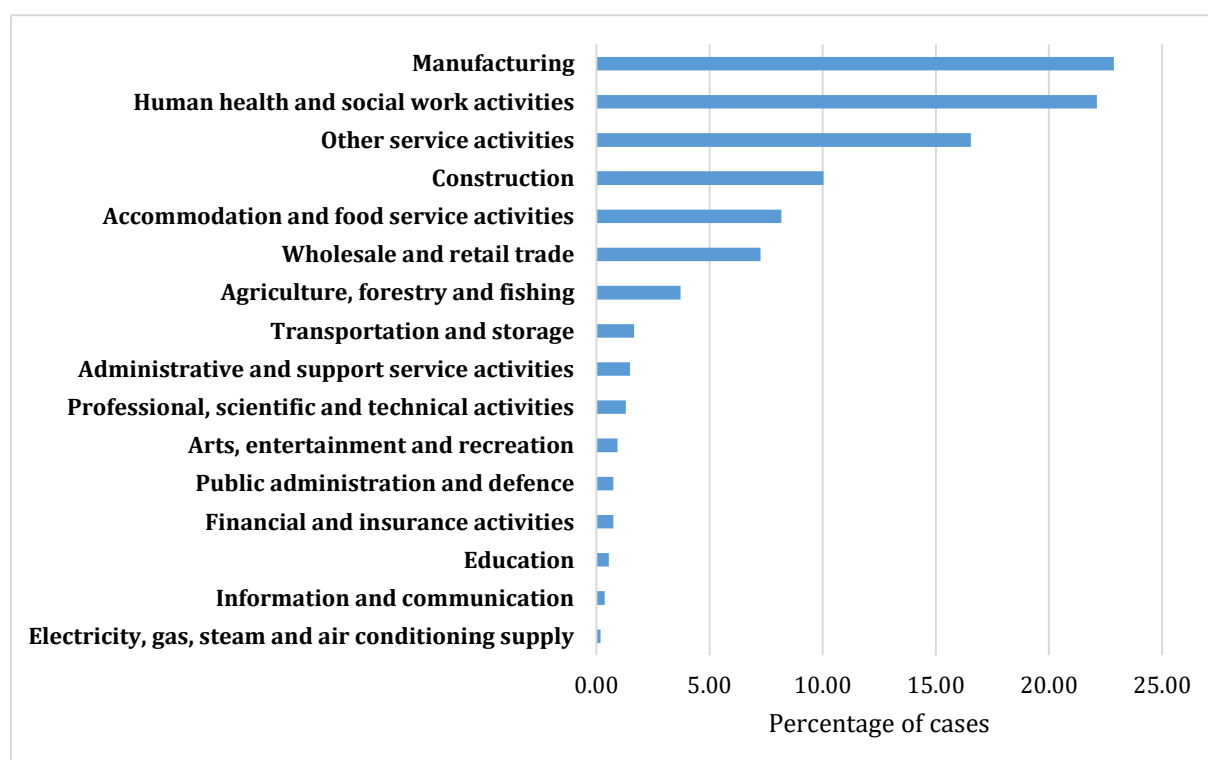
\*1 diagnosis had no sex assigned.

\*\*Including one case that is unclear which type of CD it is.

### 3.4.3 INDUSTRY AND OCCUPATION

The most frequently reported industrial sector for cases of CD reported to ROI was manufacturing followed by health and social care and 'other service activities', which includes hairdressing and other beauty treatments (Figure 5).

**Figure 5: Proportion of cases of contact dermatitis reported to EPIDERM-ROI by Standard Industrial Classification (SIC), 2005-2021**

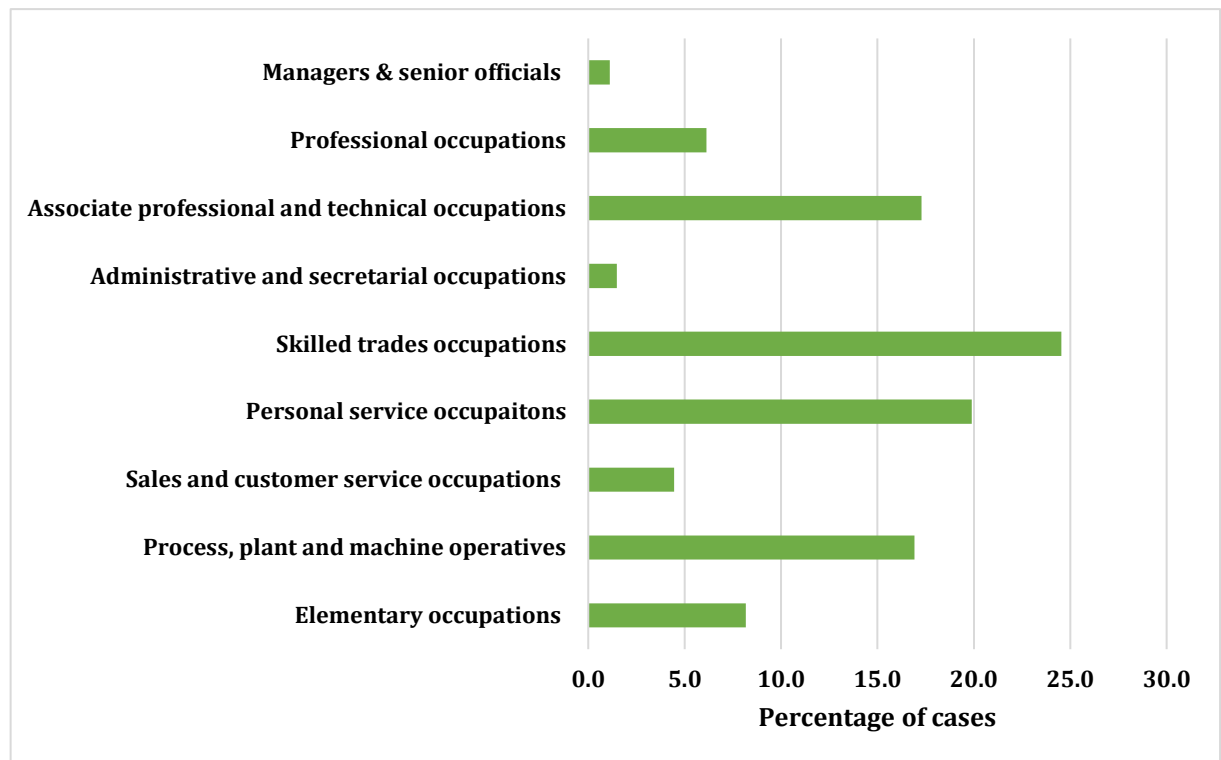


The most frequently reported occupations for cases of CD reported to EPIDERM-ROI were nurses (11.5% of the 538 CD cases) which fall under SOC group 3 'Associate professional and technical occupations' (Figure 6), hairdressers (8.0%) and beauty therapists (7.2%) which fall under SOC group 6 'Personal service occupations', and chemical and related process operatives (7.1%) which fall under SOC group 8 'Process, plant and machine operatives'.

Of the 11 non-CD cases reported to EPIDERM-ROI, six cases of contact urticaria were reported in a nurse, a cleaner, a carpenter, a dental student, a baker and a chef. Three cases of nail

disorder (a case with a co-diagnosis of onycholysis of fingernails) were reported in two beauticians and a nail technician; and one case of (unspecified) infective disease was reported in an agricultural student.

**Figure 6: Proportion of cases of contact dermatitis reported to EPIDERM-ROI by Standard Occupational Classification (SOC), 2005-2021**



### 3.4.4 SUSPECTED AGENTS

Up to six suspected agents may be cited for each case report, and the agents most frequently associated with CD are shown in Table 7. The most frequently reported groups of agents for the ROI were rubber chemicals and materials, wet work, preservatives, and nickel and its compounds.

