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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 2015.

Dr Annemarie Money, Dr Melanie Carder and Professor Raymond Agius

Centre for Occupational and Environmental Health, Centre for Epidemiology,
Institute of Population Health, The University of Manchester, 4th Floor C Block
Ellen Wilkinson Building, Oxford Road, Manchester M13 9PL

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GLOSSARY OF TERMS

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

HSA - The Republic of Ireland Health and Safety Authority.

HSE - The UK Health and Safety Executive.

OPRA - The OPRA scheme began 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.

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

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

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

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

SWORD - The SWORD scheme began in 1989 and collects reports of cases of occupational respiratory disease from consultant respiratory physicians.

THOR - The Health and Occupation Research network which runs several surveillance schemes for work-related disease including EPIDERM, SWORD and OPRA. THOR took over from the Occupational Disease Intelligence Network (ODIN), which had the same role until 2001.

THOR-GP – The THOR-GP scheme began 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

- ROI-THOR currently comprises 4 surveillance schemes collecting data on work-related illness (WRI) in the Republic of Ireland (ROI); ROI-SWORD (chest physicians, data collection commenced 2005), ROI-EPIDERM (dermatologists, 2005), ROI-OPRA (occupational physicians (OPs), 2007) and THOR-GP in the ROI (general practitioners (GPs), 2015)
- This is the latest annual report describing reporting activity to ROI-THOR including a comparison with reports to analogous THOR schemes in Northern Ireland (NI) and in Great Britain (GB)
- Currently 13 dermatologists, 12 chest physicians, 26 OPs and 22 GPs participate in ROI -THOR, reporting incident cases that they believe to have been caused or aggravated by work
- A total of 201 cases were reported in 2015 (OPs: 148, dermatologists: 20, chest physicians: 24, GPs: 9). This brings the total ever reported (2005-2015) to 1970 (OPs:1390, dermatologists:429, chest physicians:142, GPs:9)
- Case reports from OPs (2007-2015) were predominantly mental ill-health (53%) and musculoskeletal (34%) with smaller proportions of skin (9%), respiratory (2%) and 'other' WRI (3%). The majority (77%) of cases were reported in health and social care (mainly nurses) with a significant proportion also reported in transport (bus/train drivers) (14%)
- The breakdown of cases reported by OPs (by diagnostic group, industry, agents etc.) was very similar between the ROI and the other two comparator areas (NI and GB)
- Case reports from dermatologists i.e. EPIDERM (2005-2015) were predominantly contact dermatitis (CD) (96%), female (53% of CD cases) with a mean age (all CD cases) of 37 years. Frequently reported industries/occupations were healthcare (nurses), manufacturing (process operatives) and hairdressing and beauty, and agents included rubber, nickel, wet work and preservatives
- The main difference between reports to EPIDERM in the ROI and GB / NI is that the latter contained proportionally more diagnoses of skin neoplasia
- Case reports from chest physicians i.e. SWORD (2005-2015) were predominantly asthma (35%), male (82%) with a mean age (all cases) of 54 years. Frequently reported industries/occupations were construction (labourers) (25%) and manufacturing (30%) with isocyanates the most frequently reported agent
- The main difference between reports to SWORD in the ROI and GB / NI is that the latter contained proportionately more asbestos related diagnoses (74%)
- Skin and respiratory occupational disease incidence rates were generally similar, or slightly lower in the ROI compared to NI and GB
- The 22 GPs participating in the ROI reported 9 cases during 2015 - their first year of reporting (note: GPs participate for one randomly selected month per year as opposed to participants in all other ROI schemes who participate on a monthly basis) and had the highest active participation rate of the four schemes (55%).

EXECUTIVE SUMMARY

BACKGROUND: The Health and Occupation Research (THOR) network in the Republic of Ireland (ROI-THOR) currently comprises 4 surveillance schemes enabling chest physicians, dermatologists, occupational physicians and (since January 2015), general practitioners (GPs) to (voluntarily) report cases of work-related illness (WRI). The aim of this report is to describe cases of WRI reported to ROI-THOR in the latest full calendar year (2015) and to provide a summary of reporting activity since the commencement of reporting (2005), including a comparison with cases reported to analogous THOR schemes in Great Britain (GB) and Northern Ireland (NI) over the same time period (EPIDERM, SWORD and OPRA only).

METHODS: Participating physicians were asked to provide anonymised case reports of incident cases seen during their reporting period. Cases reported to ROI-THOR were analysed by age, gender, occupation/industry and suspected causal agent, and compared with cases reported in GB and NI over the same time period. Annual average incidence rates (per 100,000 employed) of dermatologist and chest physician reported WRI were estimated.

RESULTS: The 73 physicians enrolled in ROI-THOR in 2015 (13 dermatologists, 12 chest physicians, 26 OPs and 22 GPs) reported a total of 201 cases during 2015. Of these, 148 were reported to ROI-OPRA (49% mental ill-health, 35% musculoskeletal, 14% skin, 2% 'other' WRI and 1% respiratory), 20 were reported to ROI-EPIDERM (90% contact dermatitis (CD)), 24 were reported to ROI-SWORD (4 occupational asthma, 4 non-malignant pleural disease, 1 inhalation accident, 7 bronchitis/emphysema, and 11 pneumoconiosis), GPs reported 9 cases of WRI in

the first full calendar year of reporting (4 'other' WRI, 3 mental ill-health and 2 musculoskeletal). This brings the total cases ever reported (2005-2015) to 1970 case reports (dermatologists: 429, chest physicians: 142, OPs: 1390, GPs: 9 case reports).

Case reports to ROI-EPIDERM (2005-2015) were predominantly (96%) of CD, female (53% of CD cases), with a mean age (all CD cases) of 37 years (age range: 15-81 years). Cases reported in NI and GB were also predominantly CD (but proportionally more neoplasia was reported in GB/NI compared to ROI) with a similar age/gender mix. The most frequently reported industries and occupations for CD cases showed similarities between the ROI and the other two comparator geographical areas, with cases frequently reported in health and social care (23% of ROI cases), manufacturing (25% of ROI cases) and other service activities (which includes hairdressers and beauticians) (13% of ROI cases) with related occupations being nurses (13% of ROI cases), chemical and related process operatives (9% of ROI cases) and hairdressers (7% of ROI cases). Rubber chemicals and materials, nickel, wet work and preservatives were the most frequently reported agents for CD in the ROI. Rubber and wet work, along with soaps and detergents, were also the most frequently reported agents for CD cases reported in GB and NI.

The largest proportion of the 142 case reports to ROI-SWORD (2005-2015) was asthma (35%), whilst for NI and GB the highest proportion was benign pleural plaques (NI 38%, GB 42%), attributable to asbestos exposure. Other diagnoses to ROI-SWORD included 28 diagnoses of benign pleural plaques, 28 diagnoses of pneumoconiosis and 13 diagnoses of inhalation accidents were also reported to ROI-SWORD, with a further 1 or more diagnoses reported in each of the remaining SWORD reporting categories. Respiratory cases reported in the ROI were

predominantly male (82%), and had a mean age of 54 years (age range 19 - 83). The two industrial sectors from which cases were most frequently reported by chest physicians to SWORD (ROI, GB and NI) were construction and manufacturing with related occupations being labouring in building and woodworking trades and coal mine operatives (ROI) and carpenters and joiners (NI and GB). The 50 diagnoses of asthma in ROI were associated with 69 different agents, with isocyanates being the most frequently reported. In comparison, the most frequently reported agent for asthma in GB was also isocyanates followed by flour.

The results for SWORD and EPIDERM show that overall absolute skin and respiratory occupational disease incidence rates were generally similar, or slightly lower in the ROI compared to NI and GB.

Case reports to ROI-OPRA (2007-2015) were predominantly of mental ill-health (53%) followed by musculoskeletal (34%), skin (9%), 'other' (3%) which included lead toxicity and respiratory (2%). A similar diagnostic breakdown was seen for cases reported in GB and NI. Cases reported to ROI-OPRA were predominantly female (68%) with a mean age (total cases) of 43 years (age range 19-69). A similar age/gender mix was seen in NI and GB. The most frequently reported industry and occupation for ROI was the health and social care sector (77%) and nurses (24%). Cases in GB and NI were also frequently reported in the health and social care sector (although some industry sectors, such as health and social care, have better provision of occupational health services compared to others and therefore proportionally more cases might be expected). For all three geographical areas, mental ill-health case reports were most frequently attributed to 'factors intrinsic to the job' which included 'workload', 'travel', and 'organisational factors' and to 'interpersonal relationships'. Commonly reported tasks and movements associated

with the musculoskeletal disorders were 'lifting/carrying/pushing/pulling', 'accidents' and 'materials handling'. Information provided by OPs in OPRA regarding the length of time between onset of symptoms and consultation with an OP shows a similar pattern for both the ROI and GB with most cases reported within 1 to 3 months after onset of symptoms.

Since collection of data reported by GPs in the ROI only started in 2015, only limited comparisons can be made with data reported by GPs in NI and GB, however so far, the case mix is similar with proportionately more mental ill-health and musculoskeletal diagnoses compared to skin and respiratory diagnoses.

CONCLUSION: ROI-THOR continues to provide a valuable source of data relating to medically attributed occupational disease incidence in the ROI with nearly 2000 cases reported since the inception of the schemes. Although case reports to the newest scheme (THOR-GP) were relatively low, the active participation rate in 2015 for this scheme was higher than the other ROI schemes. It is intended that with increased enrolment/participation in THOR-GP (and the other ROI schemes), aided by steps such as the introduction of free accredited online Continuing Professional Development, participation and reporting will increase further, enabling both continued comparisons with UK data and analyses 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 (ROI-THOR) currently comprises 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, whilst OPRA commenced in 2007. THOR-GP is the newest ROI scheme with data collection commencing in January 2015. The ROI schemes are based on the analogous well-established UK-wide schemes³⁻⁷.

The aim of this report is to describe cases of WRI reported to SWORD, EPIDERM, OPRA and THOR-GP in the ROI during the previous calendar year (2015) and to SWORD, EPIDERM and OPRA for the combined period (2005-2015) and to compare these with cases reported in Great Britain (GB) and Northern Ireland (NI) over the same period. This builds on previous reports submitted annually to the ROI Health Safety Authority (HSA) since 2006⁸⁻¹⁶.

2 METHODS

The methodology behind THOR has been described in detail previously with participating physicians being asked to report only new cases of disease seen during their reporting month that they believe to have been caused or aggravated by work (general guidance on reporting is provided via the web site)³. The methodology was established using paper-based reporting (a reporting card). However, more recently reporters have been given the option to provide data in an electronic format and since 2002, all new THOR schemes, including those in the ROI, have been designed to be exclusively electronic. Reporters are requested to give information on diagnosis, age, gender, geographical location, occupation, industry and suspected agent(s). The occupation and industry are coded using the Standard Occupational Classification (SOC) and the Standard Industrial Classification (SIC), respectively¹⁷,¹⁸. Suspected agents are coded using in-house coding schemes developed in conjunction with the Health and Safety Executive (HSE) in the UK. All coding is undertaken independently by two assistants, and any discrepancies are reconciled by a third person.

Physicians reporting to EPIDERM are requested to assign their case to one or more of the following major sub-groups: contact dermatitis (CD), contact urticaria (CU), folliculitis/acne, infection, mechanical dermatoses, nail disorders, neoplasia, and 'other dermatoses' (with the ability to specify the diagnosis if the latter is chosen). Similarly, the sub-groups for chest physician reporting to SWORD are occupational asthma, inhalation accidents, allergic alveolitis, bronchitis/emphysema, infectious disease, non-malignant pleural disease (NMPD), mesothelioma, lung cancer,

pneumoconiosis, and 'other respiratory disease'. Physicians reporting to OPRA and THOR-GP (who can return case details for all causes of occupational ill-health) record the diagnosis which is subsequently coded using the International Classification of Disease 10th Revision (ICD-10)¹⁹ so that comparisons can be made between reporting schemes.

Participants in THOR contribute data as 'core' reporters (who report every month) or as 'sample' reporters (who report for one randomly allocated month each year). Physicians reporting to SWORD, EPIDERM and OPRA in the ROI participate as core reporters (in the UK there is typically a smaller group of core reporters with the majority of physicians participating on a sample basis) whilst reporters to THOR-GP in the ROI participate as sample only (UK GPs also currently participate as sample only). To estimate the total number of incident cases for the UK, cases reported by the 'sample' reporters are multiplied by 12 and this sub-total added to the cases reported by the 'core' reporters. Unless otherwise specified, the UK derived results presented in this report are based on estimated cases.

Cases of occupational disease reported to EPIDERM, SWORD and OPRA by physicians in the Republic of Ireland (ROI) from 2005 to 2015 have been extracted from the databases (current at end of December 2015) and compared with data reported by physicians in NI and GB. Cases reported to THOR-GP in ROI for the first full calendar year of reporting (2015) have also been extracted and analysed. Data were analysed using the statistical package SPSS V22.0.

Annual average incidence rates (per 100,000 employed) of dermatologist and chest physician reported WRI were estimated based on a previously published methodology²⁰. In brief, numerators were adjusted for participation (the proportion of physicians participating in THOR) 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 2005-2015 obtained from the UK Labour Force Survey (LFS)²¹ or the ROI National Household Survey²². Both 'unadjusted' (no adjustment for participation and response) and 'adjusted' (adjustment for participation and response) rates are presented. Incidence rates were calculated for ROI and GB and for total work-related skin disease, CD, neoplasia and total work-related respiratory disease, asthma and asbestos related diseases only (the number of actual case reports in NI and in other diagnostic sub-groups were deemed 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 in all three geographical areas (access to an OP within the UK and the ROI is biased towards the public sector and larger employers).

Ethics Committee approval has been given for THOR in the Republic of Ireland by the Public Health Research Ethics Committee of The Royal College of Physicians of Ireland.

3 RESULTS

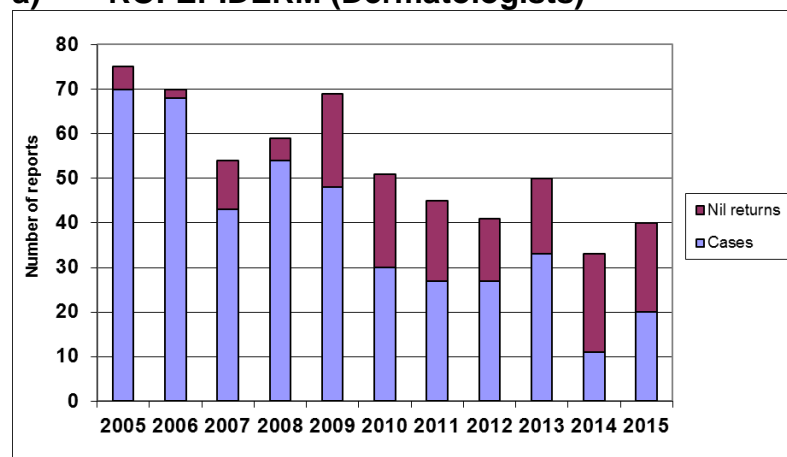
3.1 PARTICIPATION

The number of reports received for ROI-EPIDERM, ROI-SWORD and ROI-OPRA by year is shown in Figure 1, whilst Figure 2 shows the cases per active reporter per year. A total of 13 dermatologists, 12 chest physicians, 26 OPs and 22 GPs were enrolled in ROI-THOR in 2015. Of these, 4 (31%) dermatologists actively participated in 2015 (i.e. returned a web form at least once either containing cases or declaring 'I have nothing to report this month') with 8 (62%) dermatologists actively participating at least once during 2005-2015. Of the 12 chest physicians, 2 actively reported in 2015 with 6 (50%) actively participating at least once during 2005-2015. Of the 26 OPs enrolled in ROI-OPRA, 8 (31%) actively participated in 2015 with 17 (65%) actively participating during 2007-2015. Of the 22 GPs enrolled in ROI-THOR-GP in 2015, 12 (55%) actively participated.

