THOR

The Health and Occupation Research network

(Incorporating specialists' and THOR-GP reports)

http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/
Or
http://www.coeh.man.ac.uk/thor

Dear colleague,

I am pleased to share with you the latest quarterly report describing the recent data collected by you in the context of THOR, as well as a special feature on respiratory disease and cleaning agents, and the regular feature of the Beck Report.

I am also pleased to inform you that we have received further funding from the HSE for the SWORD and EPIDERM schemes. This should ensure that we have adequate resources for data collection until the end of 2018, with a provision for reporting and analyses of data until the end of next year.

We also have had some additions to the THOR team. I mentioned in the letter accompanying the previous Quarterly Report that we were in the process of recruiting an Occupational Physician to the THOR team, and I'm delighted to inform you that we have appointed Dr Martin Seed. Martin has been involved with our department for a long time and has collaborated with Prof Agius in developing the QSAR model for respiratory sensitisers. He is also a Consultant Occupational Physician with the NHS. In addition to his invaluable input to THOR in general, Martin will be providing a new feature for the quarterly reports 'Observations from OPRA'.

In addition, we have appointed Dr Siti Rushdy, who will work as a Research Assistant with Dr Melanie Carder and Dr Annemarie Money, and Laura Byrne who is the new Project Assistant for the SWORD and EPIDERM schemes. This means that we have a full team again, which should hopefully ease the burden on the other members of the team. I would like to take this opportunity to thank Susan Taylor and Annemarie and Melanie for their hard work, in particular during the last 3 to 4 months, whilst we were recruiting new staff.

We have also recently held an internal workshop with colleagues in the University of Manchester and HSE to discuss future developments in the occupational health reporting schemes. At the time of writing, the outcomes of this workshop were not yet available, but I will provide you with details in the next report.

Finally, I would like to inform you that this year we will have a combined Annual Advisory Committee meeting, covering all the reporting schemes, on Thursday 10th May. We are very keen to hear from you and we appreciate any feedback on the reporting schemes, and even if you are not able to attend this meeting, we would very much like to hear from you! If you would like to attend this meeting, please contact Melanie Carder or Annemarie Money. Thank you again for your continued support of THOR.

Best wishes,

Martie Van Tongeren
Professor of Occupational and Environmental Medicine

QUARTERLY REPORT MARCH 2018

This THOR combined quarterly report (including THOR-GP) summarises all the cases reported in the quarter October to December 2017. It includes a special feature on 'Cleaning agents and work-related respiratory disease'.

If you have any comments regarding the type of information you would like to see included (or not) in future reports, or suggestions as to how we could improve the reports then please contact THOR's Manager, Dr Melanie Carder at melanie.carder@manchester.ac.uk or phone 0161 275 5636. We are pleased to hear from you.

CASE REPORTS: October to December 2017

Over 1000 physicians currently participate in THOR / THOR-GP (as of March 2018). Physicians can report either on a core (reporting each month) or a sample (reporting for one randomly selected month each year) basis. A total of 322 actual, 1576 (estimated) cases were reported during this period, with estimated cases being those reported by sample reporters multiplied by 12 and added to the core cases.

The actual and estimated cases by major category and diagnostic group, for clinical specialists (chest physicians, dermatologists, occupational physicians (OPs) and general practitioners (GPs)) are shown in Table 1 (NB. only actual cases are provided for THOR-GP; since methods for calculating estimated totals based on GP reports are under further development)

Table 1 Actual and estimated cases by major category and diagnostic group, Oct to Dec 2017