For allergic CD rubber chemicals and materials were the agents most often associated with case reports in the ROI, for irritant CD the agent most frequently reported was wet work, while for mixed contact dermatitis, nickel was most frequently reported.

**Table 7: Most frequently reported agents\* for contact dermatitis, reported by dermatologists to EPIDERM-ROI (2005-2021) – number of cases and (percentage of total cases)**

	<b>Number</b>	<b>(%)</b>
<b>Rubber chemicals &amp; materials</b>	125	23
<b>Wet work</b>	80	15
<b>Preservatives</b>	74	14
<b>Nickel &amp; its compounds</b>	72	13
<b>Acrylics &amp; acrylates</b>	47	9
<b>Chromium &amp; its compounds</b>	46	9
<b>Plants</b>	32	6
<b>PPE</b>	30	6
<b>Cobalt &amp; its compounds</b>	30	6
<b>Resins</b>	28	5
<b>Hairdressing chemicals</b>	27	5
<b>PPD</b>	23	4
<b>Drugs &amp; medicaments</b>	20	4
<b>Perfumes/fragrance</b>	18	3
<b>Soaps &amp; detergents</b>	18	3
<b>Food, additives and flavourings</b>	18	3
<b>Number of cases</b>	<b>538</b>	

\*Each case can have more than one reported agent. Therefore, the percentage of cases with each agent may equal more than 100

The suspected agents associated with the six cases of contact urticaria reported to EPIDERM-ROI were latex, wood shavings, fish, cobalt chloride, and nickel sulphate. The (unspecified) infective case was associated with ‘coming into contact with infected animals’ and the 3 nail cases were attributed to methacrylate nail series, nickel, plants, and acrylics and acrylates.

### 3.5 SURVEILLANCE OF WORK-RELATED AND OCCUPATIONAL RESPIRATORY DISEASE (SWORD): 2005-2021

#### 3.5.1 DIAGNOSES

The addition of the 17 cases reported in 2021 brings the total number of cases reported by chest physicians to SWORD-ROI (2005-2021) to 274. These produced 310 diagnoses, with 6 cases not being assigned a diagnosis (involving a labourer exposed to silica, a dentist exposed to adhesive/bonding agents, a machine operator exposed to urea formaldehyde, a labourer exposed to acid anhydrides, and a labourer and a tunnel worker - both exposed to asbestos). Diagnoses of asthma comprised the largest proportion of cases (37%) and the most of all diagnoses (33%) reported to SWORD-ROI (Table 8).

**Table 8: Number and type of diagnoses reported by chest physicians to SWORD (2005-2021) in the Republic of Ireland**

	<b>Number</b>	<b>(%)</b>
<b>Asthma</b>	101	33%
<b>Inhalation accidents</b>	23	7%
<b>Allergic alveolitis</b>	6	2%
<b>Bronchitis/ emphysema</b>	28	9%
<b>Infectious disease</b>	1	<1%
<b>Non-malignant pleural disease</b>	59	19%
<b>Mesothelioma</b>	12	4%
<b>Lung cancer</b>	12	4%
<b>Pneumoconiosis</b>	43	14%
<b>Other respiratory</b>	25	8%
<b>Total cases</b>	<b>274</b>	
<b>Total diagnoses</b>	<b>310*</b>	<b>100%</b>

\*six cases were not assigned to a diagnosis. However, information on occupation, industry and suspected agent was provided.

### **3.5.2 AGE AND SEX**

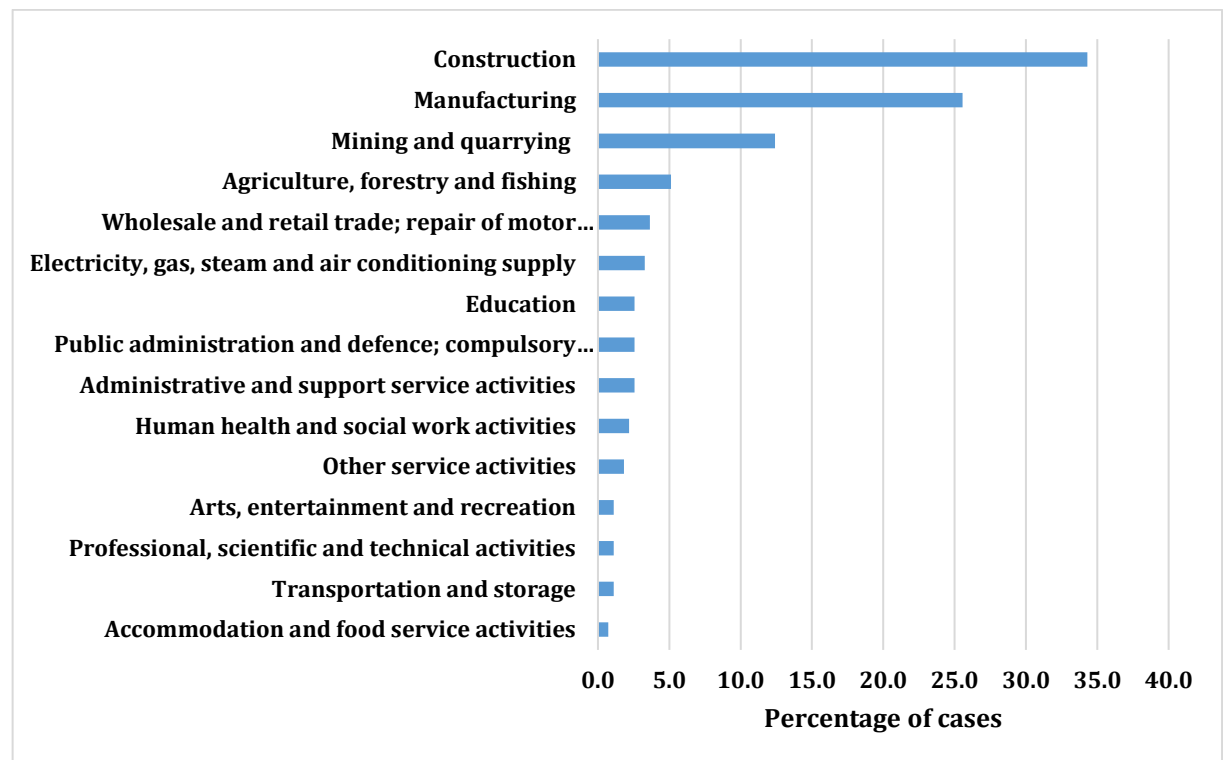
Case reports to SWORD-ROI were predominantly male (84%), with a mean age (male plus female combined) of 57 years (age range 19 - 87 years). Of these, 40 of the case reports were in the 75+ age group (all males except two cases whose gender have not been reported), with 49 diagnoses: 26 non-malignant pleural disease, 10 pneumoconiosis, 3 asthma, 3 lung cancer, 2 mesothelioma, 1 bronchitis/emphysema and 4 'other' (diagnosed as asbestosis, silicosis, asthma overlap syndrome and pleural effusion). Most of these cases (31 out of 40) were attributed to asbestos exposure, with the remaining attributed to silica (5 cases), coal dust (3 cases), cement, plaster & masonry (2 cases), work involving exposure to dust of fumes (2 cases) and each of the following cited once – dust, fuel oil/diesel oil, ill-defined fumes/gases, fungi/moulds/yeast, and other creatures – mites/ticks etc.

Of all asthma cases reported 73% were males with a mean age (male plus female combined) of 46 years (age range 19 - 79 years).

