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 2022.

Annual Report

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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, summarising the results from The Health and Occupation Research network in the Republic of Ireland (THOR-ROI) based on data collected during 2022.
- THOR-ROI comprises of 4 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) and THOR-GP-ROI (general practitioners).
- The COVID-19 pandemic crisis and the interruptions it caused made 2020 and 2021 challenging years. Although case numbers remain below normal, there appears to have been a slight improvement in general practitioner reporting from 2021.
- In 2022, 27 occupational physicians, 12 dermatologists 9 chest physicians and 20 general practitioners participated in THOR-ROI.
- A total of 57 cases were reported in 2022 (occupational physicians: 16, dermatologists: 19, chest physicians: 18, and general practitioners: 4). In total, the number of reported incident cases between 2005 and 2022 is 2958 (occupational physicians: 2040, dermatologists: 576, chest physicians: 298, general practitioners: 44).
- Dermatologists reported (2005-2022) predominantly contact dermatitis cases (98%), with majority of all reported cases reports being female (57% of contact dermatitis cases) and a mean age (all contact dermatitis cases) of 38 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 (2005-2022) (32%). The majority of all reported cases reports was male (83%), 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.
- Occupational physician case reports (2007-2022) were predominantly mental ill-health (53%) and musculoskeletal (33%) with smaller proportions of skin (8%), respiratory (2%) and 'other' WRIH (4%). The majority (77%) of cases were reported in health and social care (mainly nurses and nurse auxiliaries), mostly in females (67%) with mean age (all cases) of 43 years. A significant proportion were also reported in transport (bus drivers) (11%).
- The 20 general practitioners participating in THOR-GP-ROI have reported 44 cases since the scheme commenced data collection in 2015; musculoskeletal cases were reported most frequently (18 cases). Most cases were reported in females (62%) with mean age of 42 years.
- A total of 35 case reports attributed to SARS-CoV-2 virus have been reported by occupational physicians and general practitioners to THOR-ROI between 2020 and 2022, with majority of the cases having a diagnosis of long-covid (48%), followed by post-covid (34%) or active covid-19 infection (17%). All cases worked in the health and social care industrial sector, with nurses (46%) and nurse auxiliaries (21%) being the most frequently reported occupations.

SUMMARY OF CASES REPORTED TO THOR-ROI

Disease group	Reporting physicians	Number of cases		
		2022	2005[a]-2022	
		(n)	(n)	(%)
Skin	Dermatologists	19	576	19%
	Occupational physicians	2	176	6%
	General practitioners	1	6	<1%
Respiratory	Chest physicians	18	298	10%
	Occupational physicians	4	52	2%
	General practitioners	0	1	<1%
Musculoskeletal	Occupational physicians	4	683	23%
	General practitioners	1	18	<1%
Mental ill-health	Occupational physicians	6	1045	35%
	General practitioners	2	12	<1%
Other	Occupational physicians	1	84	3%
	General practitioners	0	7	<1%
Total cases [b, c]	**All physicians**	**57**	**2958**	

[n] Number of cases; [%] Proportion of cases from the total number of cases reported to all 4 schemes between 2005 and 2022.

[a] 2007 for occupational physicians; 2015 for general practitioners

[b] a case may have been assigned to more than 1 disease group (for example, musculoskeletal and mental ill-health)

[c] Totals may have increased from previous reporting due to the submission of late cases.

EXECUTIVE SUMMARY

BACKGROUND: Chest physicians, dermatologists, occupational physicians and general practitioners voluntarily report cases of work-related illness (WRI) to the 4 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 (2022) 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 occupational physicians; 2015 for general practitioners).

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 were estimated for selected reporter groups/diagnoses.

RESULTS: The 68 physicians enrolled in THOR-ROI in 2022 (27 occupational physicians, , 12 dermatologists, 9 chest physicians and 20 general practitioners) reported 57 cases (59 diagnoses). In comparison, 109 (121 diagnoses), 93 (103 diagnoses) and 100 (116 diagnoses) cases were reported in 2019, 2020 and 2021, respectively. Of the 57 cases reported to THOR-ROI in 2022, 16 cases were reported by occupational physicians, 18 were reported by chest physicians, 19 were reported by dermatologists and 4 cases were reported by general practitioners. General practitioners reported no cases to THOR-GP ROI in the previous year. This brings the total number of cases reported between 2005 and 2022 to 2958 (occupational physicians: 2040, dermatologists: 576, chest physicians: 298, , general practitioners: 44 case reports).

CONCLUSION: Since the inception of the reporting schemes nearly 3,000 cases of WRI have been reported to THOR-ROI. There have been fluctuations in reporter activity since the COVID-19 pandemic crisis, with overall number of reported cases somewhat lower in 2022 compared to previous years. It is

clearly important to promote the THOR-ROI scheme and increase recruitment of physicians in ROI to increase the reporting levels.

Despite the changes in the reporting numbers, the distribution of reported cases of WRI by diagnosis has remained relatively stable, although since the start of the pandemic 35 cases related to COVID-19 have been reported.

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).[1,2] 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.[3-7]

This report describes the cases of WRI reported to SWORD, EPIDERM, OPRA and THOR-GP in the ROI during the previous calendar year (2022) and since reporting commenced. This builds on previous reports submitted annually to the ROI Health and Safety Authority (HSA) since 2006.[8-23]

2 METHODS

The methodology behind THOR has been described previously in detail. In brief, participating physicians report new cases of WRI 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.[24,25] 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 2 researchers, and any discrepancies are reconciled by a third person.

Physicians reporting to EPIDERM are requested to assign their case to 1 or more of the following major sub-groups: contact dermatitis, contact urticaria, 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 10th Revision (ICD-10) [26] 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 2022 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.[26] 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 2005-2022 obtained from the ROI National Household Survey.[27] 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, contact dermatitis, 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 occupational physician data were not calculated because it was not possible to accurately determine the population covered by occupational physicians (access to an occupational physician within the ROI is biased towards the public sector and larger employers). The number of cases reported to OPRA in 2022 was not sufficient to permit meaningful statistical time trend analysis.

Ethics approval for data collection by THOR in the Republic of Ireland was granted by 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 (application for renewal currently in progress).

3 RESULTS

3.1 PARTICIPATION

Similar to 2020 and 2021, a total of 68 physicians (27 occupational physicians, 20 general practitioners, 12 dermatologists and 9 chest physicians) were enrolled in THOR-ROI in 2022. Of the 12 dermatologists, 2 (17%) actively participated in 2022 (i.e., returned a web form at least once either containing cases or declaring 'I have nothing to report this month'), with 8 dermatologists actively participating (submitted at least once either a case or a nil return declaring 'I have nothing to report this month') during 2005-2022. Of the 9 chest physicians, 2 (22%) actively reported in 2022. Overall, 7 chest physicians have actively participated in 2005-2022. Of the 27 occupational physicians enrolled in OPRA-ROI, 8 (30%) actively participated in 2022, with 22 occupational physicians actively participating during 2007-2022. Of the 20 general practitioners enrolled in THOR-GP-ROI in 2022, 5 (25%) actively participated in 2022, with 14 general practitioners actively participating during 2015-2022.

3.2 OVERVIEW OF 2022 CASE REPORTS

Reporters to THOR-ROI returned 57 cases and 35 nil returns in 2022. The number of cases, nil returns, and participating physicians for 2022 compared to 2021 and 2020 are presented in Table 1.

Table 1: Number of physicians, cases and nil returns reported by scheme in 2020, 2021 and 2022.

	January – December 2022			**January – December 2021***			**January – December 2020**		
	Physicians	Cases	Nil returns	Physicians	Cases	Nil returns	Physicians	Cases	Nil returns
OPRA	27	16	26	27	60	17	27	40	24
EPIDERM	12	19	6	12	23	10	12	23	21
SWORD	9	18	1	9	17	1	9	31	0
THOR-GP	20	4	2	20	0	2	20	3	3

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

The 57 cases reported to THOR-ROI in 2022 comprised of 16 cases reported by occupational physicians to OPRA-ROI, 18 respiratory cases reported by chest physicians to SWORD-ROI, 19 skin cases reported

by dermatologists to EPIDERM-ROI and 4 cases were reported by general practitioners to THOR-GP-ROI in 2022 (Table 2).

Table 2: Number of cases / diagnoses reported to SWORD-ROI, EPIDERM-ROI, OPRA-ROI and THOR-GP-ROI, 2022

	Diagnosis	SWORD-ROI	EPIDERM-ROI	OPRA-ROI	THOR-GP-ROI[a]
Skin disease	Contact dermatitis	/	19	1	1
	Urticaria	/	0	0	0
	Other skin	/	0	1	0
	Total skin diagnoses	/	19	2	1
	Total skin cases	/	19	2	1
Respiratory disease	Asthma	8	/	1	0
	Inhalation accidents	3	/	0	0
	Alveolitis	0	/	0	0
	Bronchitis	1	/	0	0
	Infection	1	/	2[c]	0
	Non-malignant pleural disease	4	/	0	0
	Mesothelioma	0	/	0	0
	Lung cancer	0	/	0	0
	Pneumoconiosis	2	/	0	0
	Other respiratory disease	0	/	1	0
	Total respiratory diagnoses	19	/	4	0
	Total respiratory cases	18	/	4	0
Mental ill-health	Anxiety and depression	/	/	0	2
	Post-traumatic stress disorder	/	/	1	0
	Other work stress	/	/	6	0
	Adjustment disorder	/	/	0	0
	Other mental ill-health	/	/	0	0
	Total mental ill-health diagnoses	/	/	7	2
	Total mental ill-health cases[b]	/	/	6	2
Musculoskeletal disorders	Upper limb	/	/	4	0
	Spine/back	/	/	1	0
	Lower limb	/	/	3	1
	Other musculoskeletal	/	/	1	0
	Total musculoskeletal diagnoses	/	/	9	1
	Total musculoskeletal cases[b]	/	/	4	1
Other work-related illness	Total other diagnosis	/	/	1	0
	Total other cases	/	/	1	0
	Total diagnoses	**19**	**19**	**17**	**4**
	Total cases[b]	**18**	**19**	**16**	**4**

[a] General practitioners report on a 'sample' basis for only 1 randomly assigned month per calendar year.
[b] A case may have been assigned to more than 1 disease group (for example, musculoskeletal and mental ill-health)

[c] All 4 cases of respiratory disease reported by occupational physicians to OPRA-ROI had a diagnosis of either active COVID-19 infection (respiratory infection) or long covid-19/post covid-19 ('other' respiratory diseases).

