

Work-related ill-health as reported to The Health and Occupation Research (THOR) network by physicians in the UK in 2020.

Report to the Health and Safety Executive

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EXECUTIVE SUMMARY

BACKGROUND: Chest physicians and dermatologists voluntarily report cases of work-related ill health (WRIH) to two constituent schemes of The Health and Occupation Research (THOR) network in the UK which are funded by the Health and Safety Executive (HSE). This report describes the cases of WRIH reported to EPIDERM and SWORD in the latest full calendar year (2020).

METHODS: Physicians have been and are continuously recruited to SWORD and EPIDERM with assistance from the scheme's champions and relevant societies within the UK. Participating physicians are asked to provide anonymised information of incident cases seen during their reporting period (every month for core reporters, and one randomly assigned month for sample reporters). Results are described as actual cases reported to the schemes as well as estimated cases; for the latter the cases reported by the sample reporters are weighted (by factor 12) to account for the reduced reporting period. Actual and estimated cases reported to SWORD and EPIDERM were analysed by age, sex, occupation/industry and suspected causal agent.

RESULTS: The 470 physicians enrolled in EPIDERM and SWORD in 2020 (123 dermatologists and 347 chest physicians) reported 245 actual cases and 685 estimated cases. Of these, 144 cases were reported by chest physicians and 101 cases were reported by dermatologists. In comparison, 658 actual and 2176 estimated cases were reported in 2019 (dermatologists: 274 actual and 1099 estimated cases; chest physicians 384 actual and 1077 estimated cases). Cases reported to EPIDERM in 2020 were predominantly contact dermatitis (92%). In terms of industry sector, similar to 2019 cases reported to EPIDERM in 2020 were most frequently employed in the human health and social care sector (38%), followed by 'other service activities' (23%). Beauticians (15%), hairdressers (7%) and nurses (11%) were the most frequently reported occupations in EPIDERM in 2020. For work-related respiratory disease,

non-malignant pleural disease was reported by chest physicians most frequently in 2020 (26%), followed by asthma (20%) and pneumoconiosis (20%). Similar to 2019, the industry sectors reported most frequently by chest physicians in 2020 were construction (32%) and manufacturing (28%), with carpenters and joiners (9%), bakers and flour confectioners (7%), and electricians and electrical fitters (6%) the most frequently reported occupations.

CONCLUSION: A decrease in the reporting of cases to SWORD and EPIDERM in 2020 has been observed, nonetheless the most frequently reported diagnoses, industrial and occupational sectors in 2020 were similar to those reported in 2019. The decrease in the reporting of cases in 2020 is largely due to the COVID-19 pandemic crisis and the interruptions that it caused. Hence, comparison of incidence in WRIH with previous years is not recommended. Nevertheless, SWORD and EPIDERM continues to provide the best overall source of data relating to medically attributed occupational respiratory and skin disease incidence in the UK.

1 INTRODUCTION

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

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

This report describes the cases of WRIH reported to SWORD and EPIDERM in the latest full calendar year (2020).

2 METHODS

Participating physicians were asked to provide anonymised information of incident cases seen during their reporting month that they believe to have been wholly or partly caused or aggravated by work. All physicians report either every month ('core' reporters) or for one

randomly assigned month per year ('sample' reporters). Reporters are requested to give information on diagnosis, age, gender, geographical location, occupation, industry and suspected agent(s). Reporting can be done using a postal reporting card or electronically using an online web form. In 2020, due to the covid-19 pandemic crisis which resulted in the closure of the University of Manchester and THOR researchers having to work from home, ability of THOR's researchers to send out postal reporting cards to reporters as well as their ability to process any postal reporting cards sent to the University during the closure period was limited. Hence, reporting electronically using the online web form was encouraged and promoted.

The occupation and industry are coded using the Standard Occupational Classification (SOC) and the Standard Industrial Classification (SIC), respectively. Suspected agents are coded using in-house coding schemes developed in conjunction with the Health and Safety Executive (HSE) in the UK. All coding is undertaken independently by two researchers, and any discrepancies are reconciled by a third person.

Physicians reporting to SWORD and EPIDERM are requested to assign their case to one or more of the following major sub-groups:

Table 1: Sub-groups of diagnoses reported by dermatologists and chest physicians to SWORD and EPIDERM

SWORD	EPIDERM
occupational asthma	contact dermatitis
inhalation accidents	contact urticaria
allergic alveolitis	folliculitis/acne
bronchitis/emphysema	infection
infectious disease	mechanical dermatoses
non-malignant pleural disease (NMPD)	nail disorders
mesothelioma	neoplasia
lung cancer	'other dermatoses'(with the ability to specify the diagnosis if this is chosen)
pneumoconiosis	
'other respiratory disease' (with the ability to specify the diagnosis if this is chosen)	

Two new categories were introduced for cases of COVID-19 reported to THOR: COVID-19 and long COVID. Reporters are free to report COVID-19 cases under either the “infectious disease” or “other respiratory disease” category.