CATEGORY	DIAGNOSTIC GROUP	CLINICAL SPECIALISTS			OCCUPATIONAL PHYSICIANS			GENERAL PRACTITIONERS	
		Actual diagnoses	Estimated diagnoses	%	Actual diagnoses	Estimated diagnoses	%	Actual diagnoses	%
RESPIRATORY DISEASE	Asthma	23	34	*15*	3	14	*100*	**No case reports from GPs this quarter**	
	ascribed to sensitisation	*21*	*32*	-	-	-	-		
	ascribed to irritation/RADS	*2*	*2*	-	-	-	-		
	Unspecified	*0*	*0*	-	-	-	-		
	Inhalation accidents	0	0	*0*	0	0	*0*		
	Allergic alveolitis	3	3	*1*	0	0	*0*		
	Bronchitis/emphysema	1	1	*<1*	0	0	*0*		
	Infectious disease	0	0	*0*	0	0	*0*		
	Non-malignant pleural disease	18	106	*47*	0	0	*0*		
	predominantly plaques	*13*	*68*	-	-	-	-		
	predominantly diffuse	*6*	*50*	-	-	-	-		
	Unspecified/other	*0*	*0*	-	-	-	-		
	Mesothelioma	7	62	*28*	0	0	*0*		
	Lung cancer	0	0	*0*	0	0	*0*		
	Pneumoconiosis	16	16	*7*	0	0	*0*		
	Other	8	8	*4*	0	0	*0*		
	Total diagnoses	**76**	**230**		**3**	**14**			
	Total cases	**71**	**225**	***100***	**3**	**14**	***100***		

As more than one diagnosis may be reported the sum of percentages and total cases in each diagnostic category may be greater than 100%

CATEGORY	DIAGNOSTIC GROUP	CLINICAL SPECIALISTS			OCCUPATIONAL PHYSICIANS			GENERAL PRACTITIONERS	
		Actual diagnoses	Estimated diagnoses	%	Actual diagnoses	Estimated diagnoses	%	Actual diagnoses	%
SKIN	Contact dermatitis	86	295	*88*	4	15	*29*	**No case reports from GPs this quarter**	
	Allergic	*35*	79	-	-	-	-		
	Irritant	*33*	154	-	-	-	-		
	Allergic and irritant	*18*	62	-	-	-	-		
	Unspecified	0	0	-	-	-	-		
	Contact urticaria	1	1	*<1*	0	0	*0*		
	Folliculitis/acne	0	0	*0*	0	0	*0*		
	Infective	0	0	*0*	0	0	*0*		
	Mechanical	0	0	*0*	0	0	*0*		
	Nail	0	0	*0*	0	0	*0*		
	Neoplasia	5	38	*11*	0	0	*0*		
	Other	1	1	*<1*	3	36	*71*		
	Total diagnoses	***93**	***335**		**7**	**51**			
	Total cases	***94**	***336**	***100***	**7**	**51**	***100***		
MUSCULOSKELETAL	Hand/wrist/arm	**No case reports from clinical specialists**			21	76	*38*	3	*30*
	Elbow				0	0	*0*	0	*0*
	Shoulder				2	24	*12*	2	*20*
	Neck/thoracic spine				0	0	*0*	1	*10*
	Lumbar spine/trunk				3	25	*13*	2	*20*
	Hip/knee				2	24	*12*	1	*10*
	Ankle/foot				2	24	*12*	0	*0*
	Other				5	38	*19*	2	*20*
	Total diagnoses				**35**	**211**		**11**	
	Total cases				**34**	**199**	***100***	**10**	***100***

As more than one diagnosis may be reported the sum of percentages and total cases in each diagnostic category may be greater than 100%
*****One of the cases was not provided with a diagnosis***

CATEGORY	DIAGNOSTIC GROUP	CLINICAL SPECIALISTS			OCCUPATIONAL PHYSICIANS			GENERAL PRACTITIONERS	
		Actual diagnoses	**Estimated diagnoses**	**%**	**Actual diagnoses**	**Estimated diagnoses**	**%**	**Actual diagnoses**	**%**
MENTAL ILL-HEALTH	Anxiety/depression	**No case reports from clinical specialists**			43	230	*32*	4	*100*
	Post-traumatic stress disorder				6	72	*10*	0	*0*
	Other work-related stress				49	445	*62*	2	*50*
	Alcohol or drug abuse				0	0	*0*	0	*0*
	Psychotic episode				1	1	*<1*	0	*0*
	Other				2	13	*2*	1	*25*
	Total diagnoses				**101**	**761**		**7**	
	Total cases				**96**	**723**	***100***	**4**	***100***