All 19 of the cases reported to EPIDERM-ROI had a diagnosis of contact dermatitis (10 diagnosed as allergic, 3 as irritant and 6 as allergic and irritant). The industry and occupation of cases were reported in:

- Human health and social work activities (6 cases): nurse (2 cases); nursing auxiliaries and assistants (2 case), dental nurse (1 case), kitchen and catering assistants (1 case)

- Manufacturing (2 cases): production, works and maintenance manager (1 case); and food, drink and tobacco process operatives (1 cases)

- Construction (1 case): fork-lift truck driver (1 case)

- Wholesale and retail trade; repair of motor vehicles and motorcycles (2 cases): Motor mechanics, auto engineers (1 case); Goldsmiths, silversmiths, precious stone workers (1 case). Other personal service activities (8 cases): Beauticians and related occupations (4 cases); Hairdressers and barbers (4 cases).

In total, 25 groups of agents were associated with the 19 reported cases. These included rubber chemicals and materials (12 times), plants (5 times), hairdressing materials (5 times), methacrylate esters (4 times), preservatives (4 times), food additives/flavouring (3 times), other acrylics and acrylates (3 times), water and wet work (2 times), cobalt and its compounds (twice), and p-phenylene diamine (PPD) (twice), cobalt and its compounds (twice), chromium and its compound (twice) and the following all cited once: dyes and pigments, perfumes/fragrances, manganese and its compounds, tin and its compounds, inorganic tin, nickel and its compounds, other unspecified metals, drugs and medicaments, other resins.

The 18 cases (19 diagnoses) reported to SWORD-ROI included the following:

- 8 cases of occupational asthma: (1 due to irritation, 7 due to sensitisation),
- 3 cases of inhalation accidents,

- 1 case of bronchitis,
- 4 cases of non-malignant pleural disease (all plaques),
- 2 cases of pneumoconiosis.

The most frequently reported industry sector for the 18 cases was construction (39%), followed by human health and social work activities (17%). The most frequently reported occupation was labourer in construction (22%), followed by welding (11%). The following 11 agents were associated with the 18 cases of work-related respiratory disease: asbestos (6 times), fungi/moulds/yeast (3 times), welding fumes (twice) and each of the following cited once – hairdressing products, sterilising agents and disinfectants, high temperatures/hot work, kerosine/paraffin oil, oils, pathogens and micro-organisms, wood and wood dust, and other creatures (mites/ticks).

The 17 diagnoses (16 cases) reported to OPRA-ROI in 2022 were predominantly musculoskeletal (24%) followed by mental ill-health (35%) and respiratory (24%), with smaller proportions of skin health (12%), and 'other' WRI (6%).

Only 1 case of 'other' WRI was reported by occupational physicians in 2022 to OPRA-ROI. This case was diagnosed with post covid symptoms and worked in the human health and social care sector as a nurse.

For the 4 cases (9 diagnoses) of musculoskeletal ill-health reported by occupational physicians, upper limb was the most frequently reported diagnosis (44%), followed by lower limb disorders (33%) and spine / neck / back problems (11%). All musculoskeletal cases reported in 2022 were from the health and social care sector; with frequently reported occupations within this industry sector being nursing auxiliaries and assistants (50%), nurses (25%) and hospital and health service managers (25%). The most frequently reported tasks included accidents/trauma/fall (86%) and heavy lifting/ carrying/ pushing/ pulling (14%); while accidents (86%) and lifting (14%) were the most frequently reported movements.

The most frequently reported industry sector for the 6 mental ill-health cases (7 diagnoses) was health and social care (83%) with frequently reported occupations within this industry sector being doctors (50%) and nurses (17%). The types of events reported as associated with these cases included factors

intrinsic to the job (56%, including workload/demand [42%], and organisational factors [14%]); interpersonal relationships (29%); and traumatic experience of other people's injury or fatality at work (14%).

Four respiratory cases were reported by occupational physicians in 2022 to OPRA-ROI. Two cases were diagnosed as a respiratory infection with SARS-CoV-2 virus, while the remaining 2 cases were diagnosed as "other" respiratory disorder (post covid-19 or long covid-19) and asthma. Most of these cases (75%) were working in the human health and social care sector.

Only 2 skin cases were reported by occupational physicians in 2022 to OPRA-ROI, 1 was diagnosed as contact dermatitis and 1 case was diagnosed as "other" skin disorder (burn to skin dorsum of left hand). All cases were from the health and social care sector.

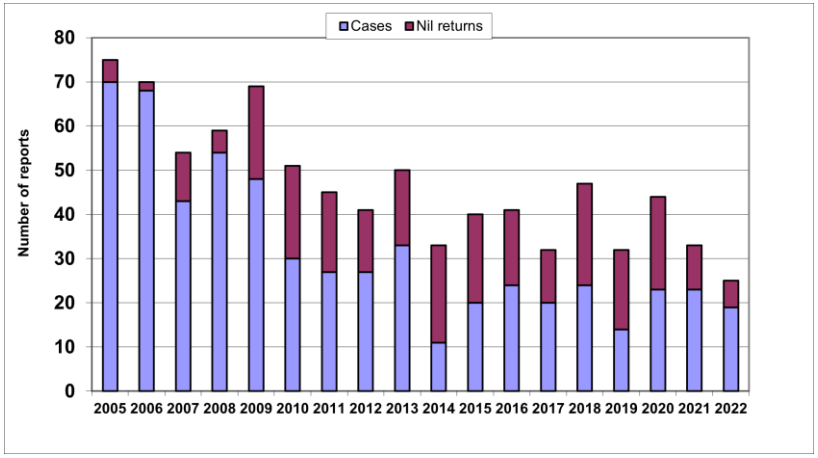
General practitioners reported 4 cases of WRI in 2022 to GP-ROI. Two cases were diagnosed as mental health and the remaining 2 cases were skin and musculoskeletal health.

3.3 INCIDENCE RATES

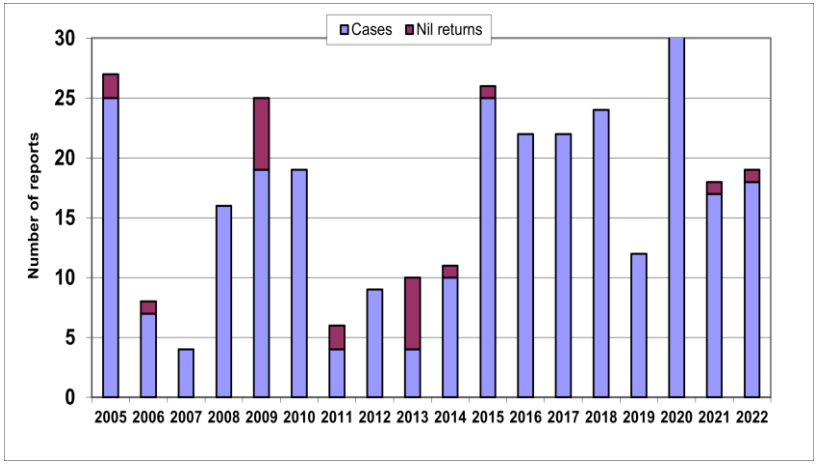
The number of reports received for EPIDERM-ROI, SWORD-ROI, OPRA-ROI, and THOR-GP-ROI by year are shown in Figure 1, whilst Figure 2 shows the cases per active reporter per year.

Figure 1: Reports (cases and nil returns) in a) EPIDERM-ROI (2005-2022) b) SWORD-ROI (2005-2022) c) OPRA-ROI (2007-2022) and d) THOR-GP-ROI (2015-2022)

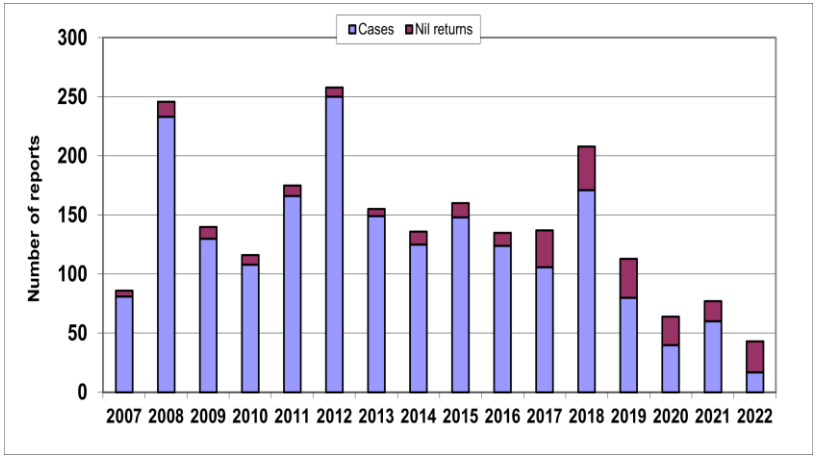
a) EPIDERM-ROI (Dermatologists)



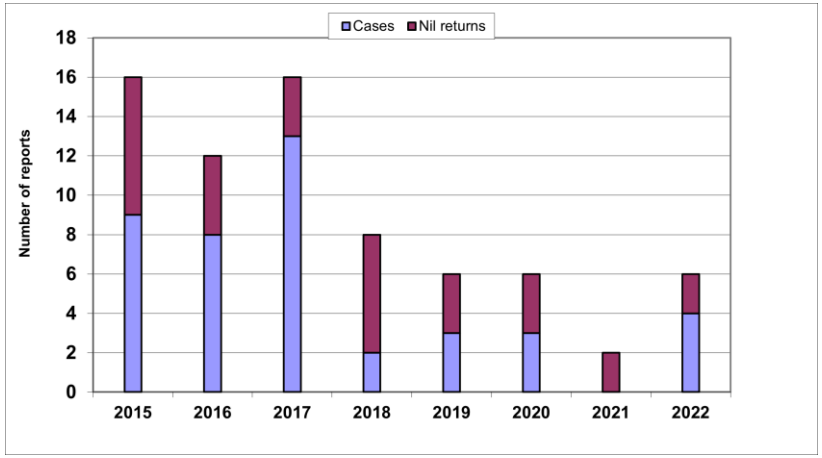
b) SWORD-ROI (Chest physicians)



c) OPRA-ROI (Occupational physicians)

