

**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 2016.**

Money A, Carder M and Agius R

Centre for Occupational and Environmental Health, School of Health Sciences, Faculty of Biology, Medicine and Health, The University of Manchester, 4<sup>th</sup> Floor C Block Ellen Wilkinson Building, Oxford Road, Manchester M13 9PL

	<b>CONTENTS</b>	<b>PAGE NUMBER</b>
<b>1</b>	<b>INTRODUCTION</b>	<b>12</b>
<b>2</b>	<b>METHODS</b>	<b>13</b>
<b>3</b>	<b>RESULTS</b>	<b>16</b>
<b>3.1</b>	<b>PARTICIPATION</b>	<b>16</b>
<b>3.2</b>	<b>INCIDENCE RATES</b>	<b>20</b>
<b>3.3</b>	<b>OVERVIEW OF 2016 CASE REPORTS</b>	<b>22</b>
<b>3.4</b>	<b>OCCUPATIONAL SKIN SURVEILLANCE (EPIDERM): 2005-2016</b>	<b>29</b>
<b>3.4.1</b>	<b>DIAGNOSES</b>	<b>29</b>
<b>3.4.2</b>	<b>AGE AND GENDER</b>	<b>29</b>
<b>3.4.3</b>	<b>INDUSTRY AND OCCUPATION</b>	<b>33</b>
<b>3.4.4</b>	<b>SUSPECTED AGENTS</b>	<b>34</b>
<b>3.5</b>	<b>SURVEILLANCE OF WORK-RELATED AND OCCUPATIONAL RESPIRATORY DISEASE (SWORD): 2005-2016</b>	<b>38</b>
<b>3.5.1</b>	<b>DIAGNOSES</b>	<b>38</b>
<b>3.5.2</b>	<b>AGE AND GENDER</b>	<b>38</b>
<b>3.5.3</b>	<b>INDUSTRY AND OCCUPATION</b>	<b>41</b>
<b>3.5.4</b>	<b>SUSPECTED AGENTS</b>	<b>44</b>
<b>3.6</b>	<b>OCCUPATIONAL PHYSICIANS REPORTING ACTIVITY (OPRA): 2007-2016</b>	<b>46</b>
<b>3.6.1</b>	<b>DIAGNOSES</b>	<b>46</b>
<b>3.6.2</b>	<b>AGE AND GENDER</b>	<b>48</b>
<b>3.6.3</b>	<b>INDUSTRY AND OCCUPATION</b>	<b>48</b>
<b>3.6.4</b>	<b>SUSPECTED AGENTS</b>	<b>53</b>
<b>3.6.5</b>	<b>SYMPTOM ONSET</b>	<b>56</b>
<b>3.7</b>	<b>THE HEALTH AND OCCUPATION RESEARCH NETWORK IN GENERAL PRACTICE (THOR-GP) 2015-2016</b>	<b>62</b>
<b>3.7.1</b>	<b>OVERVIEW</b>	<b>62</b>
<b>4</b>	<b>DISCUSSION</b>	<b>64</b>

	<b>LIST OF TABLES</b>	<b>PAGE NUMBER</b>
<b>1</b>	<b>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 (2005-2016)</b>	<b>21</b>
<b>2</b>	<b>Number of cases reported to ROI-SWORD, ROI-EPIDERM, ROI-OPRA and ROI-THOR-GP, 2016</b>	<b>26</b>
<b>3</b>	<b>Cases of work-related illness reported to ROI-THOR, 2016</b>	<b>27</b>
<b>4</b>	<b>Number and type of diagnoses reported by dermatologists to EPIDERM (2005-2016) in the Republic of Ireland, Northern Ireland &amp; Great Britain</b>	<b>30</b>
<b>5</b>	<b>Age and gender of contact dermatitis diagnoses in ROI-EPIDERM (2005-2016)</b>	<b>32</b>
<b>6</b>	<b>Most frequently reported agents for contact dermatitis, reported by dermatologists to EPIDERM (2005-2016) – number of cases and (percentage of total cases in the respective column)</b>	<b>37</b>
<b>7</b>	<b>Number and type of diagnoses reported by chest physicians to SWORD (2005-2016) in the Republic of Ireland, Northern Ireland &amp; Great Britain</b>	<b>40</b>
<b>8</b>	<b>Suspected agents associated with cases of work-related respiratory disease reported to ROI-SWORD, 2005-2016</b>	<b>45</b>
<b>9</b>	<b>Number and type of diagnoses reported by occupational physicians to OPRA (2007-2016) in the Republic of Ireland, Northern Ireland &amp; Great Britain</b>	<b>47</b>
<b>10</b>	<b>Proportion of musculoskeletal cases reported to OPRA (2007-2016) by task and movement in the Republic of Ireland, Northern Ireland and Great Britain</b>	<b>55</b>
<b>11</b>	<b>Number and type of diagnoses reported by general practitioners to THOR-GP (2015-2016) in the Republic of Ireland, Northern Ireland and Great Britain</b>	<b>63</b>

	<b>LIST OF FIGURES</b>	<b>PAGE NUMBER</b>
<b>1</b>	<b>Reports (cases and nil returns) in a) ROI-EPIDERM (2005-2016) b) ROI-SWORD (2005-2016) and c) ROI-OPRA (2007-2016)</b>	<b>18</b>
<b>2</b>	<b>Cases per active reporter* in a) ROI-EPIDERM (2005-2016) b) ROI-SWORD (2005-2016) and c) ROI-OPRA (2007-2016)</b>	<b>19</b>
<b>3</b>	<b>Proportion of cases of contact dermatitis reported to EPIDERM by age and gender (2005-2016)</b>	<b>31</b>
<b>4</b>	<b>Proportion of cases of contact dermatitis reported to EPIDERM by Standard Industrial Classification (SIC), 2005-2016</b>	<b>35</b>
<b>5</b>	<b>Proportion of cases of contact dermatitis reported to EPIDERM by Standard Occupational Classification (SOC), 2005-2016</b>	<b>36</b>
<b>6</b>	<b>Proportion of cases of respiratory disease reported to SWORD by Standard Industrial Classification (SIC), 2005-2016</b>	<b>42</b>
<b>7</b>	<b>Proportion of cases of respiratory disease reported to SWORD by Standard Occupational Classification (SOC), 2005-2016</b>	<b>43</b>
<b>8</b>	<b>Proportion of cases of work-related ill-health reported to OPRA by age and gender, 2007-2016</b>	<b>50</b>
<b>9</b>	<b>Proportion of cases of work-related ill-health reported to OPRA by Standard Industrial Classification (SIC), 2007-2016</b>	<b>51</b>
<b>10</b>	<b>Proportion of cases of work-related ill-health reported to OPRA by Standard Occupational Classification (SOC), 2007-2016</b>	<b>52</b>
<b>11</b>	<b>Proportion of actual cases of mental ill-health reported to OPRA by precipitating event, 2007-2016</b>	<b>54</b>
<b>12</b>	<b>Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related anxiety and depression reported to OPRA (2007-2016) in the Republic of Ireland and Great Britain</b>	<b>57</b>
<b>13</b>	<b>Proportional time lapse between month of symptom onset and reporting month for actual cases of other work stress reported to OPRA (2007-2016) in the Republic of Ireland and</b>	<b>58</b>

## **Great Britain**

- |           |   |           |
|-----------|---|-----------|
| <b>14</b> | <b>Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related upper limb disorders reported to OPRA (2007-2016) in the Republic of Ireland and Great Britain</b> | <b>59</b> |
| <b>15</b> | <b>Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related spine/back disorders reported to OPRA (2007-2016) in the Republic of Ireland and Great Britain</b> | <b>60</b> |
| <b>16</b> | <b>Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related contact dermatitis reported to OPRA (2007-2016) in the Republic of Ireland and Great Britain</b>   | <b>61</b> |

## **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, ROI-OPRA and ROI-THOR-GP. 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

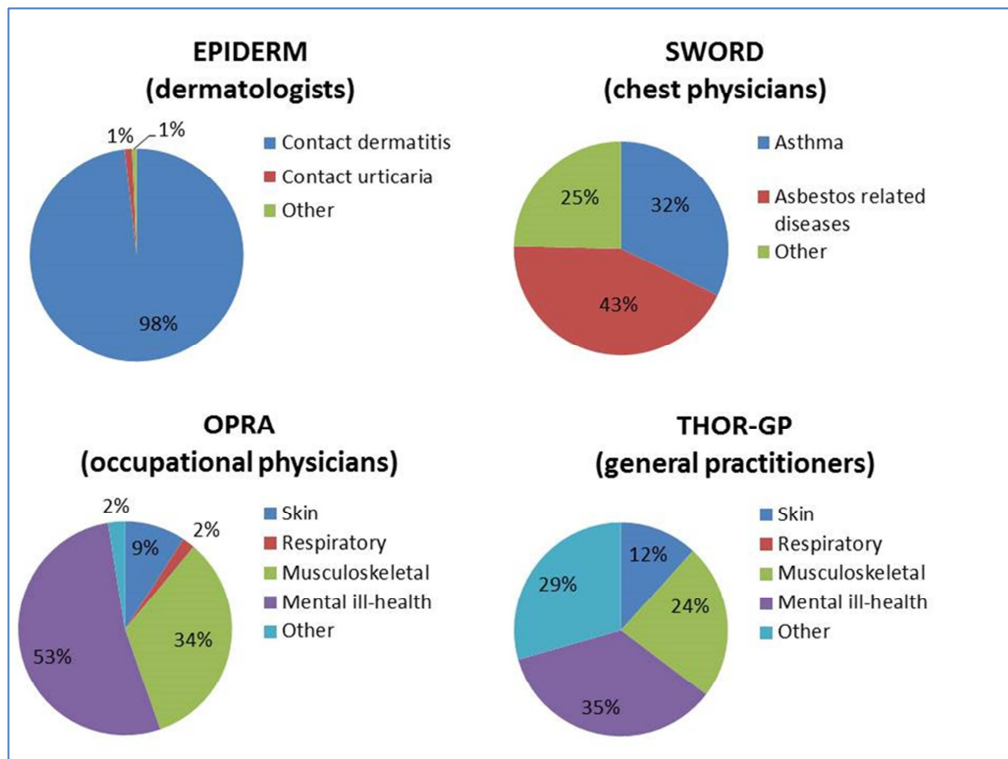
- This is the latest annual report describing reporting activity to The Health and Occupation Research network for the Republic of Ireland (ROI-THOR) including a comparison with reports to analogous THOR schemes in Northern Ireland (NI) and Great Britain (GB)
- ROI-THOR comprises 4 surveillance schemes 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)
- At present, 13 dermatologists, 12 chest physicians, 27 OPs and 22 GPs participate in ROI -THOR, reporting incident cases that they believe to have been caused or aggravated by work
- In total, 178 cases were reported in 2016 (OPs: 124, dermatologists: 24, chest physicians: 22, GPs: 8). The total ever reported (2005-2016) is 2148 (OPs:1514, dermatologists:453, chest physicians:164, GPs:17)
- OP case reports (2007-2016) were predominantly mental ill-health (53%) and musculoskeletal (34%) with smaller proportions of skin (9%), respiratory (2%) and 'other' WRI (3%). The majority (75%) of cases were reported in health and social care (mainly nurses) with a significant proportion also reported in transport (bus/train drivers) (13%)
- The breakdown of cases (by diagnostic group, industry, agents etc.) was very similar between the three geographical areas (ROI, NI and GB)
- Dermatologist case reports (2005-2016) were predominantly contact dermatitis (CD) (96%), female (54% 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 the UK is that the latter contained proportionally more diagnoses of skin neoplasia
- Chest physician case reports (2005-2016) were predominantly asthma (36%), male (83%) with a mean age (all cases) of 55 years. Frequently reported industries/occupations were construction (labourers) (27%) and manufacturing (29%) with isocyanates the most frequently reported agent
- The main difference between reports to SWORD in the ROI and the UK is that the latter contained proportionately more asbestos related diagnoses
- 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 have reported 17 cases since the scheme commenced data collection in 2015; mental ill-health cases were reported most frequently (6 cases).

## Summary of cases reported to ROI-THOR

Disease group	Reporting physicians	Number of cases	
		2016	2005 <sup>a</sup> -2016
<b>Skin</b>	Dermatologists	24	453
	Occupational physicians	8	140
	General practitioners	2	2
<b>Respiratory</b>	Chest physicians	22	164
	Occupational physicians	6	29
	General practitioners	0	0
<b>Musculoskeletal</b>	Occupational physicians	40	512
	General practitioners	2	4
<b>Mental ill-health</b>	Occupational physicians	73	805
	General practitioners	3	6
<b>Other</b>	Occupational physicians	1	39
	General practitioners	1	5
<b>Total cases<sup>b</sup></b>	<b>All physicians</b>	<b>178</b>	<b>2148</b>

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

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



Based on total reports to each scheme



## **EXECUTIVE SUMMARY**

**BACKGROUND:** Chest physicians, dermatologists, occupational physicians (OPs) and general practitioners (GPs) currently 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 (ROI-THOR). This report aims to describe cases of WRI reported to ROI-THOR in the latest full calendar year (2016) and to provide a summary of reporting activity since the commencement of reporting (2005 for dermatologists and chest physicians; 2007 for OPs; 2015 for GPs), including a comparison with cases reported to analogous THOR schemes in Great Britain (GB) and Northern Ireland (NI) over the same time period.

**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.

**RESULTS:** The 74 physicians enrolled in ROI-THOR in 2016 (13 dermatologists, 12 chest physicians, 27 OPs and 22 GPs) reported a total of 178 cases (191 diagnoses) during 2016. Of these, 124 cases were reported by OPs to ROI-OPRA (59% mental ill-health, 32% musculoskeletal, 6% skin, 5% respiratory and 1% 'other' WRI), 24 were reported by dermatologists to ROI-EPIDERM (all contact dermatitis (CD)), 2 with a co-diagnosis of 'other' skin, 22 were reported by chest physicians to ROI-SWORD (41% occupational asthma, 23% non-malignant pleural disease, 14% each for bronchitis/emphysema, mesothelioma and pneumoconiosis, and 9% 'other')

respiratory disease, and 8 cases of WRIH were reported by GPs to ROI-THOR-GP (3 mental ill-health, 2 musculoskeletal, 2 skin and 1 'other' WRI). This brings the total cases ever reported (2005-2016) to 2148 case reports (dermatologists: 453, chest physicians: 164, OPs: 1514, GPs: 17 case reports).

Cases reported to ROI-EPIDERM (2005-2016) were predominantly CD (96%), female (54% of CD cases), with a mean age (all CD cases) of 37 years (age range: 15-81 years). Cases reported by dermatologists in NI and GB were also predominantly CD (but proportionally more neoplasia was also reported) with a similar age/gender mix. In all three geographical areas, the most frequently reported industries were health and social care (23% of ROI cases), manufacturing (24% of ROI cases) and other service activities (which includes hairdressers and beauticians) (15% of ROI cases) with related occupations being nurses (13% of ROI cases), chemical and related process operatives (9% of ROI cases) and hairdressers (8% 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.