### **3.5.3 INDUSTRY AND OCCUPATION**

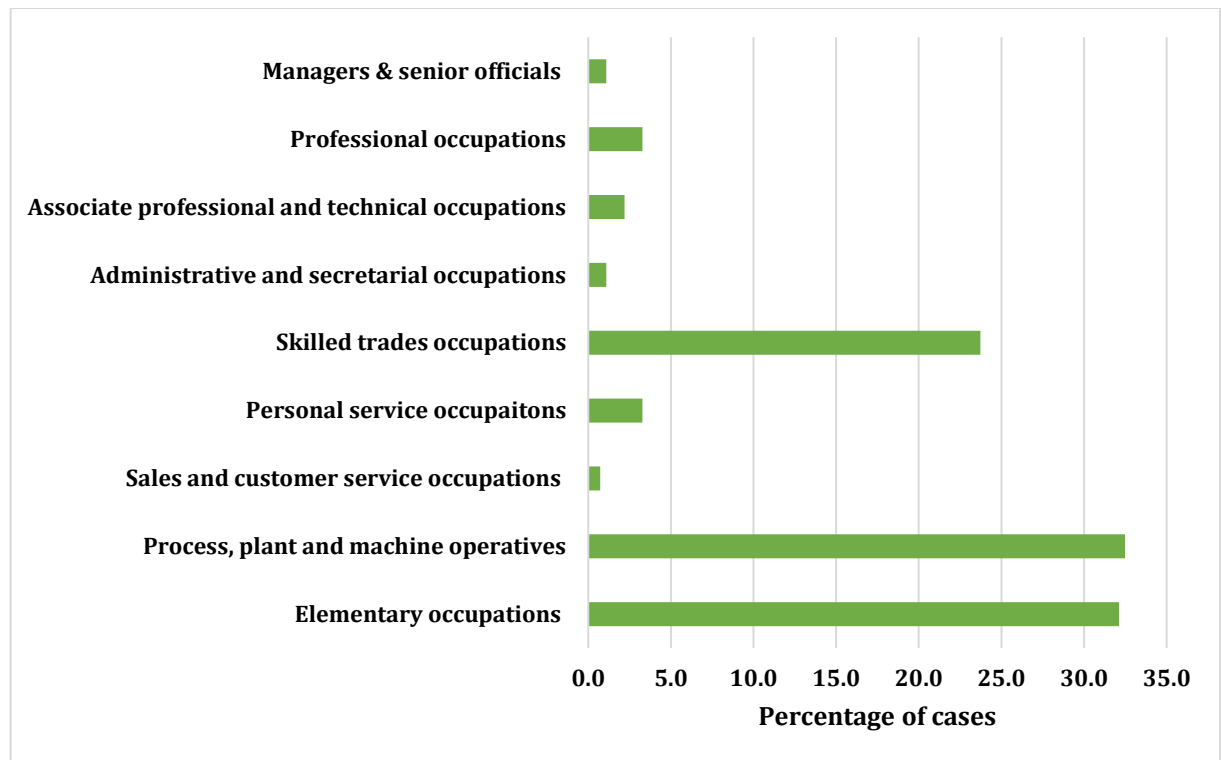
Cases of work-related respiratory disease were most frequently reported in the construction and manufacturing sectors (Figure 7). Within the manufacturing sector, cases were most frequently reported in the manufacturing of food products, non-metallic mineral products (for example, cement), chemicals and chemical products, basic pharmaceutical products and pharmaceutical preparations, and fabricated metal products.

**Figure 7: Proportion of cases of respiratory disease reported to SWORD-ROI by Standard Industrial Classification (SIC), 2005-2021**



The most frequently reported occupations for cases reported in the ROI were labouring in building and woodworking trades (which fall under the major category of “Elementary occupations”) and coal mine operatives (which fall under the major category of “Process, plant and machine operatives”) (Figure 8).

**Figure 8: Proportion of cases of respiratory disease reported to SWORD-ROI by Standard Occupational Classification (SOC), 2005-2021**



### 3.5.4 SUSPECTED AGENTS

The agents associated with the respiratory diagnoses reported to SWORD-ROI are presented in Table 9. A total of 63 agents were associated with the 101 diagnoses of occupational asthma, with isocyanates, cement, fumes/gases, glues and adhesives and hypochlorites being the most frequently reported.

Asbestos and silica were the most frequently reported agents (cited 14 and 12 times, respectively) for cases of pneumoconiosis. In total, 101 diagnoses were reported as being associated with asbestos: 59 of non-malignant pleural disease, 14 of pneumoconiosis, 12 of mesothelioma, 11 of lung cancer, 1 of bronchitis/emphysema, 1 of asthma, and 3 of “other”.



**Table 9: Suspected agents associated with cases of work-related respiratory disease most frequently reported to SWORD-ROI, (2005-2021)**

<b>DIAGNOSIS</b>	<b>SUSPECTED AGENTS (as recorded by the physician)</b>
<b>Asthma</b>	Isocyanates, toluene diisocyanate and di-phenyl methane di isocyanate (16 cases); cement, plaster & masonry (8 cases); fumes/gases (8 cases); glues and adhesives, hypochlorites; exposure to dust/fumes/smoke; wood/wood dust; coal; hairdressing products; soaps and detergents; ammonia and bleaches; other gases; paints, dyes and pigments, inks; oil/diesel fuel; other ethers; acetic acid; zinc; drugs & medicaments; epoxy resins and other polymers; biological substances including food, fungi/moulds/yeast, chlorine exposure and other creatures e.g. mites, ticks.
<b>Inhalation accidents</b>	Other gases (3 cases); sterilising agents & disinfectants (3 cases); cleaning materials (2 cases); other esters (2 cases); and ammonia (2 cases).
<b>Allergic alveolitis</b>	Dusts; pathogens & micro-organisms; other veg, fungal agents & pollen; food; fungi/moulds/yeast and other creatures (pigeons).
<b>Bronchitis/emphysema</b>	Coal (14 cases); cement, plaster & masonry (12 cases); exposure to dust/fumes (9 cases); fumes/gases; wood/wood dusts; smoking; petroleum oils; fungi/moulds/yeast.
<b>Infectious disease</b>	Toxoplasma.
<b>Benign pleural disease</b>	Asbestos and dust.
<b>Mesothelioma</b>	Asbestos.
<b>Lung cancer</b>	Asbestos and radon.
<b>Pneumoconiosis</b>	Asbestos (14 cases); silica (12 cases); coal (11 cases); cement, plaster & masonry (9 cases); exposure to dust/fumes; fumes/gases; Other metals; petroleum oils; other silicates.
<b>Other respiratory</b>	
<b>Asbestosis</b>	Asbestos (1 case) and coal/rock dust, blast fumes, fungal antigen (1 case)
<b>Asthma overlap syndrome</b>	Coal dust / fungal antigen (1 case).
<b>Bronchiolitis obliterans organising pneumonia (BOOP)</b>	Mixed brick dust, cement dust, fungi, styrene beads and glues (1 case).
<b>Occupational Bronchitis</b>	Wood and wood dust (MDF) (1 case).
<b>Emphysema/focal bronchiectasis</b>	Coal and blast fumes (1 case).
<b>Hyposmia</b>	Exhaust fumes (1 case).

<b>Hard metal lung disease</b>	Tungsten (1 case).
<b>Inhalation accident</b>	Metabisulphite (1 case).
<b>Nasopharyngeal malignancy</b>	Wood dust / varnishes (1 case).
<b>Organic dust toxic syndrome</b>	Mushrooms and compost (2 cases).
<b>Pleural effusion</b>	Asbestos (1 case).
<b>Pleural rounded atelectasis</b>	Asbestos (1 case).
<b>Reactive upper-airways dysfunction syndrome</b>	Ammonia (1 case) and Chemical spill of a Mixture of Trifluoroacetic anhydride; ethyl nicotinate; tetramethylethylenediamine: ethyl acetate plus a proprietary chemical of unidentified composition (1 case).
<b>Rhinosinusitis / sinusitis (4 cases)</b>	Urea, formaldehyde, ammonia, wood dust, aspartame, oil mist.
<b>Rhinitis (2 cases)</b>	Toluene di-isocyanate (1 case), and 'multiple possible agents' (1 case).
<b>Rhinorrhoea</b>	A specified histamine H2-receptor antagonist (1 case).
<b>Silicosis</b>	Silica (1 case)
<b>Sick building syndrome</b>	Agent not cited (1 case).