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

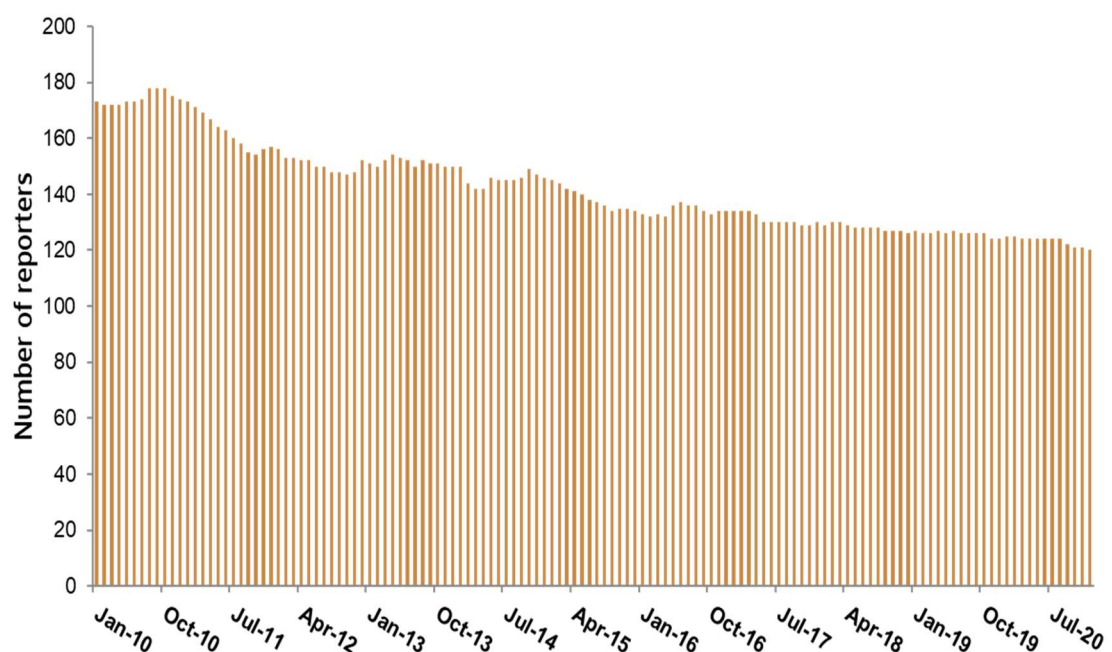
3 RESULTS

3.1 OVERVIEW OF SCHEMES PARTICIPATION

An overview of the reporting activity of the physicians participating in EPIDERM and SWORD is briefly described below.

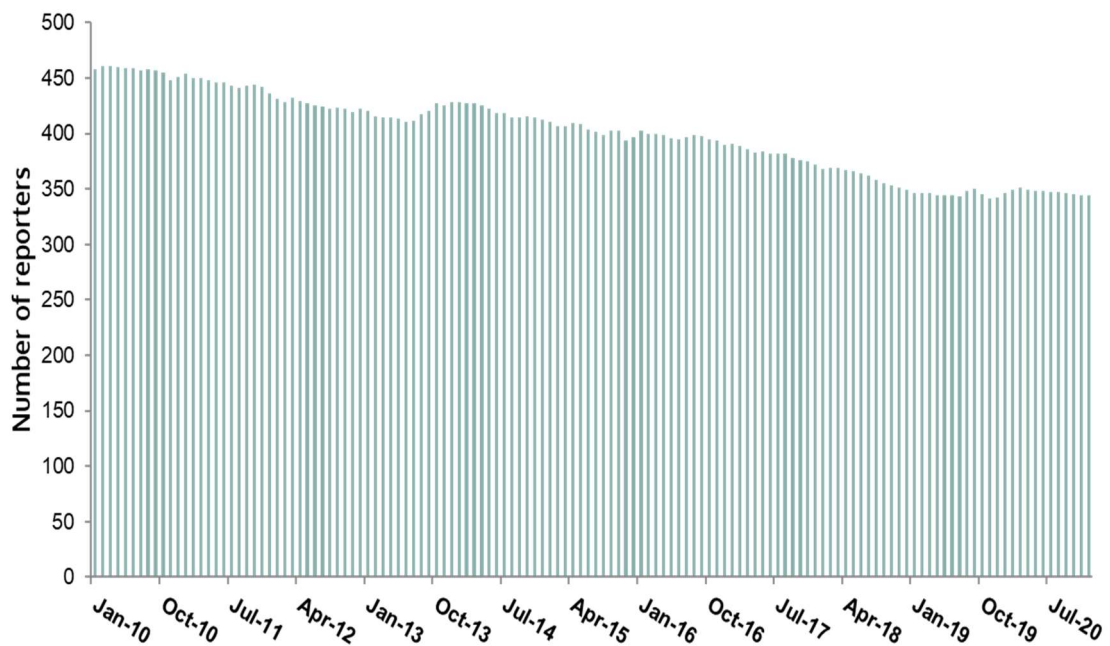
An average of 123 dermatologists were enrolled in EPIDERM in 2020 (Figure 1). Compared to 2019, 2020 saw a slight decrease in the overall number of dermatologists enrolled in EPIDERM (from 126 in 2019 to 123 in 2020).

Figure 1: Number of reporters in EPIDERM, Jan 2010 – Dec 2020



On average, 347 chest physicians were enrolled in SWORD in 2020 (Figure 2). Unlike EPIDERM, there was a slight increase in the overall number of chest physicians enrolled in SWORD between 2019 and 2020 (from 345 in 2019 to 347 in 2020).

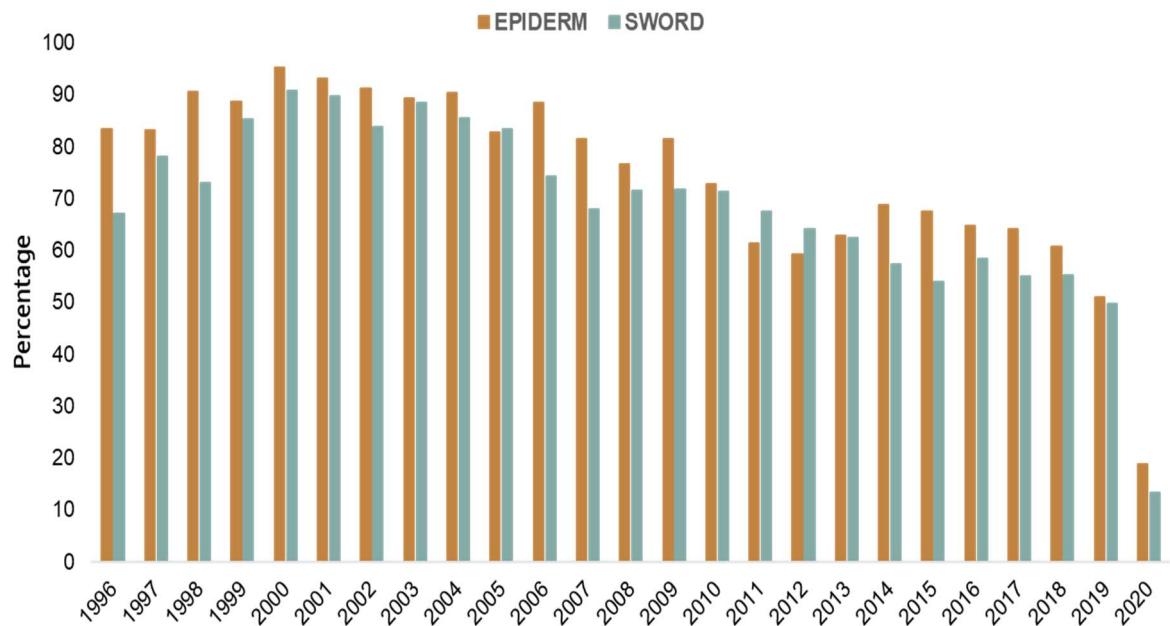
Figure 2: Number of reporters in SWORD, Jan 2010 – Dec 2020