Respiratory cases reported to ROI-SWORD (2005-2016) were predominantly asthma (36%), whilst for GB and NI the highest proportion was benign pleural plaques (NI 36%, GB 42%), attributable to asbestos exposure. Other diagnoses to ROI-SWORD included 33 diagnoses of benign pleural plaques, 31 diagnoses of pneumoconiosis, 15 diagnoses of bronchitis/emphysema and 13 diagnoses of inhalation accidents, 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 (83%), and had a mean age of 55 years (age range 19 - 85). Cases of asthma in ROI had a mean age of 45 years, compared to 55 years in NI and 45 years in GB. 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 59 diagnoses of asthma in ROI were associated with 83 different agents, with isocyanates being the most frequently reported. For comparison, the most frequently reported agent for asthma in GB was also isocyanates followed by flour.

Incidence rates based on reports from dermatologists and chest physicians suggested that overall, absolute skin and respiratory occupational disease incidence was generally similar, or slightly lower in the ROI compared to NI and GB.

Reports from OPs to ROI-OPRA (2007-2016) were predominantly mental ill-health (53%) followed by musculoskeletal (34%), skin (9%), 'other' (3%) which included lead toxicity and ethanol sensitivity, 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 (75%) and nurses (23%). 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.

General practitioners reported 18 cases of WRIH since the scheme commenced data collection in 2015: 6/18 (33%) mental ill-health, 5/18 (28%) 'other' WRIH, 4/18 (22%) musculoskeletal disorders and 2/18 (11%) skin disease. A similar diagnostic breakdown was seen for cases reported in GB and NI.

**CONCLUSION:** ROI-THOR continues to provide the best overall source of data relating to medically attributed occupational disease incidence in the ROI with nearly 2150 cases reported since the inception of the schemes. It is hoped that with increased enrolment/participation in THOR-GP (and the other ROI schemes), aided by steps such as the introduction of free Continuing Professional Development (CPD) resources, notably Electronic Experiential Learning, Audit and Benchmarking (EELAB) and the promotion of THOR in the ROI, case numbers will increase, 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), thus providing useful information for the HSA and ROI.

## **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)<sup>1, 2</sup>. These are SWORD (chest physicians), EPIDERM (dermatologists), OPRA (occupational physicians) and THOR-GP (general practitioners). SWORD and EPIDERM both started data collection in the ROI in 2005, 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 schemes<sup>3-7</sup>.

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 (2016) and since reporting commenced (SWORD and EPIDERM 2005; OPRA 2007; THOR-GP 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 2006<sup>8-17</sup>.

## 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)<sup>3</sup>. 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), respectively<sup>18</sup>.<sup>19</sup>. Suspected agents are coded using in-house coding schemes developed in conjunction by the Health and Safety Executive (HSE) in the UK. All coding is undertaken independently by two researchers, and any discrepancies are reconciled by a third person.

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

pneumoconiosis, and “other respiratory disease”. Physicians reporting to OPRA and THOR-GP (who can return case details for all causes of occupational ill-health) record the diagnosis which is subsequently coded using the International Classification of Disease 10<sup>th</sup> Revision (ICD-10)<sup>20</sup> 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). 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.

Reporters to THOR-GP in the ROI participate as sample only, i.e. reporting in only one randomly allocated month per year. During the comparison period (2015-2016), GPs in the UK also participated as sample only. However, when THOR-GP started data collection in the UK all physicians participated as core, with sample reporting introduced in 2007 (with the ratio of sample:core increasing thereafter). Following the move from core to sample it was observed that UK GPs reporting for one random month per year reported a much higher incidence of WRI than when the same GPs report every month of the year. The reasons behind this observation are currently

being studied, but for the time being only 'actual' numerator cases will be stated (for ROI, NI and GB) without any 'grossing up' to take account of sample reporting.

Cases of occupational disease reported to EPIDERM, SWORD and OPRA by physicians in the Republic of Ireland (ROI) from 2005 to 2016 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 two full calendar year of reporting (2015-2016) have also been extracted and analysed. Data were analysed using the statistical package SPSS V20.0.

Annual average incidence rates (per 100,000 employed) of dermatologist and chest physician reported WRI were estimated based on a previously published methodology<sup>21</sup>. 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 2005-2016 obtained from the UK Labour Force Survey (LFS)<sup>22</sup> or the ROI National Household Survey<sup>23</sup>. 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 and total work-related respiratory disease 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**

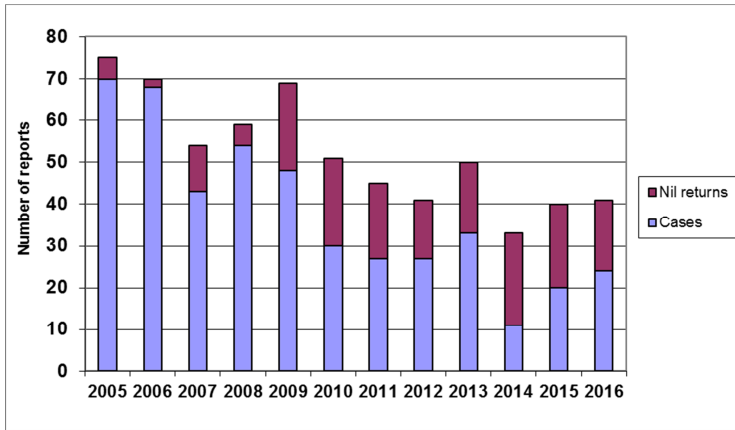
The number of reports received for ROI-EPIDERM, ROI-SWORD and ROI-OPRA by year is shown in Figure 1 whilst Figure 2 shows the cases per active reporter per year. A total of 13 dermatologists, 12 chest physicians 27 OPs and 22 GPs were enrolled in ROI-THOR in 2016. Of these, 4 (31%) dermatologists actively participated in 2016 (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 2005-2016. Of the 12 chest physicians, 2 actively reported in 2016 with 6 (50%) actively participating at least once during 2005-2016. Of the 27 OPs enrolled in ROI-OPRA, 6 (22%) actively participated in 2016 with 17 (63%) actively participating during 2007-2016. Of the 22 GPs enrolled in ROI-THOR-GP in 2016, 9 (41%) actively participated.

For comparison, 55% of (approximately 418) chest physicians enrolled in SWORD in the UK actively participated during 2016 with 87% (of approximately 761, including

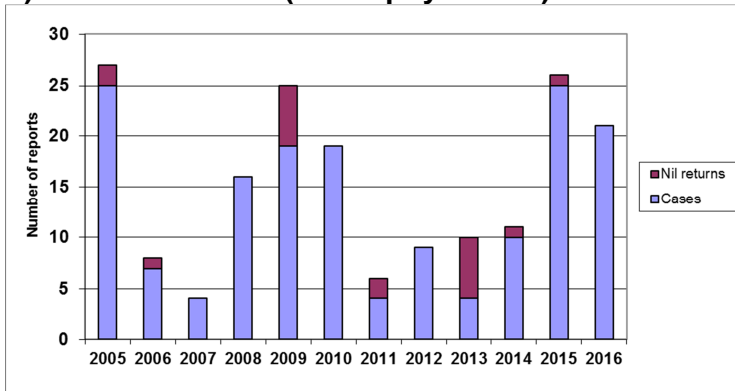
24 physicians from NI) ever actively participating (2005-2016). The equivalent figures for dermatologists enrolled in EPIDERM were 67% (of approximately 147 physicians, 2016) and 86% (of approximately 317 physicians, including 15 in NI, 2005-2016) and for occupational physicians enrolled in OPRA were 68% (of approximately 239 physicians, 2016) and 87% (of approximately 579 physicians, including 19 in NI, 2007-2016).

**Figure 1 Reports (cases and nil returns) in a) ROI-EPIDERM (2005-2016) b) ROI-SWORD (2005-2016) and c) ROI-OPRA (2007-2016)**

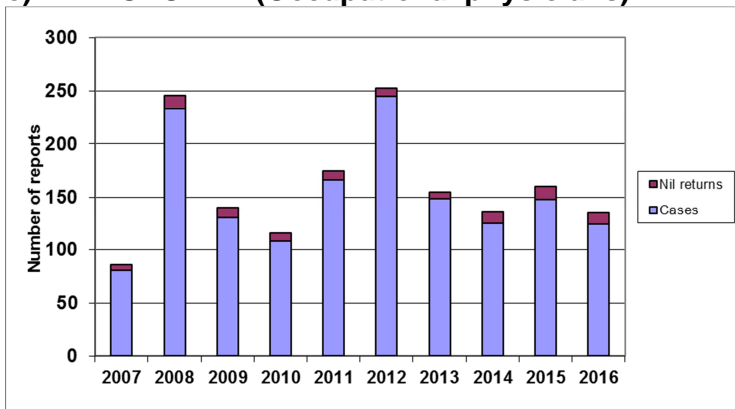
**a) ROI-EPIDERM (Dermatologists)**



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



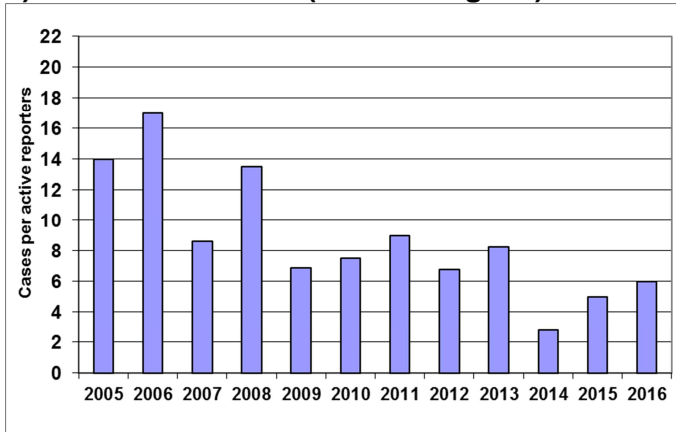
**c) ROI-OPRA (Occupational physicians)**



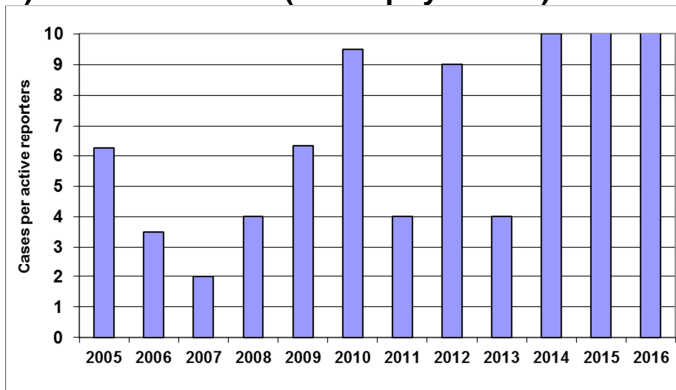
**NOTE: Scale differences**

**Figure 2 Cases per active reporter\* in a) ROI-EPIDERM (2005-2016) b) ROI-SWORD (2005-2016) and c) ROI-OPRA (2007-2016)**

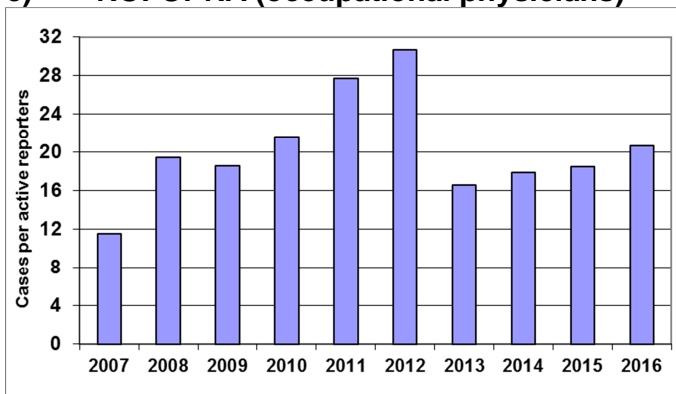
**a) ROI-EPIDERM (Dermatologists)**



**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 20 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 (2005-2016)**

	Great Britain		Northern Ireland		Republic of Ireland	
	'Crude'	'Adjusted'	'Crude'	'Adjusted'	'Crude'	'Adjusted'
<b>Respiratory (chest physicians)</b>						
<b>All</b>	7	15	2	17	1	20
<b>Asthma</b>	1	2	<1	2	<1	7
<b>Asbestos related</b>	6	11	2	13	<1	6
<b>Skin (dermatologists)</b>						
<b>All</b>	6	13	12	29	2	18
<b>Contact dermatitis</b>	5	10	6	14	2	17
<b>Neoplasia</b>	1	3	6	14	0	0

### 3.3 OVERVIEW OF 2016 CASE REPORTS

A total of 178 cases were reported to ROI-THOR in 2016 (Table 2). These comprised 124 cases reported by OPs to ROI-OPRA, 24 skin cases reported by dermatologists to ROI-EPIDERM, 22 respiratory cases reported by chest physicians to ROI-SWORD and 8 cases reported by general practitioners to ROI-THOR-GP.

All 24 of the cases reported to ROI-EPIDERM had a diagnosis of CD, with 1 case having a co-diagnosis of 'nail' and 1 having a co-diagnosis of 'other' specified as 'oncholysis of finger nails'. The cases were reported in the beauty industry (11 cases) (beautician (6), hairdresser (4), and nail technician), healthcare (4) (healthcare assistant, nurse, medical scientist and cleaner), accommodation and food service activities (3) (catering assistant (2), chef ), retail trade, except motor vehicles (2) (supermarket worker, sales assistant), construction (plasterer), manufacture of food and beverages (baker), services to buildings and landscape activities (cleaner) and 'other' manufacturing (process operative) (Table 3). The agents associated with the 24 cases of CD were wet work (cited 8 times), acrylics and acrylates (cited 6 times), hairdressing chemicals (cited 4 times), P-Phenylene diamine (PPD) (cited 4 times), rubber chemicals and materials (cited twice), drugs and medicaments (cited twice), plants (cited twice), and the following all cited once – soaps and detergents, preservatives, cement, high temperatures / hot work, glove use, nickel and its compounds, cobalt and its compounds.

The 22 cases reported to ROI-SWORD included 9 diagnoses of asthma, (2 reported in coal mining, 4 in manufacture of food and beverages, 2 in agriculture, and 1 in

electricity, gas and water supply; suspected agents reported as dust (cited twice), cement, plaster and stone dust (cited twice), hypochlorites (cited twice), ill-defined fumes/gases (cited twice), and glutaraldehyde, coal, food, other biological substances and other creatures (all cited once). 5 diagnoses of non-malignant pleural disease (4 in construction, 1 in electricity, gas and water supply, suspected agent reported as asbestos), 3 diagnoses of mesothelioma (2 in construction, 1 in the armed forces; suspected agent reported as asbestos), 3 diagnoses of pneumoconiosis (2 in coal mining, 1 in construction; suspected agents reported as coal (cited twice), silica, cement, plaster and stone dust, petroleum oils (all cited once), 3 bronchitis / emphysema diagnoses (2 in coal mining, 1 in manufacture of furniture; suspected agents recorded as coal (cited twice), cement, plaster and stone dust (once), petroleum oils (once), wood and wood dust (once)), and 2 diagnoses of other work-related respiratory disease (specified as bronchiolitis obliterans with organising pneumonia (BOOP) and severe COPD/emphysema/focal bronchiectasis, reported in coal mining and construction, suspected agents reported as coal, cement, plaster and stone dust, fungi / moulds, styrene, petroleum oils)

The 124 cases (132 diagnoses) reported to ROI-OPRA in 2016 were predominantly diagnoses of mental ill-health (58%) followed by musculoskeletal (30%), with smaller proportions of skin (6%), respiratory (5%) and 'other' WRI (1%). The most frequently reported industries for the 73 mental ill-health cases reported to ROI-OPRA in 2016 was health and social care (40%) with frequently reported occupations within this industry sector being nurses (34%) and clerical workers (14%). 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 40 musculoskeletal cases reported to ROI-OPRA was health and social care (80%) and nurses (33%) with frequently reported tasks/movements including manual handling/lifting and accidents/assault.