## **3.6 Occupational Physicians Reporting Activity (OPRA): 2007-2021**

### **3.6.1 DIAGNOSES**

A total of 1998 case reports (2169 diagnoses) were reported to OPRA-ROI between January 2007 and December 2021. A breakdown of the cases by major diagnostic group is provided in Table 10. The largest proportion of cases was for mental ill-health (53%), followed by musculoskeletal disorders (33%), with smaller proportions of skin (8%) and respiratory diagnoses (2%).

Work-related stress was the most frequently reported mental ill-health diagnosis reported to OPRA-ROI (58% of the 1149 diagnoses), whilst the most frequently reported musculoskeletal disorder was spine / neck / back disorders (54% of the 712 diagnoses). Diagnoses reported under 'other mental ill-health' included adjustment disorder, burnout, fatigue, overload, traumatic event, social phobia and mixed affective disorder. Whilst 'other' musculoskeletal diagnoses were primarily injuries.

CD was the most frequently reported skin diagnosis to OPRA-ROI (86% of the 175 diagnoses) and 'other' respiratory disease was the most frequently reported respiratory diagnosis (42% of the 50 diagnoses). These diagnoses included long-covid / post-covid cough (6 diagnoses), sinusitis (5 diagnoses), respiratory rhinitis (2 diagnoses), tuberculosis (2 diagnoses), smoke inhalation, 'upper respiratory tract irritation' / 'acute respiratory tract irritation', reactive airways / acute bronchial hyper-reactivity, persistent cough and dry cough.

**Table 10: Number and type of cases / diagnoses reported by occupational physicians to OPRA-ROI (2007-2021)**

	<b>Number</b>	<b>(%)</b>
<b>Skin</b>	<b>175</b>	<b>8</b>
• Contact dermatitis	151	86
• Other dermatoses	24	14
<b>Respiratory</b>	<b>50</b>	<b>2</b>
• Asthma	12	24
• Inhalation accidents	7	14
• Infectious disease	7	14
• Bronchitis/emphysema	3	6
• Other respiratory	21	42
<b>Musculoskeletal</b>	<b>712</b>	<b>33</b>
• Upper limb	262	37
• Spine / neck / back	382	54
• Lower limb	42	6
• Other musculoskeletal	26	4
<b>Mental ill-health</b>	<b>1149</b>	<b>53</b>
• Anxiety and depression	289	25
• Adjustment disorder	129	11
• PTSD	30	3
• Psychotic episode	1	<1
• Other work stress	663	58
• Other mental ill-health	37	3
<b>Total other cases/diagnoses</b>	<b>83</b>	<b>4</b>
<b>Total cases</b>	<b>1998</b>	
<b>Total diagnoses</b>	<b>2169</b>	<b>100%</b>

Note: A case can have more than one diagnosis so the sum of the sub-categories may be greater than the total cases (both by category and overall)

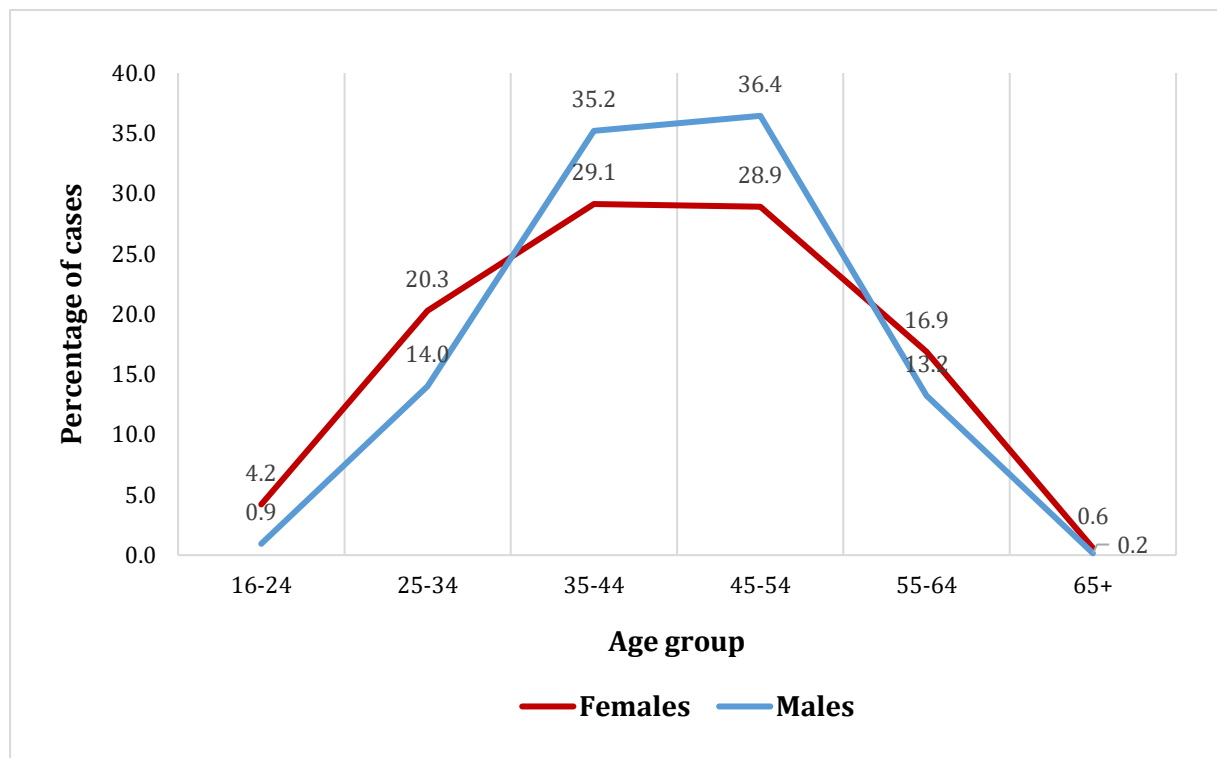
The 83 diagnoses in the ‘other’ category (OPRA-ROI) were reported as covid-19 infection/post-covid/long-covid (24 cases), ‘assault’ (15 cases); noise induced hearing loss (6 cases); sleep problems (5 cases); eye injury (4 cases); latex allergy (2 cases); latent TB infection (2 cases); dry eyes (2 cases); headache (2cases) and tinnitus (2 cases). In addition, each of the following diagnoses were reported once: acoustic trauma, blindness, incontinence due to bladder injury, category 3 bilateral loss, complications of needle stick injury, chemical splash, conjunctivitis,

chest pain, concussion, ear pain, ethanol sensitivity, epidural hematoma, eye irritation, lead toxicity, hepatitis C, umbilical hernia, well-being affected by commute, influenza A, 'shift work disorder', UR incisor and UL incisor, and stress/anxiety after needlestick injury.

### 3.6.2 AGE AND SEX

The proportions of cases reported to OPRA-ROI by age and sex are shown in Figure 9. Cases were most frequently reported in the 35-44 years of age group for females and 45-54 for males.