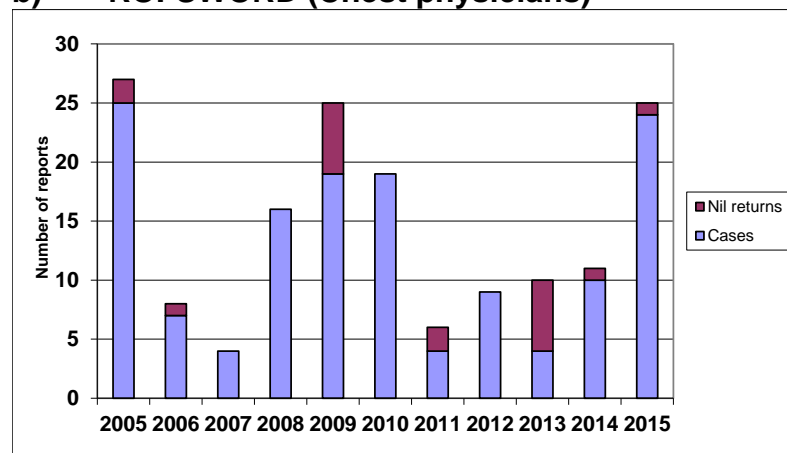
For comparison, 53% of (approximately 428) chest physicians enrolled in SWORD in the UK actively participated during 2015 with 87% (of approximately 738, including 18 physicians from NI) ever actively participating (2005-2015). The equivalent figures for dermatologists enrolled in EPIDERM were 66% (of approximately 148 physicians, 2015) and 87% (of approximately 305 physicians, including 11 in NI, 2005-2015) and for occupational physicians enrolled in OPRA were 76% (of approximately 270 physicians, 2015) and 87% (of approximately 571 physicians, including 16 in NI, 2007-2015).

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

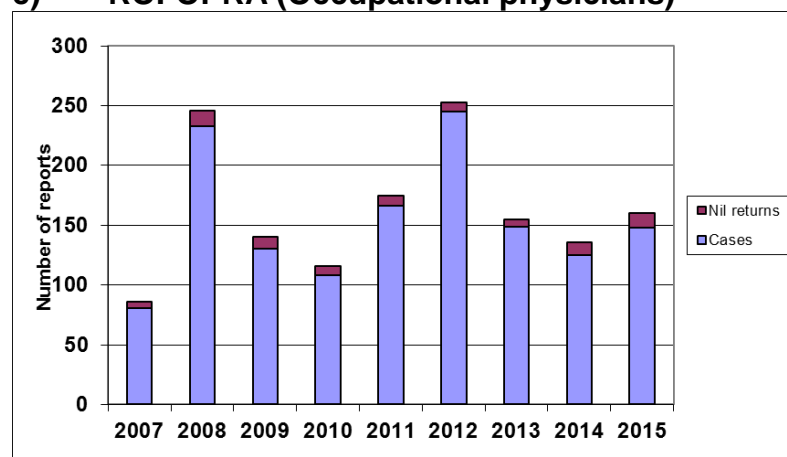
a) ROI-EPIDERM (Dermatologists)



b) ROI-SWORD (Chest physicians)



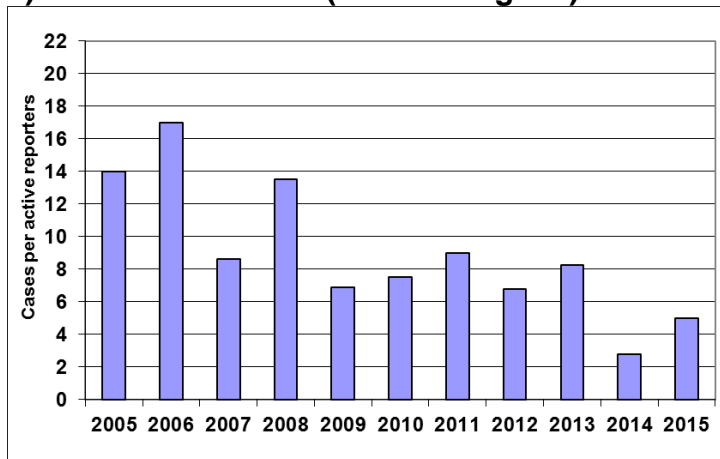
c) ROI-OPRA (Occupational physicians)



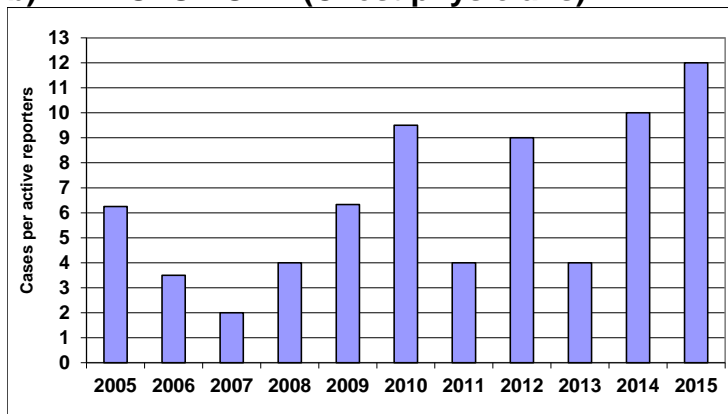
NOTE: Scale differences

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

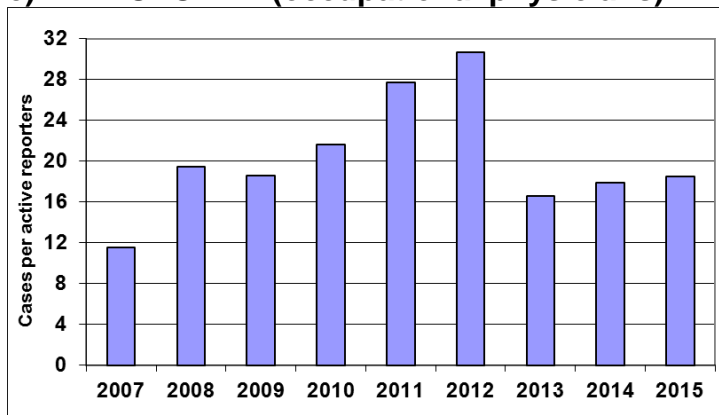
a) ROI-EPIDERM (Dermatologists)



b) ROI-SWORD (Chest physicians)



c) ROI-OPRA (occupational physicians)



*An active reporter is defined as someone who returns a case report or responds 'I have nothing to report' in a calendar year.

NOTE: Scale differences

3.2 INCIDENCE RATES

The annual average incidence rate for dermatologist reported skin disease in the ROI was 2 per 100,000 employed, per year (Table 1). After adjusting for ‘non-participation’ and ‘non-response’, this increased to an estimate of 18 per 100,000 employed. In comparison, rates for NI and GB were typically higher.

For chest physicians in the ROI, the annual average incidence rate of total respiratory disease was 1 per 100,000 employed per year, rising to 16 per 100,000 employed, per year, after adjusting for ‘non-participation’ and ‘non-response’. Incidence rates for NI and GB were again typically higher.

Table 1 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 Great Britain, Northern Ireland and the Republic of Ireland (2005-2015)

| | GREAT BRITAIN | | NORTHERN IRELAND | | REPUBLIC OF IRELAND | |
|---------------------------------------|---------------|------------|------------------|------------|---------------------|------------|
| | ‘Crude’ | ‘Adjusted’ | ‘Crude’ | ‘Adjusted’ | ‘Crude’ | ‘Adjusted’ |
| Respiratory (chest physicians) | | | | | | |
| All | 8 | 15 | 3 | 18 | 1 | 16 |
| Asthma | 1 | 2 | <1 | 2 | <1 | 5 |
| Asbestos related disease | 6 | 12 | 2 | 13 | <1 | 5 |
| | | | | | | |
| Skin (dermatologists) | | | | | | |
| All | 6 | 14 | 12 | 28 | 2 | 18 |
| Contact dermatitis | 5 | 10 | 6 | 15 | 2 | 17 |
| Neoplasia | 1 | 3 | 3 | 7 | 0 | 0 |

3.3 OVERVIEW OF 2015 CASE REPORTS

A total of 201 cases were reported to ROI-THOR in 2015 (Table 2). These comprised 148 cases reported by OPs to ROI-OPRA, 20 skin cases reported by dermatologists to ROI-EPIDERM, 24 respiratory cases reported by chest physicians to ROI-SWORD and 9 cases reported by general practitioners to ROI-THOR-GP.

The majority of the cases reported to ROI-EPIDERM were diagnoses of CD (18/20) with a further 2/20 diagnoses of contact urticaria. The cases were reported in the beauty industry (4) (hairdresser, beautician (2), and tattoo artist), healthcare (4) (healthcare assistant, nurse, pharmacist, dental student), accommodation and food service activities (4) (chef (3), cleaner), manufacturing (3) (2 process operatives and 1 motor mechanic), 2 in construction (carpenter, service engineer), 2 in agriculture (farmer, gardener) and 1 in transport, storage and communications (merchant seaman) (Table 3). The agents associated with the 18 cases of CD were rubber materials and chemicals (cited 8 times), cleaning and sterilizing agents (cited 3 times), preservatives (cited 3 times), acrylates (cited 3 times), wet work (cited twice), resins (cited twice), nickel (cited twice), P-phenylene diamine (PPD) (cited twice), drugs and medicaments, personal protective equipment, colophony and flux, food, and barrier creams. The 2 cases of contact urticaria were associated with latex and food (fish/seafood).

The 24 cases reported to ROI-SWORD included 11 diagnoses of pneumoconiosis (5 reported in coal mining, 4 in construction, 1 in automobile repair and 1 in manufacture of furniture; suspected agents reported as coal (cited 5 times), cement,

plaster and stone dust (cited 5 times), dust (cited 4 times), asbestos (cited 3 times), other silicates (cited twice), ill-defined fumes, wood and wood dust, isocyanates), 7 bronchitis / emphysema diagnoses (6 in coal mining, 1 in construction / demolition; suspected agents recorded as cement, plaster and stone dust (cited 6 times), coal (cited 6 times), dust (cited 4 times), asbestos, ill-defined fumes, cotton dust), 4 diagnoses of non-malignant pleural disease (3 reported in construction, 1 in electricity supply; all attributed to asbestos), 4 cases of occupational asthma (2 in manufacturing, 2 in coal mining; suspected agents recorded as glues and adhesives (cited twice), cement, plaster and stone dust (cited twice), dust, fuel oil, hydrocarbon solvents, ill-defined fumes, coal) and 1 inhalation accident (warehousing, transport and storage, attributed to food).

The 148 cases (154 diagnoses) reported to ROI-OPRA in 2015 were predominantly diagnoses of mental ill-health (49%) followed by musculoskeletal (35%), with smaller proportions of skin (14%), other WRI (2%) and respiratory (1%). The most frequently reported industry for the 73 mental ill-health cases reported to ROI-OPRA in 2015 was health and social care (60%) with frequently reported occupations being nurses and clerical workers (both accounting for 24% of total mental ill-health cases). The types of events reported as associated with these cases included workload / demand, difficulties with managers/co-workers etc. (including bullying) and assault. The most frequently reported industry and occupation for the 52 musculoskeletal cases reported to ROI-OPRA was health and social care (79%) and nurses (25%) with frequently reported tasks/movements including manual handling/lifting and accidents/assault.

The 21 skin cases included 18 diagnoses of CD, 1 of which was reported in the manufacture of chemicals (process operative), with the remainder in health and social care (midwife, doctor, nurse, healthcare attendant). The agents associated with these 18 CD cases were wet work/hand washing (cited 15 times), sterilising and disinfecting agents (cited 8 times), protective clothing and equipment (cited 4 times) and rubber materials and chemicals (cited twice). The remaining skin cases were reported under the 'other' skin problems category and diagnosed as skin injury (ambulance worker attributed to skin puncture), a diagnosis of exacerbation of varicose eczema (in a bus refueller attributed to diesel fuel) and skin sensitization (healthcare assistant attributed to multi-enzymatic cleaner). The 2 respiratory cases were both reported under the 'other' category and included one diagnosis of smoke inhalation (co-diagnosis of anxiety in a bus driver, attributed to accident), and one diagnosis of sinusitis (bus driver attributed to dust and excess heat). There were 3 further cases of 'other' WRI reported in 2015, 2 cases of noise induced hearing loss (NIHL) (reported in meat inspectors attributed to noise) and 1 diagnosis of headaches and tinnitus (prison officer attributed to assault).

General practitioners reported 9 cases of WRI in the first full calendar year of reporting. The diagnoses were as follows; 4 'other' WRI cases including 3 lacerations (in a tiler attributed to accident with hacksaw, in a chef whilst chopping food and in catering staff when cutting bread) and 1 dog bite (farmer). 3 mental ill-health cases, 1 diagnosis of work-related stress and depression (call centre worker attributed to work load), 1 diagnosis of work-related stress (baggage handler attributed to supervision of training and being on night shift) and 1 diagnosis of anxiety, insomnia and panic attacks (coffee shop worker attributed to bullying). The 2 musculoskeletal cases reported were back pain (delivery driver attributed to a road traffic accident) and muscular strain of chest (construction worker attributed to pulling a trailer).