The 8 skin cases included 5 cases of CD – 4 diagnosed as irritant and 1 as allergic CD, 2 reported in health and social care (staff nurse, cleaner), 2 reported in manufacturing (maintenance, process operative) and 1 reported in accommodation and food services (chef). The agents associated with these 5 CD cases were wet work/hand washing (cited 3 times), protective clothing and equipment (cited 3 times) platinum and its compounds, sterilising and disinfecting agents, and soaps and detergents (all cited once). Also reported were 1 case of contact urticaria (process operator in pharmaceutical manufacturing, unknown suspected agent), and 2 cases reported under 'other' skin problems category and diagnosed as burn (healthcare maintenance worker attributed to aerosol spray), and latex allergy (in a midwife attributed to latex gloves).

The 6 respiratory cases included 1 report of asthma (in a admin worker attributed to sick building syndrome), 2 inhalation accidents specified as bronchial hyper-reactivity (health care assistants attributed to spillage of peracetic acid), and 3 cases of 'other' respiratory ill-health, specified as sinusitis (2 cases) and rhinitis (all 3 cases reported in administration workers attributed to sick building syndrome). There was 1 further case of 'other' WRI reported in 2016, diagnosed as shift work intolerance (in a translator attributed to working hours).

General practitioners reported 8 cases of WRI in 2016. The diagnoses were as follows; 3 mental ill-health cases (2 depression/anxiety in a surveyor attributed to stress and a doctor attributed to pressure of work, 1 case of work-related stress in a cleaner attributed to discrimination and bullying); 2 musculoskeletal cases (1 upper limb disorder in a bar worker attributed to pulling pints; 1 lower limb disorder in a product manufacturer attributed to assembly and ergonomics); 2 cases of skin disease (1 diagnosed as irritant contact dermatitis in a kitchen worker attributed to cleaning agents and 1 diagnosed as 'other skin' and specified as cellulitis attributed to skin trauma from an injury); and 1 case reported under 'other work-related ill-health' and specified as laceration to arm (social care worker attributed to assault).

**Table 2** Number of cases reported to ROI-SWORD, ROI-EPIDERM, ROI-OPRA and ROI-THOR-GP, 2016

	<b>Diagnosis</b>	<b>ROI-SWORD</b>	<b>ROI-EPIDERM</b>	<b>ROI-OPRA</b>	<b>ROI-THOR-GP</b>
<b>Skin disease</b>	Contact dermatitis	/	24	5	1
	Urticaria	/	0	1	0
	Other skin	/	2	2	1
	Total skin diagnoses	/	26	8	2
	Total skin cases	/	24	8	2
<b>Respiratory disease</b>	Asthma	9	/	1	0
	Inhalation accidents	0	/	2	0
	Bronchitis/emphysema	3	/	0	0
	Non-malignant pleural disease	5	/	0	0
	Mesothelioma	3	/	0	0
	Pneumoconiosis	3	/	0	0
	Other respiratory disease	2	/	3	0
	Total respiratory diagnoses	25	/	6	0
Total respiratory cases	22	/	6	0	
<b>Mental ill-health</b>	Anxiety and depression	/	/	11	2
	Adjustment disorder	/	/	9	0
	Other work stress	/	/	52	1
	Other mental ill-health	/	/	5	0
	Total mental diagnoses	/	/	77	3
	Total mental cases	/	/	73	3
<b>Musculoskeletal disorders</b>	Upper limb	/	/	18	1
	Spine/back	/	/	18	0
	Lower limb	/	/	4	1
	Other musculoskeletal	/	/	0	0
	Total musculoskeletal diagnoses	/	/	40	2
	Total musculoskeletal cases	/	/	40	2
<b>Other work-related illness</b>		/	/	1	1
<b>Total diagnoses</b>		<b>25</b>	<b>26</b>	<b>132</b>	<b>8</b>
<b>Total cases</b>		<b>22</b>	<b>24</b>	<b>124</b>	<b>8</b>

**Table 3 Cases of work-related illness reported to ROI-THOR, 2016**

	<b>Occupations</b>	<b>Industries</b>	<b>Agents</b>
<b>Skin reports to ROI-EPIDERM</b>	Beautician, hairdresser, nail technician, medical scientist, cleaner, care assistant, nurse, sales and retail assistants, chef / cook, retail cashiers and check-out operators, plasterer, process operative, bakers.	Beauty, healthcare, construction, other manufacturing, hotels and restaurants, retail trade (except motor vehicles), services to building and landscapes, manufacture of food and beverages	Wet work, acrylics and acrylates, hairdressing chemicals, P-Phenylene diamine (PPD), rubber chemicals and materials, drugs and medicaments, plants soaps and detergents, preservatives, cement, high temperatures/hot work, glove use, nickel and its compounds, cobalt and its compounds
<b>Skin reports to ROI-OPRA</b>	Nurse, midwife, chef/cook, metal working production and maintenance fitters, cleaners/domestics, labourers in building and woodworking trades, chemical and related process operators.	Health and social care, manufacture of chemicals, manufacture of basic pharmaceutical products, accommodation and food services	Protective clothing and equipment, wet work, soaps and detergents, sterilizing agents and disinfectants, rubber chemicals and materials, wet work, platinum and its compounds' aerosol spray'.
<b>Skin reports to ROI THOR-GP</b>	Cleaner, farmer	Healthcare, agriculture	Cleaning materials, friction
<b>Respiratory reports to ROI-SWORD</b>	Coal mining operative, labourers in building and woodwork trades, construction operative, farm worker, labourers in process and plant operations n.e.c, electrician/electrical fitter, carpenters/joiners, animal care occupations, routine laboratory testers, seafarers (merchant navy), cleaners	Construction, mining and quarrying, manufacture of food and beverages, agriculture, fishing and forestry, manufacture of furniture, electricity, gas and water supply, water transport	Asbestos, dust, cement/plaster/stone dust, hypochlorities, ill-defined fumes/gases, glutaraldehyde, coal, food, other biological substances, other creatures, silica, petroleum oils, wood and wood dust, fungi/moulds
<b>Respiratory reports to ROI-OPRA</b>	Admin assistant, healthcare assistant	Health and social care, manufacture of pharmaceutical products	Sick building syndrome, acids
<b>Musculoskeletal reports to ROI-</b>	Nurse, care assistant and home carer, nursing auxiliaries and assistants, ambulance	Health and social care, public administration and defence, insurance services, legal and	Accidents/assaults, materials manipulation, lifting/carrying/pushing/pulling, keyboard work, guiding or

	<b>Occupations</b>	<b>Industries</b>	<b>Agents</b>
<b>OPRA</b>	staff, houseparent and residential warden, veterinarian, solicitor, paramedic, civil service executive officers, accounts and wages clerks, general office assistants/clerks, hairdressers/barbers, customer care occupations, other goods handling and storage occupations n.e.c, hospital porters, cleaners, launderers/dry cleaners	accounting services, scientific research and development, veterinary activities, other personal service activities	holding tool, machine operation
<b>Musculoskeletal reports to ROI THOR-GP</b>	Bar staff, assemblers and routine operatives	Hotels and restaurants, manufacturing	Lifting/carrying/pulling/pushing assembly
<b>Mental ill-health reports to ROI-OPRA</b>	Nurse, general office assistants/clerks, bus and coach drivers, accounts and wages clerks, care assistants and home carers, sales and retail assistants, financial institution managers, retail and wholesale managers, hospital and health service managers, teachers, train drivers, nursing auxiliaries and assistants, hospital porters, financial managers, marketing and sales managers, storage and warehouse managers, dentists, veterinarians, researchers, social workers, paramedics, ship and hovercraft officers, sales representatives, marketing associate professionals, personnel and industrial relations officers, civil service administrators, counter clerks, secretaries, carpenters/joiners, ambulance staff, dentists, metal working machine operatives, cleaners	Health and social care, transport, storage and communication, financial intermediation, wholesale and retail trade, public administration and defence, hotels and restaurants, real estate, renting and business activities, construction, manufacture of rubber and plastic products, manufacture of fabricated metal products	Bullying/sexual harassment, workload, violence at work, interpersonal relationships, organizational factors, accidents, disciplinary actions, traumatic experience, travel, change in way of working/work content, physical working environment
<b>Mental ill-health reports to ROI THOR-GP</b>	Surveyor, doctor, cleaner	Real estate, renting and business activities, healthcare, wholesale and retail trade	Unspecified stress, work pressure, bullying/sexual harassment

### **3.4 OCCUPATIONAL SKIN SURVEILLANCE (EPIDERM), 2005-2016**

#### **3.4.1 DIAGNOSES**

In total 453 case reports were reported by dermatologists to ROI-EPIDERM between January 2005 and December 2016. These 453 case reports produced 442 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 (48%) 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 51%, GB 22%).

#### **3.4.2 AGE AND GENDER**

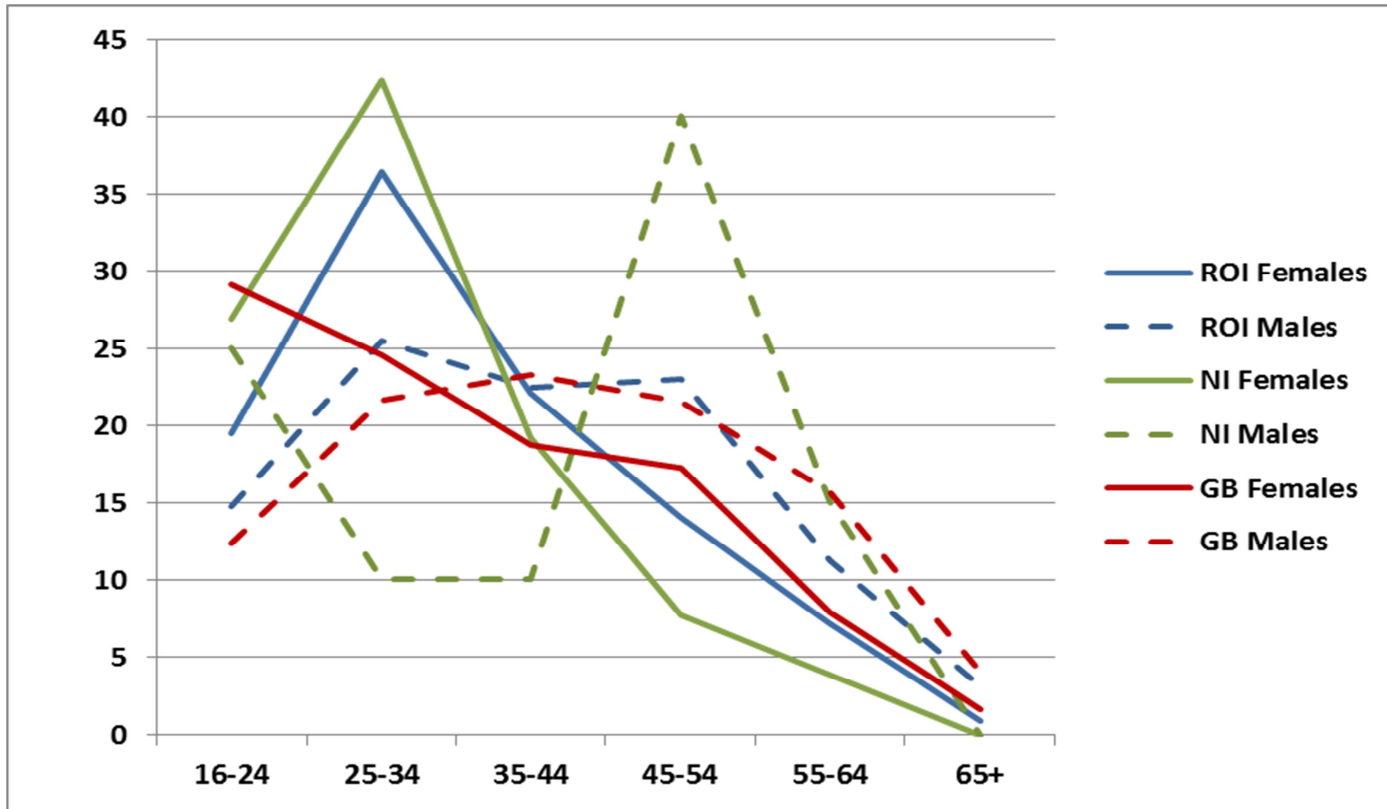
Overall (2005-2016) cases of CD in the ROI were most frequently reported in the 25-34 year age group for both males and females (Figure 3). This compared to 45-54 (males) and 25-34 (females) year age group in NI and 35-44 (males) and 16-24 (females) year age group in GB. Overall in the ROI, there were more cases of CD reported in females (54%) than males (45%), 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 (2005-2016) in the Republic of Ireland, Northern Ireland & Great Britain

	<b>ROI (actual)</b>	<b>NI (actual)</b>	<b>NI (estimated)</b>	<b>GB (actual)</b>	<b>GB (estimated)</b>
<b>Contact dermatitis</b>	434 (96%)	46 (48%)	552 (48%)	6976 (84%)	15611 (73%)
• Allergic	• 232 (53%)	• 14 (30%)	• 168 (30%)	• 2362 (34%)	• 5970 (38%)
• Irritant	• 162 (37%)	• 20 (43%)	• 240 (43%)	• 3254 (47%)	• 6411 (41%)
• Mixed	• 39 (9%)	• 7(15%)	• 84 (15%)	• 1186 (17%)	• 2561 (16%)
• Unclear	• 1 (<1%)	• 5 (11%)	• 60 (11%)	• 184 (3%)	• 734 (5%)
<b>Contact urticaria</b>	5 (1%)	0	0	316 (4%)	635 (3%)
<b>Folliculitis/acne</b>	0	0	0	30 (<1%)	52 (<1%)
<b>Infective</b>	1 (<1%)	1 (1%)	12 (1%)	20 (<1%)	53 (<1%)
<b>Mechanical</b>	0	0	0	79 (1%)	211 (1%)
<b>Nail</b>	1 (<1%)	1 (1%)	12 (1%)	21 (<1%)	120 (1%)
<b>Neoplasia</b>	0	49 (51%)	588 (51%)	952(11%)	4593 (22%)
<b>Other dermatoses</b>	1 (<1%)	0	0	101 (1%)	475 (2%)
<b>Total cases</b>	<b>453 (100%)</b>	<b>96 (100%)</b>	<b>1152 (100%)</b>	<b>8332 (100%)</b>	<b>21312 (100%)</b>
<b>Total diagnoses</b>	<b>442*</b>	<b>97</b>	<b>1164</b>	<b>8495</b>	<b>21750</b>

\*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 (2005-2016)





**Table 5 Age and gender of contact dermatitis diagnoses in ROI-EPIDERM (2005-2016)**

<b>DIAGNOSIS</b>	<b>MALES</b>	<b>FEMALES</b>	<b>ALL</b>
<b>Allergic CD</b>			
Number of diagnoses (%)	121 (52%)	111 (48%)	232 (100%)
Mean age (years)	41	36	38
Age range (years)	15-81	17-64	15-81
<b>Irritant CD</b>			
Number of diagnoses (%)	60 (37%)	101 (62%)	162 (100%)*
Mean age (years)	37	33	34
Age range (years)	16-62	19-77	16-77
<b>Mixed CD</b>			
Number of diagnoses (%)	15 (38%)	24 (62%)	39 (100%)
Mean age (years)	39	40	39
Age range (years)	19-54	17-65	17-65
<b>All CD</b>			
Number of diagnoses (%)	197(45%)	236 (54%)	434 (100%)
Mean age (years)	40	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 434 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 (8%) which fall under SOC group 6 'Personal service occupations'. For comparison, in GB, 13% (of the 15611 CD cases), 1% and 11% cases were reported in nurses, chemical and process operatives and hairdressers, respectively, whilst for NI, 20% (of the 552 CD cases) were reported in nurses and 17% 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 (5%), which falls within SOC group 9 'Elementary occupations'. Cleaners/domestics were also a frequently reported occupation in cases of CD in NI (13%). For comparison, only 7 cases (2%) were reported in cleaners and domestics in the ROI.