As more than one diagnosis may be reported the sum of percentages and total cases in each diagnostic category may be greater than 100%

Other cases

In addition to the main diagnostic categories described in Table 1, OPs and GPs can report 'other' diagnoses of work-related ill-health (WRIH). OPs reported 5 'other' cases this quarter: multi system sarcoidosis, emotional distress arising from work pressure, emotional distress, distressed/anxious following a prior work incident, and 1 case of co-morbid depression, self-harm, and anorexia. GPs reported 1 'other' case of spotty rash (chicken pox).

QUARTERLY FEATURE – Cleaning Agents

The effect of cleaning products on lung function has recently been making UK headlines[i] following the publication of a study in the American Journal of Respiratory and Critical Care Medicine[ii]. Researchers at the University of Bergen in Norway tracked over 6,000 participants over the course of 20 years and the study found that women (but not men) who worked as cleaners, or regularly used cleaning sprays for 20 years, had a lung function decline equivalent to smoking 20 cigarettes a day over the same period.

We have investigated the incidence, and trend in incidence of occupational and work-related respiratory disorders, attributed to cleaning agents using the THOR data. It is known that exposure to cleaning products at work or at home, either via direct use or as a result of use by others, is associated with adverse respiratory outcomes such as asthma and COPD. The ubiquitous nature of cleaning as an activity means occupational exposure may occur across a broad range of occupations and industries, therefore, identifying this 'at risk' workforce population is important to help inform effective prevention and control measures. Figure 1 outlines the specific THOR datasets and time periods included in the study and how the cases were selected and re-categorised according to 'type' of cleaning agent.

Overall, approximately 7% of the (non-asbestos related) respiratory cases reported to THOR were attributed to 'cleaning agents'; 6% (667) reported to SWORD by consultant chest physicians; 10% (70) for respiratory cases reported by occupational physicians to OPRA and 11% (16) of the respiratory cases reported by general practitioners to THOR-GP. Table 2 provides additional information on the selected cases.