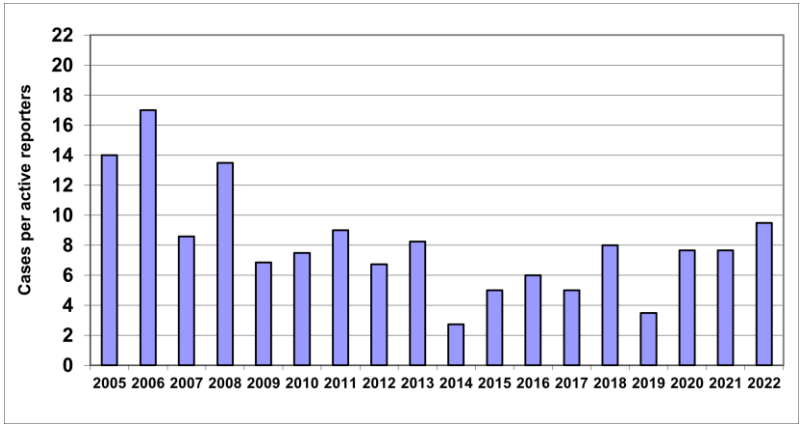


d) THOR-GP-ROI (General practitioners)

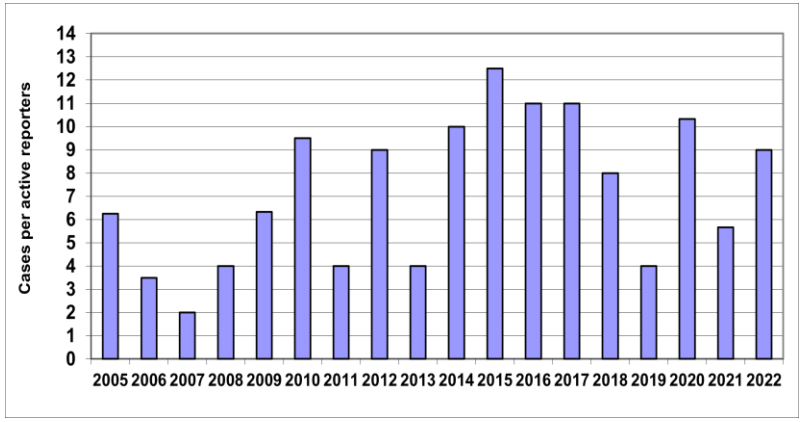


NOTE: Scale differences

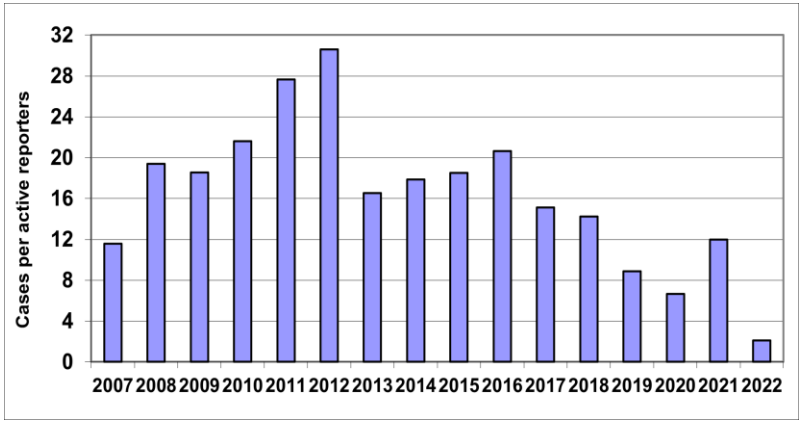
Figure 2: Cases per active reporter* in a) EPIDERM-ROI (2005-2022) b) SWORD-ROI (2005-2022) c) OPRA-ROI (2007-2022) and d) THOR-GP-ROI (2015-2022)



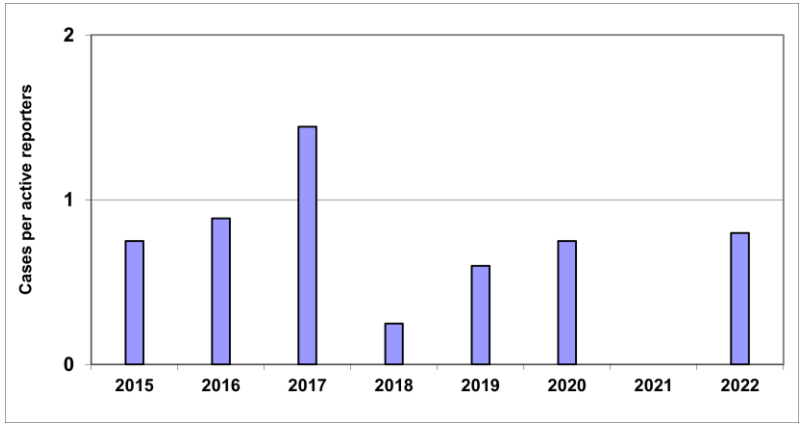
a) EPIDERM-ROI (Dermatologists)



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 1 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 15.5 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 per 100,000 employed, per year, after adjusting for 'non-participation' and 'non-response'.

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 (2005-2022)

	Annual, average incidence rate per 100,000 employed	
	'Crude'	**'Adjusted'**
Respiratory (chest physicians)		
All	0.8	20
Asthma	0.3	6.6
Asbestos related	0.2	6.6
Skin (dermatologists)		
All	1.6	15.5
Contact dermatitis	1.5	15

3.4 OCCUPATIONAL SKIN SURVEILLANCE (EPIDERM): 2005-2022

3.4.1 DIAGNOSES

In total, 576 case reports were reported by dermatologists to EPIDERM-ROI between January 2005 and December 2022. These 576 case reports produced 568 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 contact dermatitis (98%) (Table 4).

Table 4: Number and type of diagnoses reported by dermatologists to EPIDERM-ROI (2005-2022)

	Number (%)
Contact Dermatitis	557 (98%)
• **Allergic**	• 315 (57%)
• **Irritant**	• 190 (34%)
• **Mixed**	• 51 (9%)
• **Unclear**	• 1 (<1%)
Contact urticaria	6 (1%)
Folliculitis/acne	0
Infective	1 (<1%)
Mechanical	0
Nail	3 (<1%)
Neoplasia	0
Other dermatoses	1 (<1%)
Total cases	**576**
Total diagnoses	**568* (100%)**

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

3.4.2 AGE AND SEX

Overall (2005-2022) cases of contact dermatitis in the ROI were most frequently reported in the 25–34-year age group for both males and females (Figure 3). More cases with reported

contact dermatitis were females (57%), and females were younger than males (mean age; females 35 years, males 40 years) (Table 5).

Figure 3: Proportion of cases of contact dermatitis reported to EPIDERM-ROI by age group and sex (2005-2022)

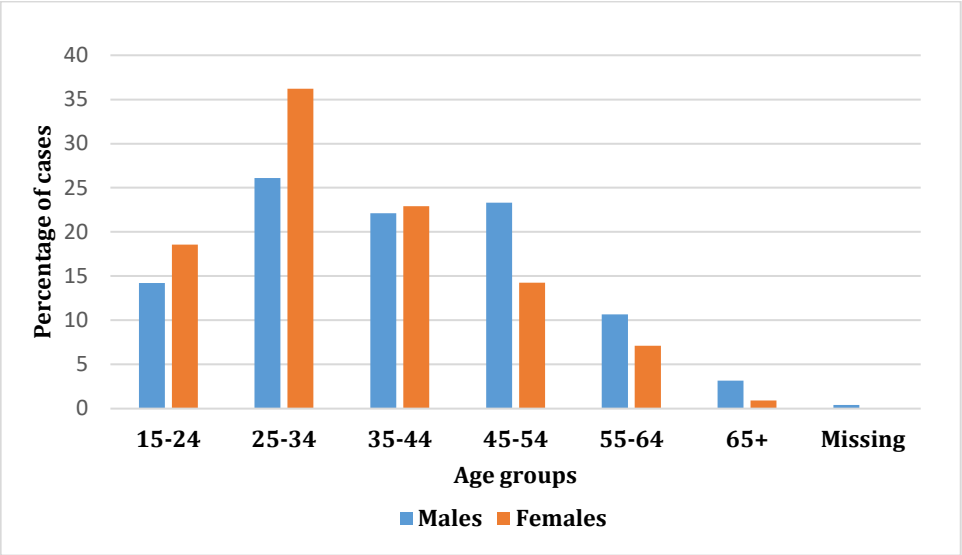


Table 5: Age and sex of contact dermatitis diagnoses in EPIDERM-ROI (2005-2022)