Of the 7 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, 1 case of (unspecified) infective disease was reported in an agricultural student, and 1 case of nail disorder (specified as onycholysis of finger nails) was reported in a beautician.

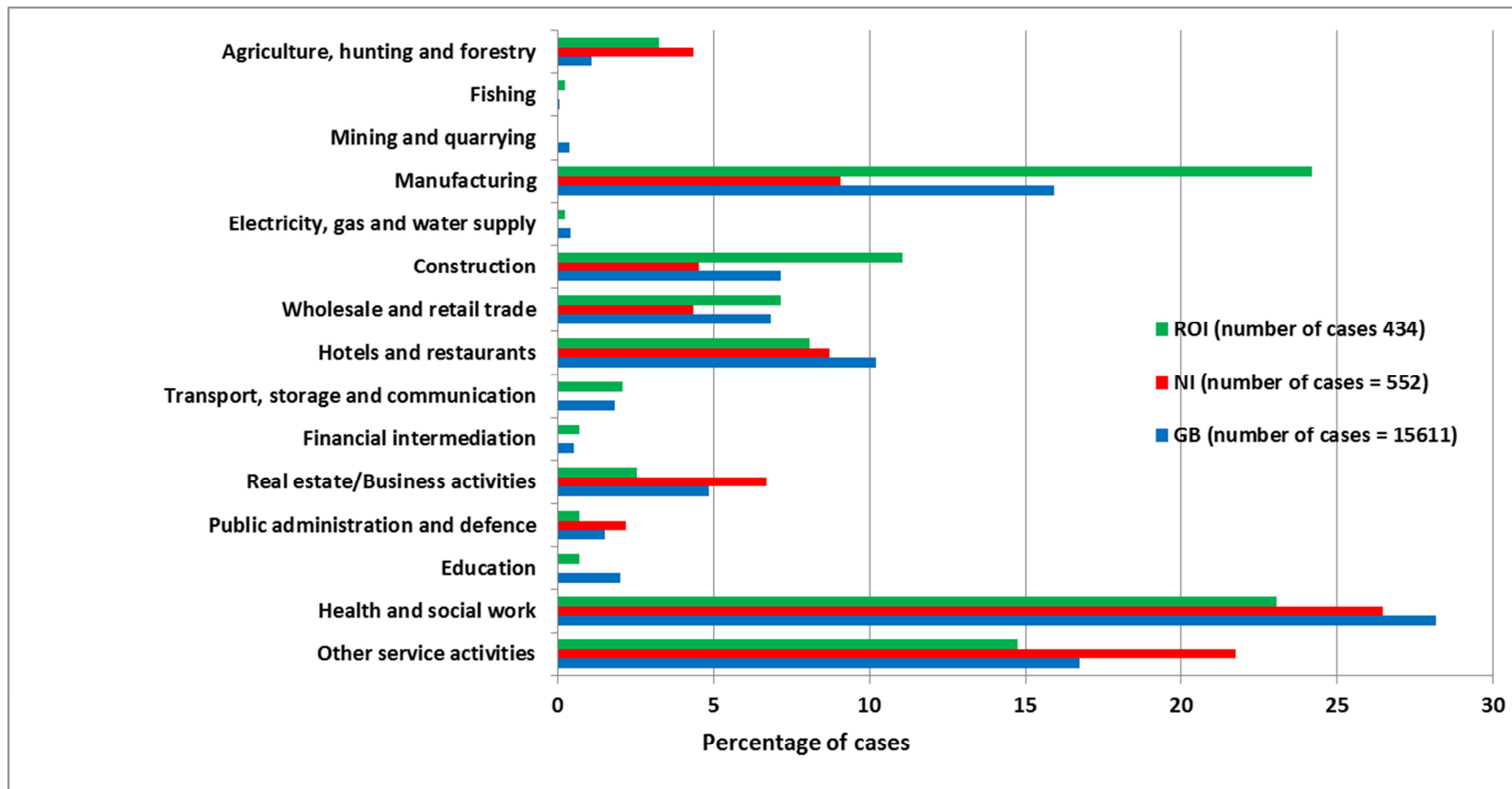
#### **3.4.4 SUSPECTED AGENTS**

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, wet work, nickel 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 GB.

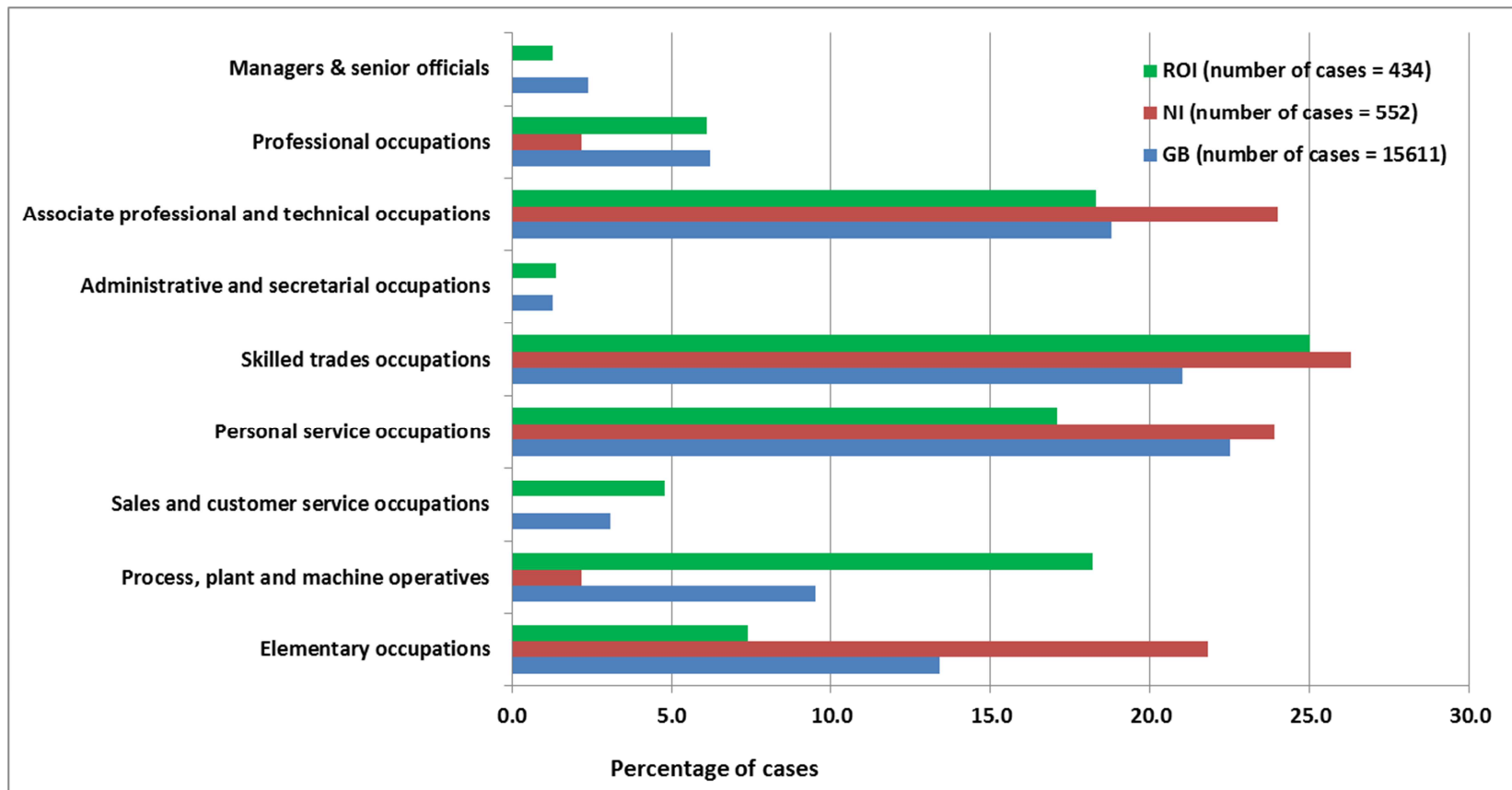
For allergic contact dermatitis (ACD) rubber chemicals and materials were the agent most often associated with case reports in the ROI, in irritant contact dermatitis (ICD) the agent was wet work, while for mixed contact dermatitis, nickel was most frequently reported.

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. The (unspecified) infective case was associated with 'coming into contact with infected animals' and the nail case specified as 'onycholysis' was attributed to methacrylate nail series.

**Figure 4 Proportion of cases of contact dermatitis reported to EPIDERM by Standard Industrial Classification (SIC), 2005-2016**



**Figure 5 Proportion of cases of contact dermatitis reported to EPIDERM by Standard Occupational Classification (SOC), 2005-2016**



**Table 6 Most frequently reported agents for contact dermatitis, reported by dermatologists to EPIDERM (2005-2016) – number of cases and (percentage of total cases in the respective column)**

	<b>ROI (actual)</b>	<b>NI (actual)</b>	<b>NI (estimated)</b>	<b>GB (actual)</b>	<b>GB (estimated)</b>
<b>Rubber chemicals &amp; materials</b>	93 (21%)	8 (17%)	84 (15%)	1392 (20%)	2866 (18%)
<b>Wet work</b>	68 (16%)	18 (39%)	216 (39%)	2032 (29%)	3253 (21%)
<b>Nickel &amp; its compounds</b>	60 (14%)	5 (11%)	60 (11%)	516 (7%)	1396 (9%)
<b>Preservatives</b>	54 (12%)	4 (9%)	48 (9%)	843 (12%)	1602 (10%)
<b>Chromium &amp; its compounds</b>	43 (10%)	2 (4%)	24 (4%)	230 (3%)	659 (4%)
<b>Cobalt &amp; its compounds</b>	27 (6%)	0	0	263 (4%)	659 (4%)
<b>Acrylics &amp; acrylates</b>	26 (6%)	2 (4%)	24 (4%)	376(5%)	677 (4%)
<b>Resins</b>	23 (5%)	0	0	310 (4%)	596 (4%)
<b>Hairdressing chemicals</b>	22 (5%)	2 (4%)	24 (4%)	518 (7%)	1343 (9%)
<b>PPE</b>	21 (5%)	7 (15%)	84 (15%)	1142 (16%)	1736 (11%)
<b>Drugs &amp; medicaments</b>	19 (4%)	0	0	95 (1%)	161 (1%)
<b>PPD</b>	19 (4%)	4 (9%)	48 (9%)	336 (5%)	926 (6%)
<b>Foods, additives &amp; flavourings</b>	16 (4%)	0	0	165 (2%)	528 (3%)
<b>Soaps &amp; detergents</b>	16 (%)	12 (26%)	144 (26%)	1721 (25%)	3569 (23%)
<b>Perfumes &amp; fragrances</b>	15 (3%)	0	0	326 (5%)	755 (5%)
<b>Plants</b>	15 (3%)	2 (4%)	24 (4%)	298 (4%)	738 (5%)
<b>Number of cases</b>	<b>434</b>	<b>46</b>	<b>552</b>	<b>6976</b>	<b>15611</b>

\*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), 2005-2016**

#### **3.5.1 DIAGNOSES**

The addition of the 2016 case reports brings the total cases reported by chest physicians to ROI-SWORD (2005-2016) to 164. These produced 183 diagnoses, with 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 (36%) reported to ROI-SWORD, whilst for NI and GB the highest proportion was benign pleural plaques (36% and 42% respectively) (Table 7).

#### **3.5.2 AGE AND GENDER**

Case reports to ROI-SWORD were predominantly male (83%), with a mean age (male plus female combined) of 55 years (age range 19 - 85 years). 21 of these case reports were in the 75+ age group (all males). These 21 case reports produced 26 diagnoses: 14 non-malignant pleural disease, 6 pneumoconiosis, 3 asthma, 1 mesothelioma and 2 lung cancer. 17/21 of these cases were attributed to asbestos exposure (the remaining 4 were attributed to silica (2 cases), animals and coal dust). The 7777 GB cases (7956 diagnoses) in the 75 and over age range were mainly

non-malignant pleural disease (44%), mesothelioma (35%) and pneumoconiosis (12%).