Response rates (number of times reporters respond either by reporting a case or submitting a nil return/ total number of reminders sent out to all reporters) per year for EPIDERM showed an initial increase between 1996 and 2001, followed by an overall decline until 2012 after which they appeared to stabilise between 60-70% (Figure 3). However, 2019 and 2020 saw a decrease in the response rate to 51% and 19%, respectively, from 61% in 2018 (Figure 3).

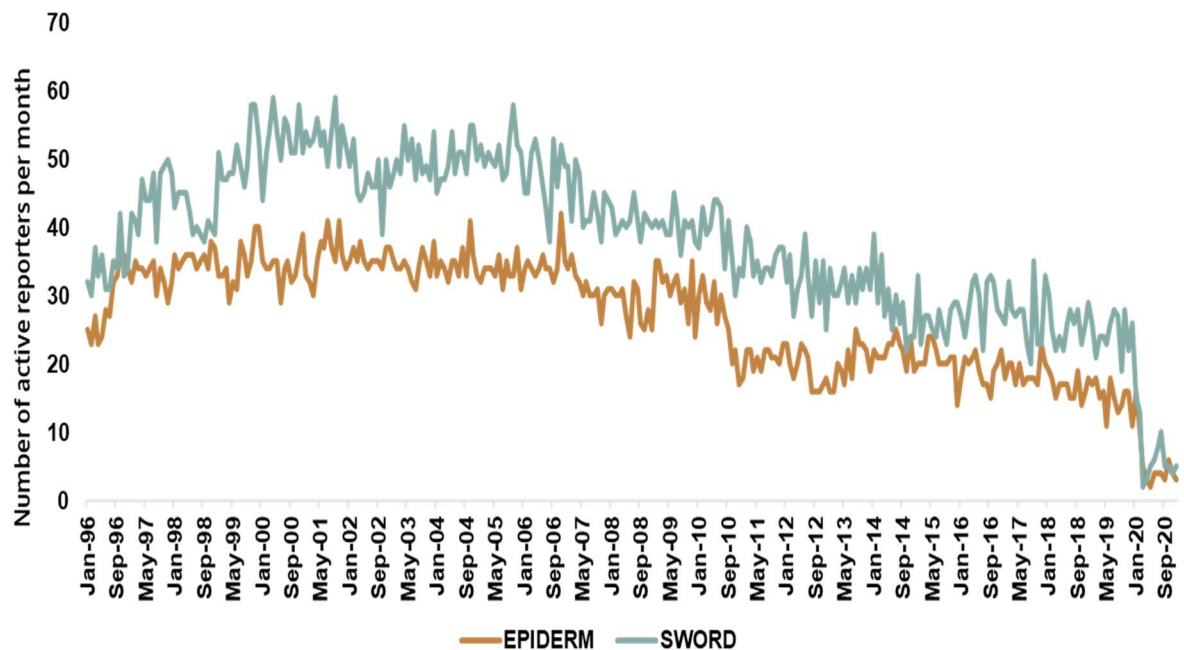
Similar to EPIDERM, response rates per year for SWORD showed an initial increase between 1996 and 2000, followed by an overall decline until 2015 after which they appeared to stabilise between 50-60% (Figure 3). However, 2020 saw a sharp decrease in the response rate to 13% from 50% in 2019 (Figure 3).

Figure 3: Response rate per year for EPIDERM and SWORD, 1996 - 2020



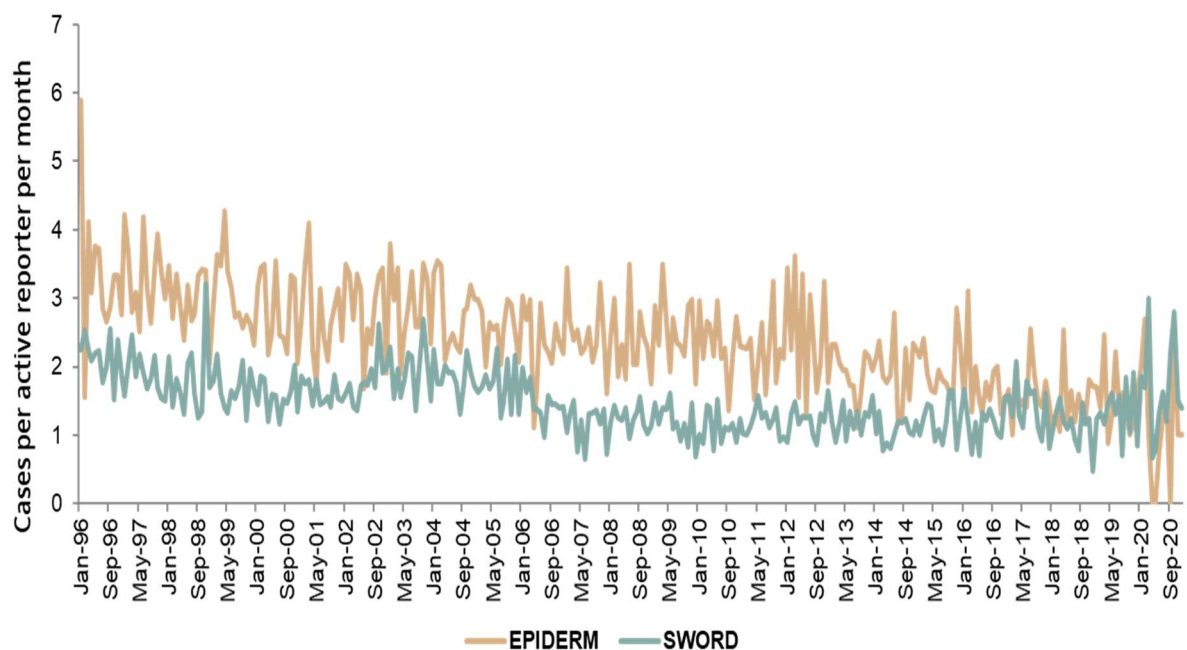
The average number of active reporters (an active reporter is defined as a reporter who either returned cases or declared ‘I have nothing to report’ (a zero return) during the study period) per month in EPIDERM has decreased dramatically from approximately 15 reporters per month in 2019 to 5 reporters per month in 2020 (Figure 4). Similarly, the average number of active reporters per month in SWORD decreased from approximately 25 reporters per month in 2019 to 7 reporters per month in 2020 (Figure 4).

