Occupational and Environmental Health Surveillance System in UK

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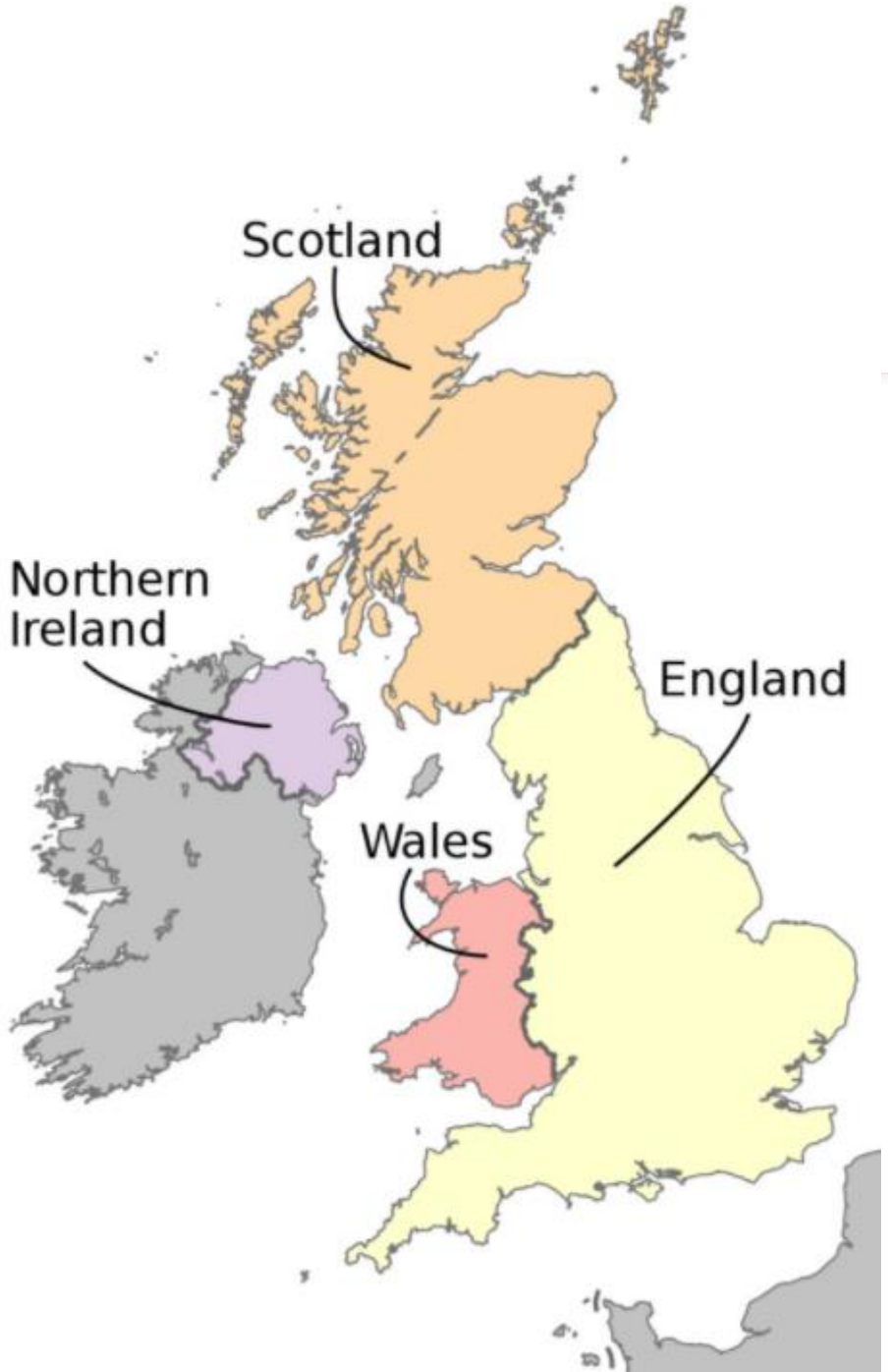
UK or GB or England

- Great Britain
  - England
  - Wales
  - Scotland
- United Kingdom
  - Great Britain
  - Northern Ireland



Surveillance

- Meaning
  - Close observation of a person or group, especially one under suspicion
  - The action of observing or the condition of being observed
- Origin
  - French word meaning “to watch over”
- Usually used for infectious diseases

Type of Surveillance in OEM

- Common purpose
  - Hazard surveillance
  - Health surveillance
- Occupational disease surveillance
  - THOR
- Environmental health surveillance
  - EPHSS

Contents

- THOR (The Health and Occupational Research Network)
  - EPIDERM (Occupational Skin surveillance)
  - OPRA (Occupational Physicians Reporting Activity)
  - SWORD (Surveillance of Work-related and Occupational Respiratory Disease)
  - THOR-EXTRA
  - THOR-GP
  - Etcs (MOSS-MSKDs, SIDAW-Infectious diseases, SOSMI-mental health)

1. THOR

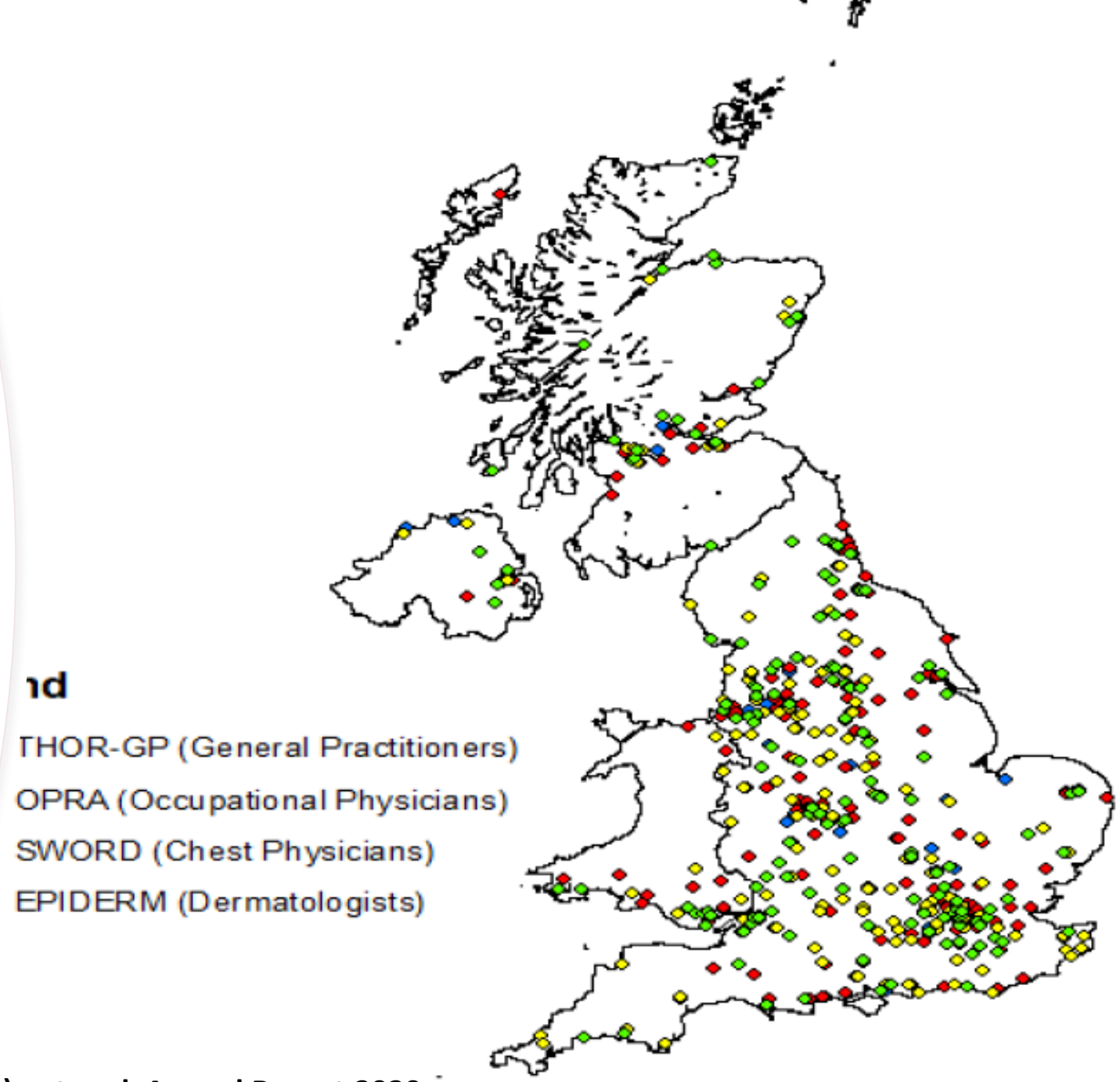
- Hosted by University of Manchester (COEH)
  - Since 2005
  - Funded by
    - Health and Safety Executive (HSE) in UK
    - Heath and Safety Authority (HSA) in the Republic of Ireland (ROI)

Brief History of THOR

- SWORD
  - Surveillance of Work-Related and Occupational Respiratory Disease) for Occupational and respiratory physicians
  - From 1989
- 4 different schemes were included in THOR
  - EPIDERM (occupational skin disease by dermatologists and OP) from 1993
  - OPRA (disease or illness caused by work) from 1996
  - THOR-GP (General practitioners; work related ill health) from 2005

Location of THOR reporters

818 physicians participated in THOR in UK during 2019



Source: The Health and Occupation Research (THOR) network Annual Report 2020

Reported in 2019 details

- Physicians reported 1086 actual (5244 estimated) cases of work-related ill-health (WRIH) to The Health and Occupation Research network (THOR) in 2019.
- Work-related respiratory disease, non-malignant pleural disease & pneumoconiosis and mesothelioma → by Chest Physicians
- Asthma or other respiratory diseases → by OPs and GPs
- Asbestos was the most frequently reported agent for respiratory disease, comprising more than half of cases reported by chest physicians.