Restricting the analysis to cases of asthma, 66% of ROI cases were males with a mean age (male plus female combined) of 45 years (age range 19 - 79 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); 67% 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 (2005-2016) in the Republic of Ireland, Northern Ireland & Great Britain

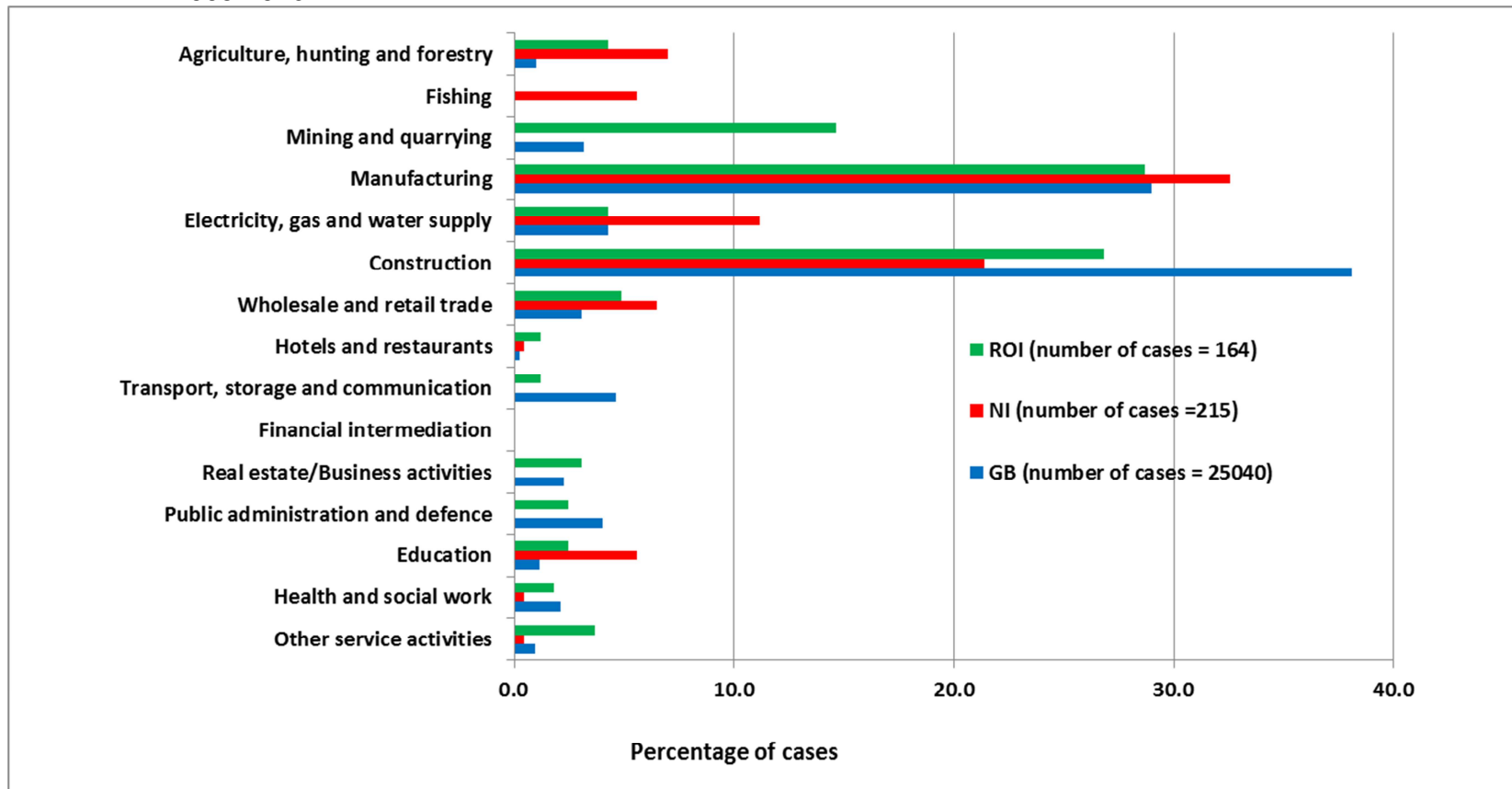
	<b>ROI (actual)</b>	<b>NI (actual)</b>	<b>NI (estimated)</b>	<b>GB (actual)</b>	<b>GB (estimated)</b>
<b>Asthma</b>	59 (36%)	7 (8%)	29 (13%)	1232 (19%)	2673 (11%)
<b>Inhalation accidents</b>	13 (9%)	2 (2%)	2 (1%)	53 (1%)	229 (1%)
<b>Allergic alveolitis</b>	4 (3%)	3 (4%)	25 (12%)	112 (2%)	431 (2%)
<b>Bronchitis/ emphysema</b>	15 (9%)	0	0	137 (2%)	467 (2%)
<b>Infectious disease</b>	1 (1%)	0	0	37 (1%)	312 (1%)
<b>Non-malignant pleural disease</b>	33 (20%)	33 (40%)	77 (36%)	2830 (42%)	10453 (42%)
<b>Mesothelioma</b>	8 (5%)	19 (23%)	41 (19%)	1139 (17%)	6716 (27%)
<b>Lung cancer</b>	7 (5%)	4 (5%)	15 (7%)	208 (3%)	1022 (4%)
<b>Pneumoconiosis</b>	31 (19%)	15 (18%)	26 (12%)	738 (11%)	2399 (10%)
<b>Other respiratory</b>	12 (7%)	4 (5%)	4 (2%)	497 (7%)	959 (4%)
<b>Total cases</b>	<b>164 (100%)</b>	<b>83 (100%)</b>	<b>215 (100%)</b>	<b>6659 (100%)</b>	<b>25040 (100%)</b>
<b>Total diagnoses</b>	<b>183</b>	<b>87</b>	<b>219</b>	<b>6983</b>	<b>25661</b>

### 3.5.3 INDUSTRY AND OCCUPATION

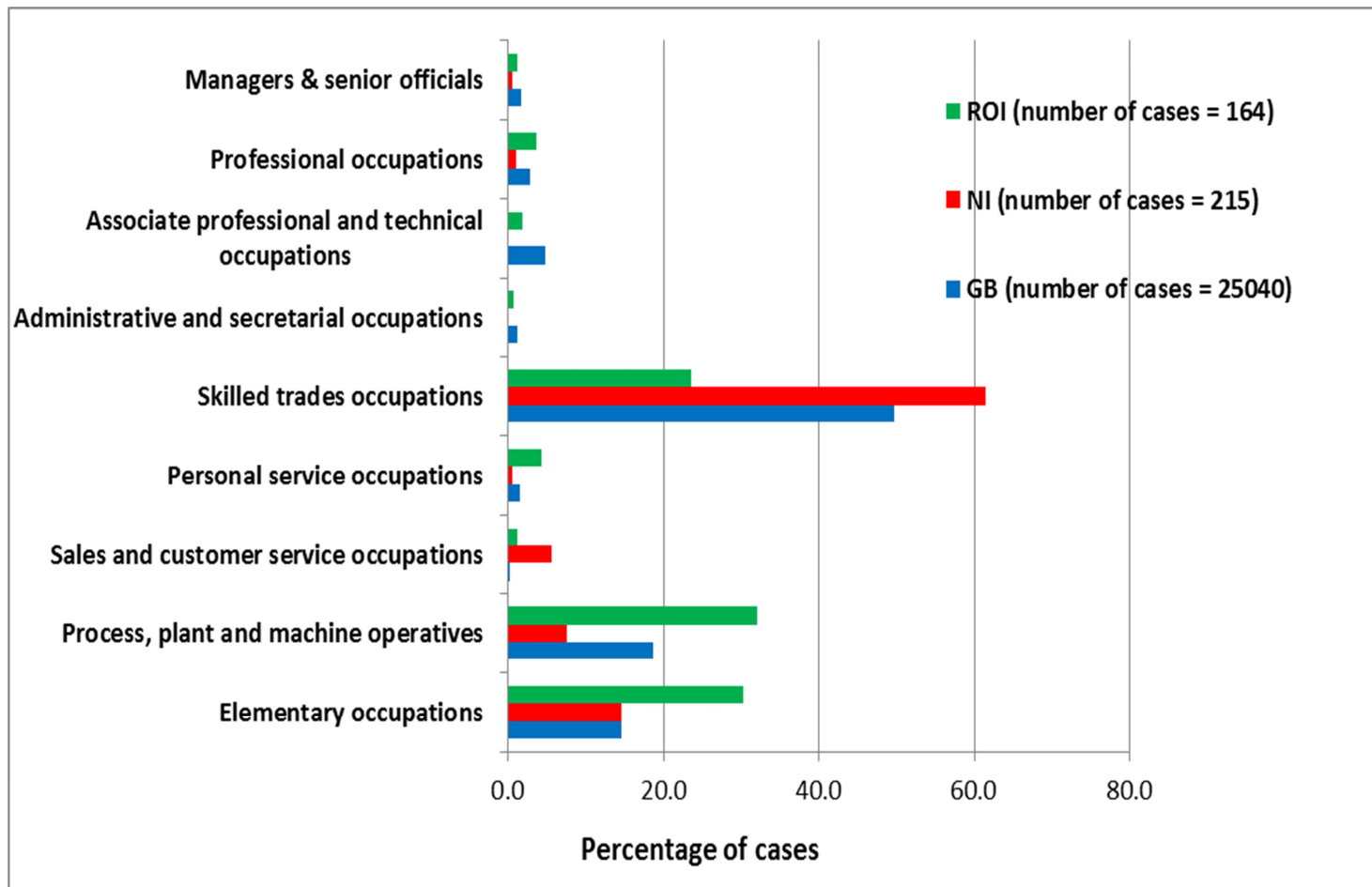
For all three geographical areas (ROI, NI and GB), cases of work-related respiratory disease were most frequently reported in the construction and manufacturing sectors (Figure 6). Within the manufacturing sector, cases in ROI were most frequently reported in the manufacture of other non-metallic mineral products (for example, cement), and food and beverages. 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), 2005-2016**



**Figure 7 Proportion of cases of respiratory disease reported to SWORD by Standard Occupational Classification (SOC), 2005-2016**



#### **3.5.4 SUSPECTED AGENT**

The agents associated with the respiratory diagnoses reported to ROI-SWORD are shown in Table 8. A total of 83 agents were associated with the 59 diagnoses of occupational asthma, with isocyanates being the most frequently reported. For comparison, the most frequently reported agents for asthma in GB were flour and isocyanates (both 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 and asbestos were the most frequently reported agents (cited 10 times each) for cases of pneumoconiosis reported in the ROI. In total, 59 diagnoses were reported as being associated with asbestos; 33 of non-malignant pleural disease, 10 of pneumoconiosis, 8 of mesothelioma, 7 of lung cancer and 1 of bronchitis/emphysema, and 1 of asthma.

**Table 8 Suspected agents associated with cases of work-related respiratory disease reported to ROI-SWORD, 2005-2016**

<b>DIAGNOSIS</b>	<b>SUSPECTED AGENTS (as recorded by the physician)</b>
<b>Asthma</b>	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, methyl ethyl ketone (MEK), glutaraldehyde, coal, other creatures and zinc welding.
<b>Inhalation accidents</b>	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.
<b>Allergic alveolitis</b>	Thermactinomycetes, mushroom/mushroom compost dust and fungal spores
<b>Bronchitis/emphysema</b>	Coal dust (8 cases), wood dust (3 cases), urea / formaldehyde / ammonia, gypsum, aspartame, asbestos
<b>Infectious disease</b>	Toxoplasma
<b>Benign pleural disease</b>	Asbestos
<b>Mesothelioma</b>	Asbestos
<b>Lung cancer</b>	Asbestos
<b>Pneumoconiosis</b>	Silica (10 cases, 1 case with additional agents reported talc/titanium/carbon black), asbestos (10 cases), welding fumes/zinc/iron/coolant oils (1 case), coal dust (7 cases), other silicates (2 cases), and wood dust/isocyanates/laquers (1 case)
<b>Other respiratory</b>	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), emphysema/focal bronchiectasis (coal and blast fumes), and bronchiolitis obliterans organising pneumonia, BOOP (mixed brick dust, cement dust, fungi, styrene beads and glues).

## **3.6 OCCUPATIONAL PHYSICIANS REPORTING ACTIVITY (OPRA), 2007-2016**

### **3.6.1 DIAGNOSES**

A total of 1514 case reports (1525 diagnoses) were reported to ROI-OPRA between January 2007 and December 2016. 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 (65% of the 805 cases) whilst the most frequently reported musculoskeletal disorder was spine/back disorders (61% of the 512 cases). Diagnoses reported under 'other mental' 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 (86% of the 140 cases) and asthma the most frequently reported respiratory diagnosis (34% of the 29 cases). Other reported dermatoses included scabies, urticaria, bleeding hands, nail infection, dry chapped hands, angio oedema, latex allergy, burn and dermatophytosis. The 10 diagnoses reported under 'other respiratory' were sinusitis (5 diagnoses), rhinitis (2 diagnoses), tuberculosis, smoke inhalation, and 'upper respiratory tract irritation'.

**Table 9** Number and type of diagnoses reported by occupational physicians to OPRA (2007-2016) in the Republic of Ireland, Northern Ireland & Great Britain

	<b>ROI</b>	<b>NI (actual)</b>	<b>NI (estimated)</b>	<b>GB (actual)</b>	<b>GB (estimated)</b>
<b>Skin</b>	140 (9%)	31 (7%)	284 (6%)	563 (6%)	3214 (7%)
• Contact dermatitis	• 120 (86%)	• 26 (84%)	• 246 (87%)	• 464 (82%)	• 2620 (82%)
• Other dermatoses	• 21 (15%)	• 5 (16%)	• 38 (13%)	• 99 (18%)	• 594 (18%)
<b>Respiratory</b>	29 (2%)	9 (2%)	86 (2%)	247 (3%)	1501 (3%)
• Asthma	• 10 (34%)	• 5 (56%)	• 49 (57%)	• 98 (40%)	• 582 (39%)
• Rhinitis	• 2 (7%)	• 1 (11%)	• 12 (14%)	• 39 (16%)	• 259 (17%)
• Inhalation accidents	• 6 (21%)	• 1 (11%)	• 12 (14%)	• 21 (9%)	• 109 (7%)
• Infectious disease	• 1 (3%)	• 1 (11%)	• 1 (1%)	• 12 (5%)	• 100 (7%)
• Bronchitis/emphysema	• 3 (10%)	• 0	• 0	• 6 (2%)	• 50 (3%)
• Other respiratory	• 8 (28%)	• 1 (11%)	• 12 (14%)	• 71 (29%)	• 401 (27%)
<b>Musculoskeletal</b>	512 (34%)	134 (29%)	1366 (27%)	2795 (31%)	15830 (33%)
• Upper limb	• 180 (35%)	• 77 (57%)	• 726 (53%)	• 1569 (56%)	• 8114 (51%)
• Neck / Spine / back	• 310 (61%)	• 35 (26%)	• 376 (28%)	• 819 (29%)	• 5329 (34%)
• Lower limb	• 26 (5%)	• 12 (9%)	• 144 (11%)	• 277 (10%)	• 1597 (10%)
• Other musculoskeletal	• 15 (3%)	• 10 (7%)	• 120 (9%)	• 130 (5%)	• 790 (5%)
<b>Mental ill-health</b>	805 (53%)	286 (62%)	3168 (64%)	5862 (65%)	29413 (61%)
• Anxiety and depression	• 205 (25%)	• 107 (37%)	• 1218 (38%)	• 2715 (46%)	• 13539 (46%)
• PTSD	• 19 (2%)	• 6 (2%)	• 50 (2%)	• 145 (2%)	• 1267 (4%)
• Psychotic episode	• 1 (<1%)	• 0	• 0	• 6 (<1%)	• 28 (<1%)
• Other work stress	• 521 (65%)	• 166 (58%)	• 1849 (58%)	• 2793 (48%)	• 13683 (47%)
• Other mental ill-health	• 120 (15%)	• 7 (2%)	• 51 (2%)	• 203 (3%)	• 896 (3%)
<b>Other diagnoses</b>	39 (3%)	17 (4%)	126 (3%)	328 (4%)	2077 (4%)
<b>Total cases</b>	<b>1514 (100%)</b>	<b>463 (100%)</b>	<b>4984 (100%)</b>	<b>9023 (100%)</b>	<b>48469 (100%)</b>
<b>Total diagnoses</b>	<b>1525</b>	<b>477</b>	<b>5030</b>	<b>9795</b>	<b>52035</b>



The 39 diagnoses in the 'other' category (ROI-OPRA) were reported as '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, bladder neck injury, ethanol sensitivity, eye irritation, lead toxicity, chemical splash, conjunctivitis and 'shift work disorder' (each reported once).