Figure 4: Number of active reporters per month for EPIDERM and SWORD, 1996 - 2020



The average number of cases per active reporter for EPIDERM decreased slightly from 1.5 in 2019 to 1.2 in 2020, while the average number of cases per active reporter for SWORD increased slightly from 1.3 in 2019 to 1.7 in 2020 (Figure 5).

Figure 5: Number of actual cases per active reporter per month for EPIDERM and SWORD, 1996 - 2020



3.2 OCCUPATIONAL SKIN SURVEILLANCE (EPIDERM): 2020

3.2.1 DIAGNOSES

In total, 101 actual (332 estimated) cases were reported by dermatologists to EPIDERM between January and December 2020. These 101 case reports produced 103 diagnoses. The most frequently reported skin diagnosis was contact dermatitis (92%) (Table 2).

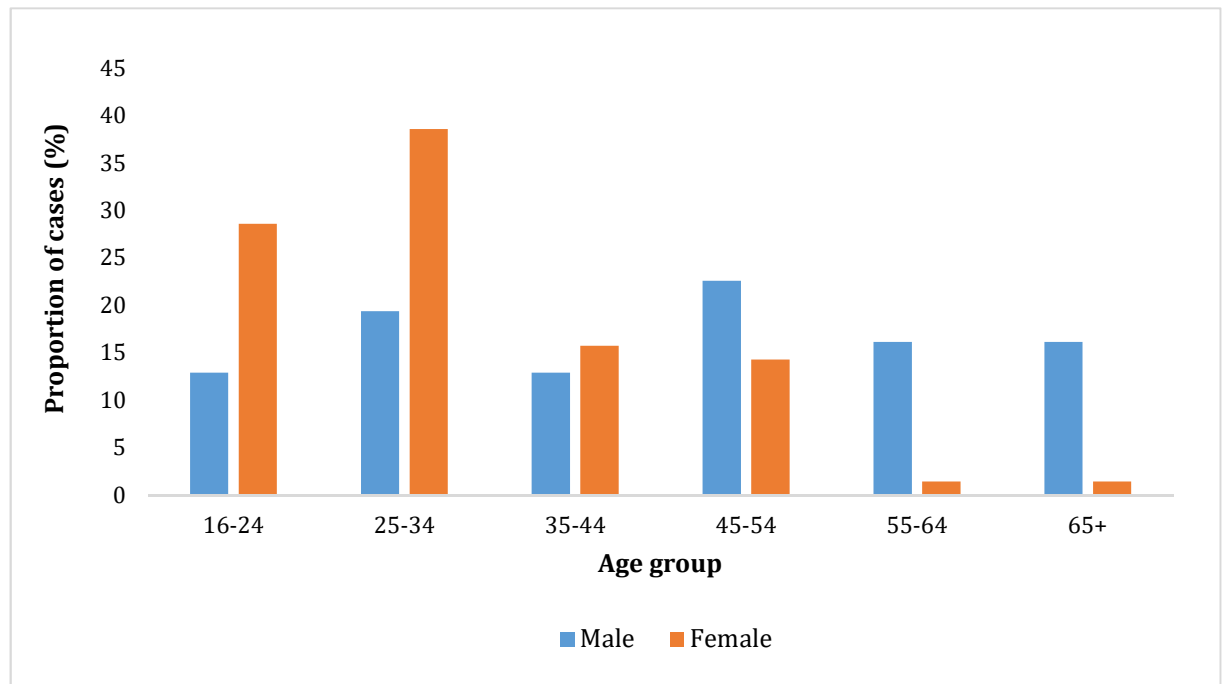
Table 2: Number and type of diagnoses reported by dermatologists to EPIDERM (2020)

	Number (%)
Contact Dermatitis	95 (92%)
• Allergic	• 51 (54%)
• Irritant	• 53 (56%)
Contact urticaria	1 (1%)
Folliculitis/acne	0 (0%)
Infective	1 (1%)
Mechanical dermatoses	1 (1%)
Nail disorder	0 (0%)
Neoplasia	5 (5%)
Other dermatoses	0 (0%)
Total cases	101
Total diagnoses	103 (100%)

3.2.2 AGE AND SEX

Case reports to EPIDERM were predominantly female (69%), with a mean age (male plus female combined) of 37 years (age range 17 - 88 years). Overall, females were younger than males (mean age; females 32 years, males 48 years) with cases most frequently reported in the 25-34 year age group for females and in the 45-54 year age group for males (Figure 6).

Figure 6: Proportion of cases reported to EPIDERM by age group and sex (2020)



3.2.3 INDUSTRY AND OCCUPATION

The most frequently reported industrial sector reported to EPIDERM was human health and social care (37.6%), followed by 'other service activities' which includes hairdressing and other beauty treatments (22.8%), and manufacturing (10.9%) (Figure 7).