**Figure 9: Proportion of cases of work-related ill-health reported to OPRA-ROI by age and sex, 2007-2021**

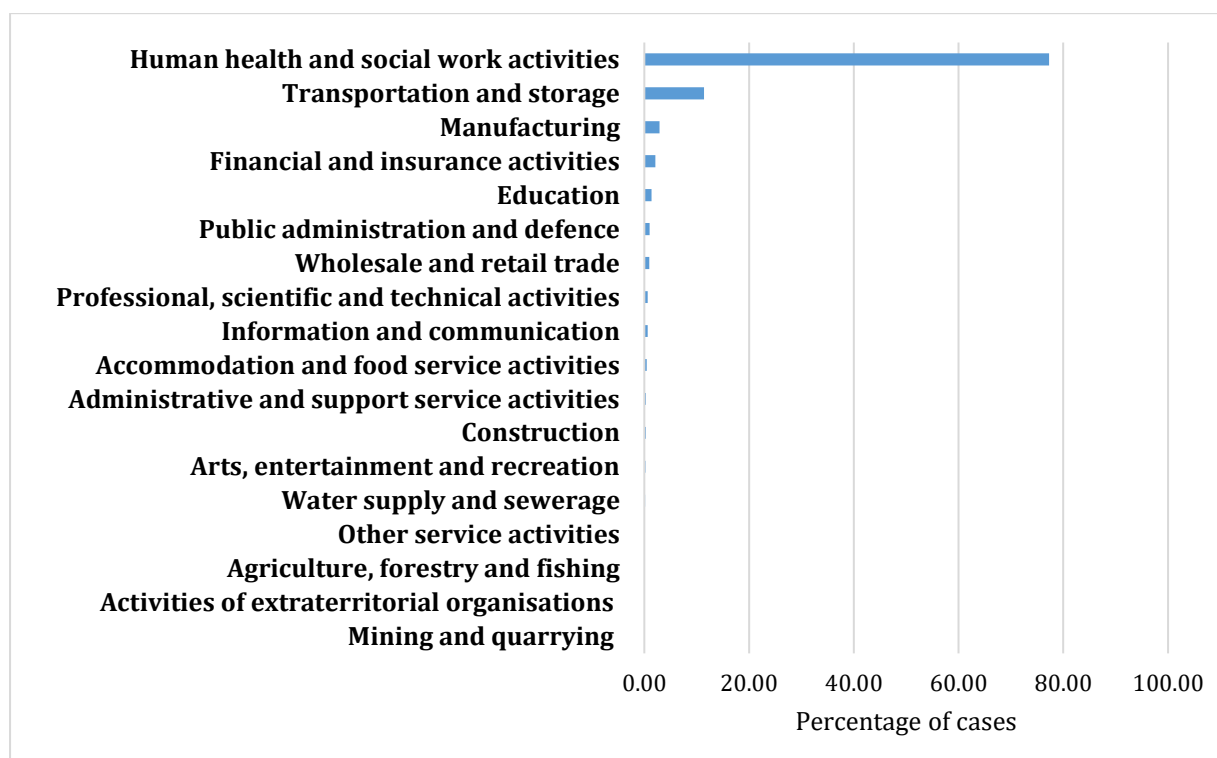


### 3.6.3 INDUSTRY AND OCCUPATION

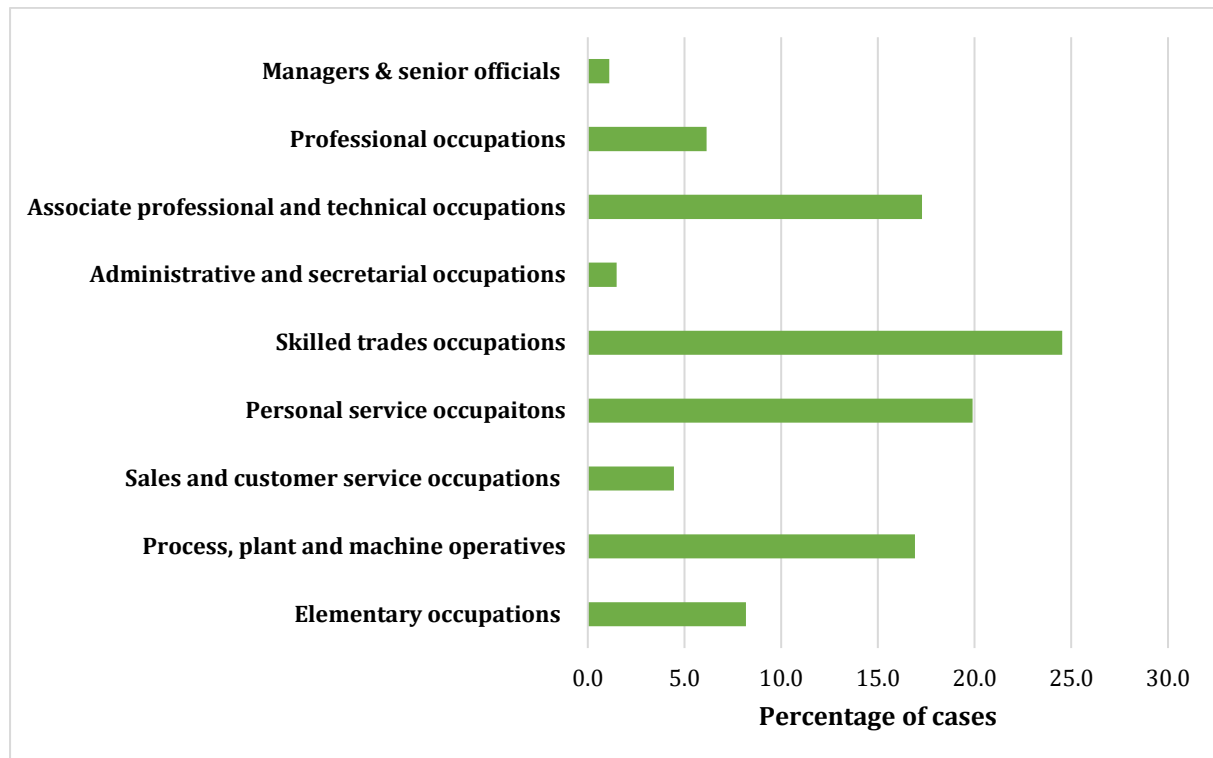
The majority of the cases reported to OPRA-ROI were reported in health and social care (77%; Figure 10) with cases also frequently reported in transport and storage (11%). These data need to be interpreted cautiously as some industry sectors, such as health and social care, may have better provision of occupational health services than other industry sectors. A relatively large

proportion of physicians participating from one sector may therefore bias the results. The most frequently reported occupations (Figure 11) were nurses (24%) which fall under the major category of ‘Associate professional and technical occupations’, nursing auxiliaries and assistants (9%) which fall under the major category of ‘Personal service occupations’, and bus drivers (6%) which fall under the major category of ‘Process, plant and machine operative occupations’.

**Figure 10: Proportion of cases of work-related ill-health reported to OPRA-ROI by Standard Industrial Classification (SIC), 2007-2021**



**Figure 11: Proportion of cases of work-related ill-health reported to OPRA-ROI by Standard Occupational Classification (SOC), 2007-2021**