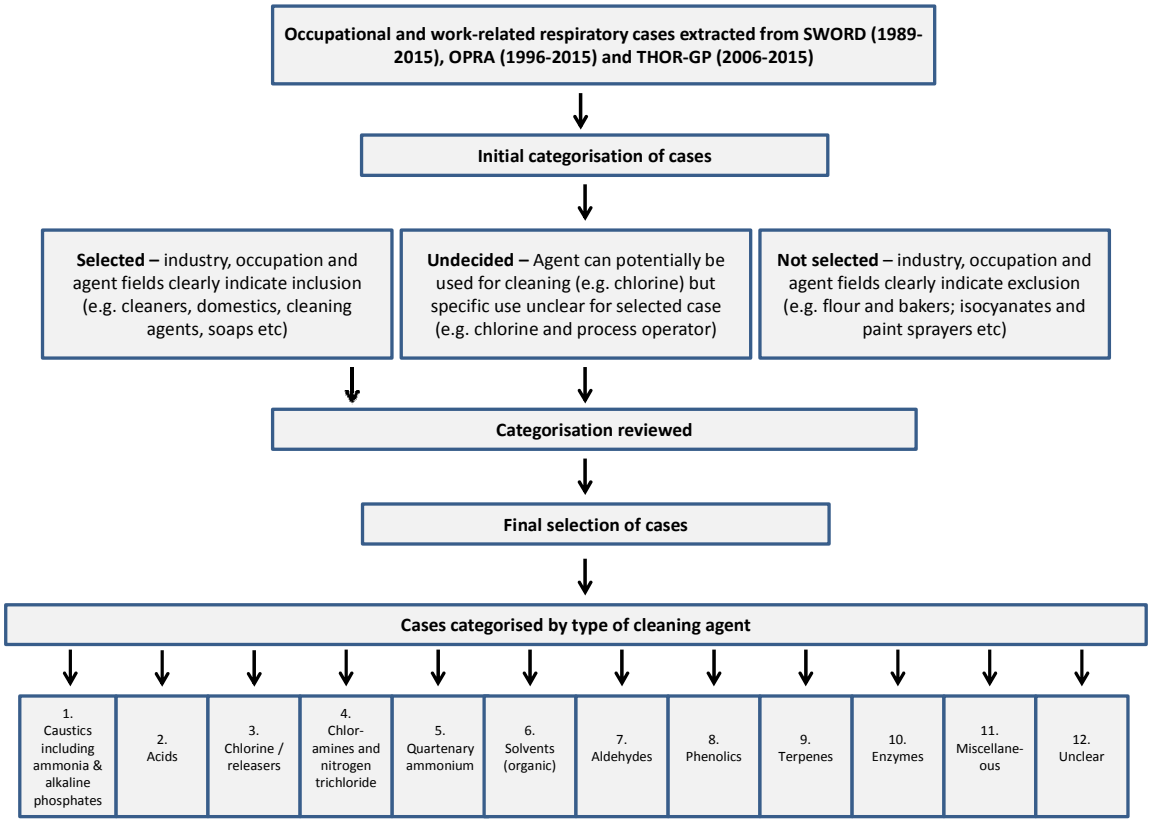

Figure 1 Selection and classification of work-related respiratory cases included in the cleaning agents study.

Table 2 Overview of selected cases of respiratory disease attributed to cleaning agents

	SWORD (chest physicians)	OPRA (occupational physicians)**	THOR-GP (general practitioners)**
Total respiratory cases*	10546	708	142
Number (%) attributed to cleaning agents	667 (6%)	70 (10%)	16 (11%)
Diagnoses	Asthma (58%), inhalation accidents (29%), rhinitis (5%), bronchitis/emphysema (2%) and allergic alveolitis (<1%), 'other' respiratory (5%)	Asthma (46%), inhalation accidents (23%), infectious (3%), bronchitis/emphysema (1%) and 'other' respiratory (30%)	Asthma (13%), inhalation accidents (19%), 'other' respiratory (69% - reported mainly as symptoms e.g. cough, wheeze, etc)
Gender	67% female	69% female	44% female
Mean age (age range)	43 (17-75)	43 (21-67)	44 (25-73)

*Excluding the mainly asbestos related diseases of mesothelioma, benign pleural disease, lung cancer and pneumoconiosis (which comprise 61% of SWORD cases).
**The majority of cases reported to OPRA and THOR-GP are musculoskeletal and mental ill-health

Incidence, trends in incidence and incidence rate ratios (IRRs) by occupation were investigated. A large variation in incidence was observed with the incidence for 'launderers, dry cleaners and pressers', being >50 times the average of all other occupations (Figure 2).

A secondary aim of the study was to explore whether it was possible, using Quantitative Structure Activity Relationships (QSAR[iii]), to categorise the cleaning agents identified into sensitisers and irritants for respiratory disease The list of cleaning agents reported to have caused at least one case of occupational asthma was scrutinised in order to identify those which were a single organic compound of low molecular weight (LMW) (<1000 Da) with an identifiable molecular structure. 14 such specific LMW chemicals were identified, of which 6 generated a hazard index score consistent with being a respiratory sensitiser.