### **3.6.2 AGE AND GENDER**

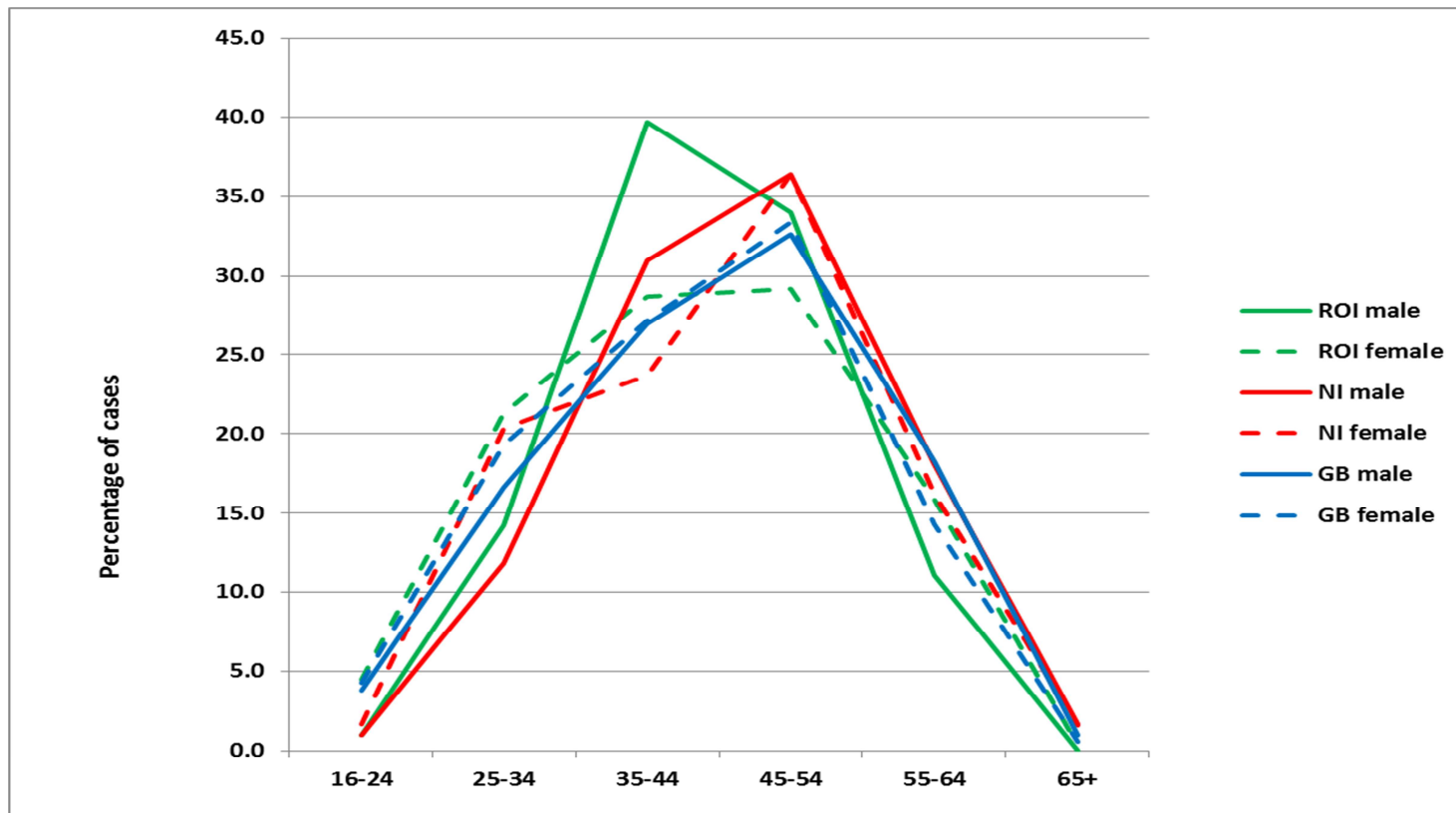
The proportions of cases reported to OPRA by age and gender are shown in Figure 8. In both NI and GB, cases were most frequently reported in the 45-54 years of age group for both males and females, whilst for ROI males were most frequently reported in the 35-44 year age group and females in the 45-54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

### **3.6.3 INDUSTRY AND OCCUPATION**

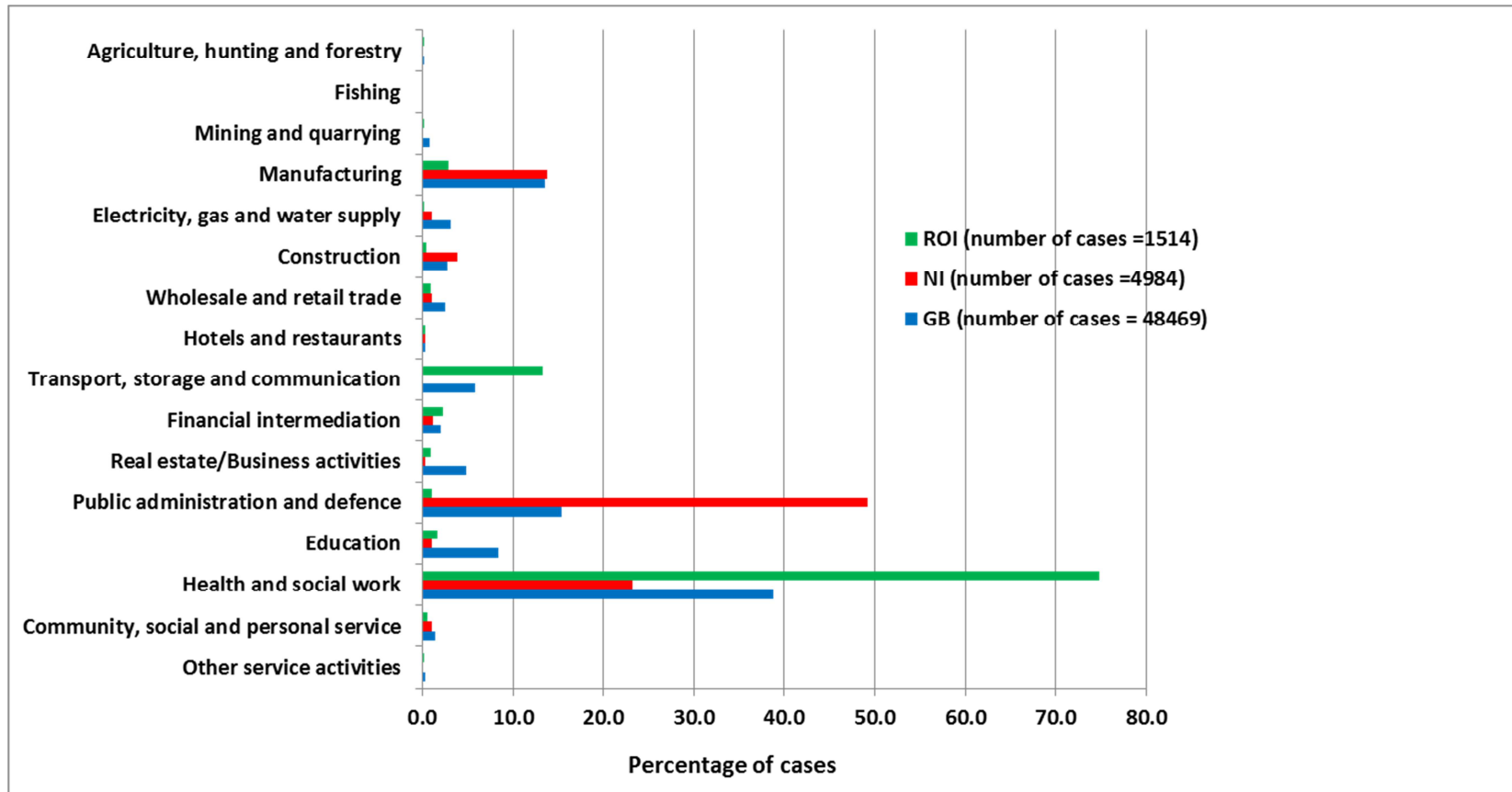
The majority (75%) of the cases reported to ROI-OPRA were reported in health and social care (Figure 9) with cases also frequently reported in transport, storage and communication (13%). These data need to be interpreted cautiously. Some industry sectors such as health and social care may have better 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 (23%), 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 (23%) of NI cases were also reported in health and social care, however the majority (49%) were reported in public administration and defence with prison service officers being the most frequently reported occupation for NI (13%).

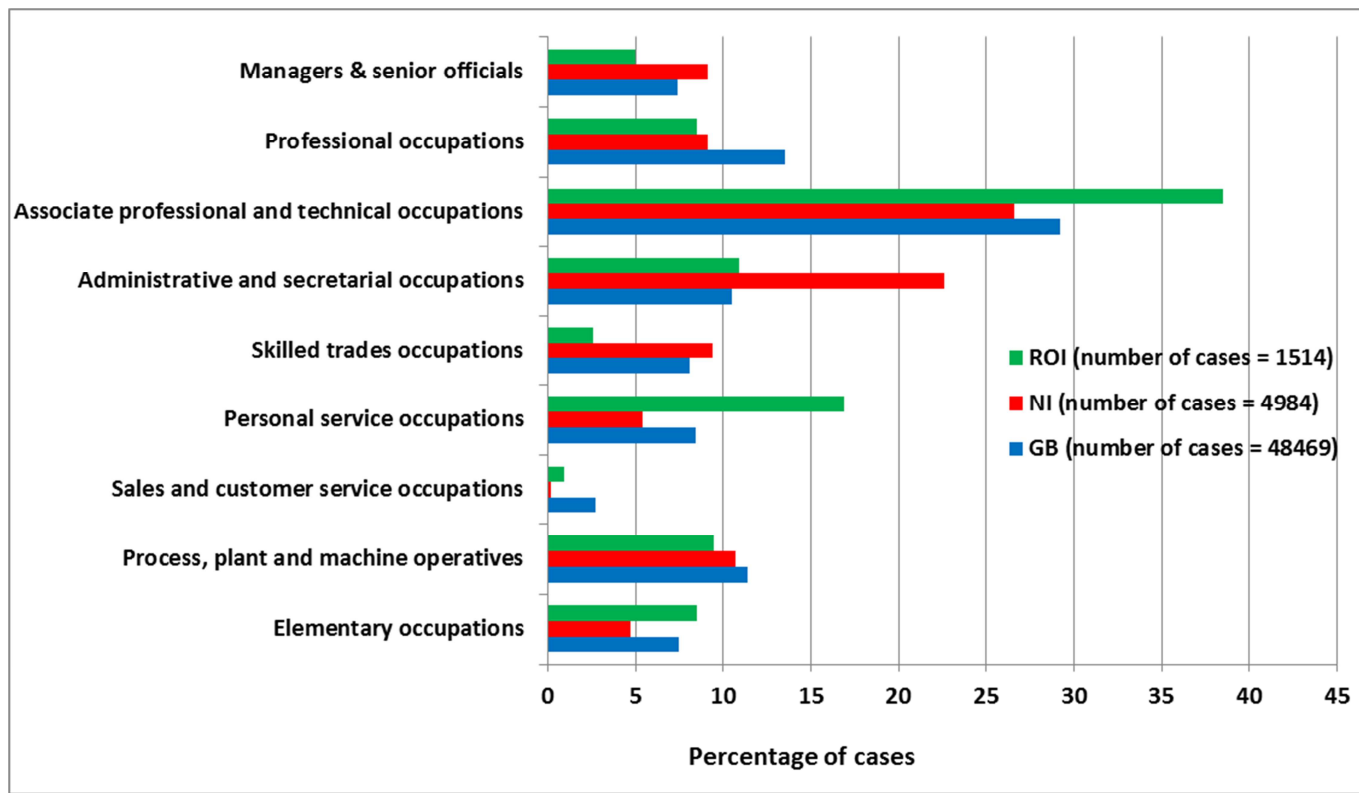
Figure 8 Proportion of cases of work-related ill-health reported to OPRA by age and gender, 2007-2016



**Figure 9 Proportion of cases of work-related ill-health reported to OPRA by Standard Industrial Classification (SIC), 2007-2016**



**Figure 10 Proportion of cases of work-related ill-health reported to OPRA by Standard Occupational Classification (SOC), 2007-2016**



### **3.6.4 SUSPECTED AGENTS**

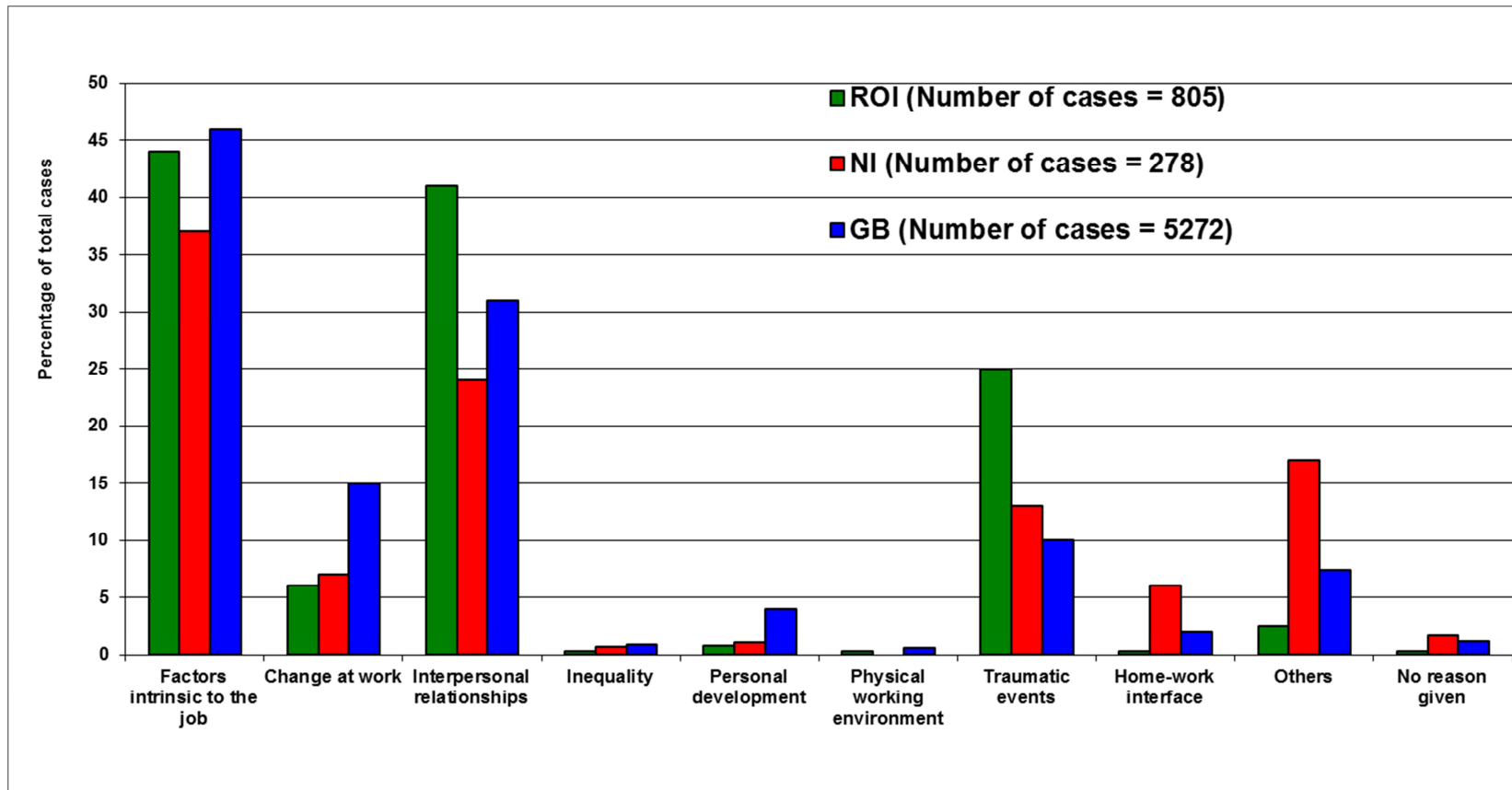
The most frequently associated precipitating events associated with the 732 mental ill-health case reports (44%) were classified as 'factors intrinsic to the job' which included 'workload', 'travel', and 'organisational factors' and 'interpersonal relationships' (41%) which included perceived bullying 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' (35%) whilst the most frequently associated movement was 'materials handling' (46%), with a further 31% 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 140 skin cases reported to ROI-OPRA were wet work (42%), protective clothing (25%), sterilising and disinfecting agents (22%), soaps and detergents (14% of cases) and rubber chemicals and materials (11%). The agents associated with the 29 respiratory cases included chlorine disinfectant, acids, wood dust, chlorine dioxide, grain, potassium dichromate, 'sanitiser fumes', cleaning agents, flour, denatured ethanol

(IMS)/isopropyl alcohol (IPA), smoke inhalation, sewage dust, disinfectant, dusty environments, high temperatures and sick building syndrome.