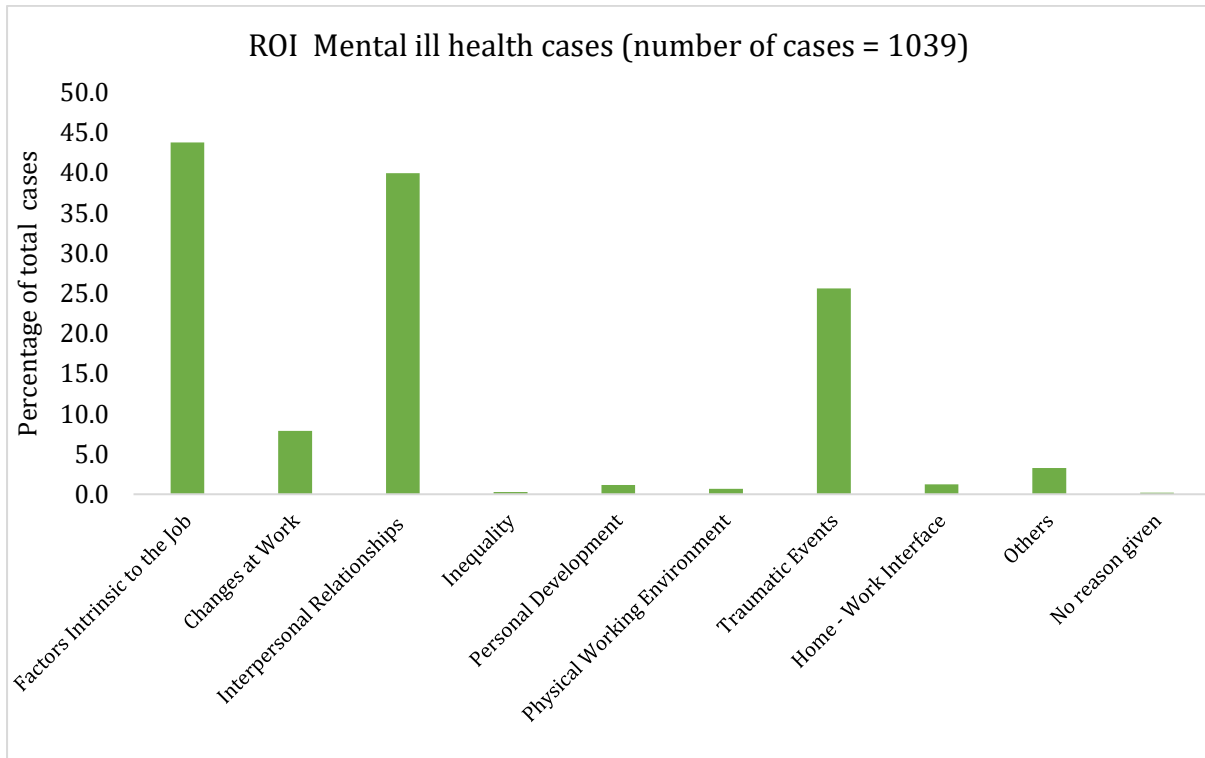


### 3.6.4 SUSPECTED AGENTS

The most frequently associated precipitating events associated with the 1039 mental ill-health case reports were classified as ‘factors intrinsic to the job’ (44%) which included ‘workload’, ‘travel’, and ‘organisational factors’; and ‘interpersonal relationships’ (40%) which included perceived bullying and difficulties with manager/staff/clients etc. (Figure 12). Other precipitating events reported to OPRA-ROI included ‘traumatic events’ (26%), for example, assaults at work / verbal abuse at work / witnessing of suicides on railway tracks; and ‘changes at work’ (8%), for example changes in work content and reduction of resources.

The most frequently associated tasks for the 679 musculoskeletal cases reported to OPRA-ROI were ‘lifting/carrying/pushing/pulling’ (33%) and accidents (33%), whilst the most frequently associated movement was ‘materials handling’ (45%), with a further 34% of cases reported as ‘accidents’ (Table 11).

**Figure 12: Proportion of actual cases of mental ill-health reported to OPRA-ROI by precipitating event, 2007-2021**



The most frequently reported agents associated with the 174 skin cases reported to OPRA-ROI were wet work (44%), protective clothing (26%), sterilising and disinfecting agents (22%), soaps and detergents (12%), and rubber chemicals and materials (9%). The agents associated with the 48 respiratory cases included SARS-CoV2 virus and other pathogens & micro-organisms, dusts, cleaning materials, sterilising agents & disinfectants, smoke, sick building syndrome, hot work, isopropyl alcohol/ industrial methylated spirit, acetic acid and other acids, chromium, chlorine, other biocides, enzymes, wood dust, grain and flour.



**Table 11: Proportions of musculoskeletal cases reported to OPRA-ROI (2007-2021) by task and movement**

<b>Task / movement</b>	<b>Number</b>	<b>(%)</b>
<b><u>TASK</u></b>		
Keyboard work	71	11%
Screwing, cutting	2	<1%
Hammering, chopping, sawing	0	0
Guiding or holding tool	15	2%
Meat boning or filleting	0	0
Packing or sorting	2	<1%
Assembly	2	<1%
Materials manipulation	130	19%
Machine operation	13	2%
Lifting/carrying/pushing/pulling	221	33%
Coordinated whole body movement	1	<1%
Driving	5	1%
Accidents	227	33%
Other	31	5%
Not stated/non-codable	17	3%
<b><u>MOVEMENT</u></b>		
Fine hand	19	3%
Forceful upper limb/grip	24	4%
Torque upper limb	2	<1%
Lifting	32	5%
Carrying	3	<1%
Pushing	1	<1%
Pulling	7	1%
Forceful leg movement	1	<1%
Overhead work	5	1%
Materials handling n.e.c.	303	45%
Bending	1	<1%
Sitting	4	1%
Standing/walking	6	1%
Kneeling	2	<1%
Twisting	2	<1%
Postural n.e.c.	75	11%
Accidents	230	34%
Other	47	7%
Not stated/non-codable	17	3%
<b>Total cases</b>	<b>679</b>	

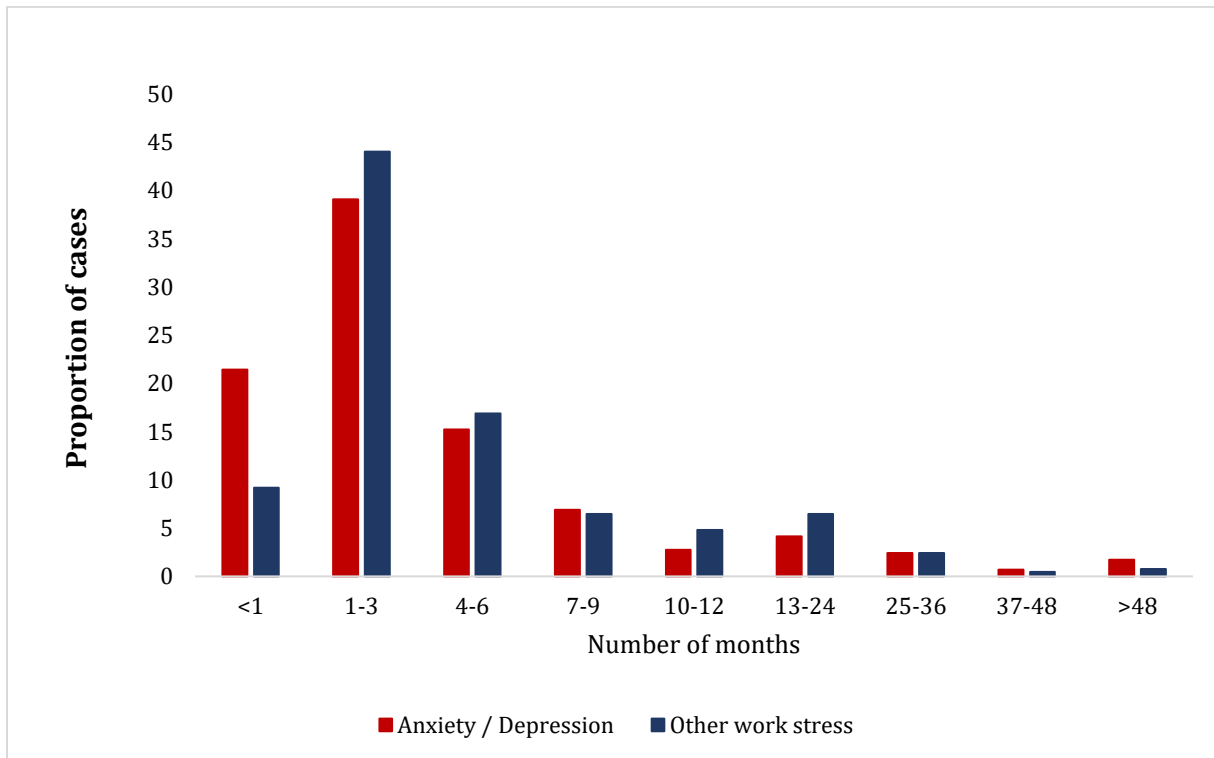
### **3.6.5 SYMPTOM ONSET**

Physicians can report the month and year of the onset of symptoms for each case reported. Within the OPRA data, 93% of case reports included information on symptom onset.