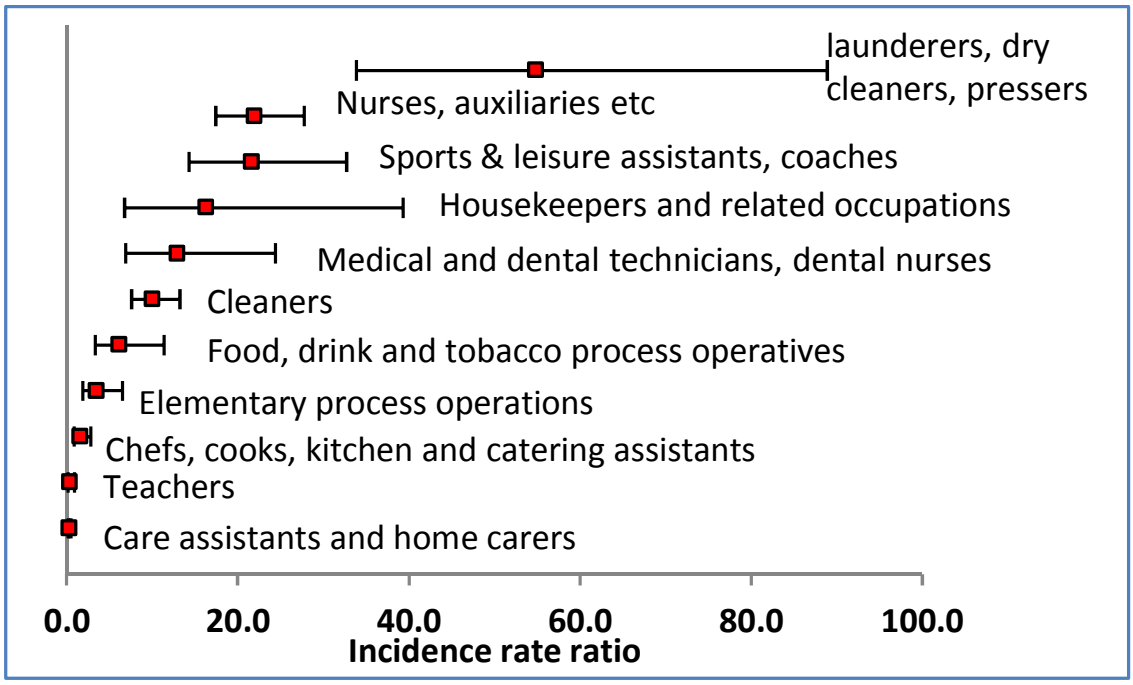

Figure 2 Incidence rate ratios for work-related respiratory disease attributed to cleaning agents, by occupation, as reported by chest physicians to SWORD, 1996-2015

Analysis of the specific chemical causes of reported cases of occupational asthma attributed to cleaning agents has identified both irritant and sensitising chemicals, some of which are also present in domestic cleaning products and might be a contributing factor to asthma in the general population. The findings of the study are currently being prepared for peer-review publication and we will keep reporters informed of the publication details as and when it goes to press.

OBSERVATIONS FROM OPRA

Dr Martin Seed, Clinical Senior Lecturer, COEH

The distribution of cases reported to OPRA this quarter is probably a fair reflection of the modern day occupational physician's workload with 96 cases of mental ill-health, 34 cases of musculoskeletal disorders, 3 cases of asthma and 7 dermatological cases. These reports continue to provide valuable data on incidence trends and causative factors for monitoring work related ill-health in the UK.

There can also be interesting rare cases within the 'other' diagnostic category as illustrated by the report of multisystem sarcoidosis in a female operation nurse manager which was attributed to 'old masonry contaminated with mould suspected of aggravating symptoms'. This case would seem consistent with previous reported associations between sarcoidosis and occupational exposure to a combination of foreign antigens, such as those present in mould, and inorganic particulates capable of triggering inflammation[iv]. A search of the SWORD database revealed three cases of pulmonary sarcoidosis, attributed to dust in a horticulturalist, prions in a horse breeder and horses in a stable lad. Recent published studies have attempted to further characterise the occupational exposures linked to sarcoidosis[v].

We would like to remind you of THOR-EXTRA which is a scheme made available for all THOR reporters to record any novel or interesting cases of work-related ill-health in addition to your sample or core reporting to the THOR schemes.