**Figure 11 Proportion of actual cases of mental ill-health reported to OPRA by precipitating event, 2007-2016**





**Table 10 Proportion of musculoskeletal cases reported to OPRA (2007-2016) by task and movement in the Republic of Ireland, Northern Ireland and Great Britain**

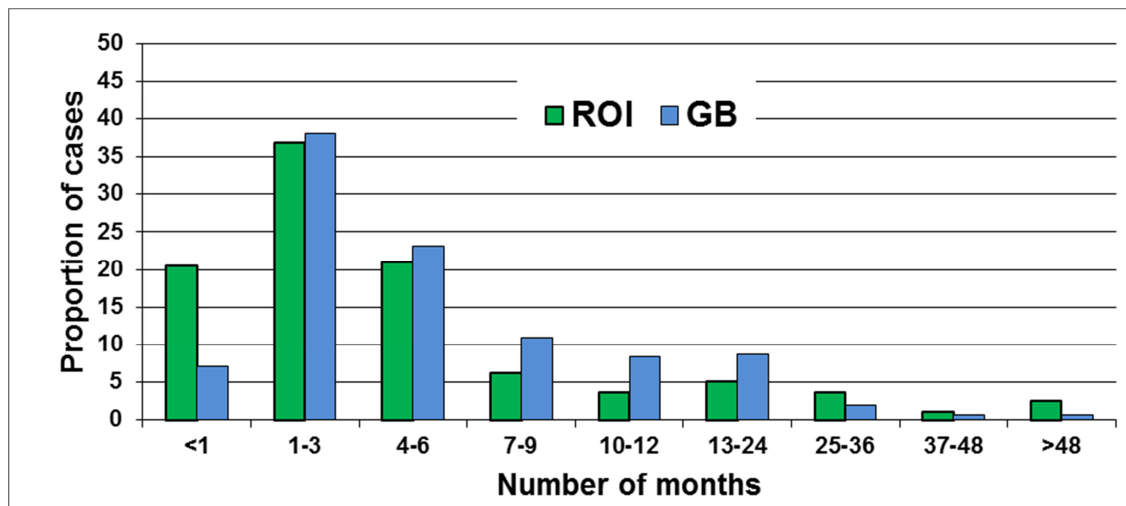
<b>Task / movement</b>	<b>ROI</b>	<b>NI</b>	<b>GB</b>
<b><u>TASK</u></b>			
Keyboard work	56 (11%)	5 (4%)	280 (10%)
Screwing, cutting	1 (<1%)	0	20 (1%)
Hammering, chopping, sawing	0	0	8 (<1%)
Guiding or holding tool	12 (2%)	22 (17%)	469 (17%)
Meat boning or filleting	0	0	39 (1%)
Packing or sorting	2 (<1%)	1 (1%)	68 (3%)
Assembly	2 (<1%)	4 (3%)	39 (1%)
Materials manipulation	95 (19%)	15 (11%)	325 (12%)
Machine operation	10 (2%)	8 (6%)	135 (5%)
Lifting/carrying/pushing/pulling	177 (35%)	19 (14%)	530 (19%)
Coordinated whole body movement	1 (<1%)	0	36 (1%)
Driving	4 (1%)	0	36 (1%)
Accidents	157 (31%)	54 (41%)	658 (24%)
Other	7 (1%)	1 (1%)	86 (3%)
Not stated/uncodeable	11 (2%)	7 (5%)	130 (5%)
<b><u>MOVEMENT</u></b>			
Fine hand	13 (3%)	2 (2%)	181 (7%)
Forceful upper limb/grip	18 (4%)	24 (15%)	623 (23%)
Torque upper limb	0	0	7 (<1%)
Lifting	26 (6%)	4 (3%)	251 (9%)
Carrying	3 (1%)	0	26 (1%)
Pushing	0	1 (1%)	18 (1%)
Pulling	6 (1%)	1 (1%)	22 (1%)
Forceful leg movement	0	0	2 (<1%)
Overhead work	3 (1%)	0	9 (<1%)
Materials handling n.e.c.	235 (46%)	37 (28%)	621 (23%)
Bending	1 (<1%)	0	33 (1%)
Sitting	4 (1%)	0	29 (1%)
Standing/walking	4 (1%)	0	45 (2%)
Kneeling	2 (<1%)	1 (1%)	12 (1%)
Twisting	2 (<1%)	0	28 (1%)
Postural n.e.c.	54 (11%)	3 (2%)	242 (9%)
Accidents	159 (31%)	54 (41%)	655 (24%)
Other	34 (7%)	40 (30%)	732 (27%)
Not stated/uncodeable	11 (2%)	7 (5%)	128 (5%)
<b>Total cases</b>	<b>512</b>	<b>132</b>	<b>2720</b>

### **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).

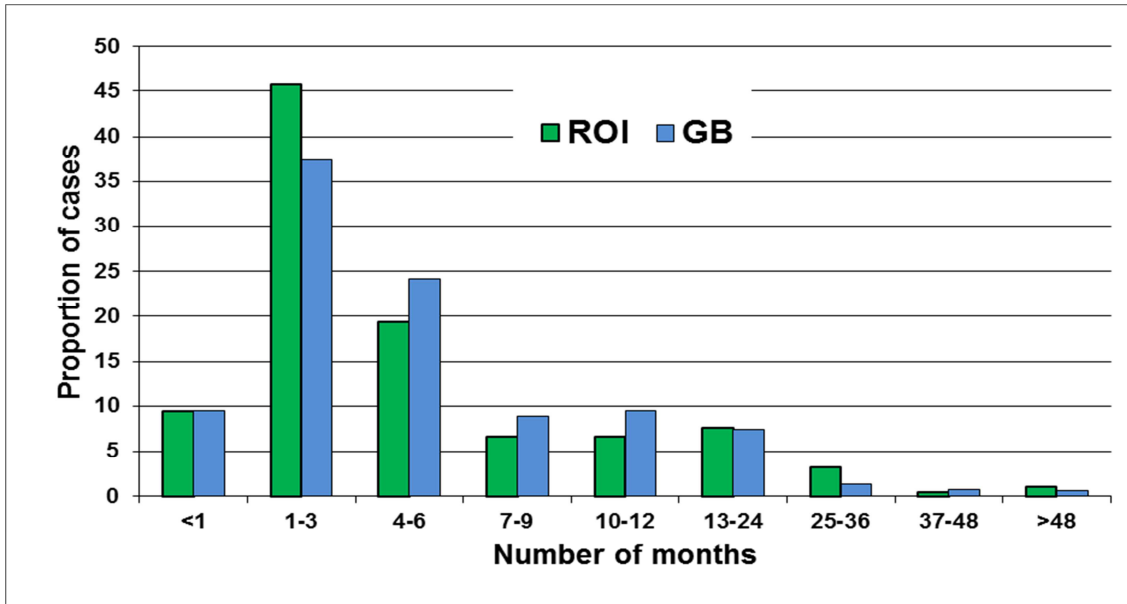
**Figure 12 Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related anxiety and depression reported to OPRA (2007-2016) in the Republic of Ireland and Great Britain**



\*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
<b>ROI</b>	195	0	87	6.5	2	12.5
<b>GB</b>	2522	0	180	7.2	4	11.1

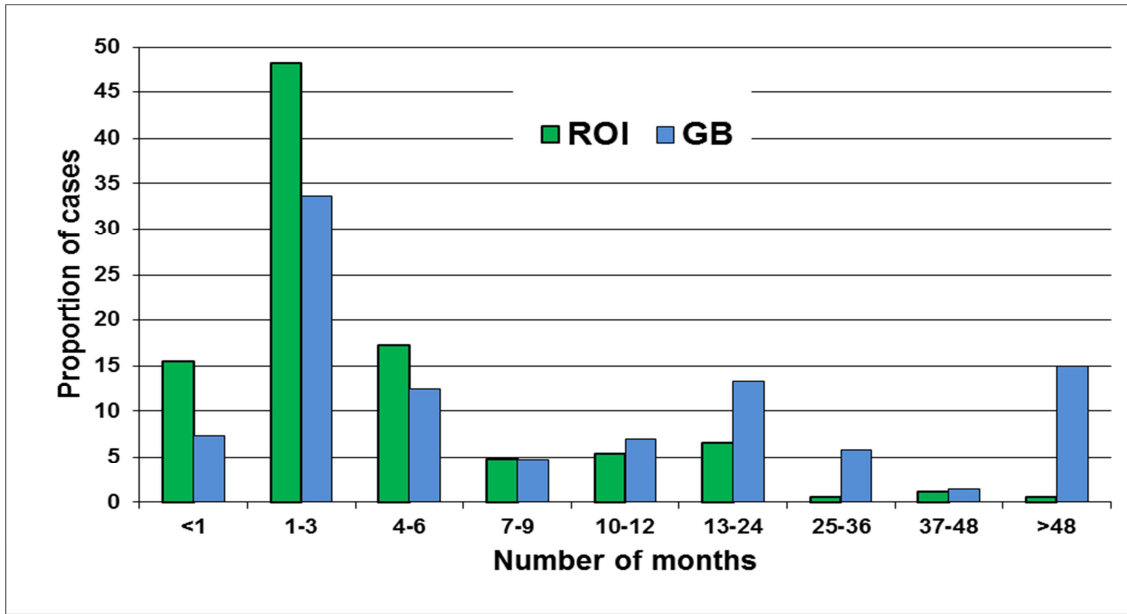
**Figure 13** Proportional time lapse between month of symptom onset and reporting month for actual cases of other work stress reported to OPRA (2007-2016) in the Republic of Ireland and Great Britain



\*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	486	0	62	5.9	3	8.4
GB	2584	0	156	6.7	4	10.7

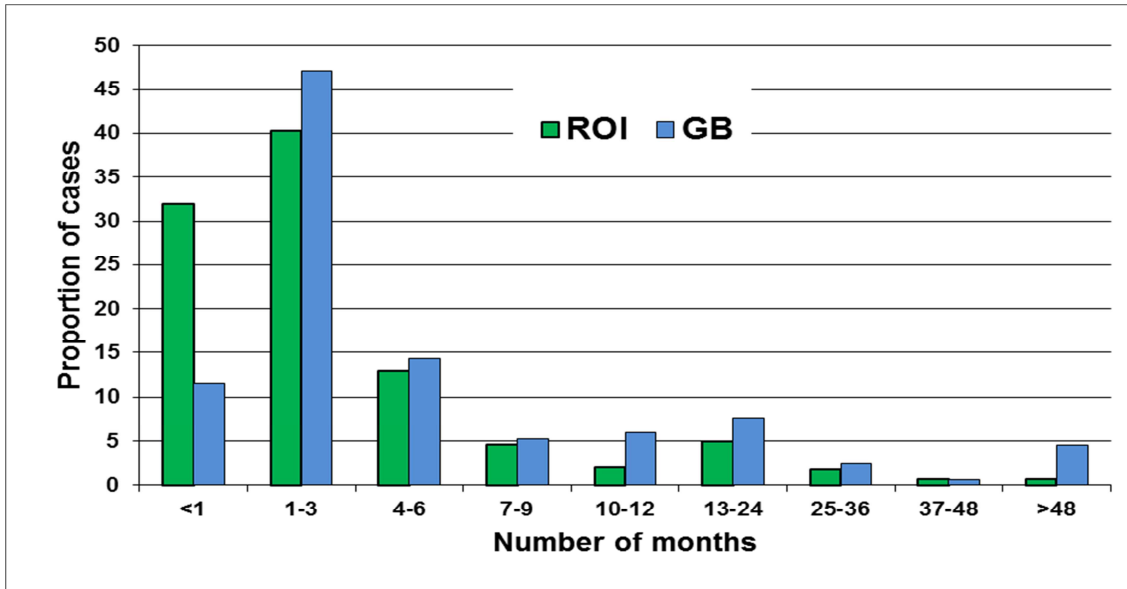
**Figure 14** Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related upper limb disorders reported to OPRA (2007-2016) in the Republic of Ireland and Great Britain



\*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
<b>ROI</b>	168	0	61	5	2	7.8
<b>GB</b>	1447	0	360	23.4	5	41.2