In ROI, for cases of anxiety and depression, 61% of cases were most frequently seen by OPs reporting to OPRA-ROI within the first 3 months after the onset of symptoms. The proportion is slightly less for other work stress with 53% of cases seen within the first 3 months of symptom onset (Figure 13). The median number of months in ROI was 2 for anxiety and depression and 3 for other work stress.

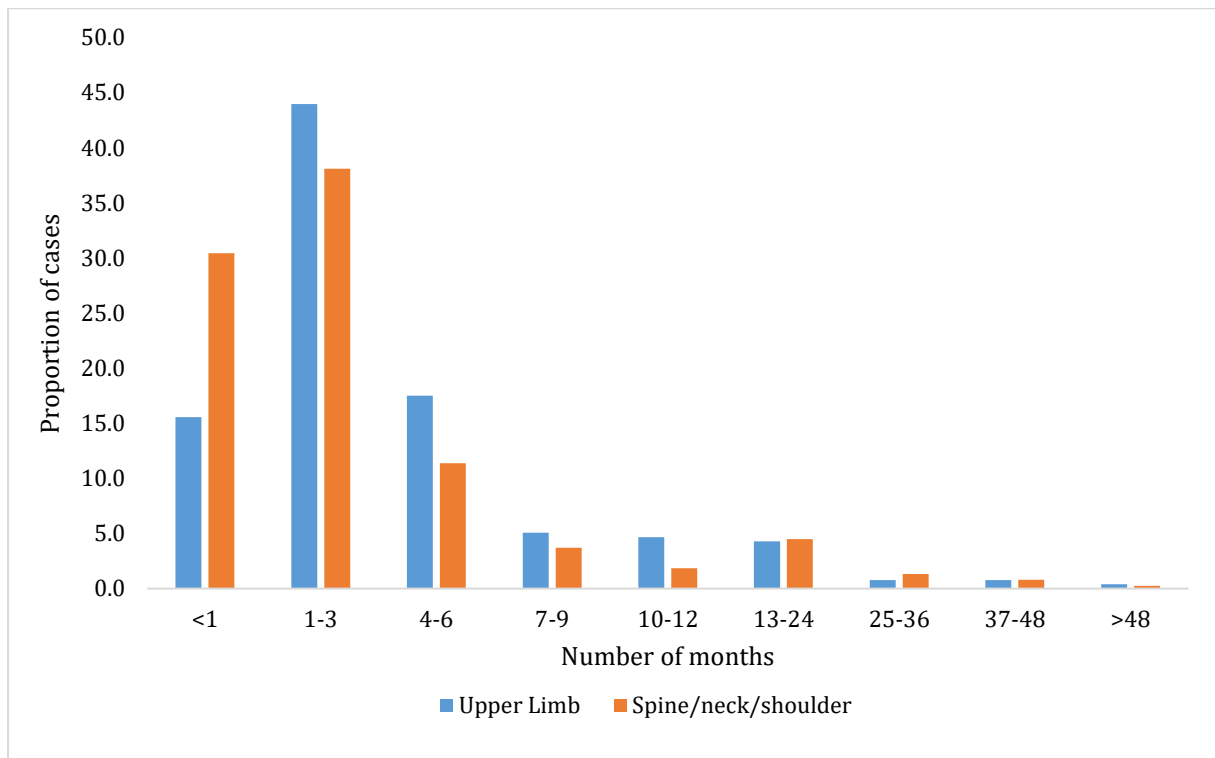
For the musculoskeletal cases reported in the ROI, the majority of upper limb disorders (60%) were reported within the first 3 months after symptom onset, with a median of 2 months (Figure 14). For spine / neck / back disorders a slightly different pattern was observed with cases in the ROI reported slightly sooner (median of 1 month).

**Figure 13: Time lapse between month of symptom onset and reporting month for actual cases of work-related anxiety / depression and other work stress reported to OPRA-ROI (2007-2021)**



**\*NB Physicians can provide full (month, year) or part (year only) data for symptom onset.**

**Figure 14: Time lapse between month of symptom onset and reporting month for actual cases of work-related upper limb disorders and spine / neck / back disorders reported to OPRA-ROI (2007-2021)**



**\*NB Physicians can provide full (month, year) or part (year only) data for symptom onset.**

## **3.7 THE HEALTH AND OCCUPATION RESEARCH NETWORK IN GENERAL PRACTICE (THOR-GP): 2015-2021**

### **3.7.1 OVERVIEW**

General practitioners have reported 38 cases (44 diagnoses) of WRI since the scheme commenced data collection in 2015 (with no cases reported to the scheme in 2021): 17 (45%) musculoskeletal, 8 (21%) mental ill-health, 6 (16%) 'other' WRI, 5 (13%) skin disease, 1 respiratory and 1 hearing loss (Table 12). Majority of the cases were females (58%) with a mean age of 43 years (all cases; age range 19-79 years). The sectors reported for these were as follows: accommodation and food service (8 cases); retail trade (7 cases); manufacturing (5 cases); health and social care (4 cases); construction (3 cases); land transport, agriculture and education (2 cases each); electricity, gas and water supply, real estate activities, information and communication, public administration and defence, and other service activities (1 case each).

The suspected agents recorded for the skin diseases reported by GPs in ROI were wet work (cited 2 times), cleaning agents, trauma to skin, hairdressing materials and micro-organisms. The tasks associated with the musculoskeletal cases reported were heavy lifting /carrying /pushing /pulling and other (cited 4 times); activities guiding or holding tools, accidents, and materials handling (all cited twice); and packaging or sorting, assembly of small parts, light lifting and keyboard work (once each). Whilst the most frequently associated movements were 'materials handling', prolonged standing, and forceful upper limb grip (all cited three times).

The precipitating events for the mental ill-health cases reported were workload/pressure of work (cited 5 times), bullying (cited twice); unspecified work stress (cited twice); and shift work, interpersonal difficulties, and inequality (once each). The agents reported for the cases of 'other' WRI reported were accidents (cited 3 times), noise; assault, foreign object in eye, and dog bite. The agent reported for the case with respiratory disorder was micro-organisms (SARS-CoV-2 virus).

**Table 12 Number and type of diagnoses reported by general practitioners to THOR-GP-ROI (2015-2021)**

	<b>Number</b>	<b>(%)</b>
<b>Skin</b>	<b>5</b>	<b>13%</b>
• Contact dermatitis	4	80%
• Other dermatoses	1	20%
<b>Respiratory</b>	<b>1</b>	<b>3%</b>
<b>Musculoskeletal</b>	<b>17</b>	<b>45%</b>
• Upper limb	11	58%
• Neck / spine / back	3	16%
• Lower limb	4	21%
• Other musculoskeletal	1	5%
<b>Mental ill-health</b>	<b>8</b>	<b>21%</b>
• Anxiety and depression	6	50%
• Other work stress	5	42%
• Other mental ill-health	1	8%
<b>Other cases/diagnoses</b>	<b>7</b>	<b>18%</b>
• Hearing loss	1	14%
• Lacerations	4	57%
• Bites	1	14%
• Other	1	14%
<b>Total cases</b>	<b>38</b>	
<b>Total diagnoses</b>	<b>44</b>	<b>100%</b>

## 4 DISCUSSION

This is the latest report providing an overview of the incidence of WRI in the ROI, based on case reports by participating physicians to the THOR-ROI surveillance scheme. In total, 100 cases (116 diagnoses) were added to the THOR-ROI database during 2021. Of these, 60 cases were reported by OPs to OPRA-ROI, 17 were reported by chest physicians to SWORD-ROI, and 23 were reported by dermatologists to EPIDERM-ROI. No cases of WRI were reported by GPs in 2021. In comparison, 109 (121 diagnoses) and 93 cases (103 diagnoses) were reported in 2019 (OPRA-ROI: 80 cases; SWORD-ROI: 12; EPIDERM-ROI: 14; THOR-GP-ROI: 3) and 2020 (OPRA-ROI: 40 cases; SWORD-ROI: 27; EPIDERM-ROI: 23; THOR-GP-ROI: 3), respectively. A total of 2867 incident cases have now been reported to THOR-ROI between 2005-2021, of which 70% were reported by OPs (2007-2021) with smaller proportions from dermatologists (19%), chest physicians (10%) and GPs (1%).