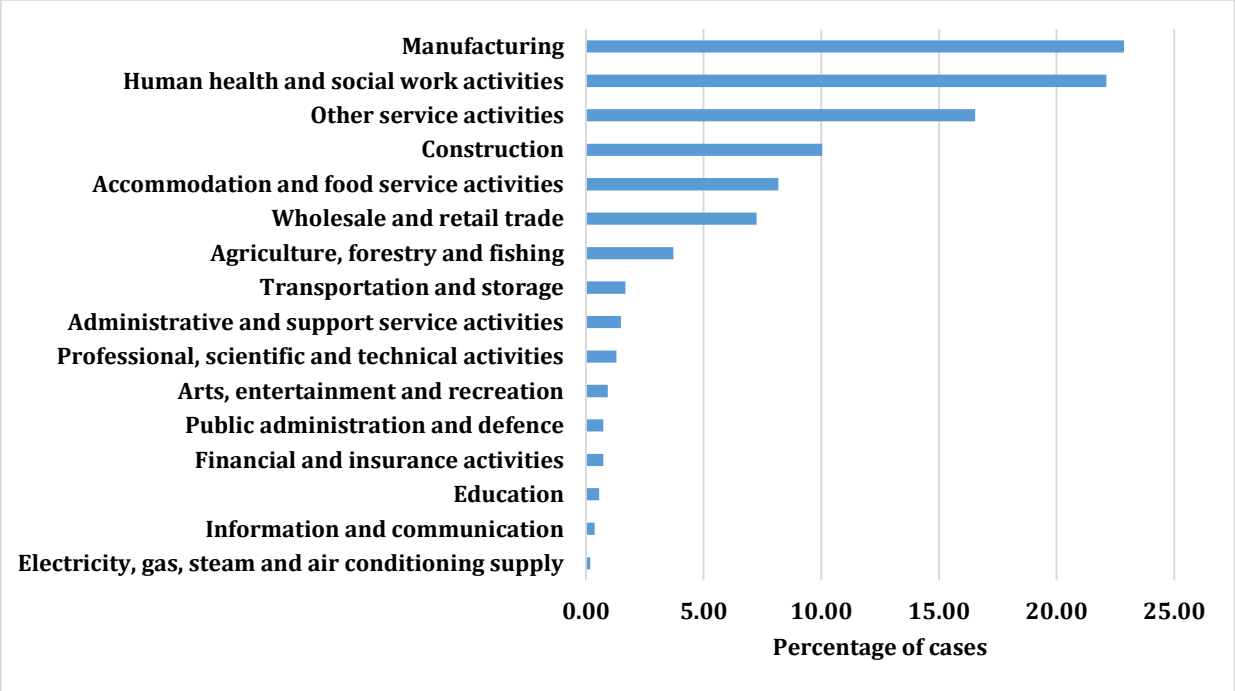
DIAGNOSIS	MALES	FEMALES	ALL
Allergic CD			
Number of diagnoses (%)	150 (48%)	165 (52%)	315 (100%)
Mean age (years)	41	36	39
Age range (years)	15-81	17-64	15-81
Irritant CD			
Number of diagnoses (%)	70 (37%)	119 (63%)	190 (100%)*
Mean age (years)	37	32	35
Age range (years)	16-65	19-77	16-77
Mixed CD			
Number of diagnoses (%)	20 (39%)	31 (61%)	51 (100%)**
Mean age (years)	38	40	39
Age range (years)	19-54	17-65	17-65
All CD			
Number of diagnoses (%)	241 (43%)	315 (57%)	557 (100%)*
Mean age (years)	40	35	38
Age range (years)	15-81	17-77	15-81

*1 diagnosis had no sex assigned.
**Including 1 case that is unclear which type of contact dermatitis (CD) it is.

3.4.3 INDUSTRY AND OCCUPATION

The most frequently reported industrial sector for cases of contact dermatitis reported to ROI was manufacturing followed by health and social care and 'other service activities', which includes hairdressing and other beauty treatments (Figure 4).

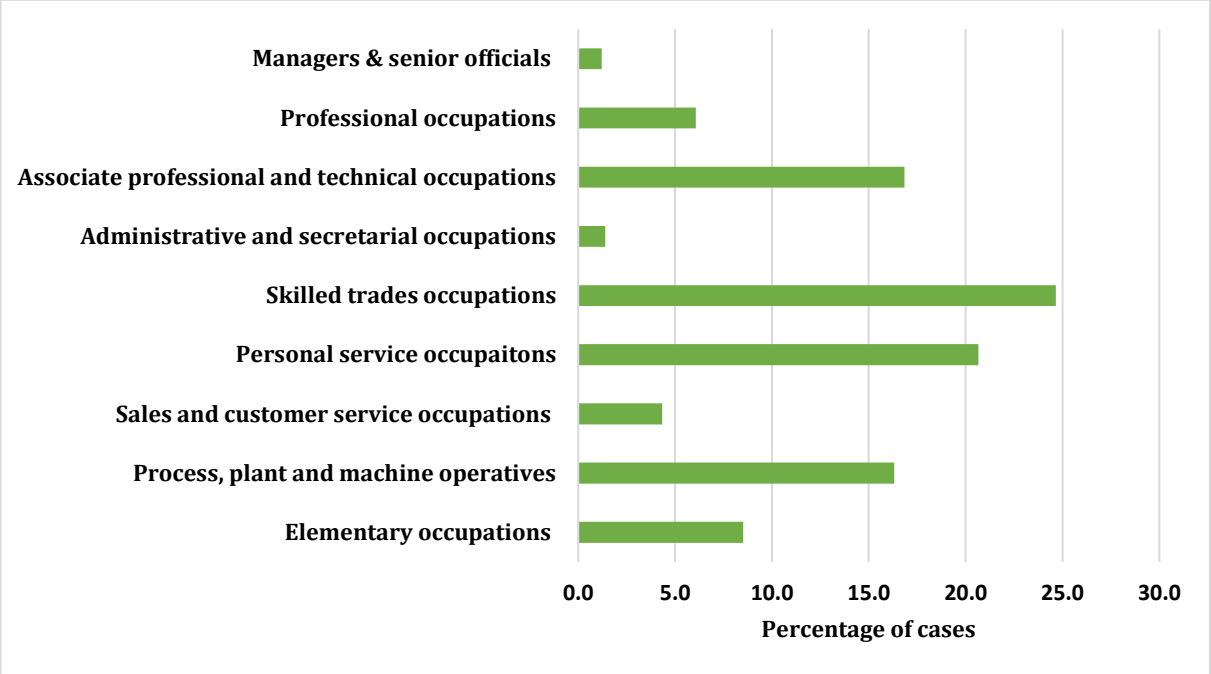
Figure 4: Proportion of cases of contact dermatitis reported to EPIDERM-ROI by Standard Industrial Classification (SIC), 2005-2022



The most frequently reported occupations for cases of contact dermatitis reported to EPIDERM-ROI were nurses (11.5% of the 557 contact dermatitis cases) which fall under SOC group 3 'Associate professional and technical occupations' (Figure 5), hairdressers (8.3%) and beauty therapists (7.5%) which fall under SOC group 6 'Personal service occupations', and chemical and related process operatives (6.8%) which fall under SOC group 8 'Process, plant and machine operatives'.

Of the 11 non-contact dermatitis cases reported to EPIDERM-ROI, 6 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 oncholysis of fingernails) were reported in 2 beauticians and a nail technician; and 1 case of (unspecified) infective disease was reported in an agricultural student.

Figure 5: Proportion of cases of contact dermatitis reported to EPIDERM-ROI by Standard Occupational Classification (SOC), 2005-2022



3.4.4 SUSPECTED AGENTS

Up to 6 suspected agents may be cited for each case report, and the agents most frequently associated with contact dermatitis are shown in Table 6. 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 contact dermatitis, rubber chemicals and materials were the agents most often associated with case reports in the ROI, for irritant contact dermatitis the agent most frequently reported was wet work, while for mixed contact dermatitis, nickel was most frequently reported.

Table 6: Most frequently reported agents* for contact dermatitis, reported by dermatologists to EPIDERM-ROI (2005-2022) – number of cases and (percentage of total cases)

	Number	(%)
Rubber chemicals & materials	137	15
Wet work	82	9
Preservatives	78	9
Nickel & its compounds	73	8
Acrylics & acrylates	54	6
Chromium & its compounds	48	5
Plants	37	4
Hairdressing chemicals	32	4
Cobalt & its compounds	32	4
PPE	30	3
Number of cases	**557**	

*Each case can have more than 1 reported agent. Therefore, the percentage of cases with each agent may equal more than 100

The suspected agents associated with the 6 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): 2005-2022

3.5.1 DIAGNOSES

The addition of the 18 cases reported in 2022 brings the total number of cases reported by chest physicians to SWORD-ROI (2005-2022) to 298. These produced 336 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 (35%) and the most of all diagnoses (33%) reported to SWORD-ROI (Table 7).

Table 7: Number and type of diagnoses reported by chest physicians to SWORD (2005-2022) in the Republic of Ireland

	Number	(%)
Asthma	112	32%
Inhalation accidents	29	9%
Allergic alveolitis	6	2%
Bronchitis/ emphysema	29	9%
Infectious disease	2	<1%
Non-malignant pleural disease	63	19%
Mesothelioma	12	4%
Lung cancer	12	4%
Pneumoconiosis	45	14%
Other respiratory	26	8%
Total cases	**298**	
Total diagnoses	**336***	**100%**

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

3.5.2 AGE AND SEX

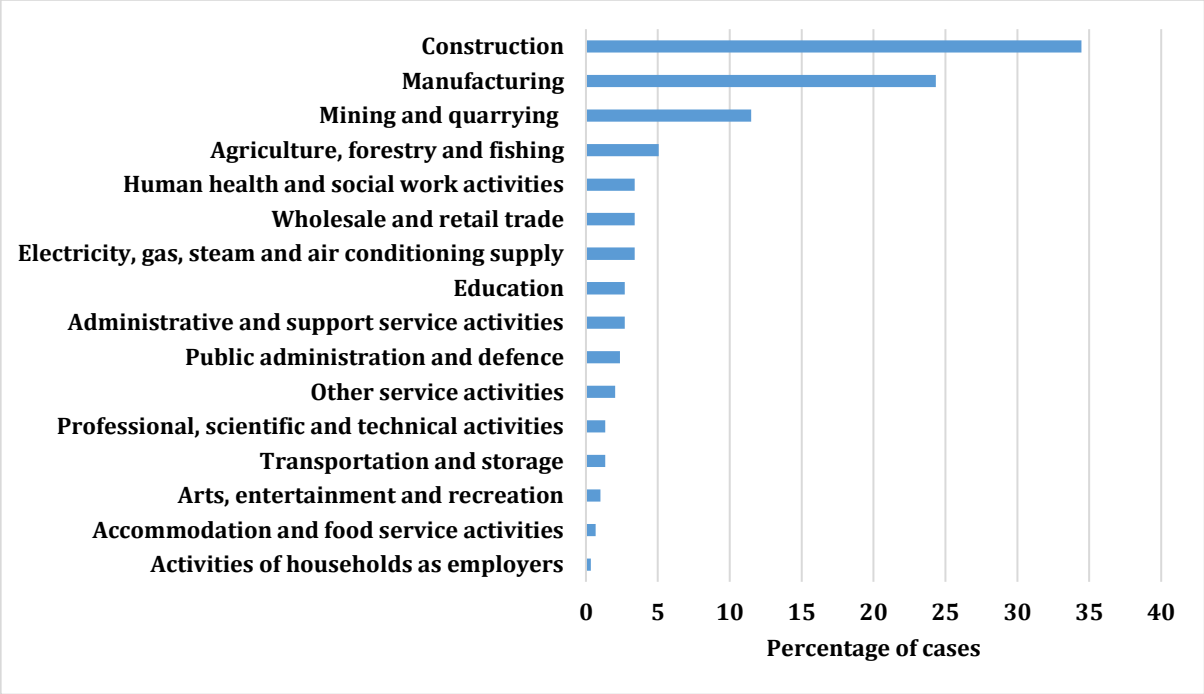
Case reports to SWORD-ROI were predominantly male (83%), with a mean age (male plus female combined) of 57 years (age range 19 - 87 years). Of these, 44 of the case reports were in the 75+ age group (all males except 2 cases whose gender have not been reported), with 53 diagnoses: 29 non-malignant pleural disease, 10 pneumoconiosis, 3 asthma, 3 lung cancer, 2 mesothelioma, 2 bronchitis/emphysema and 4 'other' (diagnosed as asbestosis, silicosis, asthma overlap syndrome and pleural effusion). Most of these cases (34 out of 44) 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, wood and wood 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 46.4 years (age range 19 - 79 years).