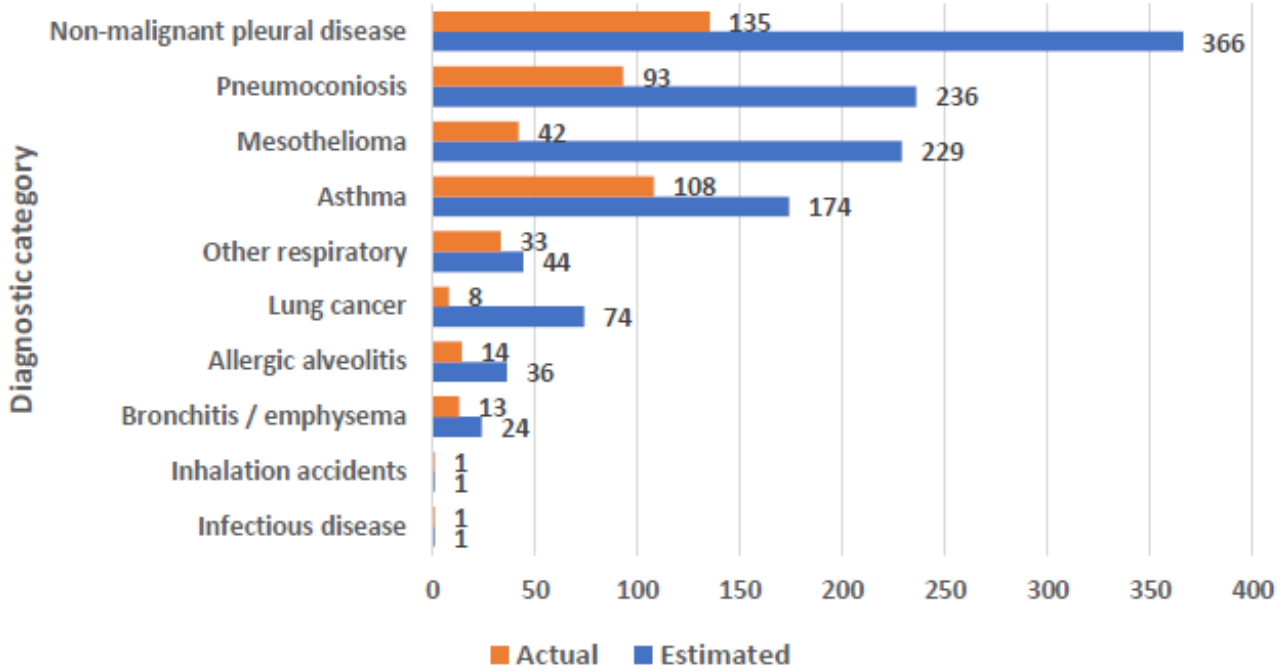


Figure. Actual and estimated cases of work-related respiratory cases by diagnostic category reported to SWORD (2019).

Table 1: Number of reports and actual and estimated cases reported by scheme (Jan – Dec 2019/2018)

	Jan-Dec 2019		Jan-Dec 2018	
	Average number of physicians	Actual cases (estimated)	Average number of physicians	Actual cases (estimated)
OPRA	181	369 (3009)	195	314 (2283)
EPIDERM	126	274 (1099)	128	286 (1144)
SWORD	345	384 (1077)	361	328 (1065)
THOR-GP	166	59*	180	73*
TOTAL	**818**	**1086 (5244)**	**864**	**1001 (4565)**

*THOR-GP physicians report actual cases only

Source: The Health and Occupation Research (THOR) network Annual Report 2020

Suspected agents

- Asbestos was associated most frequently (51%) with the reported cases, which is not unexpected considering that the first and third highest cases reported to SWORD in 2019 were NMPD and mesothelioma, and both are associated with asbestos exposure.
- The most frequent suspected agents reported for the cases of respiratory disease to OPRA included sterilising and disinfecting agents, asbestos, colophony and flux/solder, laboratory animals, isocyanates, and fungi, moulds and yeast (all 2 cases). The 3 respiratory cases reported to THOR-GP were attributed to asbestos, high temperatures and/or hot work, and ill-defined fume.

Source: The Health and Occupation Research (THOR) network Annual Report 2020

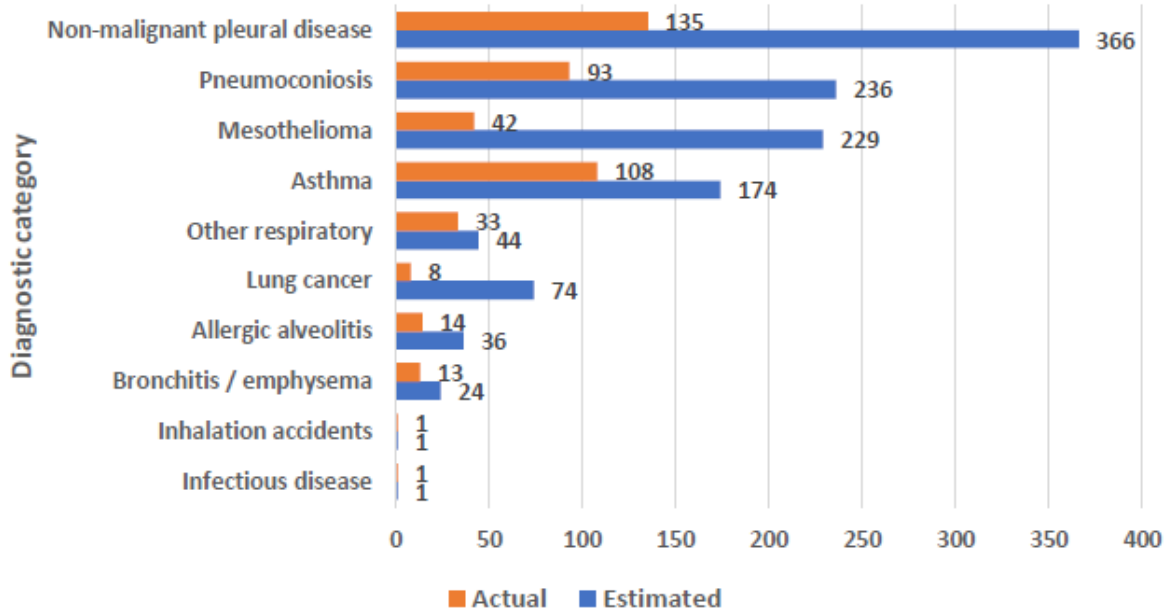
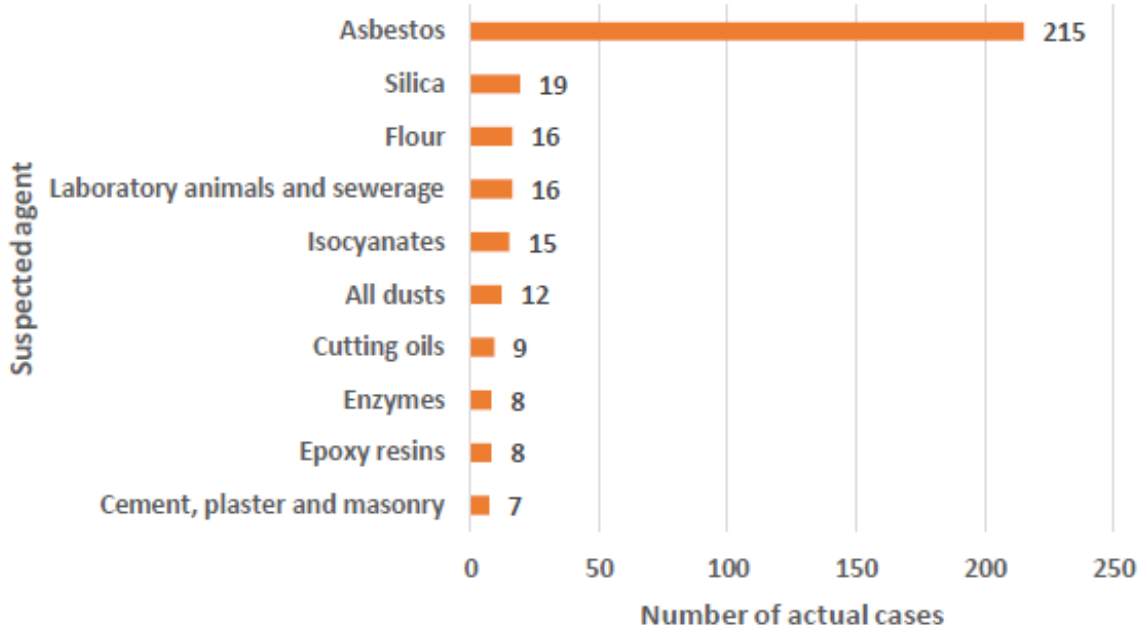


Figure. Actual and estimated cases of work-related respiratory cases by diagnostic category reported to SWORD (2019).



Most frequently reported suspected agents for work-related respiratory cases (actual) reported to SWORD (2019)

Report guideline

- Category 1 – respiratory disease
- Category 2 – Skin disease
- Category 3 – Musculoskeletal disease
- Category 4 – Auditory disease
- Category 5 – Mental disease
- Category 6 – other disease

Condition	Guidance to be used in deciding whether to report to THOR
Asthma	Work-related asthma consists of an association between asthma and work. It can be subdivided into occupational asthma and work-aggravated asthma. Occupational asthma is defined as adult asthma caused by workplace exposure and not by factors outside the workplace and includes cases where the agent acted either as a sensitiser or an irritant. Occupational asthma can occur in workers with or without prior asthma. Work-aggravated asthma is defined as pre-existing or coincidental new onset adult asthma which is made worse by non-specific factors in the workplace, for example, exposure to irritant substances (e.g. a fume-filled or dusty environment); changes in temperature (especially cold air); physical activity required by their job, such as lifting heavy boxes; or stress. Both occupational asthma (allergic and irritant) and work-aggravated asthma should be reported to THOR (please specify which in the diagnosis column)
Bronchitis/emphysema (COPD)	Includes any case in which occupational exposure is believed to be an important factor
Infectious disease	Includes, for example, ornithosis and tuberculosis
Non-malignant pleural disease	Includes localised thickening (plaques), or diffuse thickening/effusions (please specify which in the diagnosis column)
Mesothelioma	Because of the strong association of this condition with asbestos exposure all clinically diagnosed cases should be reported to OPRA. Reporting physicians should be aware of the British Thoracic Society's 2007 guidance on the condition, accessible online at https://www.brit-thoracic.org.uk/standards-of-care/guidelines/bts-guideline-for-the-investigation-and-management-of-pleural-mesothelioma/
Lung cancer	Includes any case in which occupational exposure is considered an important contributing factor, regardless of smoking habit
Pneumoconiosis	Includes pulmonary fibrosis due to coal, asbestos, silica, talc etc., with or without pleural disease
Other respiratory illness	Includes, for example, building-related illness and byssinosis

Source: The Health and Occupation Research (THOR) network Annual Report 2020

Woolhouse I, et al. BMJ Open Resp Res 2018;5:e000266.
doi:10.1136/bmjresp-2017-000266

BMJ Open Respiratory Research

BTS guideline for the investigation and management of malignant pleural mesothelioma

Ian Woolhouse,[1] Lesley Bishop,[2] Liz Darlison,[3] Duneesha de Fonseka,[4] Anthony Edey,[5] John Edwards,[6] Corinne Faivre-Finn,[7] Dean A Fennell,[8] Steve Holmes,[9] Keith M Kerr,[10] Apostolos Nakas,[11] Tim Peel,[12] Najib M Rahman,[13] Mark Slade,[14] Jeremy Steele,[15] Selina Tsim,[16] Nick A Maskell[17]

To cite: Woolhouse I, Bishop L, Darlison L, *et al*. BTS guideline for the investigation and management of malignant pleural mesothelioma. *BMJ Open Resp Res* 2018;**5**:e000266. doi:10.1136/bmjresp-2017-000266

Received 30 November 2017
Accepted 4 December 2017

ABSTRACT

The full guideline for the investigation and management of malignant pleural mesothelioma is published in *Thorax*. The following is a summary of the recommendations and good practice points. The sections referred to in the summary refer to the full guideline.