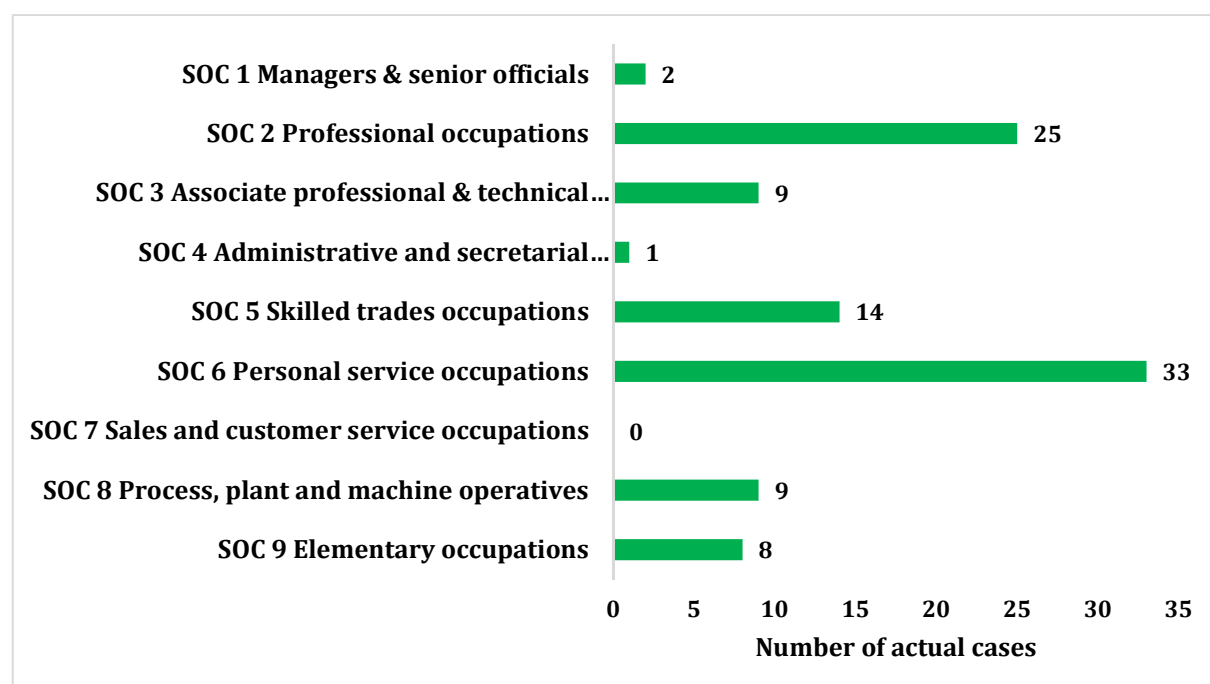
Figure 7: Number of actual cases reported to EPIDERM by Standard Industrial Classification (SIC), 2020



The most frequently reported occupations for actual cases reported to EPIDERM were beauticians and related occupations (14.9%) and hairdressers (6.9%) which fall under SOC group 6 'Personal service occupations' (Figure 8), and nurses (10.9%) which fall under SOC group 2 'professional occupations'.

Of the 8 non-contact dermatitis cases reported to EPIDERM, five cases of neoplasia were reported in a soldier, a builder, a fireman, a race horse breeder, and a retired forces officer. One case of contact urticaria was reported in a hairdresser; one case of fungal infective disease was reported in a nurse; and one case of mechanical disease was reported in a police officer.

Figure 8: Number of actual cases reported to EPIDERM by Standard Occupational Classification (SOC), 2020



3.2.4 SUSPECTED AGENTS

Up to six suspected agents may be cited for each case report, and the agents associated with the actual skin disease cases reported to EPIDERM are shown in Table 3.

A total of 53 agents were associated with the 95 diagnoses of contact dermatitis, with water/wet work/washing/washing up being the most frequently reported agent, followed by soaps and detergents, methacrylate esters and PPE (Table 3). The suspected agents associated with the five cases of neoplasia reported to EPIDERM was ultraviolet light. The case of contact urticaria was associated with ammonium persulfate; the case of mechanical disease was associated with friction and occlusion from stab vest aggravating atopic eczema; and the case of infective disease was associated with fungal infection.

Table 3: Suspected agents associated with actual cases of work-related skin disease reported to EPIDERM, (2020)

DIAGNOSIS	SUSPECTED AGENTS (as recorded by the physician)
Contact dermatitis	Water/wet work/hand washing/washing (34 cases); soaps & detergents (24 cases); rubber (24 cases); methacrylate esters (23 cases); protective clothing and PPE (22 cases); sterilizing and disinfecting agents (16 cases); preservatives (16 cases); other acrylics and acrylates (12 cases); epoxy resin and other resins (9 cases); hairdressing (5 cases); 4 cases for each of the following: cosmetics; perfumes/fragrance; food, additives and flavourings; p-phenylene diamine (PPD); 3 cases for each of the following: nickel and its compounds; paint; glues and adhesives; shampoo; plants; unspecified irritants; 2 cases for each of the following: cleaning material; cement, plaster and masonry; high temperatures; chromium and its compounds; vegetables/fruits; colophony and flux; and 1 case for each of the following: dust; formaldehyde; lubricating oils; other alcohol; cutting oils/soluble oils; synthetic coolants; unspecified acids; zinc and its compounds; cobalt and its compound; unspecified metals; flour; leather; and animal meat.
Contact urticaria	Ammonium persulphate (1 case).
Infective disease	Fungal (1 case).
Neoplasia	Ultraviolet light (5 cases).
Mechanical	Friction and occlusion (1 case).

3.3 SURVEILLANCE OF WORK-RELATED AND OCCUPATIONAL RESPIRATORY DISEASE (SWORD): 2020

3.3.1 DIAGNOSES

A total of 144 actual (353 estimated) cases were reported by chest physicians to SWORD in 2020. These 144 case reports produced 180 diagnoses. Diagnoses of non-malignant pleural disease comprised the largest proportion of all diagnoses (26%) reported to SWORD (Table 8). The two cases of infectious disease reported to SWORD were cases of SARS-CoV-2 virus (COVID-19) infection.