3.5.3 INDUSTRY AND OCCUPATION

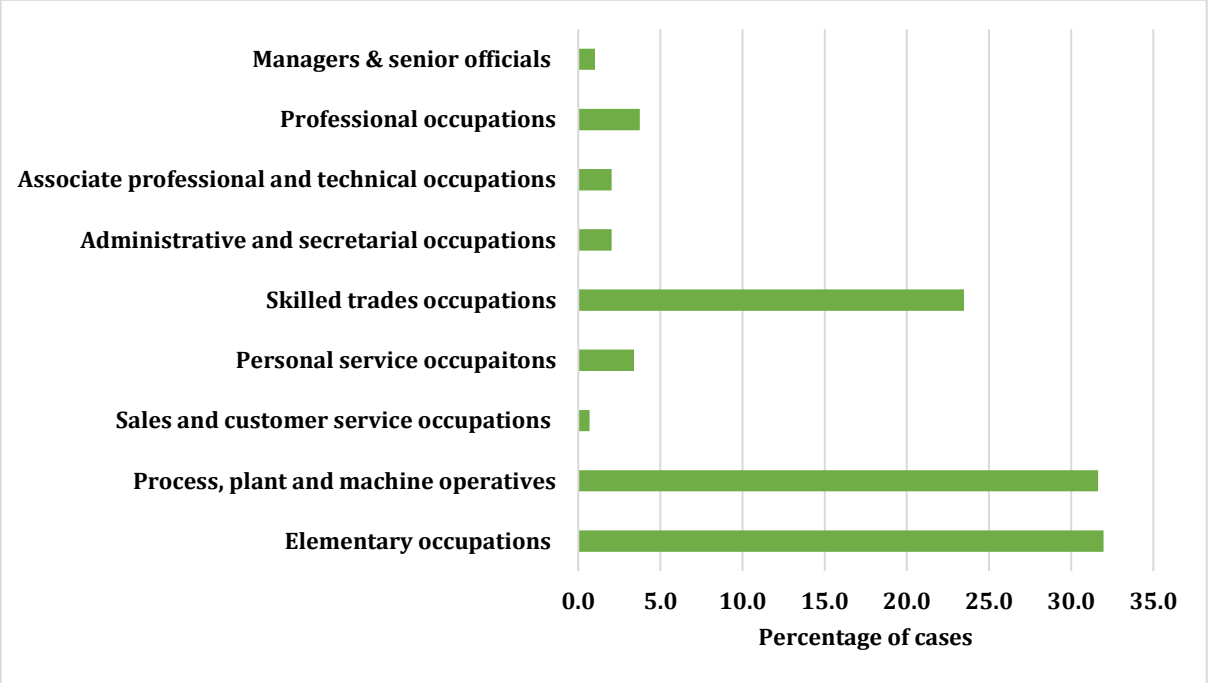
Cases of work-related respiratory disease were most frequently reported in the construction and manufacturing sectors (Figure 6). Within the manufacturing sector, cases were most frequently reported in the manufacturing of food products, non-metallic mineral products (for example, cement), chemicals and chemical products, basic pharmaceutical products and pharmaceutical preparations, and fabricated metal products.

Figure 6: Proportion of cases of respiratory disease reported to SWORD-ROI by Standard Industrial Classification (SIC), 2005-2022



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"), coal mine operatives (which fall under the major category of "Process, plant and machine operatives") and construction operatives (which fall under the major category of "Skilled trades occupations") (Figure 7).

Figure 7: Proportion of cases of respiratory disease reported to SWORD-ROI by Standard Occupational Classification (SOC), 2005-2022



3.5.4 SUSPECTED AGENTS

The agents associated with the respiratory diagnoses reported to SWORD-ROI are presented in Table 8. A total of 68 agents were associated with the 107 diagnoses of occupational asthma, with isocyanates, cement, fumes/gases, glues and adhesives, other creatures and hypochlorites being the most frequently reported.

Asbestos and silica were the most frequently reported agents (cited 16 and 12 times, respectively) for cases of pneumoconiosis. In total, 107 diagnoses were reported as being associated with asbestos: 63 of non-malignant pleural disease, 16 of pneumoconiosis, 12 of mesothelioma, 11 of lung cancer, 1 of bronchitis/emphysema, 1 of asthma, and 3 of "other".

Table 8: Suspected agents associated with cases of work-related respiratory disease most frequently reported to SWORD-ROI, (2005-2022)

DIAGNOSIS	SUSPECTED AGENTS (as recorded by the physician)
Asthma	Isocyanates, toluene diisocyanate and di-phenyl methane di isocyanate (16 cases); cement, plaster & masonry (8 cases); fumes/gases (8 cases); hairdressing products (2 cases); fungi/moulds/yeast (2 cases), chlorine exposure and other creatures e.g. mites, ticks (2 cases); welding fumes (2 cases); glues and adhesives; hypochlorites; exposure to dust/fumes/smoke; wood/wood dust; coal; sterilising agents and disinfectant;, 'high temperatures, hot work'; kerosine/paraffin oil; oils nos; 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.
Inhalation accidents	Other gases (3 cases); sterilising agents & disinfectants (3 cases); cleaning materials (2 cases); other esters (2 cases); ammonia (2 cases); fungi/moulds/yeast (2 cases); welding fumes
Allergic alveolitis	Dusts; pathogens & micro-organisms; other veg, fungal agents & pollen; food; fungi/moulds/yeast and other creatures (pigeons).
Bronchitis/emphysema	Coal (14 cases); cement, plaster & masonry (12 cases); exposure to dust/fumes (9 cases); wood/wood dusts (2 cases); fumes/gases; smoking; petroleum oils; fungi/moulds/yeast.
Infectious disease	Toxoplasma.
Benign pleural disease	Asbestos and dust.
Mesothelioma	Asbestos.
Lung cancer	Asbestos and radon.
Pneumoconiosis	Asbestos (16 cases); silica (12 cases); coal (11 cases); cement, plaster & masonry (9 cases); exposure to dust/fumes; fumes/gases; Other metals; petroleum oils; other silicates.
Other respiratory	
Asbestosis	Asbestos (1 case) and coal/rock dust, blast fumes, fungal antigen (1 case)
Asthma overlap syndrome	Coal dust / fungal antigen (1 case).
Bronchiolitis obliterans organising pneumonia (BOOP)	Mixed brick dust, cement dust, fungi, styrene beads and glues (1 case).
Occupational Bronchitis	Wood and wood dust (MDF) (1 case).
Emphysema/focal bronchiectasis	Coal and blast fumes (1 case).

Hyposmia	Exhaust fumes (1 case).
Hard metal lung disease	Tungsten (1 case).
Inhalation accident	Metabisulphite (1 case).
Nasopharyngeal malignancy	Wood dust / varnishes (1 case).
Organic dust toxic syndrome	Mushrooms and compost (2 cases).
Pleural effusion	Asbestos (1 case).
Pleural rounded atelectasis	Asbestos (1 case).
Reactive upper-airways dysfunction syndrome	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).
Rhinosinusitis / sinusitis (4 cases)	Urea, formaldehyde, ammonia, wood dust, aspartame, oil mist.
Rhinitis (2 cases)	Toluene di-isocyanate (1 case), and 'multiple possible agents' (1 case).
Rhinorrhoea	A specified histamine H2-receptor antagonist (1 case).
Silicosis	Silica (1 case)
Sick building syndrome	Agent not cited (1 case).

3.6 OCCUPATIONAL PHYSICIANS REPORTING ACTIVITY (OPRA): 2007-2022

3.6.1 DIAGNOSES

A total of 2040 case reports (2190 diagnoses) were reported to OPRA-ROI between January 2007 and December 2022. A breakdown of the cases by major diagnostic group is provided in Table 9. The largest proportion of cases was for mental ill-health (51%), followed by musculoskeletal disorders (34%), with smaller proportions of skin (9%) and respiratory diagnoses (3%).

Work-related stress was the most frequently reported mental ill-health diagnosis reported to OPRA-ROI (58% of the 1156 diagnoses), whilst the most frequently reported

musculoskeletal disorder was spine / neck / back disorders (53% of the 721 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.