INTRODUCTION

The full guideline for the investigation and management of malignant pleural meso- highest standards of care for all patients with mesothelioma in the UK.[3]

Target audience for the guideline

Given the nature of MPM, the majority of the guideline will be relevant to secondary care-based specialists; however, symptom recognition, management and follow-up are all relevant to community-based specialities.

Intended users include primary care

Category 2: Skin (the conditions of special interest (from EPIDERM) are noted on the front of the reporting card).

Condition	Guidance to be used in deciding whether to report to THOR
Contact dermatitis	Includes both allergic and irritant (please specify in the diagnosis column)
Contact urticaria	Is denoted by immediate hypersensitivity
Folliculitis/acne	Includes inflammatory diagnosis such as acne and folliculitis
Infective	Includes, for example, tinea, warts and orf
Mechanical	Includes dermatitis and callosities caused by mechanical trauma
Nail	Problems include chronic paronychia and dystrophies caused by physical or chemical occupational contact
Neoplasia	Includes skin neoplasia (keratosis, basal and squamous cell carcinomas and melanomas - please specify in the diagnosis column) caused by radiation, occupational sun exposure or chemicals
Other dermatoses	For example includes low humidity dermatitis, scleroderma-like disorders and ulceration

Source: The Health and Occupation Research (THOR) network Annual Report 2020

Category 3: Musculoskeletal (the anatomical areas of special interest are noted on the front of the reporting card).

Condition	Guidance to be used in deciding whether to report to THOR
Back or neck	Including neck/thoracic spine, lumbar spine/trunk – for example, spondylosis/disc problems (any inflammation of the synovial joints); mechanical pain (muscles/tendons/ligaments); osteoarthritis; other pain (pathology ill defined)
Upper limbs	Including shoulders, elbows, wrists and hands – for example, carpal tunnel syndrome; other nerve entrapment conditions (including radial and ulnar tunnel syndrome); tendon sheath/tendon condition (tendonitis and tenosynovitis); Raynauds phenomenon, HAVS, VWF (to include the effects of vibration and/or cold on the upper limb); epicondylitis/bursitis (medial or lateral and to include olecranon bursitis - "beat elbow"); rotator cuff injury/bursitis (to include tendonitis and frozen shoulder); osteoarthritis; other pain (pathology ill-defined)
Lower limbs	Including hips, knees, ankles and feet – for example, inflammation/bursitis (any irritation of joints or associated structures resulting in an inflammatory response; including occupationally related faciitis); osteoarthritis; other pain (pathology ill-defined)
Other musculoskeletal	Give any other diagnosis and site, for example, head injury

Source: The Health and Occupation Research (THOR) network Annual Report 2020

Category 4: Audiological

Condition	Guidance to be used in deciding whether to report to THOR
Hearing loss	In deciding whether loss of hearing should be reported, you may wish to keep in mind that occupational deafness has been defined as "Sensorineural hearing loss due to occupational noise amounting to at least 50dB, being the average of hearing loss at 1, 2 and 3 kHz frequencies"
Other audiological	Including, for example; balance problems, tympanic disorders, tinnitus

Source: The Health and Occupation Research (THOR) network Annual Report 2020

Category 5: Stress/Mental Illness

Condition	Guidance to be used in deciding whether to report to THOR
Anxiety/Depression	Include cases with symptoms of either disease (please specify)
Post-traumatic stress disorder	Include cases where either the traumatic event occurred at work (for example, body under the train in a driver) or where working conditions militate seriously against recovery from other trauma
Other work related stress	Stress associated with work where the condition does not, in your clinical judgement, constitute anxiety, depression or post traumatic disorder
Alcohol or drug abuse	Cases where the illness is either the result of working conditions or where access to substances at work have helped precipitate or sustain the illness
Psychotic episode	Include cases caused or precipitated by work (including toxic exposure)
Other mental ill-health	Includes, for example, agoraphobia, obsessive/compulsive disorder etc

Category 6: Other Diseases

Condition	Guidance to be used in deciding whether to report to THOR
Others	Here we are interested in determining the frequency of other new diseases caused by work to assess the feasibility of their surveillance. Neurological disease (other than hearing loss) e.g. neuropathy and CNS damage. You are also encouraged to report other serious diseases e.g. bladder cancer, blood dyscrasias, nephritis, hepatitis, leptospirosis which, in your clinical judgement, were caused by work

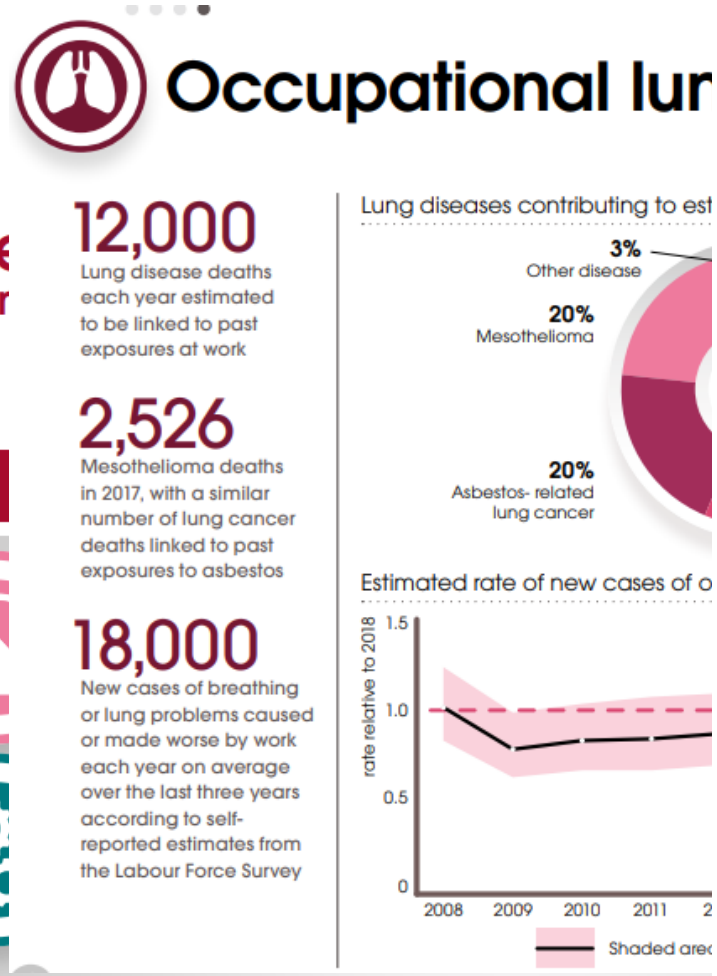
Source: The Health and Occupation Research (THOR) network Annual Report 2020

Initial assessment and reports

- Major elements of reports
  - Dx
  - Sex
  - Age
  - Postcode or town
  - Job
  - Industry
  - Agent/exposure/activity
  - Reason
  - Symptom onset date

Field	Description
Diagnosis	Give sufficient detail to code, noting location (e.g. elbow) where appropriate
Reference number	This is your reference to help you identify the case if there is a query
Sex	Male or female
Age	Age at time of diagnosis
Postcode or town	Please give the first half of the postcode if possible, or town if not
Job	Type of work (e.g. florist or welder). Be as specific as possible (machinist, assembler, process worker are difficult to code without more detail)
Industry	The industrial group of the patient's employer. Be as specific as possible (e.g. for engineering we need to know the product manufactured, and for cleaning we need the site of work). For example, manufacture of motor vehicles or hospital cleaner
Agent/exposure/activity	Please be as specific as possible, e.g. 'fibre glass' not 'irritant dust', 'chicken de-boning' not 'repetitive work'. If giving proprietary names, please try to identify the active agent
Reason	Please record the letter (**A-H**) appropriate for the reason the patient was seen (see bottom of card for categories). You may use more than one reason if necessary.
Symptom onset date	Wherever possible, please specify the month and year when the current symptoms began