Table 2 **Number of cases reported to ROI-SWORD, ROI-EPIDERM, ROI-OPRA and ROI-THOR-GP, 2015**

| | Diagnosis | ROI-SWORD | ROI-EPIDERM | ROI-OPRA | ROI-THOR-GP |
|-----------------------------------|---------------------------------|------------------|--------------------|-----------------|--------------------|
| Skin disease | Contact dermatitis | / | 18 | 18 | / |
| | Urticaria | / | 2 | 0 | / |
| | Other skin | / | 0 | 3 | / |
| | Total skin diagnoses | / | 20 | 21 | / |
| | Total skin cases | / | 20 | 21 | / |
| | | | | | |
| Respiratory disease | Asthma | 4 | / | / | / |
| | Inhalation accidents | 1 | / | / | / |
| | Bronchitis/emphysema | 7 | / | / | / |
| | Non-malignant pleural disease | 4 | / | / | / |
| | Pneumoconiosis | 11 | / | / | / |
| | Other respiratory disease | 0 | / | 2 | / |
| | Total respiratory diagnoses | 27 | / | 2 | / |
| | Total respiratory cases | 24 | / | 2 | / |
| | | | | | |
| Mental ill-health | Anxiety and depression | / | / | 13 | 2 |
| | Adjustment disorder | / | / | 9 | 0 |
| | Other work stress | / | / | 50 | 2 |
| | Other mental ill-health | / | / | 4 | 0 |
| | Total mental diagnoses | / | / | 76 | 4 |
| | Total mental cases | / | / | 73 | 3 |
| | | | | | |
| Musculoskeletal disorders | Upper limb | / | / | 16 | 0 |
| | Spine/back | / | / | 26 | 1 |
| | Lower limb | / | / | 7 | 0 |
| | Other musculoskeletal | / | / | 3 | 1 |
| | Total musculoskeletal diagnoses | / | / | 52 | 2 |
| | Total musculoskeletal cases | / | / | 52 | 2 |
| | | | | | |
| Other work-related illness | | / | / | 3 | 4 |
| | | | | | |
| Total diagnoses | | 27 | 20 | 154 | 10 |
| Total cases | | 24 | 20 | 148 | 9 |

Table 3 Cases of work-related illness reported to ROI-THOR, 2015

| | Occupations | Industries | Agents |
|---|--|--|---|
| Skin reports to ROI-EPIDERM | Farmer, healthcare assistant, chef, pharmacist, beautician, carpenter, general operative, nurse, cleaner, hairdresser, dental student, service engineer, process operative, gardener, mechanic, merchant seaman, tattoo artist | Agriculture, healthcare, catering, other service activities, construction, plastics manufacture, hotels and restaurants, pharmaceutical, forestry, logging, and related service activities, motor manufacture, water transport | Cleaning materials, sterilizing agents and disinfectants, preservatives, rubber chemicals and materials, wet work, protective clothing and equipment, P-phenylene diamine (PPD), nickel and its compounds, drugs and medicaments, colophony and flux, food, epoxy resins, acrylics and acrylates. |
| Skin reports to ROI-OPRA | Nurse, ambulance man, process operative, midwife, healthcare attendant, care assistant, catering assistant, Central Sterile Supplies Department assistant, nurse manager, bus refueller, doctor, physiotherapist | Health and social care, public transport, manufacture of chemicals | Cleaning materials, sterilizing agents and disinfectants, rubber chemicals and materials, wet work, friction, protective clothing and equipment, fuel oil |
| Respiratory reports to ROI-SWORD | Coal miner, maintenance fitter, grinding disc production, chemical process operative, construction foreman, electrician, carpenter, furniture sander/polisher, general operative, bricklayer, plasterer, car mechanic | Mining and quarrying, chemical manufacture, motor vehicle manufacture, other manufacture, electricity, gas and water supply, construction, wholesale trade and repair of vehicles, warehousing and storage | Asbestos, food additives, cleaning agent, tungsten, exhaust fumes, metabisulphite, toxoplasma |
| Respiratory reports to ROI-OPRA | Bus driver | Public transport | Dusts, high temperatures / hot work. |

| | Occupations | Industries | Agents |
|--|---|---|--|
| Musculoskeletal reports to ROI-OPRA | Healthcare assistant, nurse, prison officer, clerical worker, porter, general operative, home help, security officer, dental hygienist, occupational therapist, speech and language therapist, multi task attendant, agricultural inspector, radiographer, physiotherapist, paramedic, ward clerk, cleaners/domestics, bus driver, mechanic, transport operative, farm labourer, catering assistant, | Health and social care, education, public transport, public administration and defence, agriculture. | Assaults, accidents, body posture, ergonomics, manual handling, lifting/carrying/pushing/pulling, guiding or holding tool, materials handling, standing/walking/running, vibration |
| Mental ill-health reports to ROI-OPRA | Banker, bus driver, nurse, professor, IT manager, risk manager, train driver, healthcare assistant, accountant, clerical worker, environmental health, IT worker, doctor, stores hand, social worker, paramedic, solicitor, warehouseman, porter, operations manager, treasury, ambulance man, catering assistant, pensions manager, administration, human resources, researcher, teacher, prison officer, lab assistant, dental nurse, ward clerk, social worker, railway station controller | Health and social care, public administration and defence, education, manufacture of food and beverages, manufacture of pharmaceutical products, other manufacturing, retail trade, land transport, warehousing and support activities, financial services, employment activities | Workload, organizational factors, boredom/under responsibility, changes at work, interpersonal relationships, bullying, physical working environment, traumatic events. |

3.4 OCCUPATIONAL SKIN SURVEILLANCE (EPIDERM), 2005-2015

3.4.1 DIAGNOSES

In total 429 case reports were reported by dermatologists to ROI-EPIDERM between January 2005 and December 2015. These 429 case reports produced 416 diagnoses; 13 cases were not assigned a diagnosis (however information on occupation, industry and suspected agent was provided). The most frequently reported skin diagnosis in the ROI was CD (96%) (Table 4). The majority of the reported diagnoses in NI (53%) and GB (73%) were also CD. However, unlike the ROI case mix, the NI and GB case mix also included a proportion of neoplasia diagnoses (NI 47%, GB 22%).

3.4.2 AGE AND GENDER

Overall (2005-2015) cases of CD in the ROI were most frequently reported in the 25-34 year age group for both males and females (Figure 3). This compared to 45-54 (males) and 25-34 (females) year age group in NI and 35-44 (males) and 16-24 (females) year age group in GB. Overall in the ROI, there were more cases of CD reported in females (53%) than males (47%), and females were younger than males (mean age; females 35 years, males 39 years) (Table 5).

Table 4 **Number and type of diagnoses reported by dermatologists to EPIDERM (2005-2015) in the Republic of Ireland, Northern Ireland & Great Britain**

| | ROI (actual) | NI (actual) | NI (estimated) | GB (actual) | GB (estimated) |
|---------------------------|---------------------|--------------------|-----------------------|--------------------|-----------------------|
| Contact dermatitis | 410 (96%) | 44 (53%) | 528 (53%) | 6654 (84%) | 14706 (73%) |
| • Allergic | • 218 (53%) | • 12 (27%) | • 144 (27%) | • 2236 (34%) | • 5668 (39%) |
| • Irritant | • 152 (37%) | • 20 (45%) | • 240 (45%) | • 3125 (47%) | • 6040 (41%) |
| • Mixed | • 39 (10%) | • 7(16%) | • 84 (16%) | • 1123 (17%) | • 2355 (16%) |
| • Unclear | • 1 (<1%) | • 5 (11%) | • 60 (11%) | • 177 (3%) | • 683 (5%) |
| Contact urticaria | 5 (1%) | 0 | 0 | 302 (4%) | 577 (3%) |
| Folliculitis/acne | 0 | 0 | 0 | 30 (<1%) | 52 (<1%) |
| Infective | 1 (<1%) | 1 (1%) | 12 (1%) | 19 (<1%) | 52 (<1%) |
| Mechanical | 0 | 0 | 0 | 77 (1%) | 209 (1%) |
| Nail | 0 | 0 | 0 | 21 (<1%) | 120 (1%) |
| Neoplasia | 0 | 39 (47%) | 468 (47%) | 910 (11%) | 4419 (22%) |
| Other dermatoses | 0 | 0 | 0 | 94 (1%) | 402 (2%) |
| | | | | | |
| Total cases | 429 (100%) | 83 (100%) | 996 (100%) | 7954 (100%) | 20153 (100%) |
| Total diagnoses | 416* | 84 | 1008 | 8107 | 20537 |

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

Figure 3 Proportion of cases of contact dermatitis reported to EPIDERM by age and gender (2005-2015)

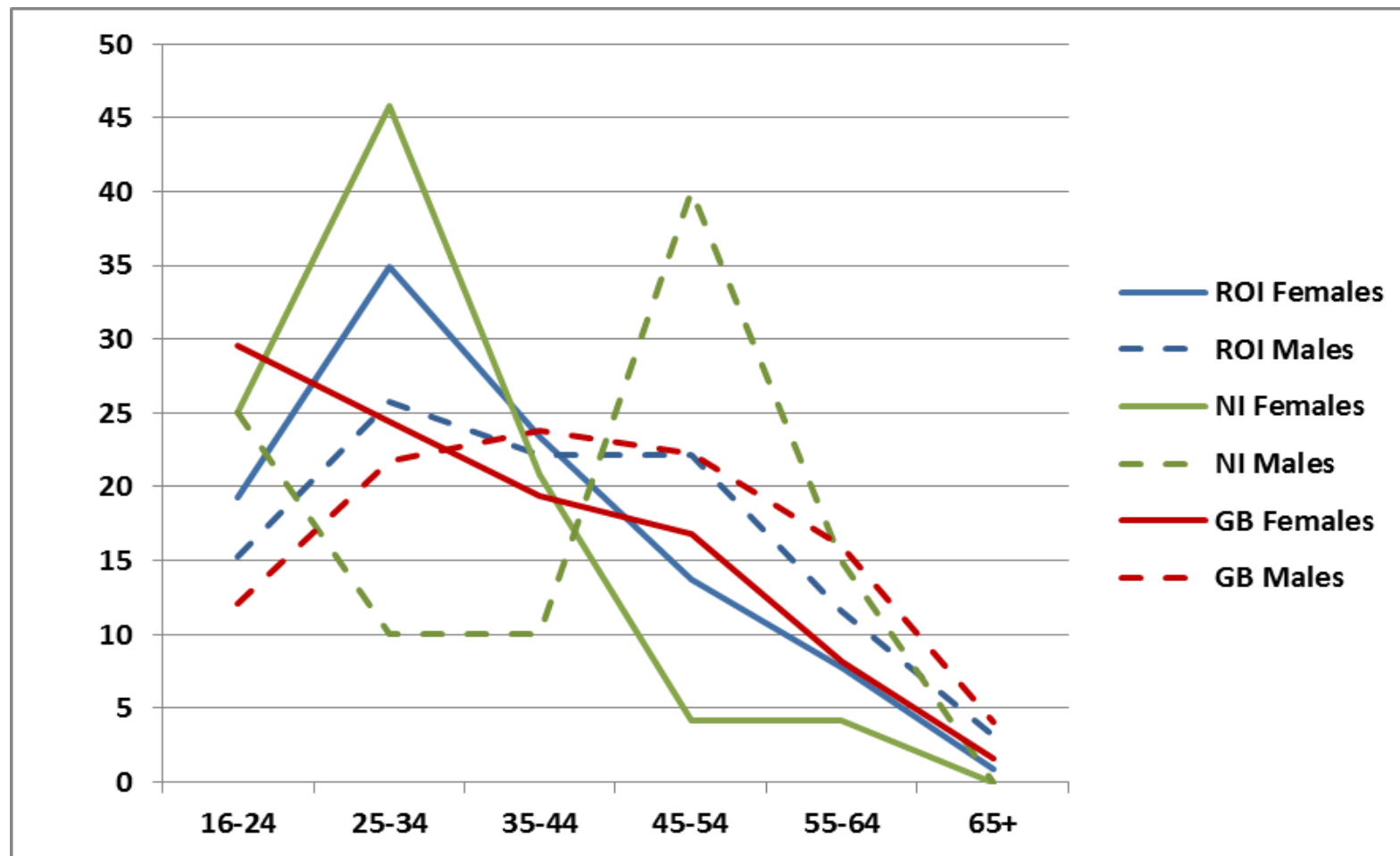


Table 5 Age and gender of contact dermatitis diagnoses in ROI-EPIDERM (2005-2015)

| DIAGNOSIS | MALES | FEMALES | ALL |
|-------------------------|--------------|----------------|-------------|
| Allergic CD | | | |
| Number of diagnoses (%) | 118 (54%) | 100 (46%) | 218 (100%) |
| Mean age (years) | 41 | 36 | 39 |
| Age range (years) | 15-81 | 17-64 | 15-81 |
| | | | |
| Irritant CD | | | |
| Number of diagnoses (%) | 57 (38%) | 94 (62%) | 152 (100%)* |
| Mean age (years) | 36 | 32 | 34 |
| Age range (years) | 16-62 | 19-77 | 16-77 |
| | | | |
| Mixed CD | | | |
| Number of diagnoses (%) | 15 (38%) | 24 (62%) | 39 (100%) |
| Mean age (years) | 39 | 40 | 39 |
| Age range (years) | 19-54 | 17-65 | 17-65 |
| | | | |
| All CD | | | |
| Number of diagnoses (%) | 191(47%) | 218 (53%) | 410 (100%) |
| Mean age (years) | 39 | 35 | 37 |
| Age range (years) | 15-81 | 17-77 | 15-81 |

*1 diagnosis had no gender assigned

3.4.3 INDUSTRY AND OCCUPATION

The most frequently reported industrial sector for cases of CD reported to ROI, NI and GB was health and social care. Manufacturing was also frequently reported in ROI and GB, and 'other service activities' (which includes hairdressing and other beauty treatments) was also frequently reported for NI (Figure 4).

The most frequently reported occupations for cases of CD reported to ROI-EPIDERM were nurses (13% of the 410 CD cases) which fall under SOC group 3 'Associate professional and technical occupations' (Figure 5), chemical and related process operatives (9%) which fall under SOC group 8 and hairdressers (7%) which fall under SOC group 6 'Personal service occupations'. For comparison, in GB, 13% (of the 14706 CD cases), 1% and 11% cases were reported in nurses, chemical and process operatives and hairdressers, respectively, whilst for NI, 16% (of the 528 CD cases) were reported in nurses and 18% were reported in hairdressers (no cases in NI were reported in chemical and process operatives). Cases of CD in GB were also frequently reported in chefs/cooks (5%), which falls within SOC group 5 'Skilled trades occupations' and cleaners and domestics (4%), which falls within SOC group 9 'Elementary occupations'. Cleaners/domestics was also a frequently reported occupation in cases of CD in NI (14%). For comparison, only 5 cases were reported in cleaners and domestics in the ROI.

Of the 6 non-CD cases reported to ROI-EPIDERM, the 5 cases of contact urticaria were reported in a nurse, a cleaner, a carpenter, a dental student and a chef, whilst a single (unspecified) infective case was reported in an agricultural student.

3.4.4 SUSPECTED AGENTS

Up to 6 suspected agents may be cited for each case report, and the agents most frequently associated with CD are shown in Table 6. The most frequently reported agents for the ROI were rubber chemicals and materials, nickel, wet work, and preservatives. Wet work, soaps and detergents and protective clothing and equipment (PPE) were the most frequently reported agents for CD cases reported in NI and wet work, soaps and detergents, and rubber chemicals and materials were the most frequently reported agents for CD cases reported in GB.

For allergic contact dermatitis (ACD) rubber chemicals and materials were the agent most often associated with case reports in the ROI, in irritant contact dermatitis (ICD) the agent was wet work, whilst for mixed contact dermatitis, nickel was most frequently reported.

The suspected agents associated with the 5 cases of contact urticaria reported to ROI-EPIDERM were fish, latex, cobalt chloride, nickel sulphate and wood shavings, whilst the single (unspecified) infective case was in an agricultural student and was associated with 'coming into contact with infected animals'.