Contact dermatitis was the most frequently reported skin diagnosis to OPRA-ROI (86% of the 176 diagnoses) and 'other' respiratory disease was the most frequently reported respiratory diagnosis (40% of the 53 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 9: Number and type of cases / diagnoses reported by occupational physicians to OPRA-ROI (2007-2022)

	Number	(%)
Skin	**176**	**8**
• **Contact dermatitis**	152	86
• **Other dermatoses**	24	14
Respiratory	**53**	**2**
• **Asthma**	13	25
• **Inhalation accidents**	7	13
• **Infectious disease**	9	17
• **Bronchitis/emphysema**	3	6
• **Other respiratory**	21	40
Musculoskeletal	**721**	**33**
• **Upper limb**	266	37
• **Spine / neck / back**	383	54
• **Lower limb**	45	6
• **Other musculoskeletal**	27	4
Mental ill-health	**1156**	**53**
• **Anxiety and depression**	289	25
• **Adjustment disorder**	129	11
• **PTSD**	31	3
• **Psychotic episode**	1	<1
• **Other work stress**	669	58
• **Other mental ill-health**	37	3
Total other cases/diagnoses	**84**	**4**
Total cases	**2040**	
Total diagnoses	**2190**	**100%**

Note: A case can have more than 1 diagnosis so the sum of the sub-categories may be greater than the total cases (both by category and overall)

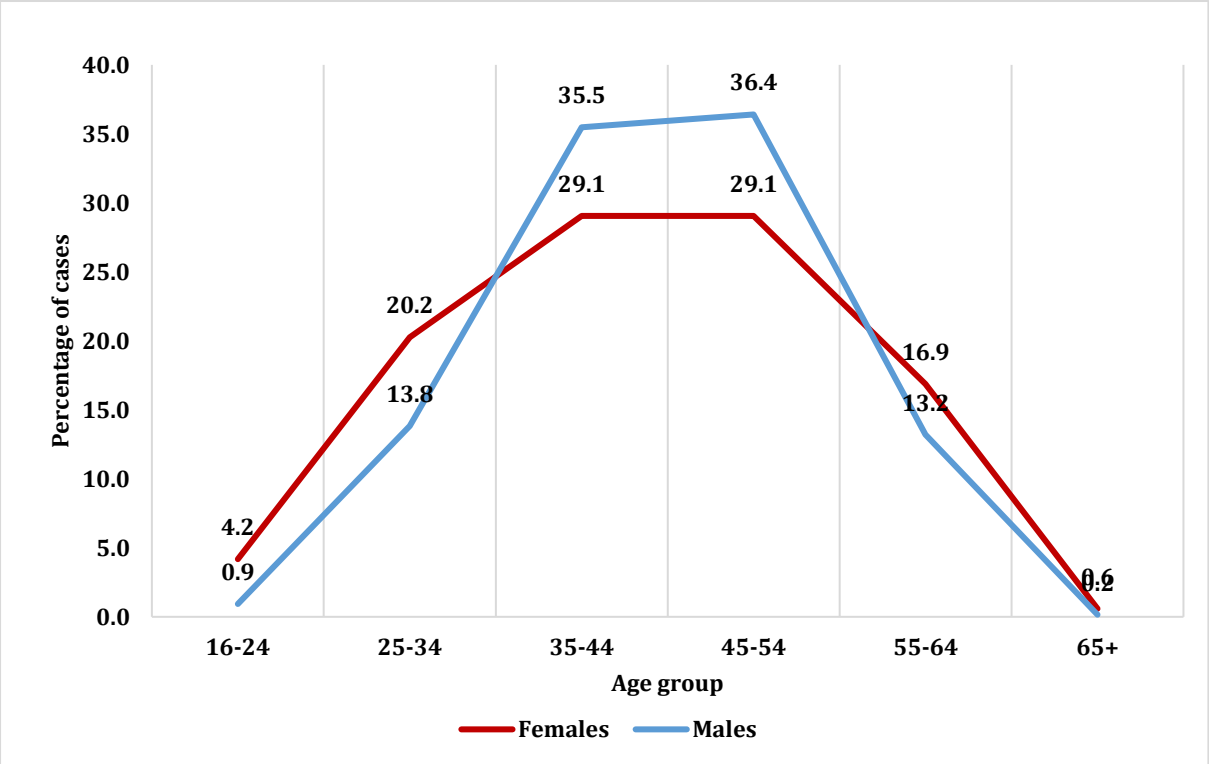
The 84 diagnoses in the 'other' category (OPRA-ROI) were reported as covid-19 infection/post-covid/long-covid (25 cases), 'assault' (15 cases); noise induced hearing loss (6 cases); sleep problems (5 cases); eye injury (4 cases); latex allergy (2 cases); latent TB infection (2 cases); dry eyes (2 cases); 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 8. Cases were most frequently reported in the 35-44 years of age group for females and 45-54 for males.

Figure 8: Proportion of cases of work-related ill-health reported to OPRA-ROI by age and sex, 2007-2022



3.6.3 INDUSTRY AND OCCUPATION

The majority of the cases reported to OPRA-ROI were reported in health and social care (77%; Figure 9) 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 10) 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', filling and other records assistants (5%) which fall under the major category of 'Administrative and secretarial occupations' and bus drivers (5%) which fall under the major category of 'Process, plant and machine operative occupations'.

Figure 9: Proportion of cases of work-related ill-health reported to OPRA-ROI by Standard Industrial Classification (SIC), 2007-2022

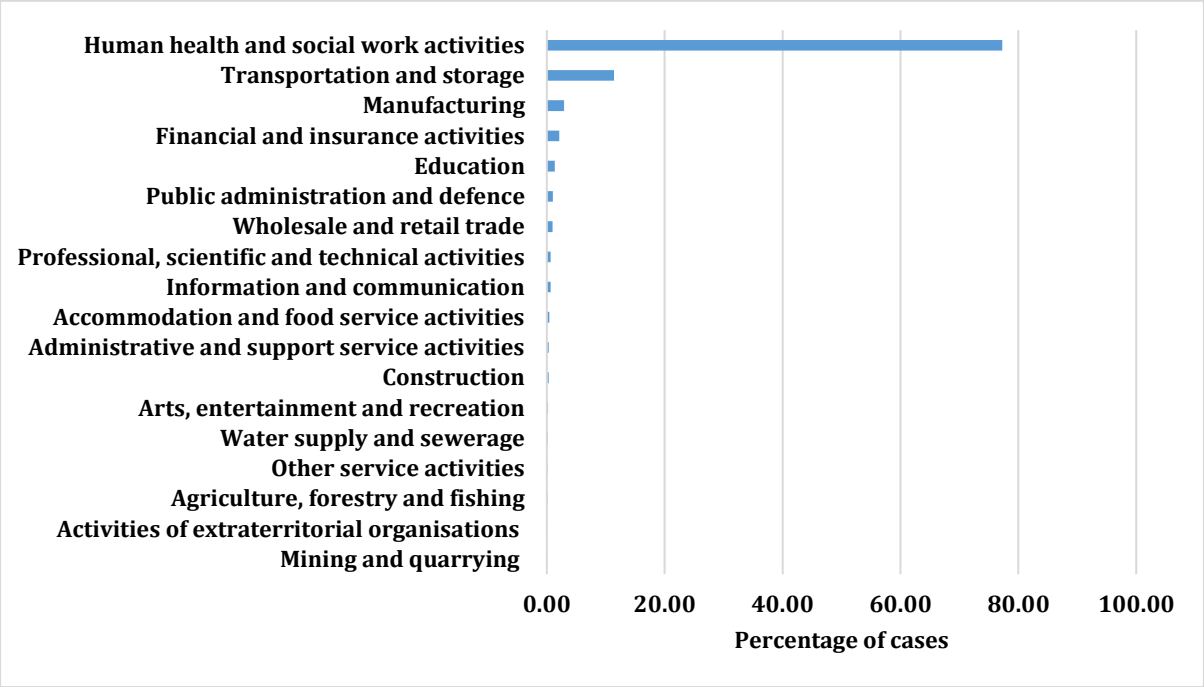
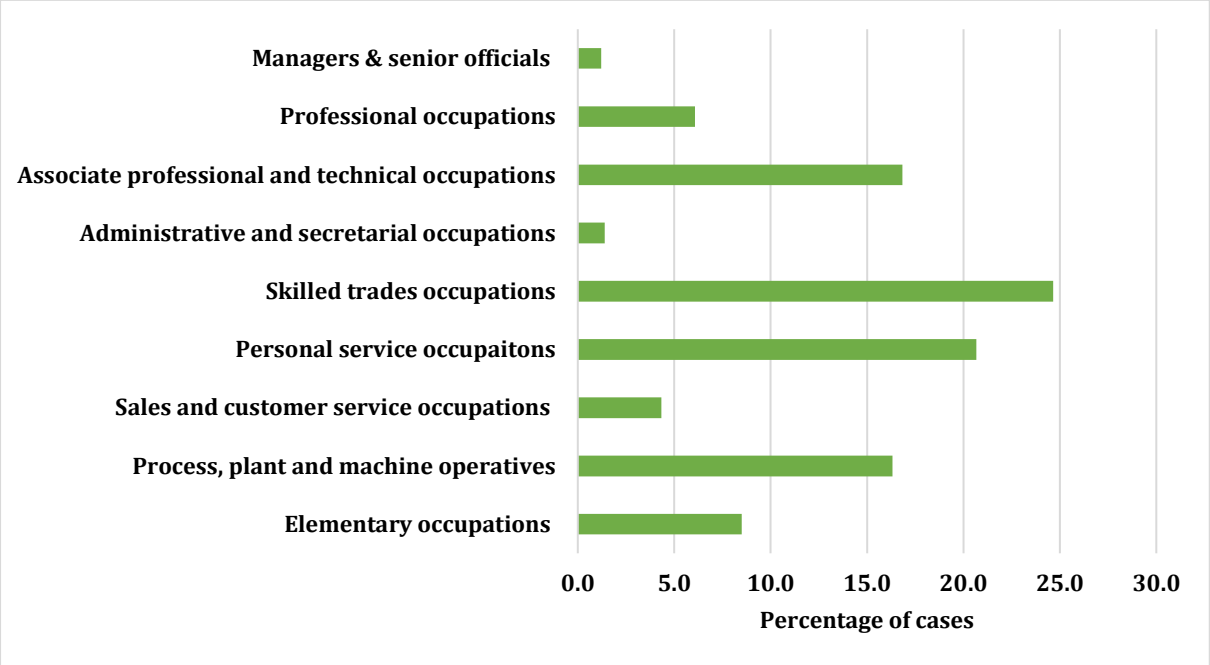


Figure 10: Proportion of cases of work-related ill-health reported to OPRA-ROI by Standard Occupational Classification (SOC), 2007-2022