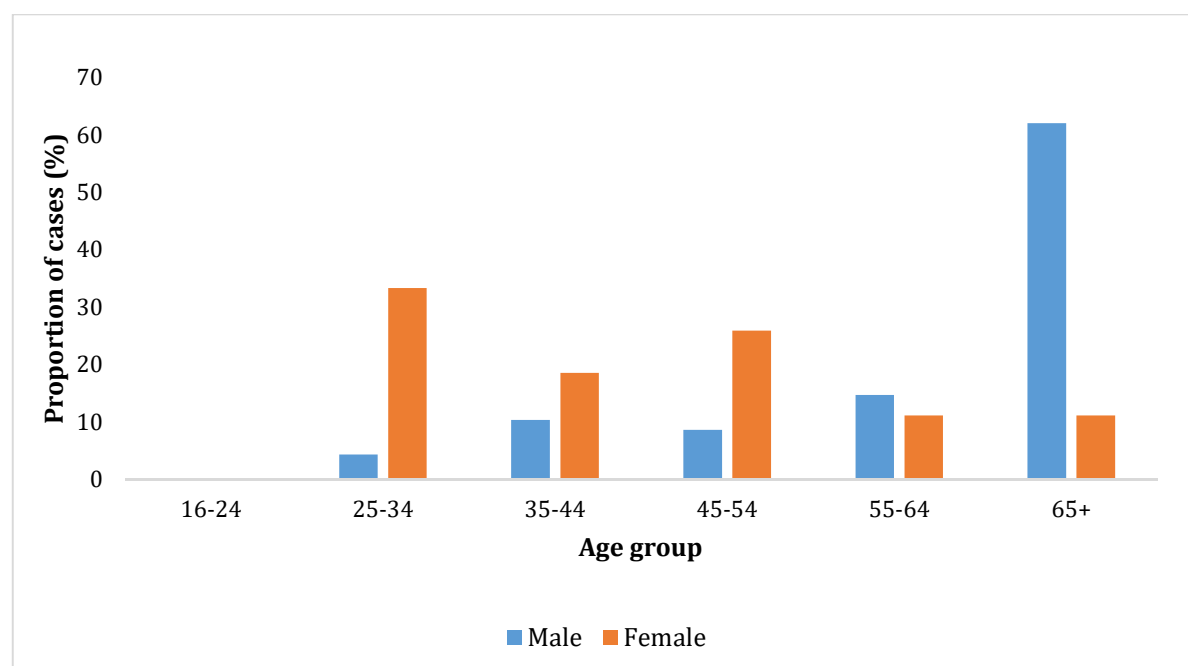
Table 4: Number and type of diagnoses reported by chest physicians to SWORD (2020)

	Number	(%)
Asthma	36	20%
Inhalation accidents	4	2%
Allergic alveolitis	4	2%
Bronchitis/ emphysema	5	3%
Infectious disease	2	1%
Non-malignant pleural disease	47	26%
Mesothelioma	17	9%
Lung cancer	1	<1%
Pneumoconiosis	36	20%
Other respiratory	28	16%
Total cases	144	
Total diagnoses	180	100%

3.3.2 AGE AND SEX

Case reports to SWORD were predominantly male (81%), with a mean age (male plus female combined) of 61 years (range 26-97 years). Overall, females were younger than males (mean age; females 45 years, males 65 years) with cases most frequently reported in the 25-34 year age group for females and in the 65+ year age group for males (Figure 9).

Figure 9: Proportion of cases reported to SWORD by age group and sex (2020)

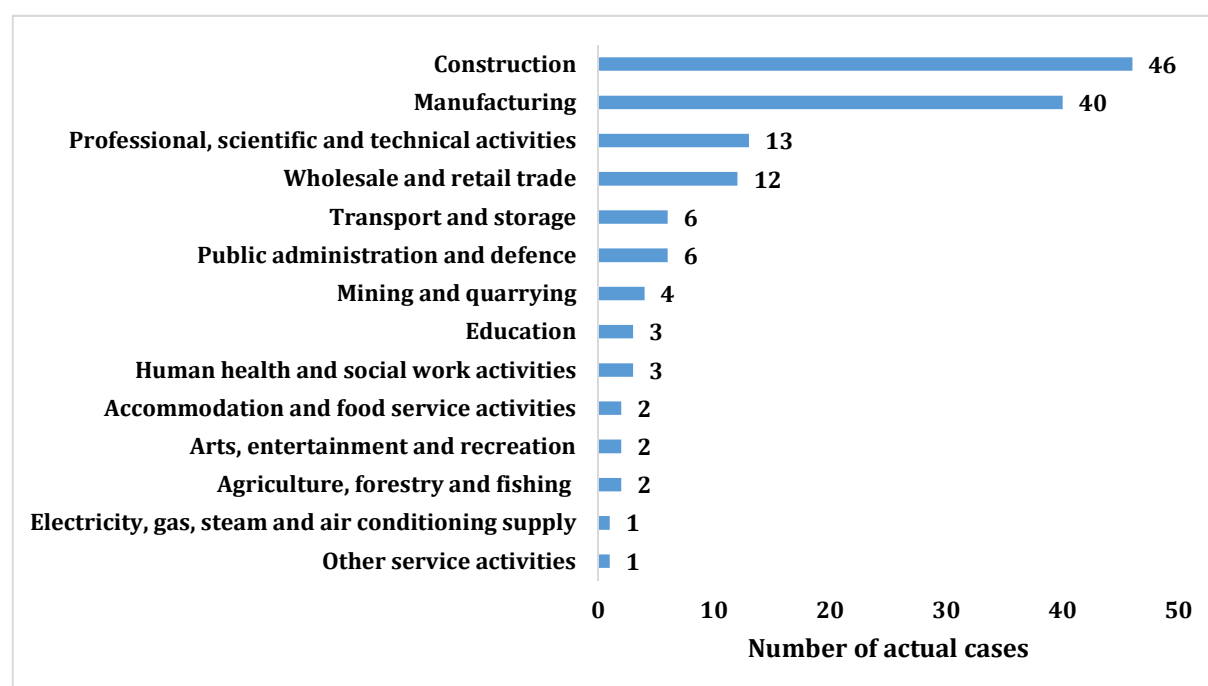


Of cases reported to SWORD in 2020, 37 of the cases were in the 75+ age group (35 males and 2 females), with 43 diagnoses: 18 non-malignant pleural disease, 11 pneumoconiosis, 11 mesothelioma, 2 allergic alveolitis, and 1 asthma. The majority of these cases (31 out of 37) were attributed to asbestos exposure, with the remaining attributed to coal (1 case), malt dust (1 case), aspergillus fumigatus (1 case) and microbial contamination of feed (1 case), with 2 cases with unknown suspect agent.