Figure 4 Proportion of cases of contact dermatitis reported to EPIDERM by Standard Industrial Classification (SIC), 2005-2015

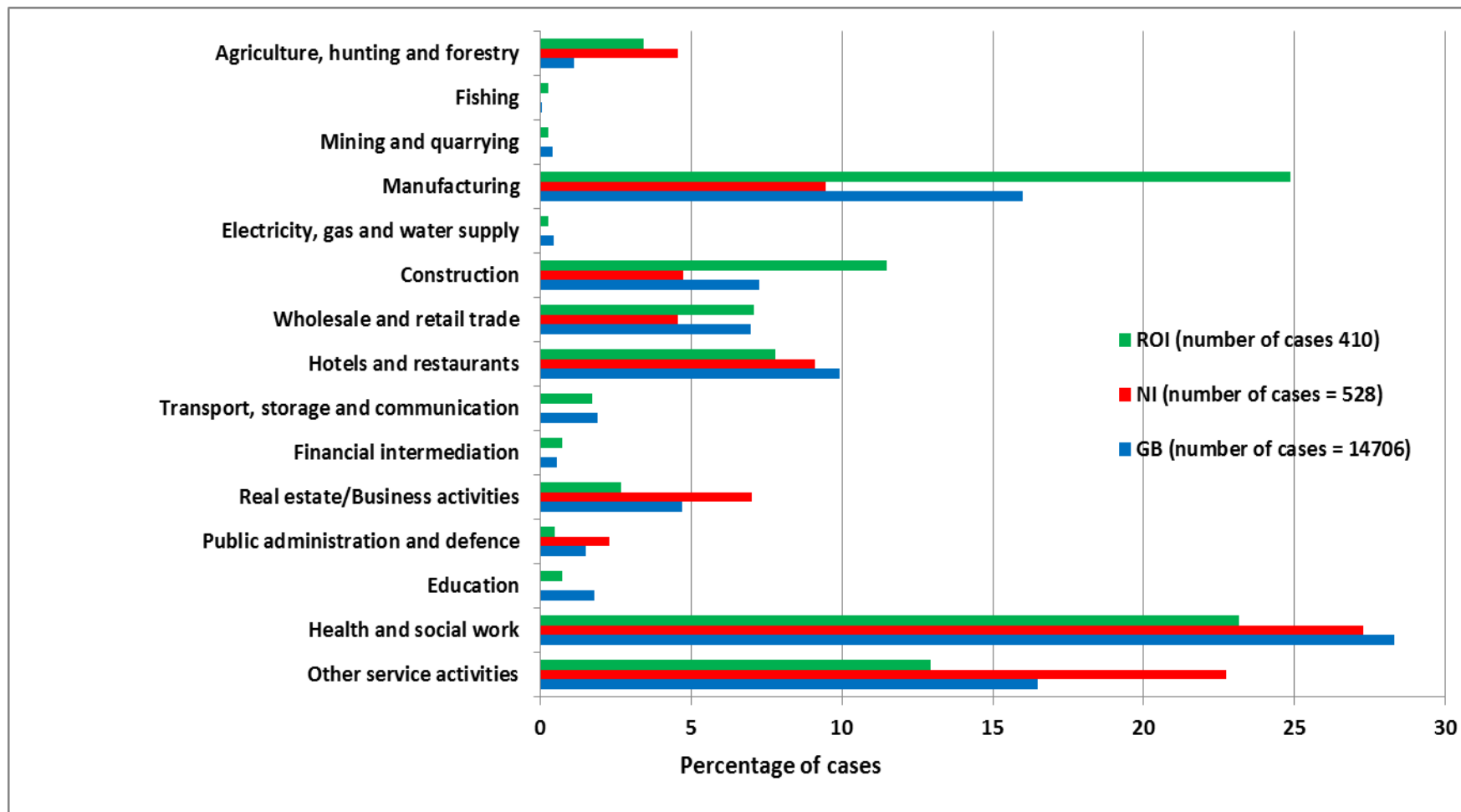


Figure 5 Proportion of cases of contact dermatitis reported to EPIDERM by Standard Occupational Classification (SOC), 2005-2015

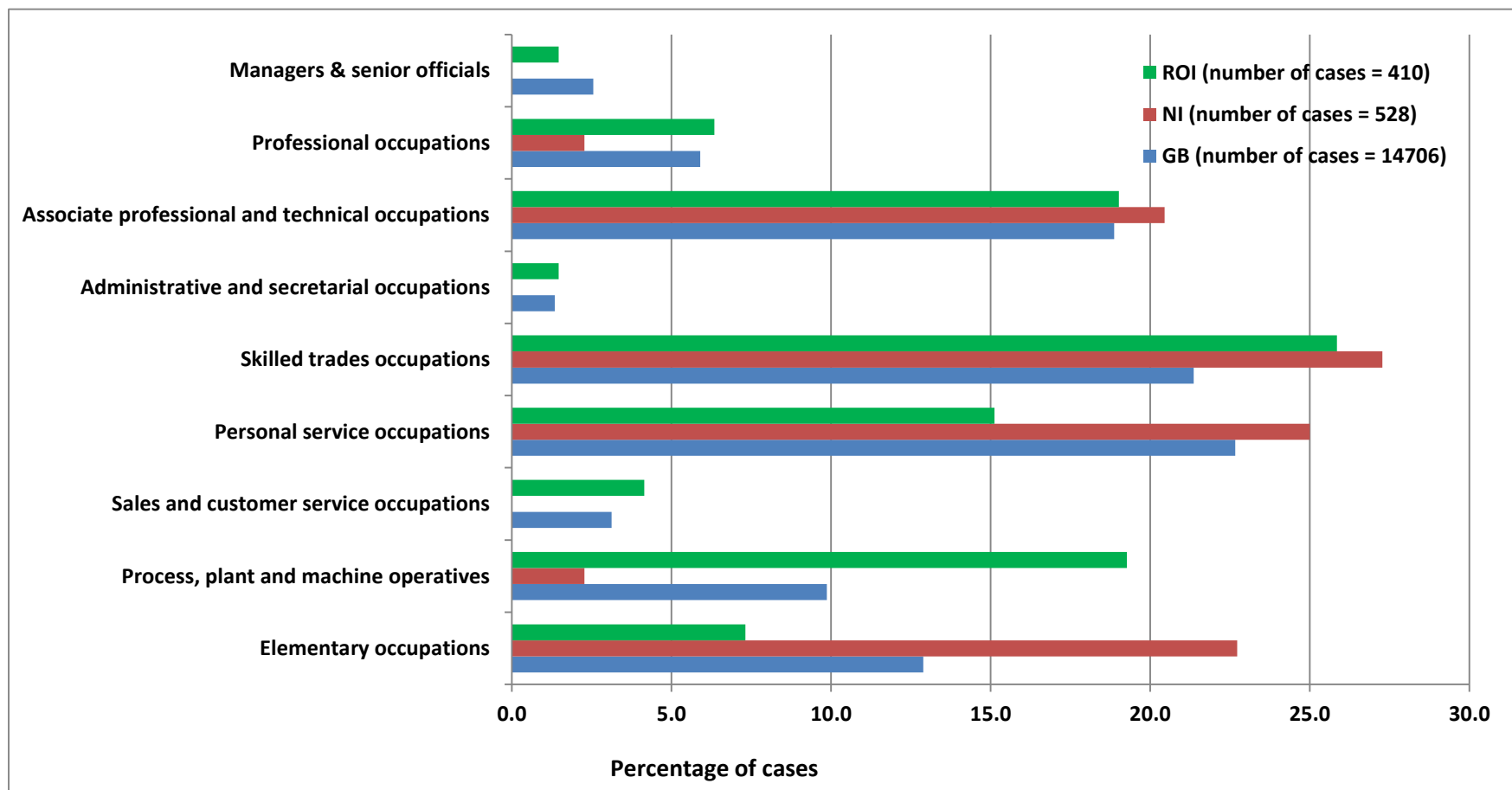


Table 6 Most frequently reported agents for contact dermatitis, reported by dermatologists to EPIDERM (2005-2015) – number of cases and (percentage of total cases in the respective column)

| | ROI (actual) | NI (actual) | NI (estimated) | GB (actual) | GB (estimated) |
|---|-------------------------|------------------------|--------------------------------|------------------------|---------------------------|
| Rubber chemicals & materials | 91 (22%) | 5 (11%) | 60 (11%) | 1312 (20%) | 2698 (18%) |
| Wet work | 60 (15%) | 18 (41%) | 216 (41%) | 1958 (29%) | 3069 (21%) |
| Nickel & its compounds | 59 (14%) | 5 (11%) | 60 (11%) | 490 (7%) | 1348 (9%) |
| Preservatives | 53 (13%) | 4 (9%) | 48 (9%) | 791 (12%) | 1484 (10%) |
| Chromium & its compounds | 43 (10%) | 2 (5%) | 24 (5%) | 220 (3%) | 638 (4%) |
| Cobalt & its compounds | 26 (6%) | 0 | 0 | 250 (4%) | 624(4%) |
| Resins | 23 (6%) | 0 | 0 | 295 (4%) | 548 (4%) |
| Acrylics & acrylates | 20 (5%) | 2 (4%) | 24 (5%) | 324(5%) | 621 (4%) |
| PPE | 20 (5%) | 7 (16%) | 84 (16%) | 1080 (16%) | 1597 (11%) |
| Hairdressing chemicals | 18 (4%) | 2 (5%) | 24 (5%) | 487 (7%) | 1257 (9%) |
| Drugs & medicaments | 17 (4%) | 0 | 0 | 95 (1%) | 161 (1%) |
| Foods, additives & flavourings | 16 (4%) | 0 | 0 | 145 (2%) | 464 (3%) |
| Soaps & detergents | 15 (4%) | 12 (27%) | 144 (27%) | 1648 (25%) | 3320 (23%) |
| Perfumes & fragrances | 15 (4%) | 0 | 0 | 305 (5%) | 712 (5%) |
| PPD | 15 (4%) | 4 (9%) | 48 (9%) | 274 (4%) | 890 (6%) |
| Plants | 13 (3%) | 2 (5%) | 24 (5%) | 267 (4%) | 619 (4%) |
| | | | | | |
| Number of cases | 410 | 44 | 528 | 6654 | 14706 |

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

3.5 SURVEILLANCE OF WORK-RELATED AND OCCUPATIONAL RESPIRATORY DISEASE (SWORD), 2005-2015

3.5.1 DIAGNOSES

The addition of the 2015 case reports brings the total cases reported by chest physicians to ROI-SWORD (2005-2014) to 142. These produced 158 diagnoses, with 20 cases having 2 or more diagnoses, and 5 cases not being assigned a diagnosis (involving 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%) reported to ROI-SWORD, whilst for NI and GB the highest proportion was benign pleural plaques (38% and 42% respectively) (Table 7).

3.5.2 AGE AND GENDER

Case reports to ROI-SWORD were predominantly male (82%), with a mean age (male plus female combined) of 54 years (age range 19 - 83 years). 15 of these case reports were in the 75+ age group (all males). Of these, 11 had a diagnosis of non-malignant pleural disease (1 with a co-diagnosis of lung cancer and 3 with a co-diagnosis of pneumoconiosis), with the occupations listed as a retired tunneller, construction labourer (4 cases), power station worker, painter, retired demolition worker, peat operative, electrician and carpenter. The remaining 4 cases were a diagnosis of lung cancer (construction operative), asthma (horse allergy reported in a riding instructor) and 2 pneumoconiosis (1 case attributed to silica: reported in a

sand blaster working in an iron foundry, and 1 case in a general construction operative attributed to asbestos). The 7228 GB cases (7379 diagnoses) in the 75 and over age range were mainly non-malignant pleural disease (46%), mesothelioma (35%) and pneumoconiosis (11%).

Restricting the analysis to cases of asthma, 66% of ROI cases were males with a mean age (male plus female combined) of 44 years (age range 19 - 76 years). By comparison, 93% of the cases of asthma reported to NI were males, with a mean age of 55 years (age range 27 - 62 years); 68% of the cases of asthma reported to GB were males with a mean age (male plus female combined) of 45 years (age range 17 - 76 years).

Table 7 Number and type of diagnoses reported by chest physicians to SWORD (2005-2015) in the Republic of Ireland, Northern Ireland & Great Britain

| | ROI (actual) | NI (actual) | NI (estimated) | GB (actual) | GB (estimated) |
|--------------------------------------|---------------------|--------------------|-----------------------|--------------------|-----------------------|
| Asthma | 50 (35%) | 7 (9%) | 29 (14%) | 1152 (18%) | 2560 (11%) |
| Inhalation accidents | 13 (9%) | 2 (2%) | 2 (1%) | 49 (1%) | 192 (1%) |
| Allergic alveolitis | 4 (3%) | 3 (4%) | 25 (12%) | 103 (2%) | 433 (2%) |
| Bronchitis/ emphysema | 12 (8%) | 0 | 0 | 131 (2%) | 439 (2%) |
| Infectious disease | 1 (1%) | 0 | 0 | 36 (1%) | 300 (1%) |
| Non-malignant pleural disease | 28 (20%) | 33 (40%) | 77 (38%) | 2685 (43%) | 9956 (42%) |
| Mesothelioma | 5 (4%) | 18 (22%) | 29 (14%) | 1090 (17%) | 6425 (27%) |
| Lung cancer | 7 (5%) | 4 (5%) | 15 (7%) | 200 (3%) | 959 (4%) |
| Pneumoconiosis | 28 (20%) | 15 (18%) | 26 (13%) | 660 (11%) | 2211 (9%) |
| Other respiratory | 10 (7%) | 4 (5%) | 4 (2%) | 455 (7%) | 862 (4%) |
| | | | | | |
| Total cases | 142 (100%) | 82 (100%) | 203 (100%) | 6259 (100%) | 23771 (100%) |
| Total diagnoses | 158 | 86 | 207 | 6561 | 24337 |

3.5.3 INDUSTRY AND OCCUPATION

For all three geographical areas (ROI, NI and GB), cases of work-related respiratory disease were most frequently reported in the construction and manufacturing sectors (Figure 6). Within the manufacturing sector, cases in ROI were most frequently reported in the manufacture of other non-metallic mineral products (for example, cement), and chemicals and chemical products. For NI and GB the most frequently reported manufacturing sector was manufacture of other transport equipment (other than motor vehicles, for example ship building).

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). The most frequently reported occupation for cases reported in both NI and GB was carpenters and joiners (skilled trades occupations) (Figure 7).