Comparison of GB statistics in 2018



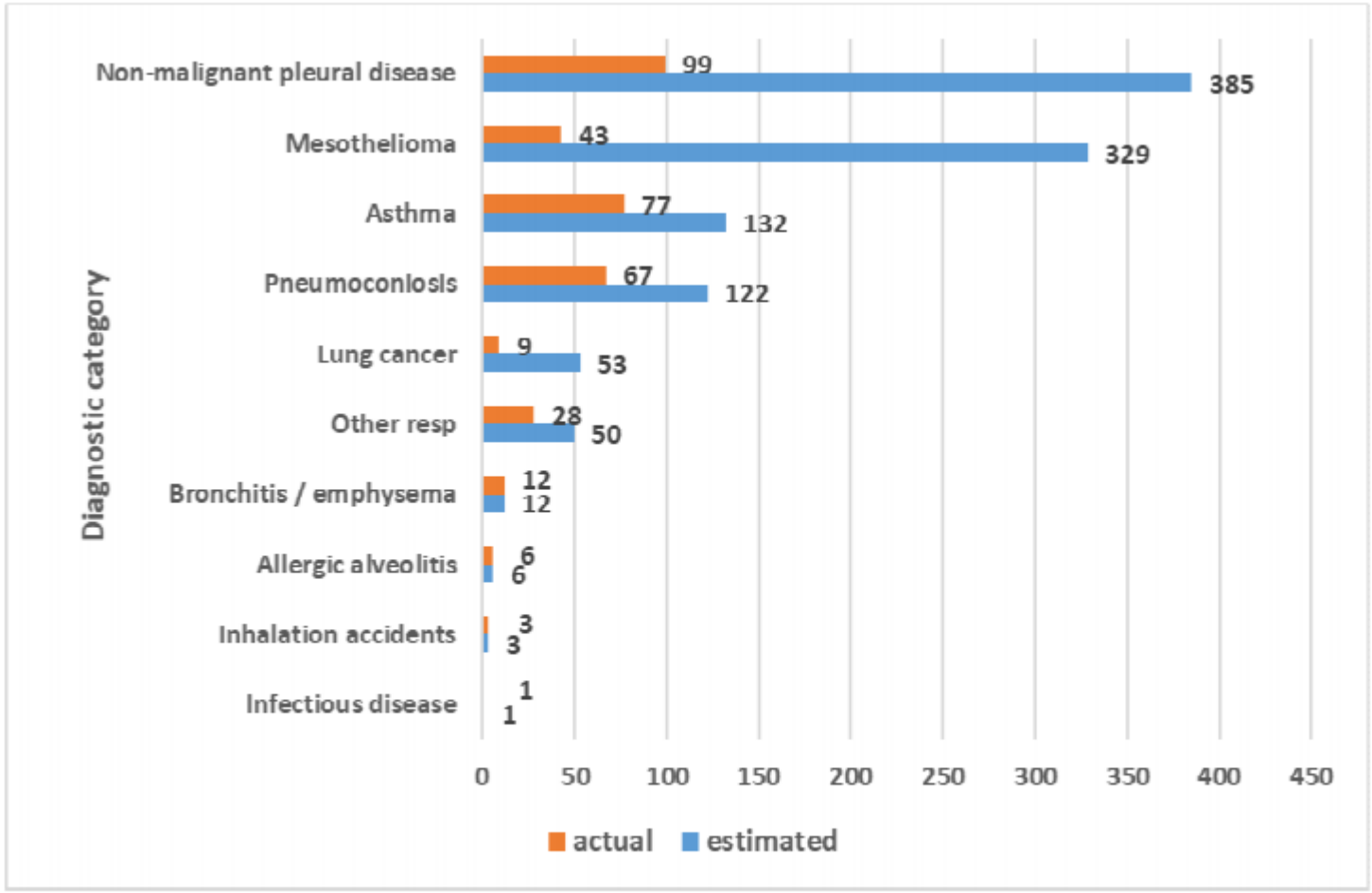


Figure 3 Actual and estimated cases of work-related respiratory cases by diagnostic categor reported to SWORD (2018).

→ **Under reported**

2. Mesothelioma death registry

- National death registry
  - Similar to KEITI (한국환경산업기술원)
  - Mesothelioma diagnosis linkage into NHIS DB

Source: https://www.hse.gov.uk/statistics/causdis/

Mesothelioma mortality in Great Britain by geographical area, 1981-2017

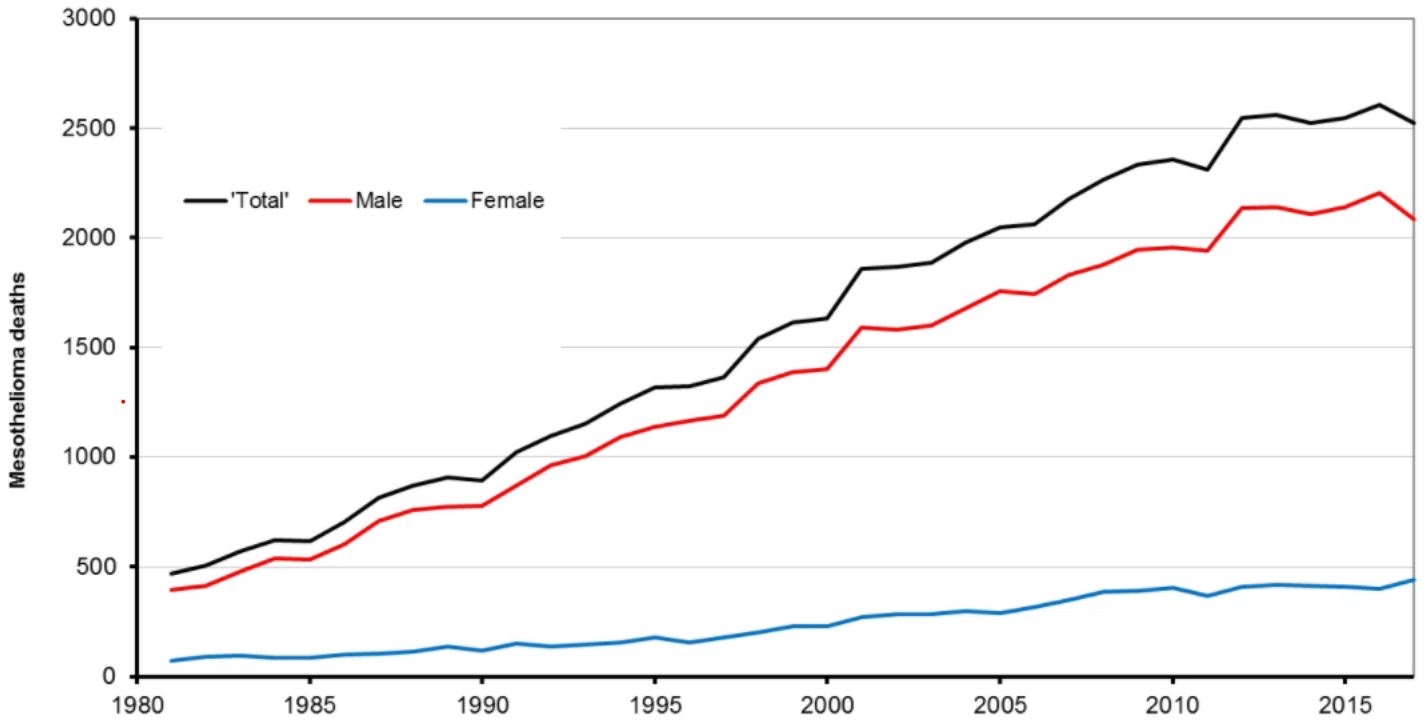
Mesothelioma is a form of cancer that principally affects the external lining of the lung (the pleura) and the lining of the lower digestive tract (the peritoneum). It takes many years to develop following the inhalation of asbestos fibres, but is usually rapidly fatal following disease onset. Annual deaths in Britain increased steeply over the last 50 years, a consequence of mainly occupational asbestos exposures that occurred because of the widespread industrial use of asbestos during 1950-1980.

This story map is part of an update of analyses of mesothelioma deaths during 1981-2017 by geographical area. It reproduces National Statistics on mesothelioma mortality as interactive maps, otherwise available at http://www.hse.gov.uk/statistics/causdis/mesothelioma/mesoarea.pdf.

The analyses use *Standardised Mortality Ratios (SMRs)* to compare the death rate in a particular geographical area with the rate for GB. SMR values higher than 100 indicate that mesothelioma rates are higher than for GB as a whole, while values lower than 100 indicate the reverse.

Trends over time for geographical areas within Great Britain are also shown. These need to be considered in the context of a more than 10-fold increase in the overall rate for Great Britain in both sexes since the late 1960s (Figure 1).

Trends in SMRs for a particular area indicate whether rates for that area have increased



PMR by occupation

SOC *unit group (4-digit)*

For males, PMRs were statistically significantly elevated for 35 of the 159 SOC unit groups with at least 10 observed or expected mesothelioma deaths. Results for these groups are listed below. Again, a substantial proportion of these unit groups were associated with building activities.

Unit groups with the highest PMRs (higher than 300):

- 5315 *Carpenters and joiners* (807 deaths, PMR = 479.8, 95% CI: 447.3, 514.1)
- 8124 *Energy plant operatives* (33 deaths, PMR = 362.3, 95% CI: 249.4, 508.8)
- 5314 *Plumbers and heating and ventilating engineers* (375 deaths, PMR = 353.9, 95% CI: 319, 391.6)
- 5216 *Pipe fitters* (46 deaths, PMR = 324, 95% CI: 237.2, 432.2)
- 2424 *Business and financial project management professionals* (38 deaths, PMR = 316.6, 95% CI: 224, 434.5)
- 2123 *Electrical engineers* (15 deaths, PMR = 309.7, 95% CI: 173.5, 510.9)

Unit groups with high PMRs (PMR of 200 to 300):

- 5236 *Boat and ship builders and repairers* (57 deaths, PMR = 274.6, 95% CI: 207.9, 355.7)
- 5241 *Electricians and electrical fitters* (471 deaths, PMR = 269.3, 95% CI: 245.5, 294.7)
- 5322 *Floorers and wall tilers* (48 deaths, PMR = 239.6, 95% CI: 176.7, 317.7)
- 1259 *Managers and proprietors in other services n.e.c.* (146 deaths, PMR = 221.2, 95% CI: 186.8, 260.2)
- 5225 *Air-conditioning and refrigeration engineers* (14 deaths, PMR = 215.1, 95% CI: 117.5, 360.9)

Other unit groups with elevated PMRs (PMRs of 100 to 200):

- 1122 *Production managers and directors in construction* (86 deaths, PMR = 199.8, 95% CI: 159.8, 246.8)
- 3563 *Vocational and industrial trainers and instructors* (32 deaths, PMR = 198.2, 95% CI: 135.6, 279.8)
- 8149 *Construction operatives n.e.c.* (96 deaths, PMR = 197.7, 95% CI: 160.1, 241.4)
- 5213 *Sheet metal workers* (41 deaths, PMR = 195.6, 95% CI: 140.4, 265.4)
- 8125 *Metal working machine operatives* (233 deaths, PMR = 195.3, 95% CI: 171, 222.1)
- 8141 *Scaffolders, stagers and riggers* (43 deaths, PMR = 183.6, 95% CI: 132.9, 247.4)
- 5214 *Metal plate workers, and riveters* (20 deaths, PMR = 181.5, 95% CI: 110.9, 280.3)
- 5442 *Furniture makers and other craft woodworkers* (31 deaths, PMR = 180.2, 95% CI: 122.4, 255.7)
- 1139 *Functional managers and directors n.e.c.* (30 deaths, PMR = 176.6, 95% CI: 119.2, 252.2)
- 5319 *Construction and building trades n.e.c.* (351 deaths, PMR = 167.7, 95% CI: 150.6, 186.2)
- 5323 *Painters and decorators* (231 deaths, PMR = 166.7, 95% CI: 145.9, 189.6)
- 2434 *Chartered surveyors* (36 deaths, PMR = 149.9, 95% CI: 105, 207.5)
- 5223 *Metal working production and maintenance fitters* (279 deaths, PMR = 141.5, 95% CI: 125.3, 159.1)