3.3.3 INDUSTRY AND OCCUPATION

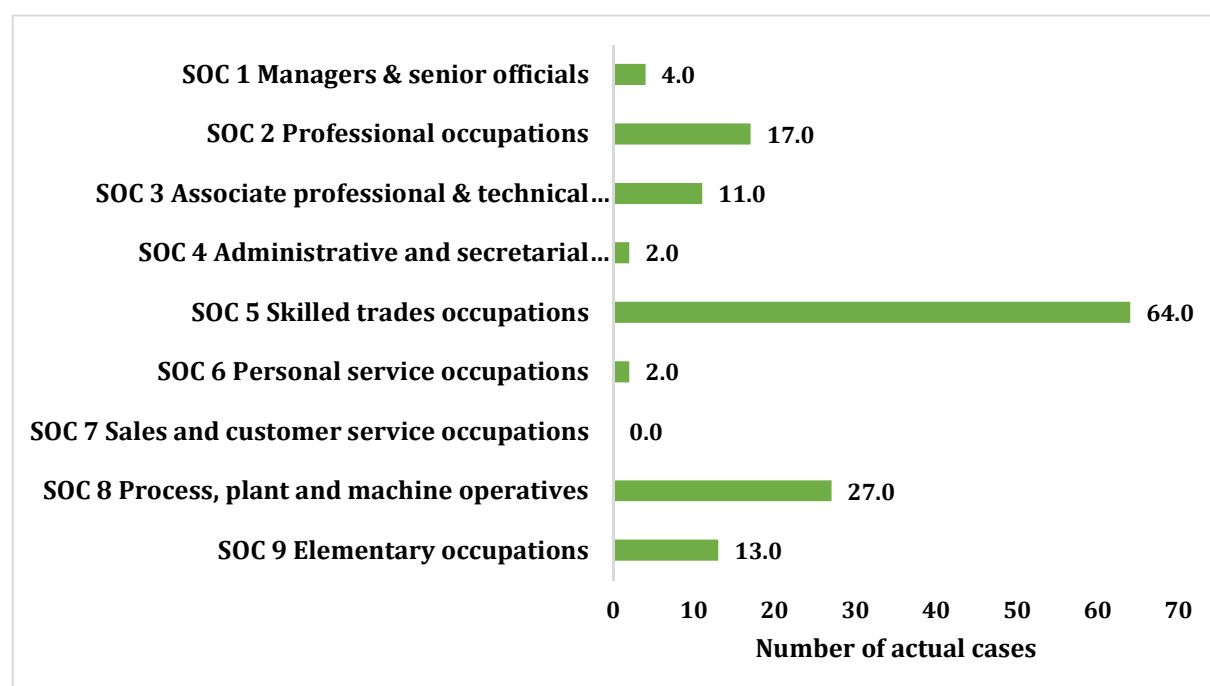
Actual cases of work-related respiratory disease were most frequently reported in the construction and manufacturing sectors (Figure 10). Within the manufacturing sector, actual cases were most frequently reported in the manufacturing of transport equipment, food products, motor vehicles, trailers and semi-trailers and other manufacturing which included manufacturing of jewellery, musical instruments, sports goods, games and toys.

Figure 10: Number of actual cases of respiratory disease reported to SWORD by Standard Industrial Classification (SIC), 2020



The most frequently reported occupations for actual cases reported were carpenters and joiners (9%), bakers and flour confectioners (7%), and electricians and electrical fitters (6%) (which fall under SOC group 5 “skilled trades’ occupations”) (Figure 11).

Figure 11: Number of actual cases of respiratory disease reported to SWORD by Standard Occupational Classification (SOC), 2020



3.3.4 SUSPECTED AGENTS

The agents associated with the respiratory diagnoses reported to SWORD are presented in Table 5. A total of 18 agents were associated with the 36 diagnoses of occupational asthma, with flour being the most frequently reported agent.

Asbestos and silica were the most frequently reported agents (cited 27 and 6 times, respectively) for cases of pneumoconiosis. In total, 89 diagnoses were reported as being associated with asbestos; 47 of non-malignant pleural disease, 27 of pneumoconiosis, 14 of mesothelioma, and 1 of lung cancer.

Table 5: Suspected agents associated with cases of work-related respiratory disease most frequently reported to SWORD, (2020)

DIAGNOSIS	SUSPECTED AGENTS (as recorded by the physician)
Asthma	Flour (9 cases); isocyanates and di-phenyl methane di isocyanate (4 cases); 3 cases for each of the following: cutting oils/soluble/oils/lubricating/milling/drilling; other creatures e.g. mites and ticks; 2 cases for each of the following: laboratory animals; hairdressing products; wood/wood dust; fungi/moulds/yeast; colophony and flux/solder; methyl methacrylate and other acrylics and acrylates; 1 case for each of the following: dusts; soaps and detergents; ventilation; fuel oil/diesel fuel; unspecified metals; and enzymes.
Inhalation accidents	Peracetic acid & caustic soda (1 case); motor exhaust (1 case); inorganic peroxide (1 case); and other chemicals (pava spray) (1 case).
Allergic alveolitis	Pathogens & micro-organisms (1 case); grain (1 case); fungi/moulds/yeast (1 case); and isocyanate (1 case).
Bronchitis/emphysema	Paper/cardboard (1 case); fuel oil/diesel fuel (1 case); silica (1 case); welding fumes (1 case); and colophony and flux/solder (1 cases).
Infectious disease	SARS_CoV_2 virus (2 cases).
Benign pleural disease	Asbestos (47 cases) and silica (1 case).
Mesothelioma	Asbestos (14 cases); and unknown agent (2 cases).
Lung cancer	Asbestos (1 case).
Pneumoconiosis	Asbestos (27 cases); silica (6 cases); and coal (4 cases).
Other respiratory	
Rhinitis	Flour (13 cases); laboratory animals (10 cases); glues and adhesives (2 cases); enzymes (1 case); metal working fluid (1 case) and other creatures e.g. mites and ticks (1 case).
Hard metal lung disease	Tungsten (1 case).