Figure 6 Proportion of cases of respiratory disease reported to SWORD by Standard Industrial Classification (SIC), 2005-2015

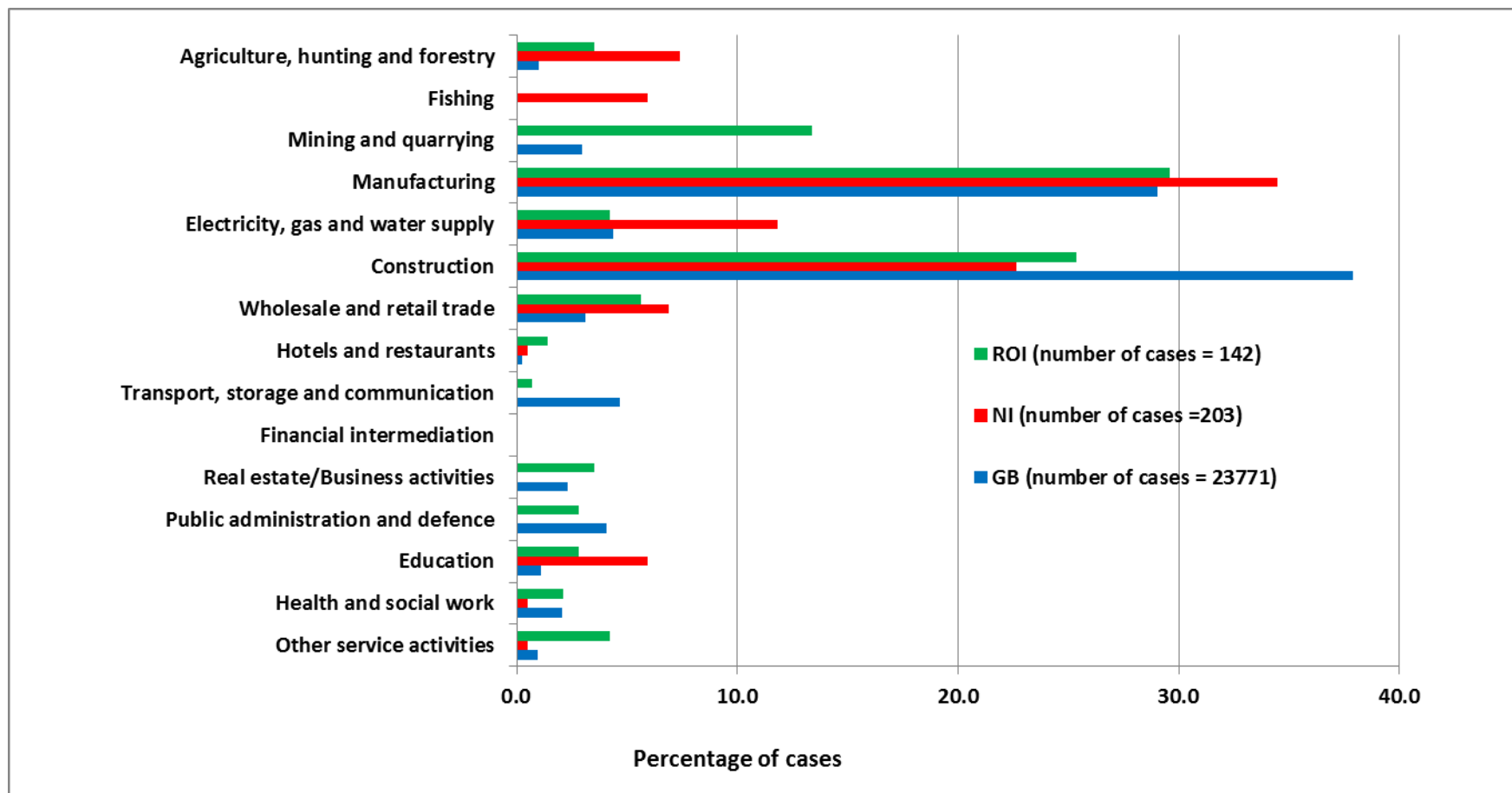
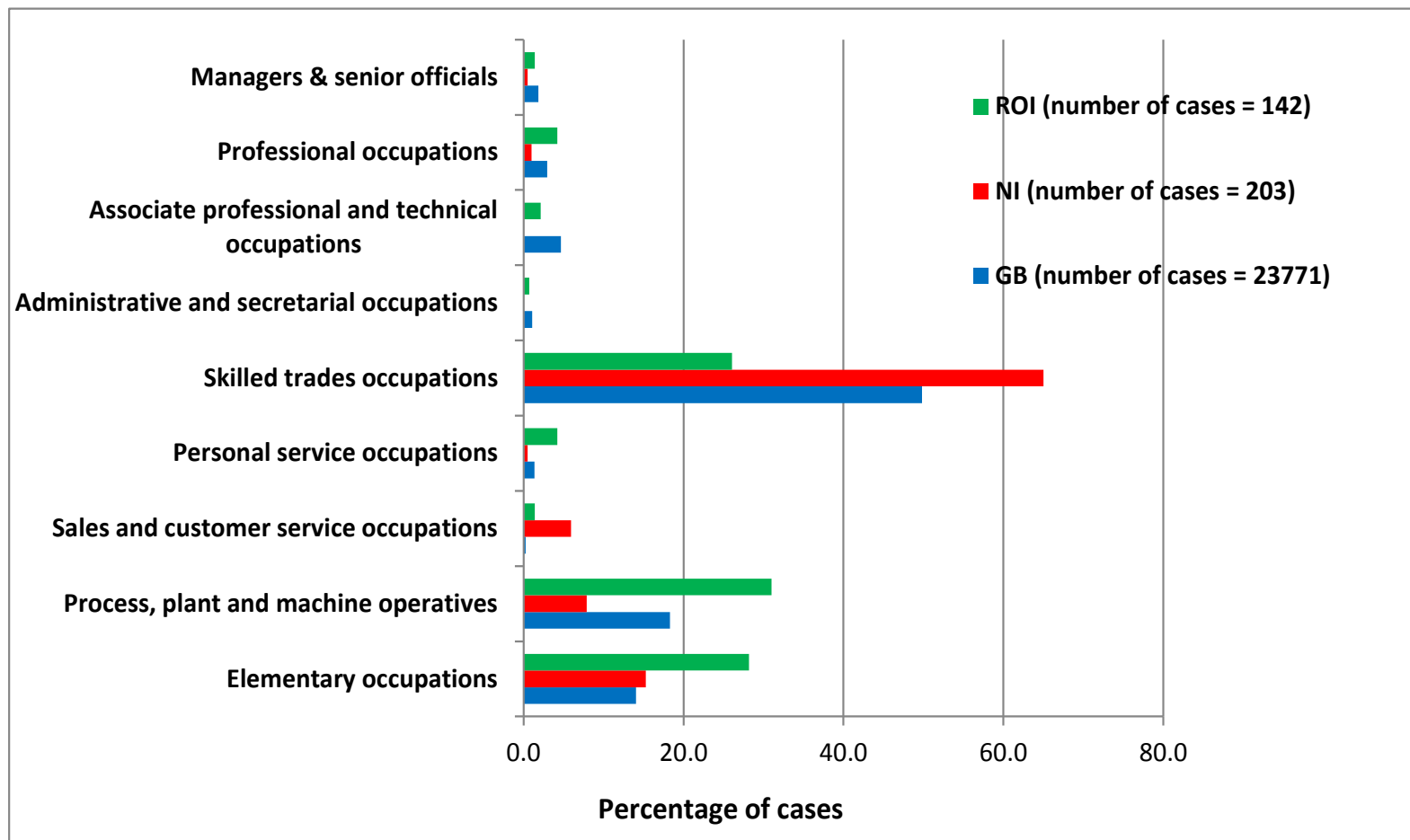


Figure 7 Proportion of cases of respiratory disease reported to SWORD by Standard Occupational Classification (SOC), 2005-2015



3.5.4 SUSPECTED AGENT

The agents associated with the respiratory diagnoses reported to ROI-SWORD are shown in Table 8. A total of 69 different agents were associated with the 50 diagnoses of occupational asthma, with isocyanates being the most frequently reported. For comparison, the most frequently reported agent for asthma in GB was also isocyanates (15%) followed by flour (13%). The agents associated with the 7 actual cases of asthma in NI were flour (4 cases), and 1 case each of fungicide, chloramines and meal worms.

Silica was the most frequently reported agent (12) for cases of pneumoconiosis reported in the ROI, with an additional 10 cases attributed to asbestos. In total, 51 diagnoses were reported as being associated with asbestos; 28 of non-malignant pleural disease, 10 of pneumoconiosis, 7 of lung cancer, 5 of mesothelioma and 1 of bronchitis/emphysema.

Table 8 Suspected agents associated with cases of work-related respiratory disease reported to ROI-SWORD, 2005-2015

| DIAGNOSIS | SUSPECTED AGENTS (as recorded by the physician) |
|-------------------------------|--|
| Asthma | Isocyanates (5 cases), inks, cement, plaster and masonry, acids, ammonia, hairdressing chemicals, glues and adhesives, bleach, soaps and detergents, formaldehyde, fuel oil, sick building syndrome, exposure to dust/fumes, hydrochloric acid, sulphuric acid, zinc, chromium, cobalt, ammonia, welding fumes, drugs and medicaments, wood/wood dust, flour, food, fungi, colophony and flux, epoxy resins, hypochlorites, dyes and pigments, persulphates, MEK- methyl ethyl ketone, and zinc welding. |
| Inhalation accidents | Ammonia (2 cases), metabisulphite (2 cases), hypochlorite, liquid urea-formaldehyde polymers, mix of sewage gases, welding fumes/oil mists, solvents, argon, cleaning agent, mixed cleaning sprays and soya dust. |
| Allergic alveolitis | Thermactinomycetes, mushroom/mushroom compost dust and fungal spores |
| Bronchitis/emphysema | Coal dust (6 cases), wood dust (2 cases), urea / formaldehyde / ammonia, gypsum, aspartame, asbestos |
| Infectious disease | Toxoplasma |
| Benign pleural disease | Asbestos |
| Mesothelioma | Asbestos |
| Lung cancer | Asbestos |
| Pneumoconiosis | Silica (9 cases, 1 case with additional agents reported talc/titanium/carbon black), asbestos (10 cases), welding fumes/zinc/iron/coolant oils (1 case), coal dust (5 cases), other silicates (2 cases), and wood dust/isocyanates/laquers (1 case) |
| Other respiratory | 4 cases reported as rhinosinusitis / sinusitis (urea/formaldehyde/ammonia, mix of damp fungi, and wood dust, aspartame), 2 diagnoses of rhinitis (toluene di-isocyanate, and 'multiple possible agents'), and 1 diagnosis each of rhinorrhoea (a specified histamine H2-receptor antagonist), hyposmia (exhaust fumes), hard metal lung disease (tungsten) and sick building syndrome (agent not cited) |

3.6 OCCUPATIONAL PHYSICIANS REPORTING ACTIVITY (OPRA), 2007-2015

3.6.1 DIAGNOSES

A total of 1390 case reports (1397 diagnoses) were reported to ROI-OPRA between January 2007 and December 2015. A breakdown of the cases by major diagnostic group, and a comparison with OPRA data from NI and GB, is provided in Table 9. For all three geographical areas, the largest proportion of cases was mental ill-health, followed by musculoskeletal disorders, with smaller proportions of skin and respiratory diagnoses.

Other work stress was the most frequently reported mental ill-health diagnosis reported to ROI-OPRA (64% of the 732 cases) whilst the most frequently reported musculoskeletal disorder was spine/back disorders (62% of the 472 cases). Diagnoses reported under 'other' mental ill-health included adjustment disorder, burnout, fatigue, social phobia and mixed affective disorder whilst 'other' musculoskeletal diagnoses were primarily injuries.

CD was the most frequently reported skin diagnosis to ROI-OPRA (87% of the 132 cases) and asthma the most frequently reported respiratory diagnosis (39% of the 23 cases). Other reported dermatoses included scabies, urticaria, bleeding hands, nail infection, dry chapped hands, angio oedema and dermatophytosis. The 6 diagnoses reported under 'other' respiratory were sinusitis (3 diagnoses), tuberculosis, smoke inhalation, and 'upper respiratory tract irritation'.

Table 9 **Number and type of diagnoses reported by occupational physicians to OPRA (2007-2015) in the Republic of Ireland, Northern Ireland & Great Britain**

| | ROI | NI (actual) | NI (estimated) | GB (actual) | GB (estimated) |
|----------------------------------|--------------------|--------------------|-----------------------|--------------------|-----------------------|
| Skin | 132 (9%) | 27 (6%) | 258 (5%) | 534 (6%) | 3020 (7%) |
| • Contact dermatitis | • 115 (87%) | • 25 (93%) | • 234 (91%) | • 439 (82%) | • 2452 (81%) |
| • Other dermatoses | • 18 (14%) | • 2 (7%) | • 24 (9%) | • 95 (18%) | • 568 (19%) |
| Respiratory | 23 (2%) | 6 (1%) | 72 (1%) | 233 (3%) | 1377 (3%) |
| • Asthma | • 9 (39%) | • 3 (50%) | • 36 (50%) | • 94 (40%) | • 545 (40%) |
| • Rhinitis | • 1 (4%) | • 1 (17%) | • 12 (17%) | • 38 (16%) | • 247 (18%) |
| • Inhalation accidents | • 4 (17%) | • 1 (17%) | • 12 (17%) | • 20 (9%) | • 108 (8%) |
| • Infectious disease | • 1 (4%) | • 0 | • 0 | • 11 (5%) | • 88 (6%) |
| • Bronchitis/emphysema | • 3 (13%) | • 0 | • 0 | • 5 (2%) | • 38 (3%) |
| • Other respiratory | • 6 (26%) | • 1 (17%) | • 12 (17%) | • 65 (28%) | • 351 (25%) |
| Musculoskeletal | 472 (34%) | 124 (29%) | 1323 (27%) | 2650 (31%) | 14926 (33%) |
| • Upper limb | • 162 (34%) | • 70 (56%) | • 708 (54%) | • 1473 (56%) | • 7567 (51%) |
| • Neck / Spine / back | • 292 (62%) | • 33 (27%) | • 363 (27%) | • 778 (29%) | • 5013 (34%) |
| • Lower limb | • 22 (5%) | • 11 (9%) | • 132 (10%) | • 271 (10%) | • 1569 (11%) |
| • Other musculoskeletal | • 15 (3%) | • 10 (8%) | • 120 (9%) | • 128 (5%) | • 777 (5%) |
| Mental ill-health | 732 (53%) | 273 (63%) | 3100 (64%) | 5558 (65%) | 27503 (60%) |
| • Anxiety and depression | • 194 (27%) | • 101 (37%) | • 1168 (38%) | • 2573 (46%) | • 12583 (46%) |
| • PTSD | • 14 (2%) | • 5 (2%) | • 38 (1%) | • 137 (2%) | • 1193 (4%) |
| • Psychotic episode | • 1 (<1%) | • 0 | • 0 | • 6 (<1%) | • 28 (<1%) |
| • Other work stress | • 469 (64%) | • 163 (60%) | • 1846 (60%) | • 2649 (48%) | • 12846 (47%) |
| • Other mental ill-health | • 111 (15%) | • 4 (1%) | • 48 (2%) | • 193 (3%) | • 853 (3%) |
| Other diagnoses | 38 (3%) | 10 (2%) | 109 (2%) | 306 (4%) | 1835 (4%) |
| Total cases | 1390 (100%) | 434 (100%) | 4823 (100%) | 8557 (100%) | 45528 (100%) |
| Total diagnoses | 1397 | 440 | 4862 | 9281 | 48661 |

The 38 diagnoses in the 'other' category (ROI-OPRA) included 'assault' (13 cases), noise induced hearing loss (6 cases), sleep problems (4 cases), latex allergy (2 cases), needle stick injury (2 cases), dry eyes (2 cases), tinnitus (2 cases), blindness, eye irritation, lead toxicity, chemical splash, and conjunctivitis (each reported once).

3.6.2 AGE AND GENDER

The proportions of cases reported to OPRA by age and gender are shown in Figure 8. In both NI and GB, cases were most frequently reported in the 45-54 years of age group for both males and females, whilst for ROI males were most frequently reported in the 35-44 year age group and females in the 45-54 year group.

3.6.3 INDUSTRY AND OCCUPATION

The majority (77%) of the cases reported to ROI-OPRA were reported in health and social care (Figure 9) with cases also frequently reported in transport, storage and communication (14%). These data need to be interpreted cautiously. Some industry sectors such as health and social care may have better provision of occupational health services and especially of occupational physicians, than other industry sectors in general. 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%), nursing auxiliaries and assistants (6%) and bus drivers (6%).

Cases in GB were also most frequently reported in the health and social care sector (but proportionally less (39%) than seen for ROI) and in nurses (11%). A substantial proportion (22%) of NI cases were also reported in health and social care, however the majority (51%) were reported in public administration and defence, with prison service officers being the most frequently reported occupation for NI (13%).