(n.e.c.= Not Elsewhere Classified)

3. EPHSS

- Environmental public health surveillance system (EPHSS)
  - One of Public Health England (PHE)'s main surveillance projects
  - System develops from 2014
    - A comprehensive and systematic approach
    - Aim
      - Identify
      - Acquire
      - Collate and analyse data

EPHSS contents

- **Implementation of the Lead Exposure in Children Surveillance System (LEICSS)**

Blood lead concentration (µmol/L) of laboratory-detected cases, England 2017 and 2015-2017

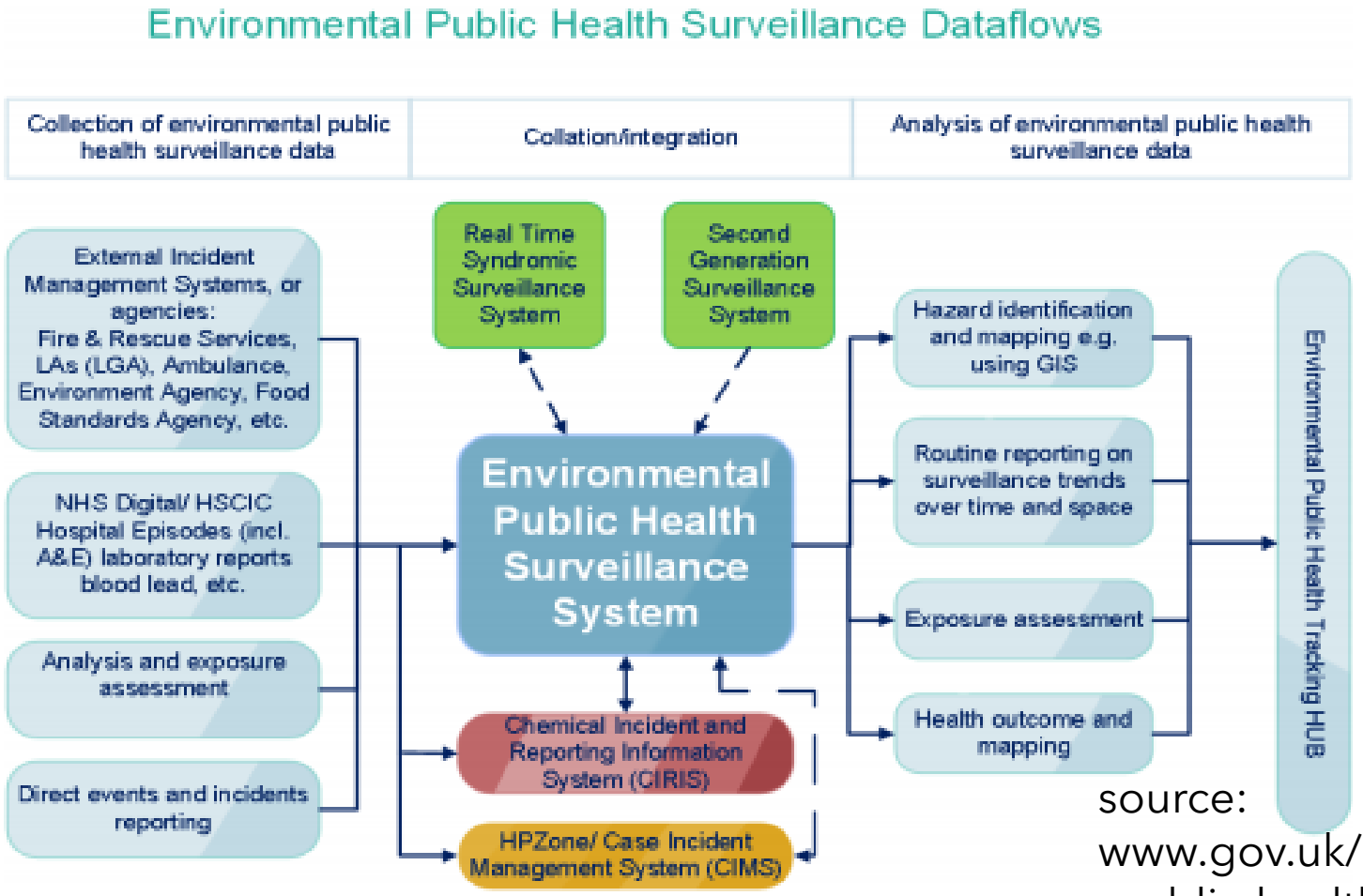
Year	Cases with data/total cases	Min.*	Max.	Median	Lower Quartile	Upper Quartile	Mean
2017	38/38	0.48	3.33	0.68	0.52	1.02	0.96
2015-17	90/91	0.48	17.59	0.75	0.55	1.09	1.13

*Only children with a BLC≥0.48µmol/L were eligible for notification to LEICSS

Source:https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachme nt_data/file/753020/hpr3918_LEICSS_2017.pdf

EPHSS contents

- **Development of an Environmental Public Health Surveillance System for England**



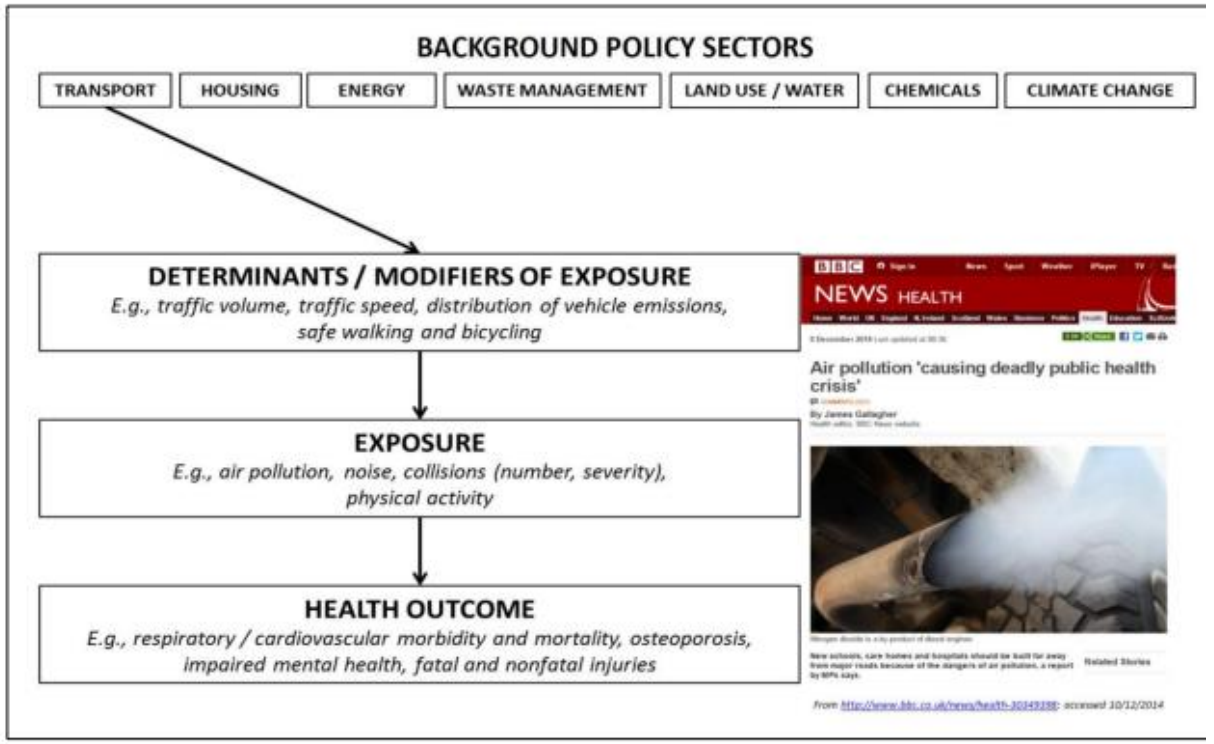
source: www.gov.uk/government/publications/environmental-public-health-surveillance-system

EPHSS contents

- **Surveillance of chronic environmental hazards, exposures and health effects**

- **Transport sector** (primarily air quality)
- **Housing sector** (indoor air pollution, heat, lead poisoning and other chemical hazards, proximity to green spaces, radon and noise pollution from roads)
- **Land contamination and use** (includes agriculture, food and water supply) - (toxic metals and chemicals (eg arsenic), pesticides, persistent organic pollutants)
- **Climate change** (vulnerable homes, heat waves and cold spells, flooding)

Policy sectors and components of a tracking system

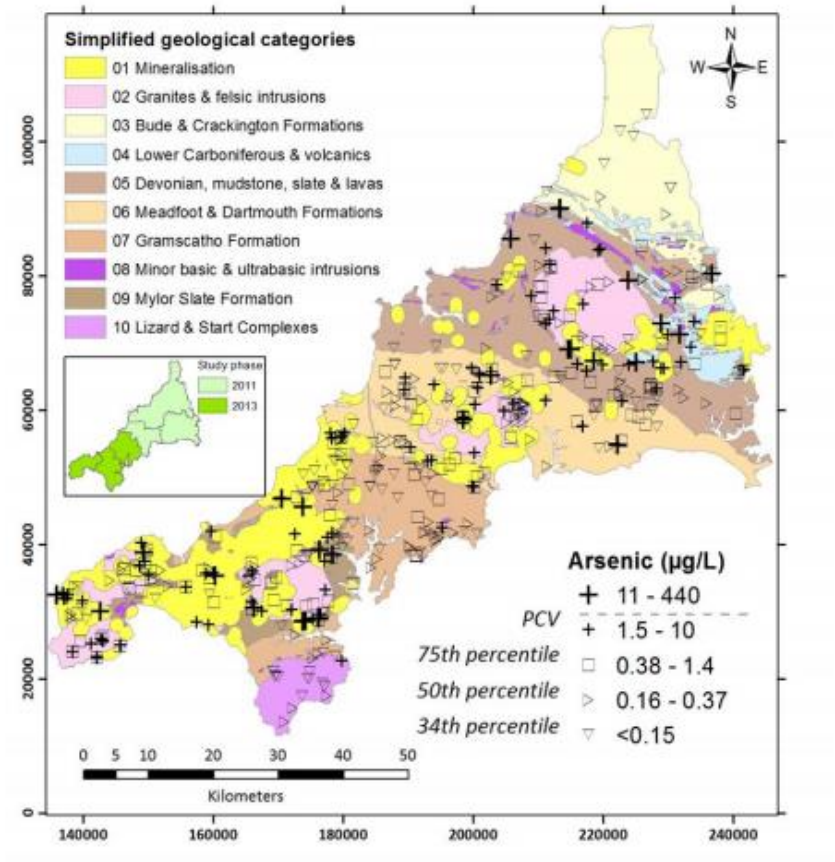


Source: PHE (2018) Environmental Public Health Tracking in England Report on recent activities