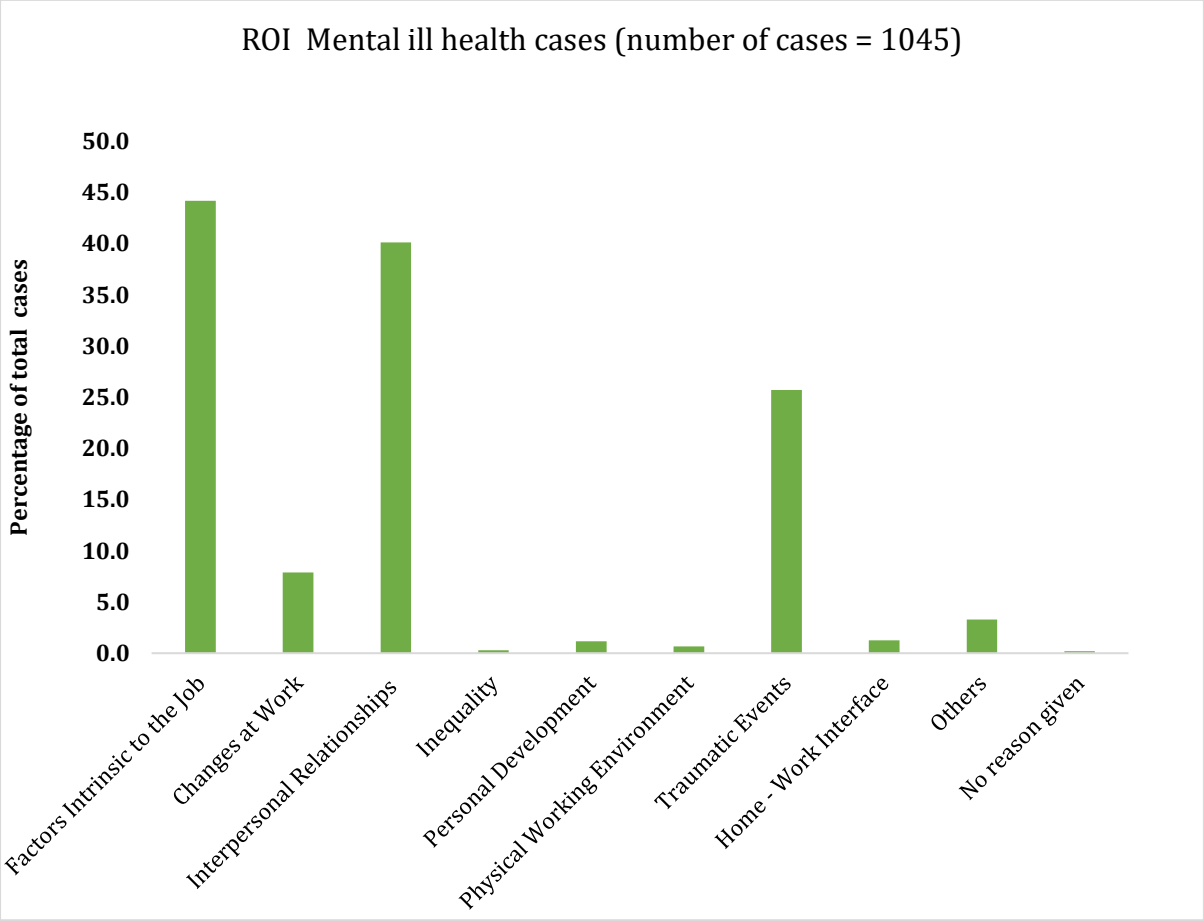


3.6.4 SUSPECTED AGENTS

The most frequently associated precipitating events associated with the 1045 mental ill-health case reports were classified as 'factors intrinsic to the job' (35%) which included 'workload', 'travel', and 'organisational factors'; and 'interpersonal relationships' (32%) which included perceived bullying and difficulties with manager/staff/clients etc. (Figure 11). Other precipitating events reported to OPRA-ROI included 'traumatic events' (21%), for example, assaults at work / verbal abuse at work / witnessing of suicides on railway tracks; and 'changes at work' (6%), for example changes in work content and reduction of resources.

The most frequently associated tasks for the 683 musculoskeletal cases reported to OPRA-ROI were accidents (31%) and 'lifting/carrying/pushing/pulling' (25%), whilst the most frequently associated movement was 'materials handling' (38%), with a further 30% of cases reported as 'accidents' (Table 10).

Figure 11: Proportion of actual cases of mental ill-health reported to OPRA-ROI by precipitating event, 2007-2022



The most frequently reported agents associated with the 176 skin cases reported to OPRA-ROI were wet work (29%), protective clothing (18%), sterilising and disinfecting agents (15%), soaps and detergents (8%), and rubber chemicals and materials (6%). The agents associated with the 52 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 10: Proportions of musculoskeletal cases reported to OPRA-ROI (2007-2022) by task and movement.

Task / movement	Number	(%)
TASK		
Keyboard work	71	10%
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	18%
Machine operation	13	2%
Lifting/carrying/pushing/pulling	221	31%
Coordinated whole body movement	1	<1%
Driving	5	1%
Accidents	233	32%
Other	31	4%
Not stated/non-codable	17	2%
MOVEMENT		
Fine hand	19	2%
Forceful upper limb/grip	24	3%
Torque upper limb	2	<1%
Lifting	33	4%
Carrying	3	<1%
Pushing	1	<1%
Pulling	7	1%
Forceful leg movement	1	<1%
Overhead work	5	1%
Materials handling n.e.c.	303	39%
Bending	1	<1%
Sitting	4	1%
Standing/walking	6	1%
Kneeling	2	<1%
Twisting	2	<1%
Postural n.e.c.	75	10%
Accidents	236	30%
Other	47	6%
Not stated/non-codable	17	2%
Total cases	**788**	

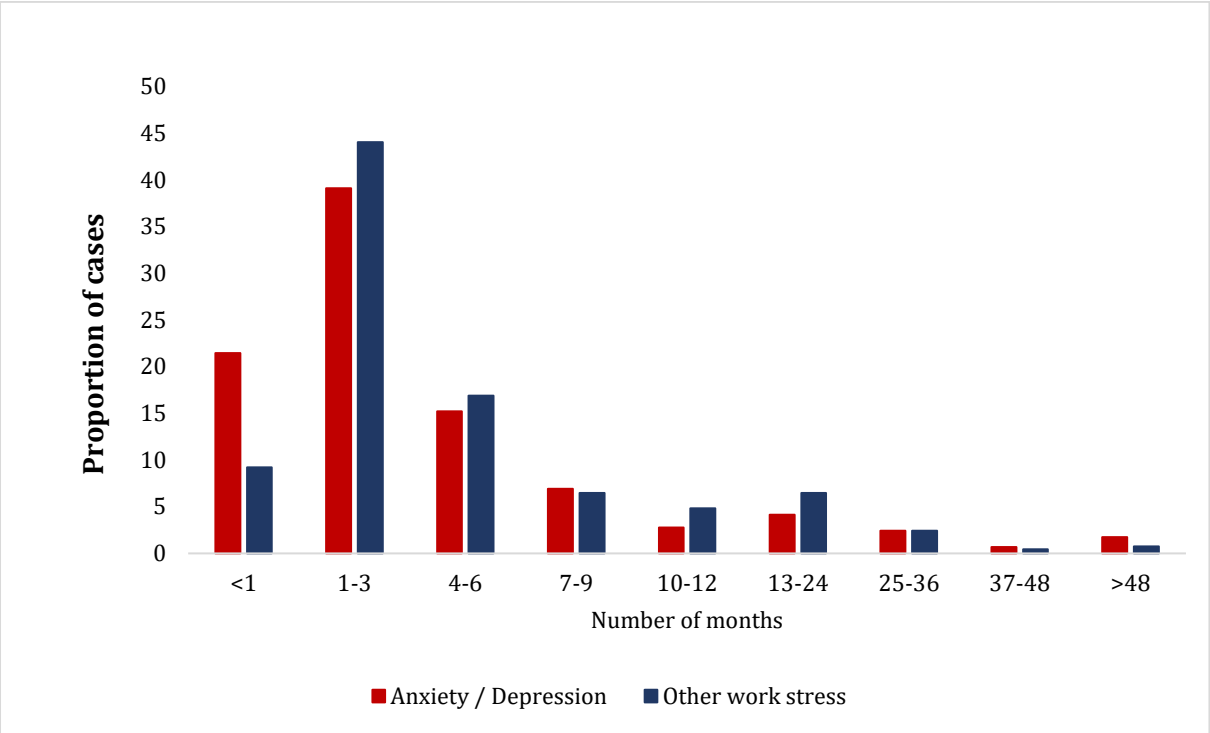
3.6.5 SYMPTOM ONSET

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, 64% of cases were most frequently seen by occupational physicians reporting to OPRA-ROI within the first 3 months after the onset of symptoms. The proportion is slightly less for other work stress with 58% of cases seen within the first 3 months of symptom onset (Figure 12). The median number of months in ROI was 2 for anxiety and depression and 3 for other work stress.

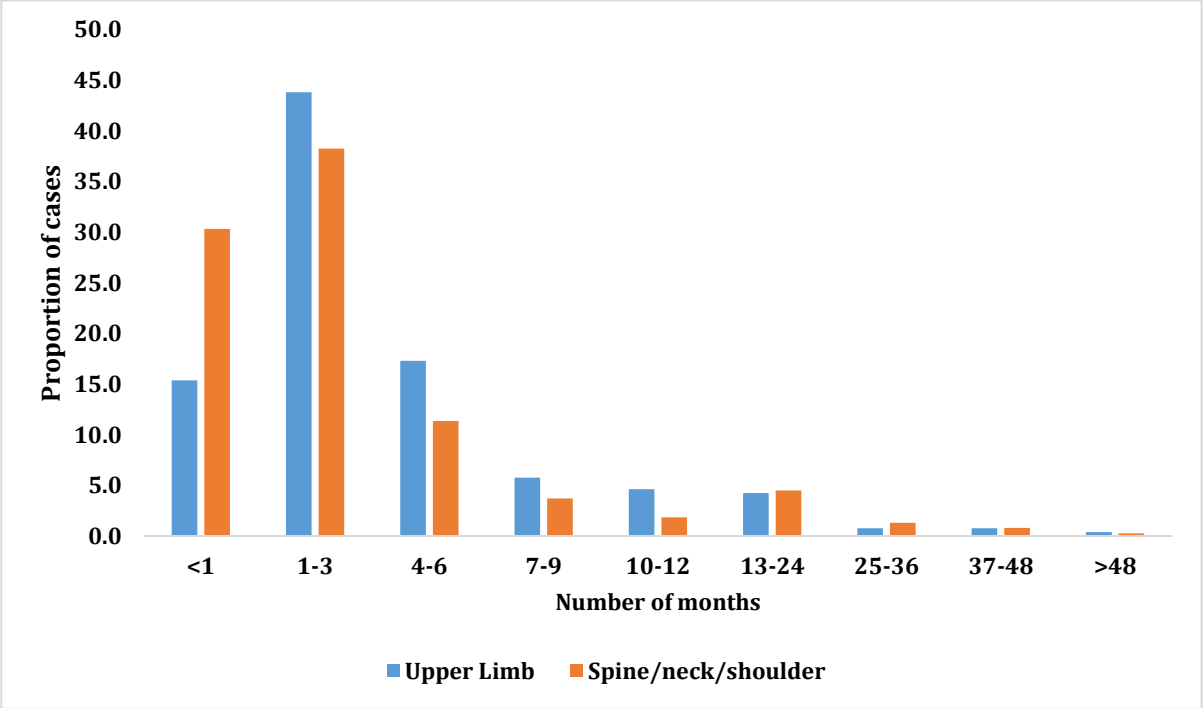
For the musculoskeletal cases reported in the ROI, the majority of upper limb disorders (64%) were reported within the first 3 months after symptom onset, with a median of 2 months (Figure 13). For spine / neck / back disorders a slightly different pattern was observed with cases in the ROI reported slightly sooner (median of 1 month).