Figure 8 Proportion of cases of work-related ill-health reported to OPRA by age and gender, 2007-2015

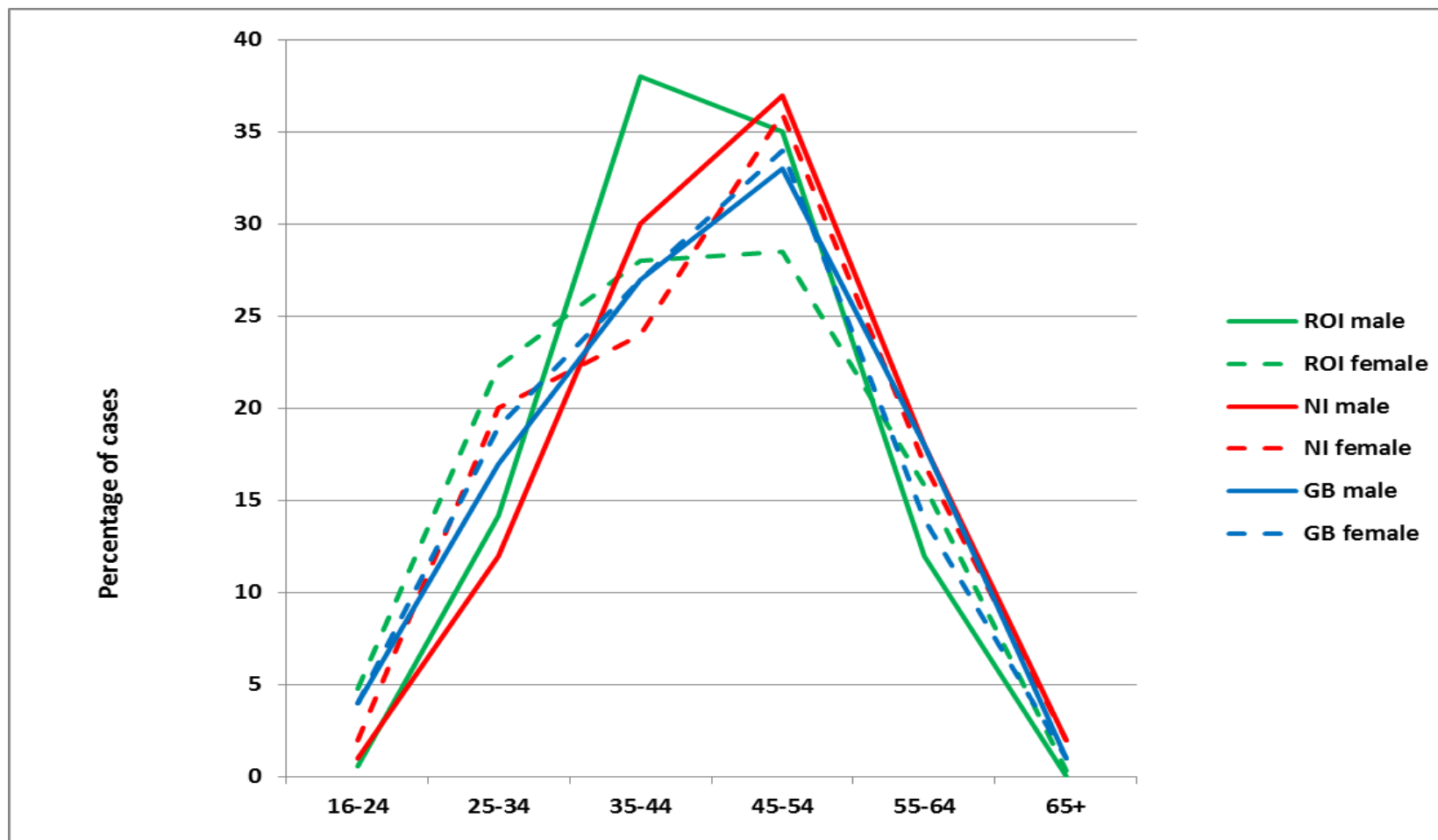


Figure 9 Proportion of cases of work-related ill-health reported to OPRA by Standard Industrial Classification (SIC), 2007-2015

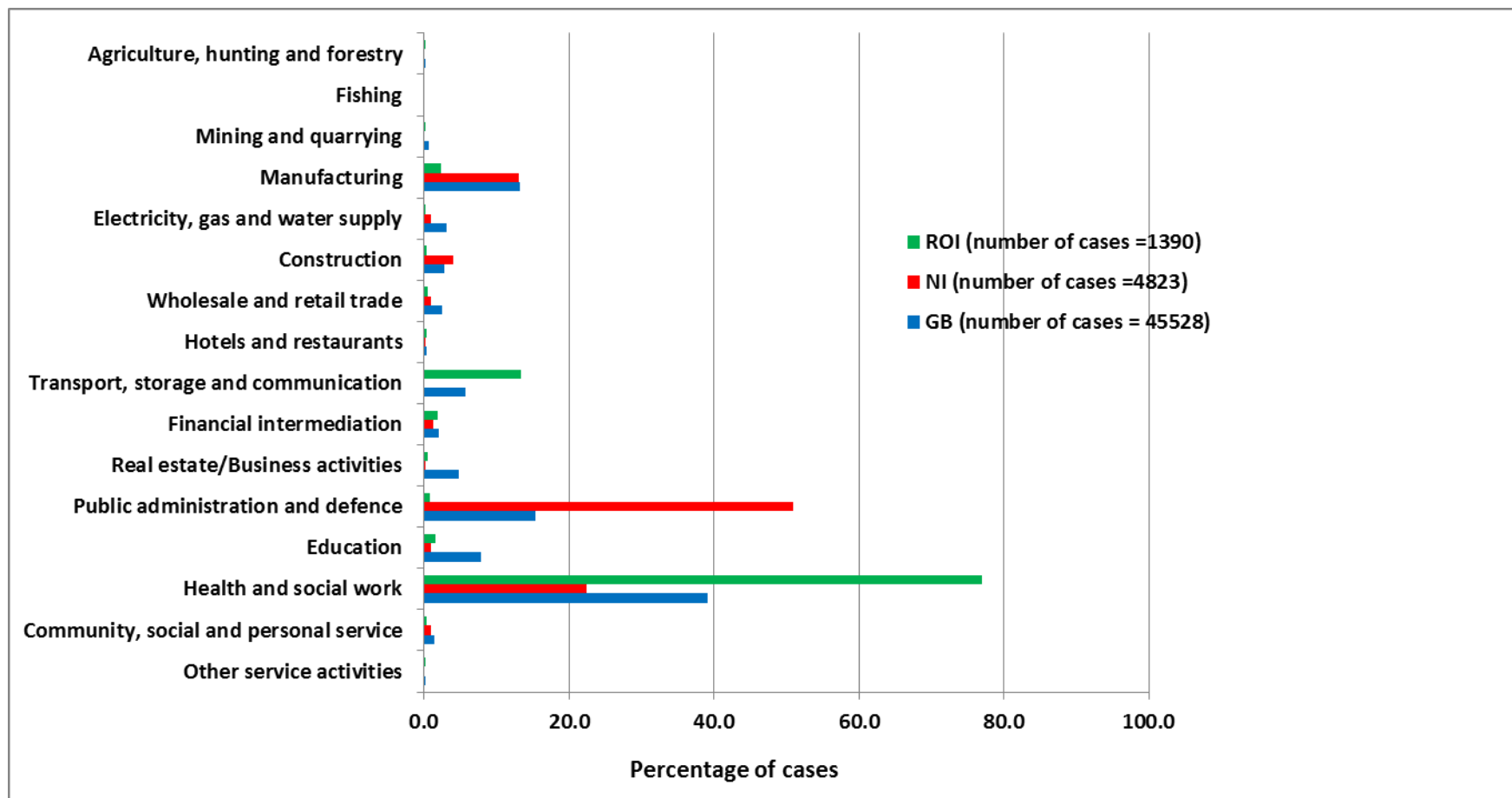
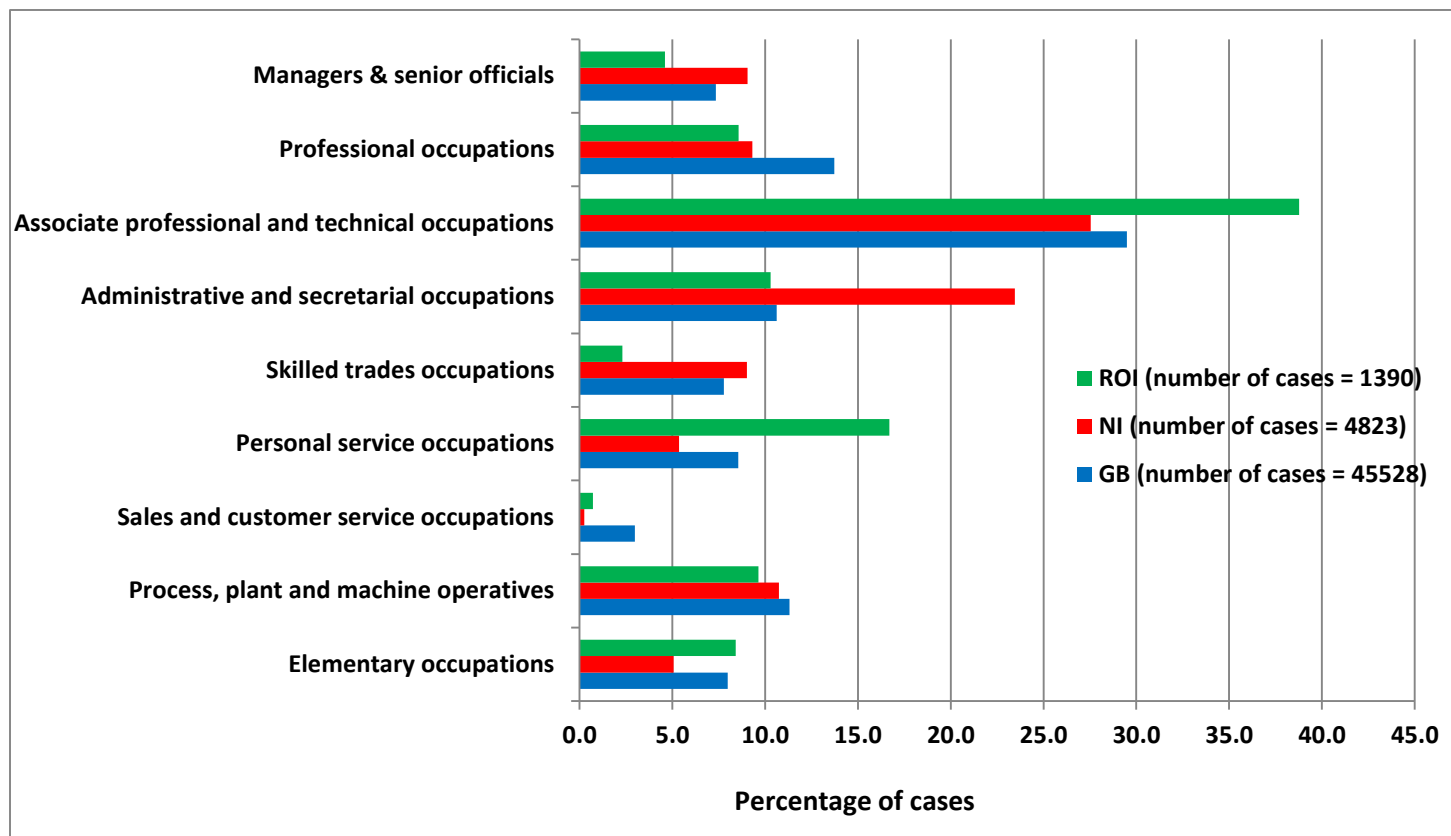


Figure 10 Proportion of cases of work-related ill-health reported to OPRA by Standard Occupational Classification (SOC), 2007-2015



3.6.4 SUSPECTED AGENTS

The most frequently associated precipitating events associated with the 732 mental ill-health case reports (45%) were classified as 'factors intrinsic to the job' which included 'workload', 'travel', and 'organisational factors' and 'interpersonal relationships' (40%) which included perceived bullying and difficulties with manager / staff / clients etc. (Figure 11). These two categories were also the most frequently reported categories for cases reported in GB and NI. Other precipitating events reported to ROI-OPRA included 'traumatic events' (25%), 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 task for musculoskeletal cases reported to ROI-OPRA was 'lifting/carrying/pushing/pulling' (36%) whilst the most frequently associated movement was 'materials handling' (47%), with a further 29% of cases reported as 'accidents' (Table 10). A very similar pattern was observed for NI and GB.

The most frequently associated agents associated with the 132 skin cases reported to ROI-OPRA were wet work (42%), protective clothing (23%), sterilising and disinfecting agents (23%), soaps and detergents (14% of cases) and rubber chemicals and materials (11%). The agents associated with the 23 respiratory cases included chlorine disinfectant, acetic acid, wood dust, chlorine dioxide, grain, potassium dichromate, 'sanitizer fumes', cleaning agents, flour, denatured ethanol (Industrial Methylated Spirit)/ isopropyl alcohol (IPA), smoke inhalation, sewage aerosol, disinfectant, dusty environments and high temperatures.

Figure 11 Proportion of actual cases of mental ill-health reported to OPRA by precipitating event, 2007-2015

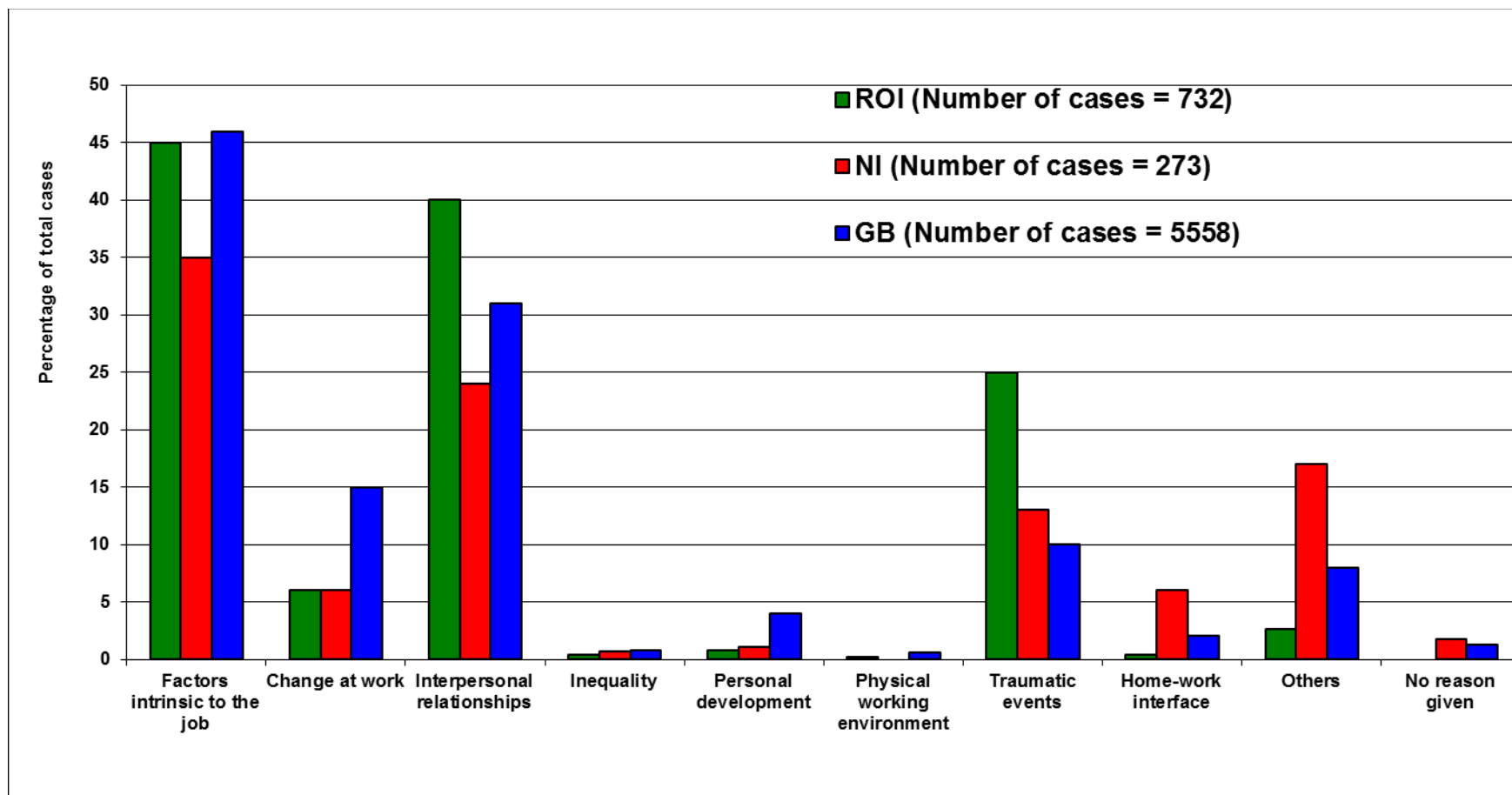


Table 10 Proportion of musculoskeletal cases reported to OPRA (2007-2015) by task and movement in the Republic of Ireland, Northern Ireland and Great Britain