EPHSS contents

- **Determining population exposure to chemicals in small domestic private water supplies**

Map of Cornwall showing geology, location and levels of arsenic measured in Private Water Supplies tested

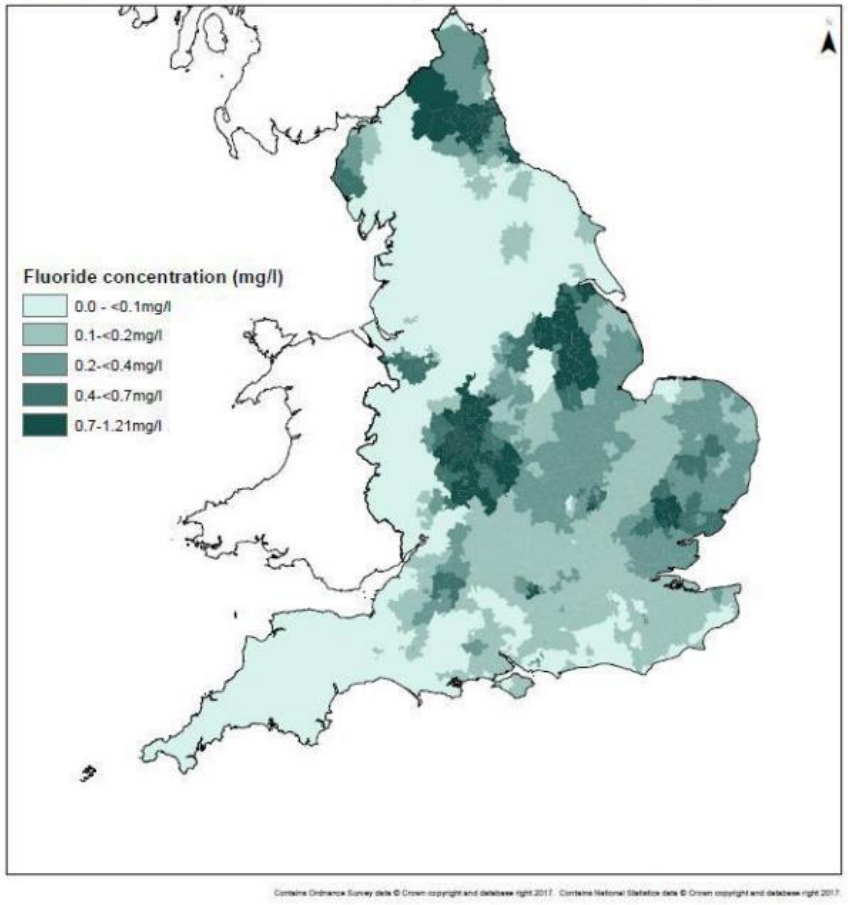


Source: Crabbe et al. (2017) Population Hazard Ranking Method for Arsenic in Private Water Supplies: Relation to Bedrock Geology. Int. J. Environ. Res. Public Health 2017, 14, 1490

EPHSS contents

- **Water fluoridation in England health monitoring report 2018**

Figure from the report. Population-weighted mean fluoride concentration (mg/l), England, 2005-15. Mapped at middle super output area level, using 2011 boundaries



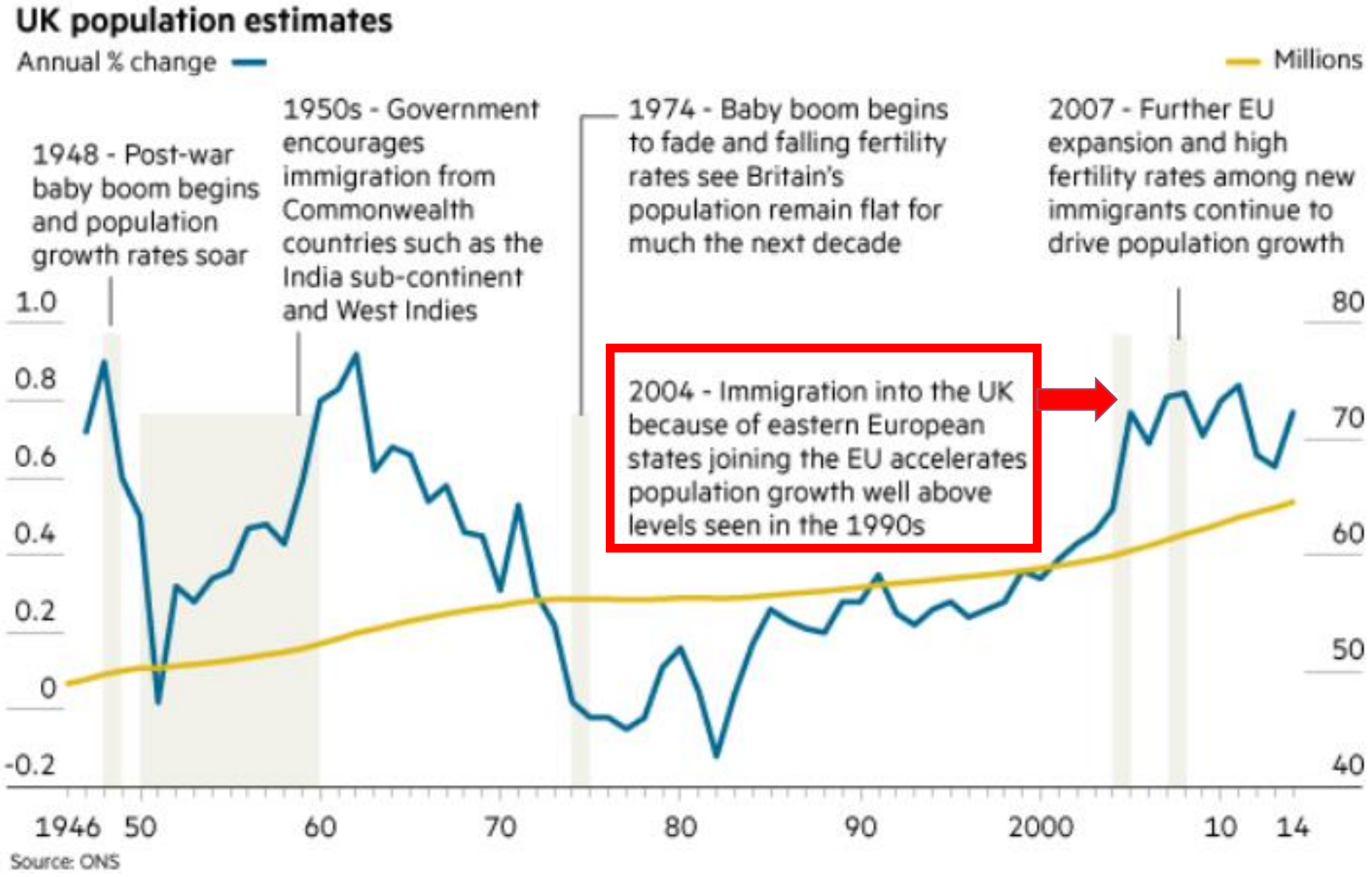
Source: www.gov.uk/government/publications/water-fluoridation-health-monitoring-report-forengland-2018

Considering points from data interpretation

- THOR → under reported
- National death registry based results → limited detail exposure
- EPHSS → no asbestos related diseases surveillance

Limitation of surveillance for ARDs

- Long latent periods
- Not definite cause specific incidence or mortality
- Since 2004 immigration increase → not traction


UK population estimates
Annual % change
Millions
1948 - Post-war baby boom begins and population growth rates soar
1950s - Government encourages immigration from Commonwealth countries such as the India sub-continent and West Indies
1974 - Baby boom begins to fade and falling fertility rates see Britain's population remain flat for much the next decade
2007 - Further EU expansion and high fertility rates among new immigrants continue to drive population growth
2004 - Immigration into the UK because of eastern European states joining the EU accelerates population growth well above levels seen in the 1990s
1.0
0.8
0.6
0.4
0.2
0
-0.2
80
70
60
50
40
1946
50
60
70
80
90
2000
10
14
Source: ONS

Summary

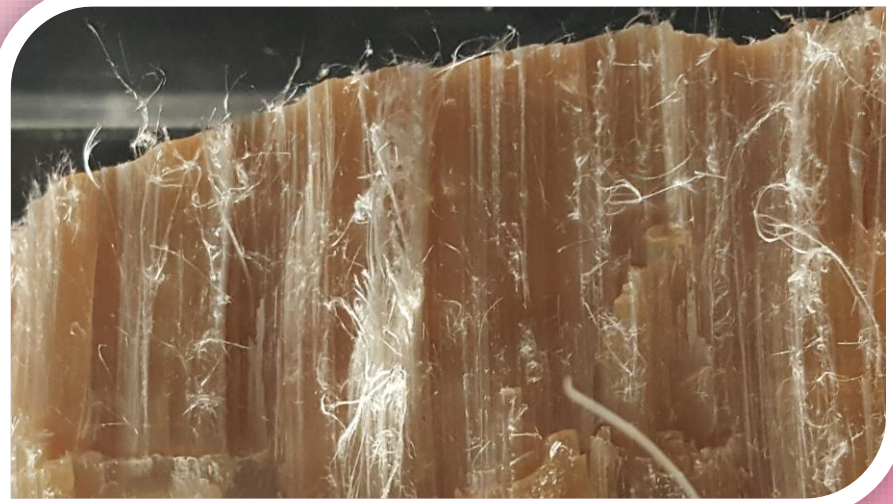
- In United Kingdom' surveillance systems
  - Occupational disease surveillance (THOR) for UK and Republic of Ireland
  - Environmental surveillance (EPHSS) for England
  - Death certificate-SOC linkage registry for UK
- Mixed strategy for occupational and environmental disease surveillance should be adopted in our study on finding ARDs.