In total, 68 physicians (27 OPs, 20 GPs, 12 dermatologists and 9 chest physicians) were enrolled in THOR-ROI in 2021, with numbers remaining stable since the inception of the schemes. The rates of physicians actively participating (the total number of cases and nil returns divided by the number of active reporters who have reported at least one case or one nil return) in THOR-ROI in 2021 are as follows: 33% of ROI chest physicians, 25% of dermatologists, 19% of OPs and 10% of GPs. Compared to 2020, the rates of OPs and GPs actively participating in OPRA-ROI and THOR-GP ROI, respectively, decreased slightly but remained stable for chest physicians and dermatologists actively participating in in SWORD-ROI and EPIDERM-ROI.

The COVID-19 pandemic crisis and the interruptions it caused made 2020 and 2021 challenging years. Following the relaxation of the first lockdown in July 2020 there was an increase in THOR-ROI reporter activity, though case numbers remained slightly below normal. A total of 33 case reports attributed to SARS-CoV-2 virus have been reported to THOR-ROI between 2020 and 2021, with majority of the cases reported by OPs (97%). The majority of the cases reported by OPs and GPs had a diagnosis of long-covid (53%), followed by post-covid (29%) or active covid-19 infection (18%). All cases reported by OPs and GPs worked in the health and social care industrial sector, with nurses (45%) and nurse auxiliaries (21%) being the most frequently reported occupations. However, these results should be interpreted

with caution as some industry sectors such as health and social care may have better provision of occupational health services than other industry sectors. The importance of occupational health in terms of managing and reducing the risk of infections in the workplace has been emphasized by the pandemic. Furthermore, occupational health plays an important role in managing and facilitating return to work of workers who have been on sick-leave due to infection with SARS-CoV-2 virus and long-Covid.

Following on from the report submitted to HSA in previous years, this report again contains estimates of incidence rates for ROI. As before, this comparison is restricted to SWORD and EPIDERM data. The addition of a further year of data (2021) has had little impact on the overall rates (the number of cases reported in the ROI is currently too small to permit the calculation of incidence rates based on a single year of data). The estimated ROI incidence rates for skin and respiratory disease reported by dermatologist and chest physicians, respectively, are generally similar, or slightly lower compared to those in the UK.

Two different rates are again presented: 'adjusted' and 'unadjusted'. In the former, the numerator is adjusted for participation (the proportion of the total dermatologists or chest physicians in the ROI participating in THOR) and response (the proportion of participating physicians actively responding each month).<sup>26</sup> However, this makes the assumption that non-participating or non-responding physicians behave in the same way as participating or responding physicians, which may not be accurate. In addition, adjusting for non-response assumes that non-responders had cases to report but did not, rather than the absence of reportable cases during their reporting month. In this latter case, reporters are encouraged to respond with 'I have no cases to report'. As such the two rates provided in Table 3 ('unadjusted' and 'adjusted') might be considered as the possible upper and lower bounds of estimated incident cases of WRI.

The trend analysis in OPRA-ROI case reports first provided in the report presented in 2019 has been repeated here with the addition of another full calendar year of data. In the present analyses, trends were estimated based on reports from OPs to OPRA-ROI and for total WRI, mental ill-health, musculoskeletal and skin only (numbers for other reporter groups and other diagnoses are currently too few to permit meaningful analysis). The results suggest an overall, annual average decrease in



number of case reports of total WRI of approximately 5% with a slightly larger decrease observed for musculoskeletal disorders and skin disease (~6%) compared to mental ill-health (~5%). However, it appears that there may not be a linearly declining trend in the incidence of work-related disease over time and that the incidence in total work-related disease appears to be stable during the last number of years.

Case reports by dermatologists in the ROI continued to be exclusively CD. The most frequently reported industrial sectors were manufacturing, and health and social care. Restricting the analyses to diagnoses of CD, frequently reported industries included the health and social care sector, manufacturing and other service activities (which includes hairdressing), whilst frequently reported occupations included nurses and hairdressers. The most frequently suspected agents reported by dermatologists in ROI for CD were rubber, wet work, preservatives, nickel, and chromium.

Since the scheme commenced data collection in 2005, asthma has the most frequently reported diagnosis by chest physicians in the ROI with the most frequently reported industries being construction and manufacturing. The asthma cases reported were also predominantly males, and isocyanate and cement are the most frequently reported agents. However, in 2021 non-malignant pleural disease was the most frequently reported diagnosis by chest physicians, followed by asthma and 'other' respiratory diseases. SWORD in ROI continues to report proportionally less asbestos-related diseases (32% of total number of actual cases) compared to SWORD in the UK (67% of total number of actual cases reported since 2005). This is consistent with the explanation that there may have been less exposure to asbestos in the ROI historically.<sup>27</sup>

Similar to the UK, the case mix reported by OPs in ROI continues its pattern noted in previous annual reports with the largest proportion being mental ill-health diagnoses, followed by musculoskeletal, with fewer skin and respiratory diagnoses. Health and social care sector continues to be the industry sector from which most cases are reported by OPs.

Information provided by OPs in OPRA regarding the length of time between onset of symptoms and consultation with an OP was again included in this report. The overall pattern observed for the main

diagnostic categories reported was similar to that reported on last year and showed that most cases were reported within the first 3 months after onset of symptoms.

In conclusion, to our best knowledge, THOR-ROI continues to provide the best overall source of data relating to medically attributed occupational disease incidence in the ROI with nearly 2900 cases reported since the inception of the schemes. With continued funding and increased enrolment/participation in all of the THOR-ROI schemes, aided by steps such as the introduction of THOR-CPD, and a renewed focus from the HSA, case numbers are likely to increase, enabling both comparisons with UK data and analyses that are, in general, more sophisticated. Similarly, as the number and types of cases reported to THOR-ROI increases overall, the various determinants of risk e.g. causal agent, precipitating event (mental ill-health) and task/movement (musculoskeletal) will continue to be analysed and reported upon.

## APPENDIX

### Appendix 1: EPIDERM substance codes



Epiderm substance  
codes.pdf

### Appendix 2: SWORD substance codes



SWORD Substance  
Codes.pdf

## Dissemination

Due to several circumstances including the COVID-19 pandemic crisis and the interruptions it caused, as well as personnel changes in the THOR Project team, we were not able to hold the 2021 Annual Advisory Committee meeting or attend any national or regional meeting/conferences to disseminate ROI data and promote participation in any of the four schemes of THOR-RIO. However, we are planning to hold the Annual Advisory Committee meeting in July 2022. Furthermore, we will engage with reporting physicians to encourage them to continue to report work-related ill-health cases to THOR-RIO.

## **ACKNOWLEDGMENTS**

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<https://sites.manchester.ac.uk/thor/thor-roi/>

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