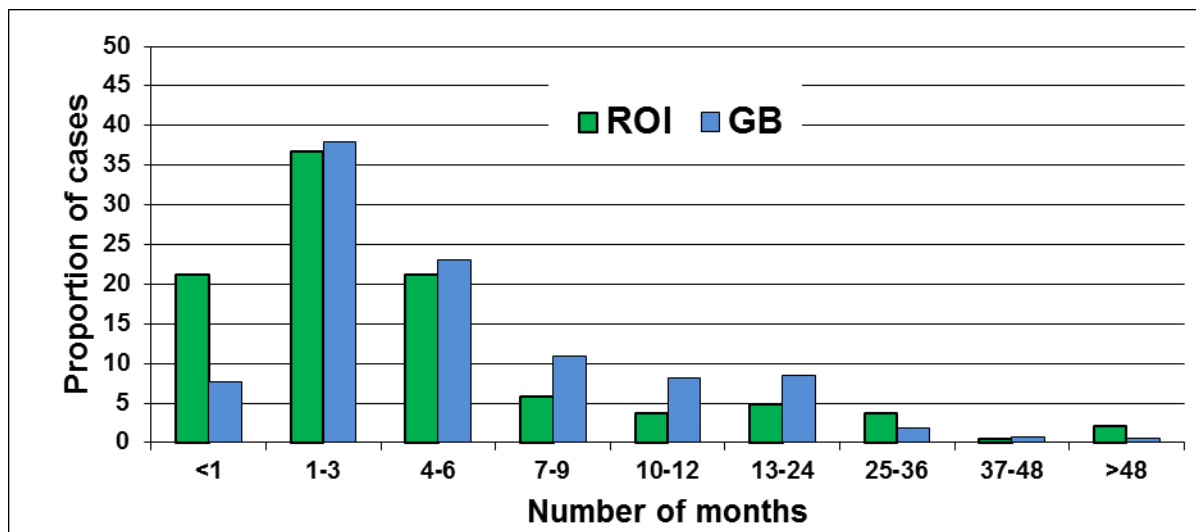
| Task / movement | ROI | NI | GB |
|----------------------------------|------------|------------|-------------|
| <u>TASK</u> | | | |
| Keyboard work | 51 (11%) | 4 (3%) | 272 (10%) |
| Screwing, cutting | 1 (<1%) | 0 | 20 (1%) |
| Hammering, chopping, sawing | 0 | 0 | 5 (<1%) |
| Guiding or holding tool | 10 (2%) | 17 (14%) | 435 (16%) |
| Meat boning or filleting | 0 | 0 | 39 (1%) |
| Packing or sorting | 2 (<1%) | 1 (1%) | 66 (2%) |
| Assembly | 2 (<1%) | 2 (2%) | 36 (1%) |
| Materials manipulation | 88 (19%) | 14 (11%) | 300 (11%) |
| Machine operation | 9 (2%) | 8 (6%) | 129 (5%) |
| Lifting/carrying/pushing/pulling | 171 (36%) | 18 (15%) | 504 (19%) |
| Coordinated whole body movement | 1 (<1%) | 0 | 33 (1%) |
| Driving | 4 (1%) | 0 | 33 (1%) |
| Accidents | 137 (29%) | 54 (44%) | 630 (24%) |
| Other | 6 (1%) | 1 (1%) | 84 (3%) |
| Not stated/uncodeable | 11 (2%) | 7 (6%) | 124 (5%) |
| <u>MOVEMENT</u> | | | |
| Fine hand | 11 (2%) | 2 (2%) | 174 (7%) |
| Forceful upper limb/grip | 16 (3%) | 19 (15%) | 582 (22%) |
| Torque upper limb | 0 | 0 | 7 (<1%) |
| Lifting | 26 (6%) | 3 (2%) | 240 (9%) |
| Carrying | 2 (<1%) | 0 | 23 (1%) |
| Pushing | 0 | 1 (1%) | 16 (1%) |
| Pulling | 6 (1%) | 1 (1%) | 19 (1%) |
| Forceful leg movement | 0 | 0 | 2 (<1%) |
| Overhead work | 3 (1%) | 0 | 9 (<1%) |
| Materials handling n.e.c. | 224 (47%) | 35 (28%) | 576 (22%) |
| Bending | 1 (<1%) | 0 | 33 (1%) |
| Sitting | 4 (1%) | 0 | 27 (1%) |
| Standing/walking | 4 (1%) | 0 | 43 (2%) |
| Kneeling | 1 (<1%) | 0 | 12 (1%) |
| Twisting | 2 (<1%) | 0 | 28 (1%) |
| Postural n.e.c. | 49 (10%) | 2 (2%) | 235 (9%) |
| Accidents | 139 (29%) | 54 (44%) | 627 (23%) |
| Other | 27(6%) | 32 (26%) | 670 (25%) |
| Not stated/uncodeable | 11 (2%) | 7 (6%) | 122 (5%) |
| Total cases | 472 | 124 | 2650 |

3.6.5 SYMPTOM ONSET

In ROI, for cases of work-related mental ill-health (specifically, anxiety and depression, and other work stress) over 50% of cases were most frequently seen by OPs reporting to OPRA 1 to 3 months after onset of symptoms, the figure is slightly less than 50% for GB cases (Figures 12 and 13). The median number of months in ROI was 2 for anxiety and depression and 3 for other work stress, whereas for GB, the median number of months was 4 for both diagnostic categories.

The majority of upper limb disorders were also reported within 1 to 3 months after symptom onset, with a median of 2 months for ROI and 5 months for GB (Figure 14). For spine/back disorders a slightly different pattern was observed with (overall) cases in the ROI reported slightly sooner (median of 1 month) compared to cases in GB (median 3 months) (Figure 15). For both the ROI and GB, case reports of CD were most frequently reported within 1-3 months of onset of symptoms (Figure 16).

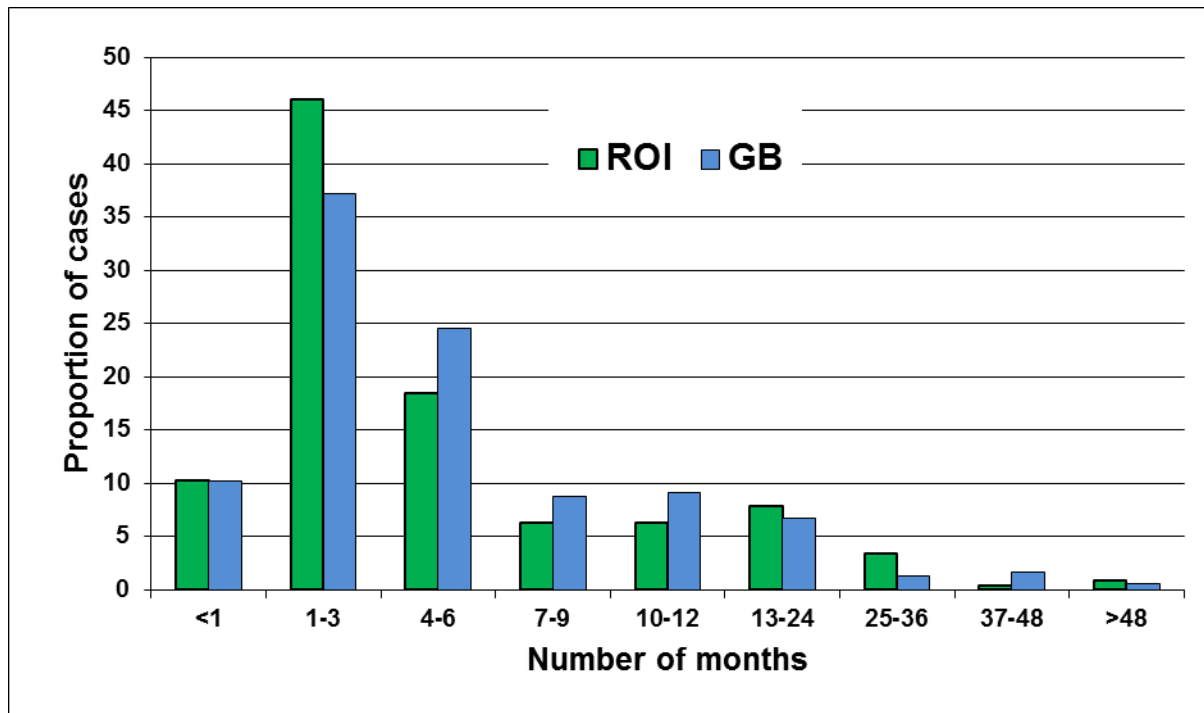
Figure 12 Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related anxiety and depression reported to OPRA (2007-2015) in the Republic of Ireland and Great Britain



*NB Physicians can provide full (month, year) or part (year only) data for symptom onset, unlike in previous reports, this analysis is based on both full and part data.

| | MONTHS | | | | | |
|-----|--------|---------|---------|------|--------|----------|
| | Number | Minimum | Maximum | Mean | Median | Std. Dev |
| ROI | 188 | 0 | 67 | 6.1 | 2 | 11.3 |
| GB | 2399 | 0 | 180 | 7.2 | 4 | 11.2 |

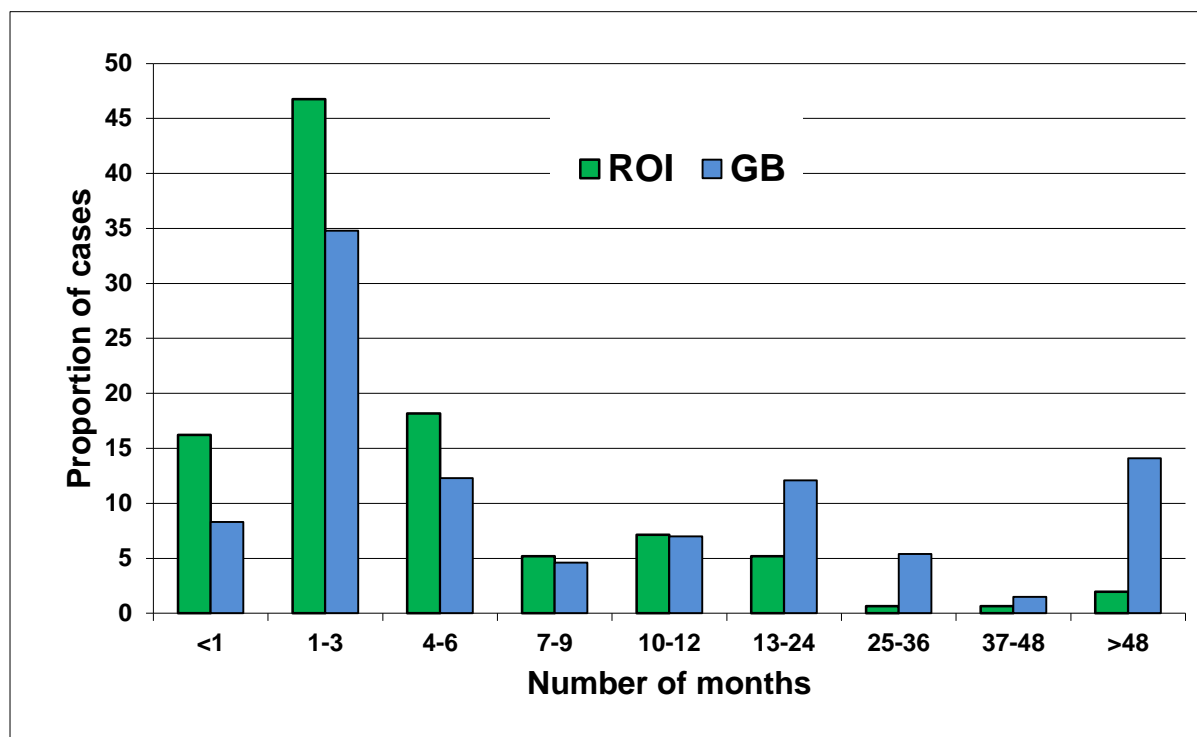
Figure 13 Proportional time lapse between month of symptom onset and reporting month for actual cases of other work stress reported to OPRA (2007-2015) in the Republic of Ireland and Great Britain



*NB Physicians can provide full (month, year) or part (year only) data for symptom onset, unlike in previous reports, this analysis is based on both full and part data.

| | MONTHS | | | | | |
|-----|--------|---------|---------|------|--------|----------|
| | Number | Minimum | Maximum | Mean | Median | Std. Dev |
| ROI | 445 | 0 | 62 | 5.8 | 3 | 8.3 |
| GB | 2461 | 0 | 156 | 6.7 | 4 | 10.9 |

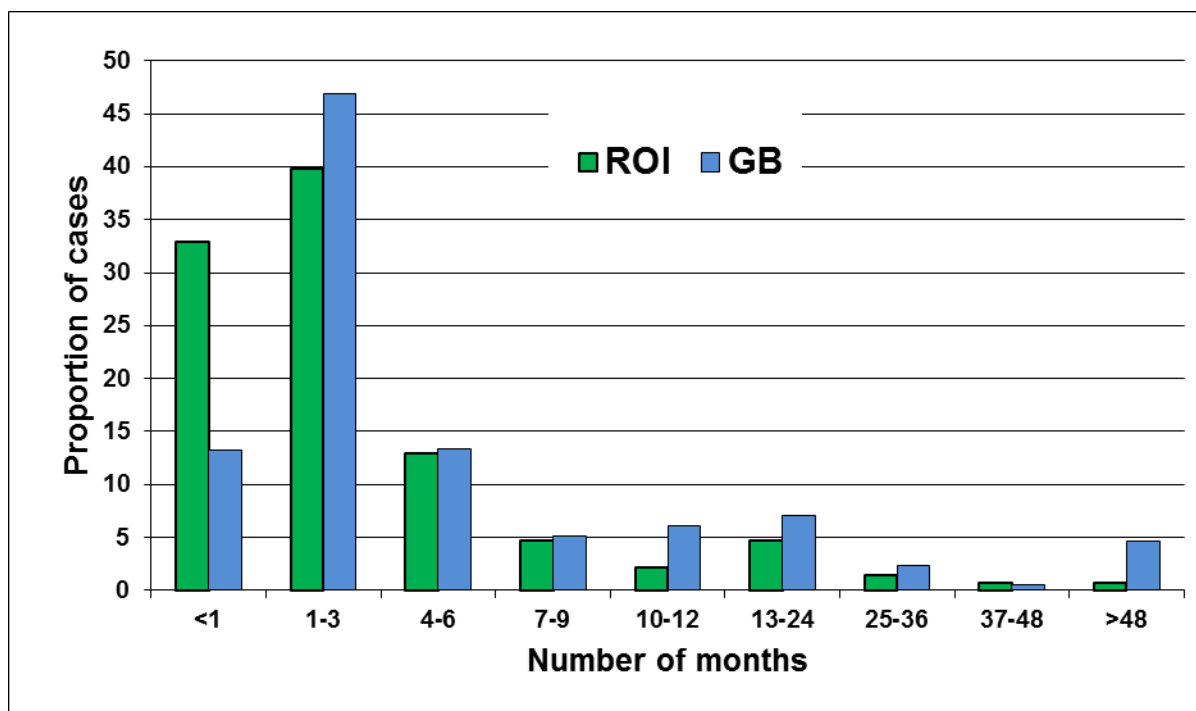
Figure 14 Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related upper limb disorders reported to OPRA (2007-2015) in the Republic of Ireland and Great Britain