Hospital based asbestos-related diseases surveillance program in Korea

Seoul St. Mary's Hospital

Department of Occupational and Environmental Medicine

Associate Professor Myong Jun-Pyo



필요성 및 목적

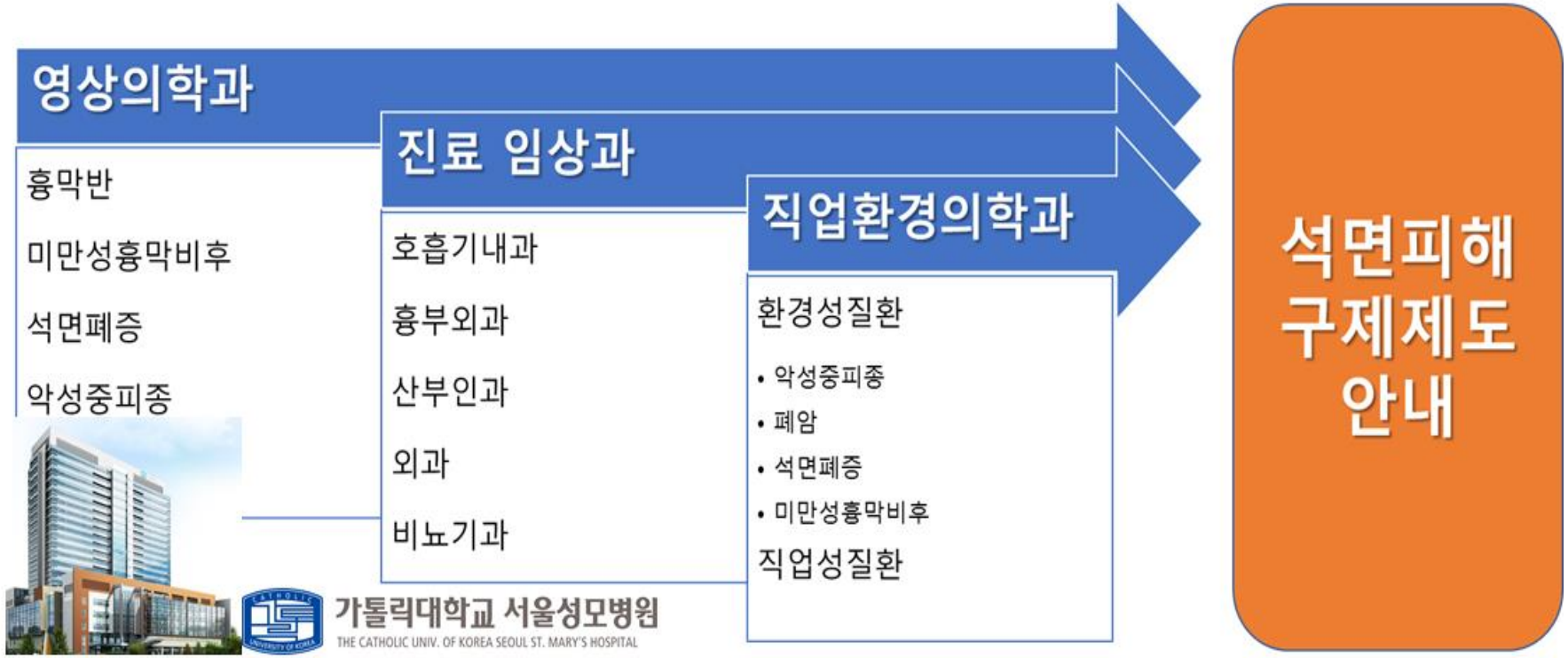
- 석면의 유해성
  - 세계보건기구(WHO) 1급 발암물질
  - 국내 사용 전면 금지 (2009)
  - 석면관련질환 : 흉막질환, 폐실질 질환
    - 흉막반, 흉막삼출, 미만성 흉막비후
    - 석면폐증, 폐암, 악성중피종
  - → 2010년 3월 석면피해구제법 제정 ,2011년부터 시행

- **석면 피해 구제 제도 대상 질병**
  - **원발성 악성중피종, 원발성 폐암, 석면폐증, 미만성 흉막비후**
- **석면 폐암 발굴 사업의 필요성**
  - **악성 중피종: 대부분 석면 기인. 진단 시 제도로 바로 안내 가능**
  - (석면피해구제 현황) 2011년 이후 인정건수
    - 악성중피종은 1,074건, 석면폐증은 2,436건, 석면폐암은 623건
  - **석면 폐암: 폐암의 원인 확인 어려움, 임상의의 관심과 참여 저조**

→ **<u>석면 폐암 환자의 석면 피해자 인정 비율이 저조</u>**

연도	구분	계	석면피해인정					특별유족인정				
			소계	악성 중피종	폐암	석면폐증	흉막비후	소계	악성 중피종	폐암	석면폐증	흉막비후
계 (‘11~’20년 누계)	계	6,345	5,107	579	787	3,731	10	1,238	753	431	54	0
	인정	4,750	3,857	543	523	2,787	4	893	607	241	45	0
	불인정	1,587	1,243	35	264	938	6	344	146	189	9	0
	보류	8	7	1	0	6	0	1	0	1	0	0
2018	소계	718	662	62	79	520	1	56	28	27	1	0
	인정	569	522	59	68	395	0	47	26	20	1	0
	불인정	143	134	3	11	119	1	9	2	7	0	0
	보류	6	6	0	0	6	0	0	0	0	0	0
2019	소계	896	810	47	87	672	4	86	25	49	12	0
	인정	726	646	47	73	526	0	80	25	45	10	0
	불인정	170	164	0	14	146	4	6	0	4	2	0
	보류	0	0	0	0	0	0	0	0	0	0	0
2020	소계	777	690	54	126	509	1	87	28	53	6	0
	인정	613	543	49	103	391	0	70	27	38	5	0
	불인정	162	146	4	23	118	1	16	1	14	1	0
	보류	2	1	1	0	0	0	1	0	1	0	0

서울성모병원 석면 질환 판단 프로세스

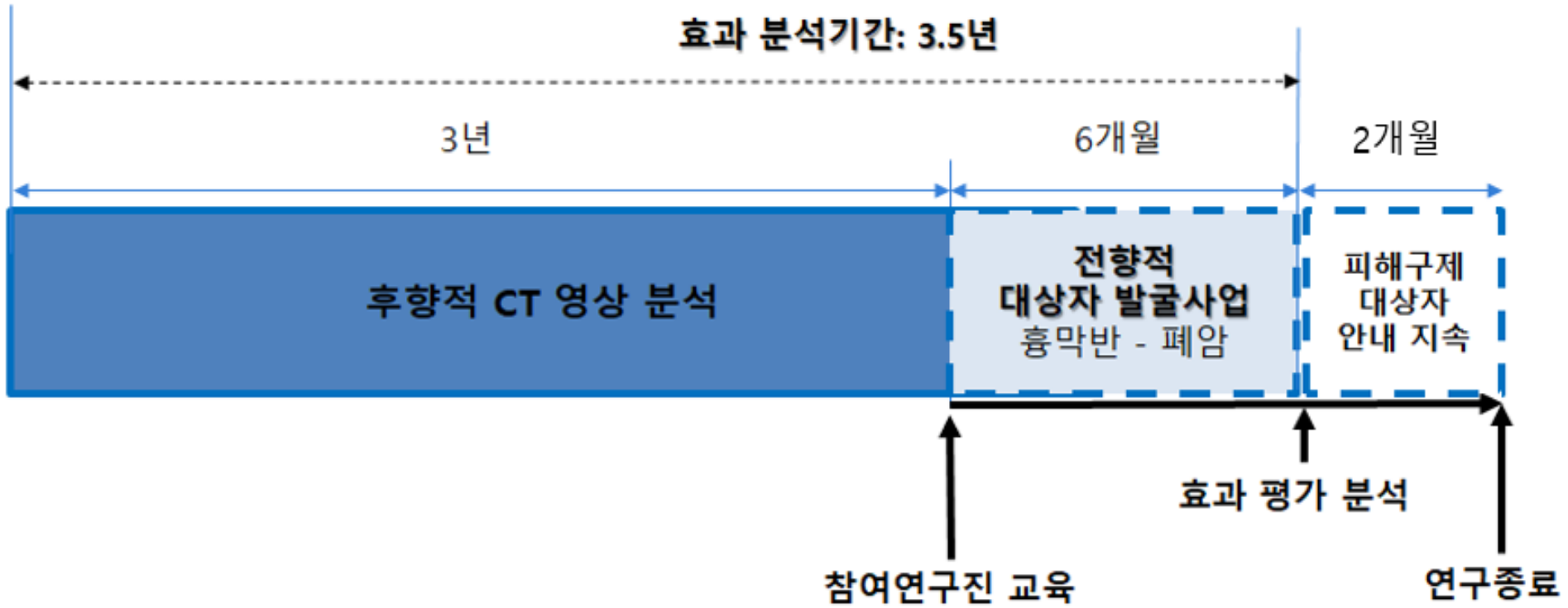


서울성모병원 영상의학과 판독문 세부내용

FINDING
Clinical information: CTx baseline diseas status evaluation #colon cancer Compared with previous chest CT at 2020.02.17
CONCLUSION
1. Again noted, focal region of clusteres micronodules in LLL(2-80 to 81, 2-57) ; R/O bronchiolitis 2. Mild left coronary arterial wall calcification 3. Prominent, nodular right breast parennchyma ;R/O gynecomastia DDx R breast mass. 4. No pathologically enlarged LAP in mediastinum and both hila 5. Multifocal, subtle pleural plaques in posterior aspect of both thorax ; R/O post infectious pleural plaques. DDx asbestos related pleural plaques.
RECOMMENDATION
Clinical evaluation for exposure history of asbestos or 직업환경의학과 consultation for #5.