4 DISCUSSION

This report provide an overview of skin and respiratory WRIH cases in the UK in 2020, based on case reports by participating physicians to the SWORD and EPIDERM surveillance schemes. In total, 245 cases (685 estimated cases) were reported to SWORD and EPIDERM during 2020. Of these, 144 were reported by chest physicians to SWORD, and 101 were reported by dermatologists to EPIDERM. In comparison, 658 cases (2176 estimated cases) were reported in 2019 (SWORD: 384 cases; EPIDERM: 274 cases).

On average, the number of physicians enrolled in SWORD and EPIDERM in 2020 remained fairly stable compared to previous years. However, response rates for both EPIDERM and SWORD saw a sharp decrease in 2020 compared to 2019. Similarly, the average number of active reporters (who have reported at least one case or one nil return) per month has decreased dramatically in 2020 compared to 2019 for both EPIDERM and SWORD. Nevertheless, the average number of cases per active reporter for EPIDERM and SWORD remained fairly stable in 2020 compared to 2019 (EPIDERM: 1.2 in 2020 vs 1.5 in 2019; SWORD: 1.7 in 2020 vs 1.3 in 2019). The sharp decrease in the response rate and number of active reporters per month in 2020 is largely due to the COVID-19 pandemic crisis and the interruptions that it caused. Due to the pandemic and the closure of the University of Manchester, THOR researchers' were required to work from home. As a consequence, sending out of postal reporting cards to reporters was stopped and the processing of postal reporting card sent to the University during the closure period was also suspended. This, therefore, will have limited the ability of reporters who prefer to report via a reporting card to report to EPIDERM and SWORD during 2020. However, reporting electronically via online web form was encouraged and promoted. Furthermore due to the COVID-19 pandemic many, if not all, of the non-urgent dermatology and respiratory clinics were suspended in the UK. Thus, resulting in a decrease in the number of cases reported to EPIDERM and SWORD in 2020. In addition, due to the closure of non-urgent clinics and the redeployment of some chest physicians to acute COVID-19 wards to respond to the COVID-19 crisis, THOR researchers

suspended chasing reporters during the epidemic peaks which again contributed to the sharp decrease in the response rate and number of active reporters per month.

Case reports by dermatologists in 2020 were almost exclusively contact dermatitis and were predominantly females. The most frequently reported industrial sectors in 2020 were identical to those reported in 2019, which were human health and social care sector, followed by 'other service activities' and manufacturing sectors. Personal service occupations and professional occupations were the most frequently reported SOC categories to EPIDERM in 2020, with beauticians and related occupations being the most frequently reported occupation. This differed slightly from 2019, whereby skilled trades were the most frequently reported SOC category and nurses was the most frequently reported occupation in 2019. Similar to 2019, the most frequently suspected agents reported by dermatologists for contact dermatitis in 2020 were water/wet work/washing/washing up, followed by soaps and detergents, and protective clothing and PPE. Water/wet work/hand washing/washing, sterilizing and disinfecting agents, and soaps and detergents were more frequently associated with irritant contact dermatitis, while methacrylate esters, rubbers and other acrylics and acrylates were more frequently associated with allergic contact dermatitis. It is likely that contact dermatitis increased in healthcare workers during the COVID-19 pandemic due to the more frequent hand washing, and the increased use of sterilisers and PPE.

Similar to 2019, non-malignant pleural disease was the most frequently reported diagnosis by chest physicians in 2020. The most frequently reported industries reported in 2020 were construction and manufacturing; with skilled trades being the most frequently reported occupation. These were identical to what was reported in 2019. Unlike EPIDERM, cases reported to SWORD were predominantly males. Similar to 2019, asbestos was the most frequently reported suspect agent, being associated with 89 out of the 144 diagnoses (47 of non-malignant pleural disease, 27 of pneumoconiosis, 14 of mesothelioma, and 1 of lung cancer) reported to

SWORD in 2020. Furthermore similar to 2019, flour was the most frequently reported agent associated with the 36 diagnoses of occupational asthma reported to SWORD in 2020.

The COVID-19 pandemic crisis and the interruptions it caused made 2020 a challenging year. Following the relaxation of the first lockdown in July 2020 there was an increase in SWORD and EPIDERM reporter activity, though case numbers remained slightly below normal. SARS-CoV-2 virus was attributed in two SWORD reports, both in the health and social care sector. The two cases (1% of the total diagnoses reported to SWORD in 2020) were reported as respiratory infective disorders. It is important to note that a few more cases of COVID-19 infection and of long-covid have been reported by occupational physicians to OPRA in 2020. Respiratory physicians are unlikely to see COVID-19 patients in their specialist occupational respiratory disease clinics. In contrast, occupational physicians are likely to identify work-related COVID-19 cases more frequently as they may see them during sickness absence consultations. It is clear that the current pandemic emphasizes the importance of occupational health in terms of managing and reducing the risk of infections in the workplace. In addition to the risk of infection with SARS-CoV-2 virus, the pandemic also impacts on the health and wellbeing of the workforce due to changing patterns of work and increasing uncertainties. Occupational physicians will play an important role in managing, rehabilitating and facilitating return to work of workers who have been on sick-leave due to infection with SARS-CoV-2 virus and long-Covid.

In conclusion, to our best knowledge, EPIDERM and SWORD continue to provide the most comprehensive source of data relating to medically attributed skin and respiratory occupational disease incidence in the UK, which help inform HSE and others to determine their priorities and work programmes on occupational health.

ACKNOWLEDGEMENTS

THOR is partially funded by the Health and Safety Executive and has also received funding from other sources. We are grateful to the physicians who report to THOR for their continuing support. The opinions expressed in this report are of the researchers and not necessarily those of the HSE.