*NB Physicians can provide full (month, year) or part (year only) data for symptom onset, unlike in previous reports, this analysis is based on both full and part data.

| | MONTHS | | | | | |
|-----|--------|---------|---------|------|--------|----------|
| | Number | Minimum | Maximum | Mean | Median | Std. Dev |
| ROI | 154 | 0 | 61 | 5 | 2 | 7.8 |
| GB | 1367 | 0 | 360 | 22.5 | 5 | 41.0 |

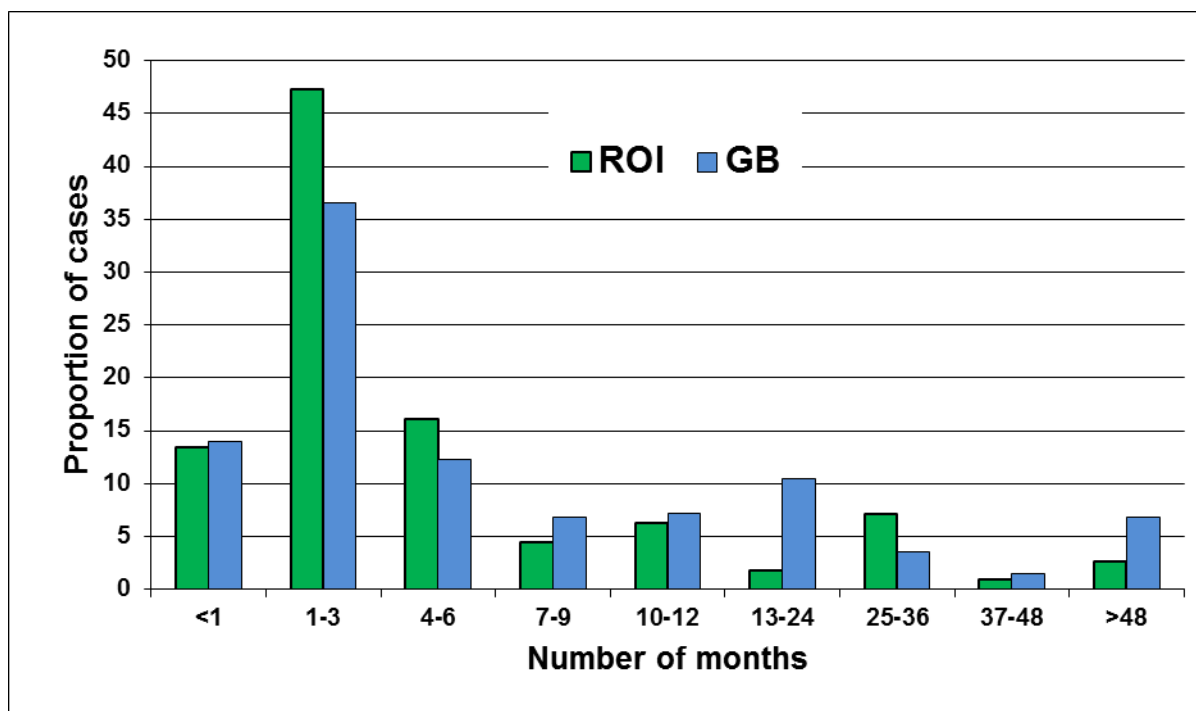
Figure 15 Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related spine/back disorders reported to OPRA (2007-2015) in the Republic of Ireland and Great Britain



*NB Physicians can provide full (month, year) or part (year only) data for symptom onset, unlike in previous reports, this analysis is based on both full and part data.

| | MONTHS | | | | | |
|-----|--------|---------|---------|------|--------|----------|
| | Number | Minimum | Maximum | Mean | Median | Std. Dev |
| ROI | 279 | 0 | 100 | 4 | 1 | 9 |
| GB | 703 | 0 | 252 | 10.8 | 3 | 28.1 |

Figure 16 Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related contact dermatitis reported to OPRA (2007-2015) in the Republic of Ireland and Great Britain



*NB Physicians can provide full (month, year) or part (year only) data for symptom onset, unlike in previous reports, this analysis is based on both full and part data.

| | MONTHS | | | | | |
|-----|--------|---------|---------|------|--------|----------|
| | Number | Minimum | Maximum | Mean | Median | Std. Dev |
| ROI | 112 | 0 | 96 | 7.5 | 2.5 | 14.0 |
| GB | 414 | 0 | 240 | 15.2 | 3 | 34.3 |

4 DISCUSSION

A total of 1970 incident cases were reported to ROI-THOR between 2005-2015, of which 71% were reported by OPs (2007-2015) with smaller proportions from dermatologists (22%), chest physicians (7%) and GPs (<1%).

A total of 73 physicians (12 chest physicians, 13 dermatologists, 26 OPs and 22 GPs) were enrolled in ROI-THOR in 2015, with numbers remaining fairly stable since the inception of the schemes. 2015 was the first year of GP reporting to THOR in the ROI and whilst the total case count was relatively low (9 cases), the active participation rate (i.e. those returning cases or declaring 'I have nothing to report this month') of the GPs in 2015 was higher than for the other ROI schemes (55% compared to 17-31%). In addition, unlike reporters to ROI-SWORD, EPIDERM and OPRA (who participate on a monthly basis), ROI-THOR-GP reporters participate for one randomly chosen month per year. Thus, as data collection to THOR-GP progresses, the 'actual' cases reported to this scheme will be weighted to account for this sampling frequency (and to ensure comparability with cases reported to other THOR schemes).

Overall, the participation rate of physicians in ROI-THOR is lower than the equivalent rates in the analogous UK THOR schemes. It has been estimated that approximately 21% of ROI chest physicians, 33% of dermatologists and 33% of OPs are enrolled in ROI-THOR compared to the UK equivalents of 72%, 65% and 50% respectively (although participation rates may be difficult to interpret because some specialist physicians may not be eligible to report to THOR e.g. they may not see patients of

working age or focus their practice on certain limited conditions). THOR-GP is different in that only a sample of GPs is expected to participate and only GPs with the appropriate qualifications and experience in occupational medicine. It has been estimated that there are potentially 150 GPs in the ROI with the appropriate qualifications and experience to be targeted for recruitment to ROI THOR-GP, equating to a current participation rate of 15% (UK equivalent is also approximately 15%). In order to increase participation rates to THOR-GP in the ROI, we have recently approached the Irish College of General Practitioners (ICGP) to ask whether it would be considered ethically acceptable to the committee to approach GPs (for recruitment) identified through a search of the internet using the terms “LFOM Ireland GP” (search results included a number of General Practice websites in the Republic of Ireland; these included the list of practice staff and their qualifications). Previously, recruitment to THOR-GP has been undertaken via the Irish Society of Occupational Medicine, and the FOM (RCPI) (i.e. the research team at The University of Manchester has not had direct access to lists of eligible GPs and their contact details).

In general, measures to increase participation in the ROI schemes (and the number of cases of WRI reported to ROI-THOR) are continuously undertaken. The most recent and significant innovation is the imminent launch of an online Continuing Professional Development (CPD) tool entitled EELAB (Electronic, Experiential Learning, Audit and Benchmarking). This will be made freely available for the use of OPs enrolled in ROI-OPRA and GPs enrolled in ROI-THOR-GP. EELAB is an innovative online resource including education and audit as well as clinical governance, through peer-benchmarking as part of a case reporting linked CPD

portfolio. The EELAB resource, when used in combination with THOR participation, has recently been accredited for CPD purposes by the Faculty of Occupational Medicine, of the Royal College of Physicians of Ireland. It is already currently used by GPs in the UK (having been initially accredited by the RCGP). Together with pilot groups of OPs in the ROI as well as in the UK, we have been developing the version of EELAB for OPs, and plan to develop versions for chest physicians and dermatologists in due course. The Board of the Faculty of Occupational Medicine of the Royal College of Physicians of Ireland has agreed that participation in ROI-OPRA should count for CPD purposes. Thus we hope to further support/encourage participating THOR physicians' CPD by supplementing their reporting with interactive resources as well as the opportunity for reflective self-learning. EELAB (for OPs and GPs in the ROI) is anticipated to go live in May 2016. Reporters and the HSA will be notified of the exact launch dates in due course.

In addition to launching EELAB, steps have been undertaken to increase active membership in the ROI-THOR, for example via activities undertaken to support the continued dissemination/endorsement of ROI-THOR. Recent activities include the publication of an article, which includes Dr Peter Noone (ROI-OPRA champion) as a co-author, describing the different occupational disease surveillance systems (including those in the ROI) across the 20 European countries participating in the Modernet (Monitoring Trends in Occupational Diseases and New and Emerging Risks Network) consortium²³. In addition, Dr Peter Noone gave a presentation of ROI-THOR data at the Irish Society of Occupational Medicine at Munich in September 2015 and Dr James Hayes and Dr Peter Noone attended the SWORD (Thursday 26th March) and OPRA (18th June) 2015 annual advisory committee meetings

respectively, held at the Centre for Occupational and Environmental Health; presentations of the 2014 ROI summary statistics were given at each meeting. Dr Peter Noone and Mr Kieran Sludds also remain the ROI representatives in the Modernet consortium²⁴. Although the initial COST funding for Modernet ended in 2014, the consortium is still very much active with a recent successful bid to EU-OSHA for funding for a project on sentinel and alert systems. Further bids arising from the consortium are anticipated.

In an effort to maximise the utility of the interim reports to the ROI reporters we have recently added a number of new features, which are routinely included in the UK reports, that we believe ROI reporters may find of interest. The first is 'The Beck Report', which provides a commentary by Dr Mark Wilkinson, Consultant Dermatologist at Leeds General Infirmary of the work-related skin cases reported to THOR. We also include a 'Case of the Quarter'; the idea is to give the opportunity for THOR reporters to share information which they have gathered with their peers and colleagues about an interesting case they have reported / encountered. All those participating in THOR (UK and ROI) are encouraged to submit a 'case of the quarter' for publication.

Following on from the substantive ROI-THOR report submitted in 2015, this report continues to compare THOR data collected by the ROI reporters with data from THOR schemes in NI and GB. The addition of another year of data (2015) has strengthened the validity of the similarities and differences previously observed in terms of the findings being broadly consistent with the pattern of employment and exposure in each country.

When comparing absolute incidence rates between the Republic of Ireland and comparator geographic areas in the British Isles, one is restricted to SWORD and EPIDERM data. This is because analogous denominator data exist i.e. the whole population who has access to the health services. For data on musculoskeletal or mental disorders arising from occupational physicians or GPs it is not as simple to determine comparable denominators.

The results show that overall absolute (skin and respiratory) incidence rates were generally similar, or slightly lower in the ROI compared to NI and GB. Two different rates are 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, NI or GB participating in THOR) and response (the proportion of participating physicians actively responding each month)²⁰. However, this makes the assumption that non-participating or non-responding physicians would 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 didn't, 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 1 ('unadjusted' and 'adjusted') might be considered as the possible upper and lower bounds of estimated incident cases of WRI.

For skin disease, case reports by dermatologists in the ROI continued to be almost exclusively CD. In NI and GB, a large proportion of cases were reported as CD. However, dermatologists in GB / NI reported a higher proportion of neoplasia

diagnoses compared to the ROI. The most frequently reported industrial sectors associated with skin neoplasia diagnoses were public administration and defence and also the construction and agricultural sectors. Restricting the analyses to diagnoses of CD, similar characteristics were seen between the three geographical areas in terms of age/gender, industry, occupation and suspected agents. 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. Little difference was observed for suspected agents reported by dermatologists in the three areas with rubber, wet work, nickel and chromium all frequently cited.

Similarly, while the case mix of respiratory diseases reported by chest physicians in the ROI, NI and GB differed somewhat (proportionately more asthma reported in ROI and proportionately more asbestos-related diseases reported in NI and GB), the most frequently reported industries were similar in all geographical areas (manufacturing and construction), as were the characteristics of the asthma cases (predominantly male, isocyanates the most frequently reported agents). The findings in relation to proportionally less reported asbestos-related diseases in ROI are consistent with the explanation that there may have been less exposure to asbestos in the ROI than in NI or GB²⁵.

The case mix reported by OPs in the ROI and the other two comparator geographical areas (GB and NI) continued to be remarkably similar, with the largest proportion being mental ill-health diagnoses, followed by musculoskeletal, with fewer skin and respiratory diagnoses. Lesser exposures to asbestos in the ROI compared

to GB/NI and lesser exposures to UV radiation overseas in ROI services probably account for the lesser frequency of asbestos related WRI and lesser frequency of reported occupational skin malignancies in the ROI. Otherwise there was little variation between geographical regions in the most frequently reported agents associated with diagnoses. As reported previously, the main difference between cases reported to OPRA from the ROI with those reported from GB and NI is that, although health and social care is the most frequently reported industrial group for all three geographical areas, a much larger proportion of ROI cases originate from this sector.

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 both the ROI and GB was similar to that reported on last year and showed that most cases were reported within 1 to 3 months after onset of symptoms. However, some variation was apparent, most noticeably that a greater proportion of other work stress cases were seen in under one month from symptom onset in GB compared to ROI, whilst for spine/back disorders the reverse was true with more cases seen in less than one month in the ROI compared to GB.

Although it is too early to make any meaningful comparisons between data reported by GPs in the ROI and data reported by GPs in NI and GB, early indications are that the case mix is similar with proportionately more mental ill-health and musculoskeletal diagnoses compared to skin and respiratory diagnoses.

In conclusion, with around 2000 cases of WRI reported to the constituent schemes since its inception in 2005, ROI-THOR continues to provide the best overall source of data relating to medically attributed occupational disease incidence in the ROI. Increased enrolment/participation in ROI-THOR (in particular the GP scheme) aided by steps such as the introduction of EELAB, will help increase case numbers, allowing not only the continued identification of the various determinants of risk e.g. causal agent, precipitating event (mental ill-health) and task/movement (musculoskeletal), but also more detailed comparisons with GB/NI data and more sophisticated analyses in general; thus providing useful information for the HSA and ROI.

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<http://www.coeh.man.ac.uk/u/ire-sword>
<http://www.coeh.man.ac.uk/u/ire-epiderm>

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