Figure 12: 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 (2007-2022)



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

Figure 13: 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 (2007-2022)



***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): 2015-2022

3.7.1 OVERVIEW

General practitioners have reported 44 cases (48 diagnoses) of WRI since the scheme commenced data collection in 2015: 18 (41%) musculoskeletal, 12 (27%) mental ill-health, 6 (14%) 'other' WRI, 6 (14%) skin disease, 1 respiratory and 1 hearing loss (Table 11). Majority of the cases were females (62%) with a mean age of 42 years (all cases; age range 19-79 years). The sectors reported for these were as follows: accommodation and food service (9 cases); retail trade (7 cases); manufacturing (5 cases); health and social care (5 cases); construction (3 cases); education (3 cases), land transport and agriculture (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 general practitioners in ROI were wet work (cited 3 times), cleaning agents, friction, 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 5 times); other activities (cited 3 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 vibration/repetitive (cited 4 times); lifting, 'materials handling', prolonged standing, and forceful upper limb grip (all cited 3 times).

The precipitating events for the mental ill-health cases reported were workload/pressure of work (cited 6 times), bullying (cited twice); unspecified work stress (cited twice); and shift work, interpersonal difficulties, change of work content, relocation, lack of training 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 11 Number and type of diagnoses reported by general practitioners to THOR-GP-ROI (2015-2022)

	Number	(%)
Skin	**6**	**14%**
• **Contact dermatitis**	5	83%
• **Other dermatoses**	1	17%
Respiratory	**1**	**2%**
Musculoskeletal	**18**	**41%**
• **Upper limb**	11	61%
• **Neck / spine / back**	3	17%
• **Lower limb**	5	28%
• **Other musculoskeletal**	1	6%
Mental ill-health	**12**	**27%**
• **Anxiety and depression**	8	50%
• **Other work stress**	5	42%
• **Other mental ill-health**	1	8%
Other cases/diagnoses	**7**	**16%**
• **Hearing loss**	1	14%
• **Lacerations**	4	57%
• **Bites**	1	14%
• **Other**	1	14%
Total cases	**44**	
Total diagnoses	**48**	**100%**

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, 57 cases (59 diagnoses) were added to the THOR-ROI database during 2022. Of these, 19 were reported by dermatologists to EPIDERM-ROI, 18 were reported by chest physicians to SWORD-ROI, 16 cases were reported by occupational physicians to OPRA-ROI and 4 cases were reported by general practitioners to GP-ROI. A total of 2958 incident cases have now been reported to THOR-ROI between 2005-2022, of which 68% were reported by occupational physicians (2007-2022) with smaller proportions from dermatologists (19%), chest physicians (10%) and general practitioners (1%).

In total, 68 physicians (27 occupational physicians, 20 general practitioners, 12 dermatologists and 9 chest physicians) were enrolled in THOR-ROI in 2022, 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 1 case or 1 nil return) in THOR-ROI in 2022 are as follows: 30% of ROI occupational physicians, 25% of general practitioners, 22% of ROI chest physicians and 17% of dermatologists. Compared to 2021, the rates of occupational physicians and general practitioners actively participating in OPRA-ROI and THOR-GP ROI, respectively, increased slightly but decreased for chest physicians and dermatologists actively participating in in SWORD-ROI and EPIDERM-ROI.

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 (2022) 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).[29] 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 2 rates provided in Table 3 ('unadjusted' and 'adjusted') might be considered as the possible upper and lower bounds of estimated incident cases of WRI.

Case reports by dermatologists in the ROI continued to be exclusively contact dermatitis. The most frequently reported industrial sectors were manufacturing, and health and social care. Restricting the analyses to diagnoses of contact dermatitis, 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 contact dermatitis were rubber, wet work, preservatives, nickel, and chromium.

Since the scheme commenced data collection in 2005, asthma has been the most frequently reported diagnosis by chest physicians in the ROI with the most frequently reported industries being construction and manufacturing. Asthma cases were the most frequently reported in 2022 followed by non-malignant pleural disease. The asthma cases reported were also predominantly males, and isocyanate and cement are the most frequently reported agents. SWORD in ROI continues to report proportionally less asbestos-related diseases (24% 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.[30]

Similar to the UK, the case mix reported by occupational physicians 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 occupational physicians.

Information provided by occupational physicians in OPRA regarding the length of time between onset of symptoms and consultation with an occupational physician 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.

A total of 35 case reports attributed to SARS-CoV-2 virus have been reported to THOR-ROI between 2020 and 2022, with majority of the cases reported by occupational physicians (97%). The majority of the cases reported by occupational physicians and general practitioners had a diagnosis of long-covid (48%), followed by post-covid (34%) or active covid-19 infection (17%). All cases reported by occupational physicians and general practitioners 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.

In conclusion, THOR-ROI continues to provide an important source of data relating to medically attributed occupational disease incidence in the ROI with over 2900 cases reported since the inception of the schemes. Given the significant changes in work patterns following the COVID-19 pandemic, THOR-ROI will play a pivotal role in highlighting any health impact of these changes.

However, as reported case numbers were lower in 2022 compared to previous and pre-pandemic years, it is important to increase reporting rate by both encouraging enrolled physicians to report, but also by recruiting new physicians in Ireland. These activities should be done in close collaboration with the HSA and professional bodies in Ireland.

APPENDIX

Appendix 1: EPIDERM substance codes

Epiderm substance codes.pdf

Appendix 2: SWORD substance codes

SWORD Substance Codes.pdf

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

REFERENCES

1. Money A, Carder M, Noone P, et al. Work-related ill-health: Republic of Ireland, Northern Ireland, Great Britain 2005–2012. *Occupational Medicine* 2015; **65**(1): 15-21.
2. The Health and Occupation Research network in the Republic of Ireland (THOR-ROI) http://research.bmh.manchester.ac.uk/epidemiology/COEH/research/thor/schemes/ireland (accessed 30 March 2020 2020).
3. THOR - The Health and Occupation Reporting network. http://research.bmh.manchester.ac.uk/epidemiology/COEH/research/thor/ (accessed 30 March 2020 2020).
4. Meredith SK, Taylor VM, McDonald JC. Occupational respiratory disease in the United Kingdom 1989: a report to the British Thoracic Society and the Society of Occupational Medicine by the SWORD project group. *British Journal of Industrial Medicine* 1991; **48**(5): 292-8.
5. Meyer JD, Chen Y, Holt DL, Beck MH, Cherry NM. Occupational Contact Dermatitis in the UK: A Surveillance Report from EPIDERM and OPRA. *Occupational Medicine* 2000; **50**(4): 265-73.
6. Cherry NM, McDonald JC. The incidence of work-related disease reported by occupational physicians, 1996–2001. *Occupational Medicine* 2002; **52**(7): 407-11.
7. Hussey L, Turner S, Thorley K, McNamee R, Agius R. Work-related ill health in general practice, as reported to a UK-wide surveillance scheme. *British Journal of General Practice* 2008; **58**(554): 637-40.
8. Turner S, Carder M, Hussey L, Zarin N, Agiue R. The incidence of occupational skin and respiratory disease as reported to the The Health and Occupation Reporting network by physicians in the Irish Republic between 2005 and 2006: Unpublished, 2007.
9. Turner S, Carder M, Money A, Agius R. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2007: Unpublished, 2008.
10. Money A, Carder M, Turner S, Agius R. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2008: Unpublished, 2009.
11. Carder M, Money A, Turner S, Agius R. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2009: Unpublished, 2010.
12. Carder M, Money A, Turner S, Agius R. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2010: Unpublished, 2011.
13. Carder M, Money A, Turner S, Agius R. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2011: Unpublished, 2012.
14. Money A, Carder M, Agius R. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2012: Unpublished, 2013.
15. Money A, Carder M, Agius R. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2013: Unpublished, 2014.
16. Money A, Carder M, Agius R. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2014.: Unpublished, 2015.

17. Money A, Carder M, Agius R. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2015: Unpublished, 2016.
18. Money A, Carder M, Agius R. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2016: Unpublished, 2017.
19. Money A, Carder M, van Tongeren M, Agius R. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2017: Unpublished, 2018.
20. Money A, Carder M, Seed M, van Tongeren M. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2018: Unpublished, 2019.
21. Wei H, Barradas A, Money A, Carder M, Seed M, van Tongeren M. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2019: Unpublished, 2020.
22. Iskander I, Carder M, Seed M, van Tongeren M. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2020: Unpublished, 2021.
23. Iskander I, Carder M, Seed M, van Tongeren M. The incidence of occupational disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2021: Unpublished, 2022
24. ONS. Standard Occupational Classification. Norwich: The Stationery Office, Office for National Statistics; 2000.
25. Office CS. Indexes to the Standard Industrial Classification of Economic Activities 1992. London: HMSO; 1993.
26. Organisation WH. International Statistical Classification of Diseases and Related Health Problems (ICD-10), 10th edition. Geneva: WHO; 1992.
27. QNHS. Quarterly National Household Survey. Dublin: Central Statistics Office; 2020.
28. McNamee R, Carder M, Chen Y, Agius R. Measurement of trends in incidence of work-related skin and respiratory diseases, UK 1996–2005. *Occupational and Environmental Medicine* 2008; **65**(12): 808-14.
29. Carder M, McNamee R, Turner S, Hussey L, Money A, Agius R. Improving estimates of specialist-diagnosed, work-related respiratory and skin disease. *Occupational Medicine* 2010; **61**(1): 33-9.
30. Cancer Trends No.17 Mesothelioma. Dublin: National Cancer Registry Ireland, 2012.