You can report a THOR-Extra case at any time by using the on-line web form on the THOR website https://coeh.manchester.ac.uk/thor/thorextra/form.php

BECK REPORT

We are most grateful to Dr Mark Wilkinson for this quarter's 'Beck Report', which provides a commentary on cases of work-related skin disease reported to THOR and THOR-GP UK this quarter.

Last quarter I highlighted the continuing problems with acrylate allergy and again 5 (5.4%) cases describe problems in nail technicians. The EU Scientific Committee on Consumer Safety (SCCS) has now produced their report[vi]. In a carefully worded document they state '. . . the SCCS is of the opinion that HEMA and di-HEMA-TMHDC, when applied appropriately to the nail plate at concentrations of up to 35% and 99% respectively as part of an artificial nail modelling system, are not likely to pose a risk of sensitisation, provided that their use is restricted to the nail plate only and contact with the adjacent skin is avoided.' It is unfortunate that in the real world contact with adjacent skin seems unavoidable in view of the continued reporting of cases[vii] and that the document will not help in addressing the problem.

Sticking with a legislative theme, I was struck that there were 5 cases of chromate allergy reported in the construction industry. A previous incarnation of the SCCS recommended the inclusion of ferrous sulphate to cement[viii] to reduce chromium VI to

chromium III (which is less soluble and less likely to penetrate the skin). Following implementation, a reduction in chromate allergy amongst construction workers was noted[ix]. 2 of the EPIDERM cases relate the chromate exposure specifically to cement and plaster, but in the other 3 the source of exposure was not stated. In Denmark, allergy from chromate (which is also used to tan leather), initially fell following the addition of ferrous sulphate to cement but then rose in patients with dermatitis[x] as a consequence of allergy to chromate in leather items such as gloves and shoes. Subsequent EU legislation implemented in 2015[xi] restricted the chromium VI content of leather to 3 mg/kg of the dry weight. It will be interesting to see if this has the desired effect in reducing cases of contact allergy to chromate in leather as well. 'Googling' also identified legislation implemented in 2017 banning hexavalent chromium in the electroplating industry[xii] although the health concerns relate to lung cancer and occupational asthma from airborne exposure.

Hairdressing continues to top the charts with 6 reported cases. We think of hair dye being the main cause of contact allergy. However, reflecting fashion, ammonium persulphate found in bleach was most reported causing allergic dermatitis in 4, followed by the hair dye para-phenylenediamine in 3 (the dermatitis was multifactorial in most). More rarely, both ammonium persulphate and PPD can cause allergic urticarial, although diagnosis requires fresh aqueous solution to test with rather than our usual patch test preparations in petrolatum. At the other extreme, there were no reports of allergy to glyceryl monothioglycolate in perm solution. One individual had allergy to methylisothiazolinone which should, following legislation implemented in 2017, now only be found in rinse off products such as shampoo and conditioner. Consequently hairdressers will be an at risk population.

Quirk of the quarter, an accountant assistant with hand dermatitis from handling nickel containing coins – clearly needs to transfer to electronic banking.

Dr Mark Wilkinson (Leeds General Infirmary)

THOR STAFF NEWS

We have 2 new members of staff joining the THOR team; Siti Rushdy has taken up post as a Research Assistant, and Laura Byrne has taken up post as Project Assistant for the SWORD and EPIDERM schemes, see table 3 below for details of THOR contacts.

THOR CONTACTS

Many thanks for your continued support of THOR, please contact us (Table 3) if you have any queries or data requests.

Table 3 THOR Contact details

SCHEME	email	Phone
EPIDERM	Laura.byrne@manchester.ac.uk	0161 275 7103
SWORD	Laura.byrne@manchester.ac.uk	0161 275 7103
OPRA	Susan.taylor@manchester.ac.uk	0161 275 5531
THOR-GP	Susan.taylor@manchester.ac.uk	0161 275 5531
DATA REQUESTS	Melanie.carder@manchester.ac.uk	0161 275 5636
GENERAL ENQUIRIES	Annemarie.money@manchester.ac.uk	0161 275 8492

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