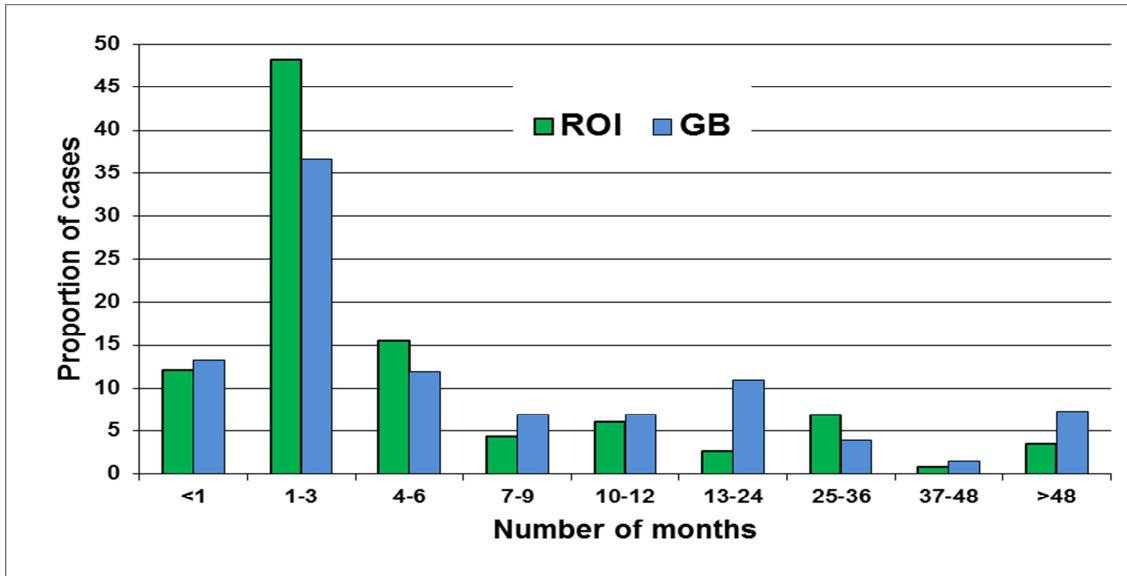
**Figure 15** Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related spine/back disorders reported to OPRA (2007-2016) in the Republic of Ireland and Great Britain



\*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
<b>ROI</b>	285	0	100	4.1	1	9.1
<b>GB</b>	729	0	252	10.8	3	28

**Figure 16** Proportional time lapse between month of symptom onset and reporting month for actual cases of work-related contact dermatitis reported to OPRA (2007-2016) 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
<b>ROI</b>	116	0	122	8.5	3	17.4
<b>GB</b>	435	0	441	16.4	3	40

### **3.7 THE HEALTH AND OCCUPATION RESEARCH NETWORK IN GENERAL PRACTICE (2015-16)**

#### **3.7.1 OVERVIEW**

General practitioners have reported 17 cases of WRIH since the scheme commenced data collection in 2015 – 6/17 (35%) mental ill-health, 5/17 (29%) ‘other’ WRIH, 4/17 (24%) musculoskeletal disorders and 2/17 (12%) skin disease (Table 11). A similar pattern was seen for NI and GB, with greater proportions of musculoskeletal and mental ill-health diagnoses compared to skin and respiratory. 59% of the cases were reported in the ROI were in males with a mean age of 47 years (all cases; age range 28-79 years). The industries reported for the ROI cases were as follows: accommodation and food service (3 cases); construction; health and social care; agriculture, fishing and forestry; warehousing activities; retail (2 cases each); manufacturing (not specified); real estate activities; public administration and defence; education (1 case each).

The suspected agents recorded for the skin disease reported in the ROI were cleaning agents and trauma to skin. The tasks and movements associated with the ROI musculoskeletal cases reported were pulling (cited twice); accidents; and posture. The precipitating events for the ROI mental ill-health cases reported were bullying (cited twice); pressure of work/stress of work (cited twice); workload and responsibilities. The agents reported for the cases of ‘other’ WRIH reported in the ROI were accidents (cited 3 times); assault; and dog bite.



**Table 11 Number and type of diagnoses reported by general practitioners to THOR-GP (2015-2016) in the Republic of Ireland, Northern Ireland & Great Britain**

	<b>ROI</b>	<b>NI</b>	<b>GB</b>
<b>Skin</b>	2 (12%)	3 (25%)	15 (6%)
• Contact dermatitis	• 1 (50%)	• 2 (67%)	• 11 (73%)
• Other dermatoses	• 1 (50%)	• 1 (33%)	• 4 (27%)
<b>Respiratory</b>	0	0	10 (4%)
• Asthma	• 0	• 0	• 2 (20%)
• Other respiratory	• 0	• 0	• 8 (80%)
<b>Musculoskeletal</b>	4 (24%)	4 (33%)	127 (55%)
• Upper limb	• 1 (25%)	• 3 (75%)	• 52 (41%)
• Neck / Spine / back	• 1 (25%)	• 0	• 48 (38%)
• Lower limb	• 1 (25%)	• 1 (25%)	• 23 (18%)
• Other musculoskeletal	• 1 (25%)	• 0	• 4 (3%)
<b>Mental ill-health</b>	6 (35%)	5 (42%)	100 (43%)
• Anxiety and depression	• 3 (50%)	• 0	• 34 (34%)
• Other work stress	• 3 (50%)	• 5 (100%)	• 51 (51%)
• Other mental ill-health	• 0	• 0	• 10 (10%)
<b>Other diagnoses</b>	5 (29%)	0	17 (7%)
• Lacerations	• 4 (80%)	• 0	• 0
• Bites	• 1 (20%)	• 0	• 1 (6%)
• Other	• 0	• 0	• 16 (94%)
<b>Total cases</b>	<b>17 (100%)</b>	<b>12 (100%)</b>	<b>233 (100%)</b>
<b>Total diagnoses</b>	<b>17</b>	<b>12</b>	<b>269</b>

## 4 DISCUSSION

This is the latest report to provide an overview of the incidence of WRI in the ROI, as suggested by case reports to the surveillance scheme ROI-THOR. A total of 2148 incident cases were reported to ROI-THOR between 2005-2016, of which 70% were reported by OPs (2007-2016) with smaller proportions from dermatologists (21%) chest physicians (8%) and GPs (1%).

A total of 74 physicians (12 chest physicians, 13 dermatologists, 27 OPs and 22 GPs) were enrolled in ROI-THOR in 2016, with numbers remaining fairly stable since the inception of the 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 in practice participation rates may be higher because some specialist physicians may not be eligible to report to THOR e.g. they may not see patients of working age). 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 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 was the launch (April 2016) of EELAB (Electronic, Experiential Learning, Audit and Benchmarking) for the use of OPs enrolled in ROI-OPRA and GPs enrolled in ROI-THORGP. EELAB is an innovative online educational, continuing professional development (CPD) and clinical governance resource (accredited by the Society of Occupational Medicine) and currently used by GPs in the UK. Together with pilot groups of OPs in the ROI as well as in the UK, we developed a version of EELAB for OPs, and plan to develop versions for chest physicians and dermatologists too. 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.

Other steps to increase active membership in the ROI-THOR are also ongoing, for example, via activities undertaken to support the continued dissemination/endorsement of ROI-THOR. These include the publication of an article, which includes Dr Peter Noone (ROI-OPRA champion), Dr James Hayes (ROI-SWORD champion), Dr Johnny Bourke (ROI-EPIDERM champion) and Mr Kieran Sludds (HSA) as co-authors, which was the first paper to present data on work-related ill-health cases in the Republic of Ireland as reported voluntarily by physicians to a network of health surveillance schemes<sup>2</sup>. Dr Peter Noone was also co-author on a paper 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) consortium<sup>24</sup>. Presentations of ROI-THOR data are given on an ad hoc basis, e.g to the Irish Thoracic Society or the Irish Society of Occupational Medicine. ROI-THOR champions and Kieran Sludds are invited to attend the annual advisory committee meetings at COEH, and Dr James Hayes and Dr Peter Noone attended the SWORD (Thursday 31<sup>st</sup> March) and OPRA (16<sup>th</sup> June) 2016 annual advisory committee meetings respectively; presentations of the 2016 ROI summary statistics were given at each meeting. Dr Peter Noone and Mr Kieran Sludds also remain the ROI representatives in the Modernet consortium<sup>25</sup>. 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.

A teleconference chaired by the HSA, and including ROI-THOR champions and staff from COEH to discuss the way ahead for THOR in the Republic of Ireland was held on 13th March 2017. Sharon McGuinness reiterated that the HSA valued the THOR-ROI scheme and wished it to continue, but with a view to growing the scheme in terms of reporters and information generated. It was agreed that more needs to be done to improve the scheme and make it more useful from a HSA point of view. In terms of reporter numbers, there was agreement that these need to increase and in addition, those reporting need to be more active. The health sector is well represented particularly by OPs in the ROI, therefore there is a need to engage other sectors and specialist consultants. The HSA agreed to work on a strategy to promote and support THOR-ROI, to encourage reporting participation via presentations at the Faculty of Occupational Medicine, specialists conferences etc. promoting the

advantages of the scheme and highlighting CPD. In terms of the data collected, HSA agreed that the use and promotion of this needs to be more focused particularly in terms of its usefulness when targeting interventions and highlighting the importance and value of the doctors reporting this information.

Following on from the substantive ROI-THOR report submitted in 2016, this report continues to compare THOR data collected by the ROI reporters with data from THOR schemes in NI and within GB. Whilst this is also the first report to compare data collected by GP reporters in the ROI with GP reporters in NI and GB, the results of this comparison should be interpreted with some caution due to the as yet comparatively small number of reports by GPs in the ROI.

Following on from the report submitted to HSA in 2016, this report again provides incidence rates for ROI and compares these with rates for GB and NI. As before, this comparison 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 addition of a further year of data (2016) has 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 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 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, NI or GB participating in THOR) and response (the proportion of participating physicians actively responding each month)<sup>21</sup>. 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.

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 also reported a significant proportion of neoplasia diagnoses. 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 with

dermatologists in the three areas with rubber, wet work, nickel and chromium all frequently reported.

Whilst 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 GB<sup>26</sup>.

The case mix reported by OPs in the three geographical areas continued to be similar, with the largest proportion being mental ill-health diagnoses, followed by musculoskeletal, with fewer skin and respiratory diagnoses. There was also 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.

Initial comparisons between data reported by GPs in the ROI and data reported by GPs in NI and GB, suggest that the case mix is similar with proportionately more mental ill-health and musculoskeletal diagnoses compared to skin and respiratory diagnoses. As the number of case reports by GPs in the ROI increases, further comparisons with data reported in the UK (for example, by occupation, industry and agent) will be possible.

In conclusion, ROI-THOR continues to provide the best overall source of data relating to medically attributed occupational disease incidence in the ROI with nearly 2150 cases reported since the inception of the schemes. It is hoped that with increased enrolment/participation in all of the ROI-THOR schemes, aided by steps such as the introduction of EELAB, and a renewed focus from the HSA, case numbers will increase, enabling both comparisons with UK data and more sophisticated analyses in general. Similarly, as the number and types of cases reported to ROI-THOR increases overall, the various determinants of risk e.g. causal agent, precipitating event (mental ill-health) and task/movement (musculoskeletal) will continue to be analysed and reported upon, thus providing useful information for the HSA and ROI.



## ACKNOWLEDGMENTS

THOR is partially funded by a grant from the Republic of Ireland Health and Safety Authority, awarded to Professor Raymond Agius and co-investigators at the University of Manchester. This report expresses the views of the authors, and not necessarily of the funders. We are grateful to all physicians in the Republic of Ireland who participate in THOR, for their invaluable contribution and co-operation. In particular we thank Dr Peter Noone, Dr Ken Addley and colleagues in the Faculty of Occupational Medicine (Royal College of Physicians of Ireland), Dr Johnny Bourke, Consultant Dermatologist, and Dr James Hayes Consultant Chest Physician (on behalf of the Irish Thoracic Society). Thanks are also due to Christina O'Connor and Susan Taylor for their research and administrative assistance. Physicians who wish to join THOR and participate in the reporting schemes can find further details at

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

## REFERENCES

- 1 The Health and Occupation Research network in the Republic of Ireland (ROI-THOR) <http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/schemes/ireland>  
Last accessed April 2017.
- 2 Money, A, Carder, M, Noone, P, Bourke, J, Hayes, J & Agius, RM. Work-related ill-health: Republic of Ireland, Northern Ireland, Great Britain 2005-2012, *Occup Med*, 2015 65:15-21.
- 3 THOR - The Health and Occupation Reporting network. Available at <http://www.medicine.manchester.ac.uk/oeht/thor>

- 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. *Br J Ind Med* 1991; 48:292–8.
- 5 Meyer JD, Chen Y, Holt DL, Beck MH, Cherry NM. Occupational contact dermatitis in the UK: a surveillance report from EPIDERM and OPRA. *Occup Med* 2000; 50: 265-273.
- 6 Cherry, NM, McDonald, JC. The incidence of work-related disease reported by occupational physicians, 1996-2001. *Occup Med (Lond)* 2002;**52**:407-411.
- 7 Hussey L, Turner S, Thorley K, McNamee R, and Agius R. Work-related ill health in general practice, as reported to a UK-wide surveillance scheme. *Br J Gen Pract.* 2008; 58(554):637-640.
- 8 S Turner, M Carder, L Hussey, N Zarin, R Agius. The incidence of occupational skin and respiratory disease as reported to The Health and Occupation Reporting (THOR) network by physicians in the Republic of Ireland between 2005 and 2006. Report submitted to the ROI Health and Safety Authority, April 2007.
- 9 S Turner, M Carder, A Money, R Agius. 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. Report submitted to the ROI Health and Safety Authority, April 2008.
- 10 Money A, Carder M, Turner S, and 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. Report submitted to the ROI Health and Safety Authority, April 2009.
- 11 Carder M, Money A, Turner S, and 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. Report submitted to the ROI Health and Safety Authority, April 2010.
- 12 Carder M, Money A, Turner S, and 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. Report submitted to the ROI Health and Safety Authority, April 2011.
- 13 Carder M, Money A, Turner S, and 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. Report submitted to the ROI Health and Safety Authority, April 2012.
- 14 Money A, Carder, M, and 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. Report submitted to the ROI Health and Safety Authority, April 2013.
- 15 Money A, Carder, M, and 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. Report submitted to the ROI Health and Safety Authority, April 2014.
  - 16 Money A, Carder, M, and 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. Report submitted to the ROI Health and Safety Authority, April 2015.
  - 17 Money A, Carder, M, and 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. Report submitted to the ROI Health and Safety Authority, April 2016.
  - 18 Office for National Statistics. Standard Occupational Classification. Norwich: The Stationery Office, 2000.
  - 19 Central Statistical Office. Indexes to the Standard Industrial Classification of Economic Activities 1992. London: HMSO, 1993.
  - 20 World Health Organisation. International Statistical Classification of Diseases and Related Health Problems (ICD-10), 10<sup>th</sup> edition. Geneva: WHO, 1992.
  - 21 Carder M, McNamee R, Turner S, Hussey L, Money A, Agius R. (2011) Improving estimates of incidence of specialist diagnosed, work-related respiratory and skin disease in Great Britain. *Occup Med (Lond)*, 61(1): 33-39.
  - 22 Office for National Statistics. Labour Force Survey 2005-2015.
  - 23 QNHS (2006) Quarterly National Household Survey, Dublin: Central Statistics Office.
  - 24 Carder M, Bensefa-Colas L, Mattioli S, Noone P, Stikova E, Valenty M, Telle-Lamberton M. (2015) A review of occupational disease surveillance systems in the Modernet consortium. *Occup Med*, Volume 65 (8) p:615-625.
  - 25 Monitoring trends in Occupational Diseases and tracing new and Emerging Risks in a NETWORK. Available at: <http://costmodernet.org/>, last accessed 2014.
  - 26 Cancer Trends No.17 Mesothelioma. National Cancer Registry Ireland, December 2012. [www.ncri.ie](http://www.ncri.ie) Last accessed February 2014.