- 임상과 → 직업환경의학과 협진의뢰
  : 노출력 문진, 석면피해구제법 or 산업재해보상보험법 안내

교육 전후 성과 비교


효과 분석기간: 3.5년
3년
6개월
2개월
후향적 CT 영상 분석
전향적
대상자 발굴사업
흉막반 - 폐암
피해구제
대상자
안내 지속
효과 평가 분석
참여연구진 교육
연구종료

Surveillance program extension

- 1차 (2017) : 가톨릭중앙의료원 산하 7개 병원
- 2차 (2019) : 전국 거점 12개 병원
- 3차 (2020) : 수도권 중심 대형병원 및 제주도 권역 포함 총 8개 병원

❖ 1차년도(2017) : 가톨릭중앙의료원 산하 7개병원

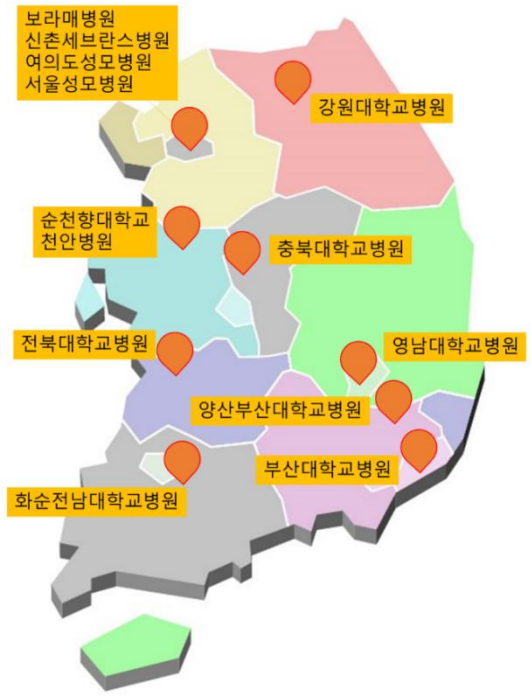
- 서울성모병원, 여의도성모병원, 의정부성모병원, 부천성모병원, 성바오로병원, 인천성모병원, 성빈센트병원

서울성모병원 석면피해발굴 프로세스를 바탕으로
→ 발굴모델 확립 및 타 의료기관에 시범적용
프로세스의 석면폐암 발굴 효과 확인 단계

❖ 2차년도(2019) : 전국단위 의료기관 참여

- **서울**: 가톨릭대학교 여의도성모병원, 가톨릭대학교 서울성모병원, 서울특별시보라매병원, 연세대학교의과대학 세브란스병원
- **강원·충청**: 강원대학교병원, 순천향대학교 천안병원, 충북대학교병원
- **전라**: 전북대학교병원, 화순전남대학교병원
- **경상**: 영남대학교병원, 양산부산대학교병원, 부산대학교병원

전국단위로 프로세스 확대운영
프로세스의 효과 확인 및
지역별 석면폐암 비율 확인



❖ 3차년도(2020) : 수도권 대형병원 및 제주권역 포함

- 삼성서울병원, 서울대학교병원, 제주대병원, 서울성모병원, 세브란스병원, 화순전남대학교병원, 여의도성모병원

수도권 대형병원(주요 폐암 진단 기관)의 참여로 초 권역 수준 평가

→ COVID-19 상황 고려

❖ 대상자 제외기준
- 1~3차 기존 연구 참여자, 이전 석면피해구제제도 기 신청자

❖ 대상자 선정 two steps 개요

1단계: 상병		2단계: 석면노출 키워드
상병코드	상병명	키워드
C34 이하 모든 상병코드	Lung cancer	-Pleural plaque -Asbestos -Mesothelioma
C45 이하 모든 상병코드	Mesothelioma	
J61 이하 모든 상병코드	Asbestosis	
J84 이하 모든 상병코드	IPF	
J92 이하 모든 상병코드	Pleural plaque	

❖ 대상자선정 및 상병 추출 전략

〈연구기관〉

- [예정]2018년 5월 1일 ~ 2021년 4월 30일(후향적), 2021년 5월 1일~10월 31일(전향적) 기간 동안 외래 방문 혹은 입원하였던 만 19세 이상의 원발성 폐암, 흉막반, 석면폐증, 특발성폐섬유화증, 악성중피종 환자 중 흉부 CT촬영자 선정
- 기간내 촬영한 모든 흉부 CT 판독문을 추출

⇩

〈중앙연구기관-서울성모병원 연구진〉

- 흉부 CT 판독 소견에서 석면 관련 질환 키워드(asbestos, pleural plaque, mesothelioma) 포함된 대상자를 추출
- 석면 관련 질환 키워드 추출 후 석면질환 외 기타병소 가능성(이전 결핵, 흉막 감염, 기흉, 전이성 암 등 흉막반 유사소견)을 배제하기 위하여 판독문 수기 검토.

⇩

〈연구기관〉

- 진료기록, 병리자료 재확인 필요한 명단 전달받아 검토
- 영상재판독 필요한 명단 전달받아 검토

⇩

〈중앙연구기관-서울성모병원 연구진〉

- 면접 대상자 최종 선정 후 각 연구기관에 전달

Questionnaire

석면노출력 조사 설문지

성 명		검진일자	20 년 월 일	연구대상자 번호	
주민등록 번호	_____ - _____			성별	☐ 남 ☐ 여
집 전화		휴대전화		e-mail	
현재 거주지					

Ⅰ. 환경 중 석면노출

[1] 거주력

1. 귀하가 태어나서 지금까지 실제 거주하신 곳의 주소를 모두 적어주십시오.

(현재 거주지부터 과거 태어난 거주지의 순서대로 적어주십시오.)

주 소						거주 기간 (예: 1956 ~ 1960)
번호	광역시/(도)	시/군/구	읍/면/동	리 / 마을	번지	
1						~ 현재까지
2						~
3						~
4						~
5						~
6						~

[2] 환경노출력

태어나서 지금까지 다음과 같은 석면 노출 사항이 있으면 해당되는 모든 문항의 □에 ■로 체크하여 주시고 거주 기간을 작성하여 주시기 바랍니다.

석면 노출	거주 기간 (예시: 1956년 2월 ~ 1961년 8월)	
□ 폐석면 광산 등의 석면더미에서 놀았던 경험이 있다.	~	설문 조사원이 주변 환경조사를 통해 추가 석면노출을 확인한 경우 거주기간을 확인하여 기재
□ 석면을 가지고 놀았던 경험이 있다.	~	
□ 슬레이트 지붕 또는 축사를 수리한 적이 있다.	~	
□ 집에서 석면을 사용하여 일을 하거나 석면제품을 수리한 적이 있다.	~	
□ 석면광산 2㎞ 이내에서 농사를 한 적이 있다.	~	
□ 집 2㎞ 이내에 석면광산이 있었다.	~	
□ 집 2㎞ 이내에 석면공장이 있었다.	~	
□ 집 2㎞ 이내에 재개발 또는 재건축으로 인한 건축물 철거가 있었다.	~	
□ 집 2㎞ 이내에 자동차 정비소(공업사)가 있었다.	~	
□ 집 2㎞ 이내에 선박제조 또는 수리업체가 있었다.	~	
□ 집 2㎞ 이내에 공단(철강주물, 발전소, 대규모화학 또는 석유화학공장, 대규모 하치장)이 있었다.	~	

<표1> 석면노출 직업

■ 아래 항목은 석면관련 직업에 대한 질문입니다. 참고하여 설문에 응답해주시기 바랍니다.

구분	번호	석면관련 직업	석면 작업내용 및 생산품
석면 광산	①	석면광산업	석면광산에서 석면을 채취하는 업무
	②	석면광산관련 작업	석면광산에서 생산된 석면을 가공하는 작업(분쇄, 포장 등)
석면 함유 제품 생산	③	석면시멘트제품 제조	슬레이트, 천장재, 방라이트, 석면압출제품 등 생산
	④	석면마찰재	브레이크 라이닝, 브레이크 패드, 석면클러치 판, 석면특수브레이크 생산
	⑤	석면 조인트시트	가스켓 생산
	⑥	석면 방직(방적)제품	석면사, 석면로프, 석면사 패킹, 석면테이프, 석면 포, 석면장갑 생산

석면/석면 함유 제품 사용	⑦	건축업	슬레이트 지붕 및 건축물 철거, 개보수 작업, 인테리어
	⑧	건설업	전기작업 및 천장텍스, 타일, 보일러 설치 등 석면 함유 제품 사용
	⑨	철강/화학공장/벽돌 제조 등 산업	배관 설치, 배관 정비, 배관 해체
	⑩	철강/화학공장/벽돌 제조 이외 산업	(철강/화학공장/벽돌제조) 이외의 건설 등 각종 산업에서 석면제품 사용
	⑪	자동차. 철도 정비작업	브레이크 수리 및 정비, 하체작업
	⑫	선박제조 및 수리업	정비, 용접작업, 석면포 사용작업
	⑬	발전소 및 고열작업	발전소, 주물공장 등 고열작업에 포함된 석면제품 사용
	⑭	기타 석면제품	석면함유 모터 정류자, 산업용 석면단열재 등
	⑮	석면 가내수공업	석면물레질, 가정에서 석면작업
	⑯	군대에서 석면취급	석면건축물, 석면제품 취급, 정비
기타	⑰	기타 석면 노출원	상세히 기술(　　)

III. 동거가족에 의한 석면 노출

1. 귀하(본인)와 같이 살았던 가족(배우자, 부모 등)으로부터 석면노출이 있었습니까?

① 아니오
② 예　　⇨ (2번으로)

2. 귀하(본인)에게 석면을 노출시킨 가족의 직무(일)를 위의 <표1> 에서 모두 고르시고, 가족관계와 함께 해당 직무를 가장 오랜 기간 근무한 순서대로 기입해 주시기 바랍니다.

번호	본인과의 가족관계	해당직업 총 근무기간		석면관련 직업번호	구체적인 작업내용
		년수	개월수		
예시	부	20	2	7	슬레이트 지붕 개보수
1	(　　)				
2	(　　)				
3	(　　)				
4	(　　)				

II. 직업 중 석면노출 (본인)

1. 귀하(본인)가 일하면서 석면을 취급하거나 노출 되었습니까 ?

① 아니오 ⇨ (IV.항목으로(동거가족에 의한 석면노출))

② 예 ⇨ (2번으로)

2. 평생동안 귀하(본인)가 종사하였던 석면관련 직업을 위의 <표1> 에서 모두 고르시고, 가장 오랜 기간 근무한 순서대로 기입해 주시기 바랍니다.

번호	관계	근무 시작		근무 마지막		석면관련 직업번호	구체적인 작업내용
		년	월	년	월		
예시	본인	1975	03	1984	10	2	석면 분쇄 및 운반
1							
2							
3							
4							

※ 위 질문 외 그 밖에 수검자와 가족에 대한 석면 노출이 의심되는 사항이 있는 경우에는, 그 내용과 기간 등에 대해 구체적으로 기술하여 주십시오.(설문조사원 또는 수검자 기재)

설문조사자 : (서명)

Results

- 1st year
  - 2017년 연구 시작 후 적극적인 석면 폐암 대상자 발굴이 이루어짐
    석면관련 폐암 의심환자/ 기간내 폐암진단환자 비율 : 0.55% → 0.98%
  - 사업 전후 비교시 석면폐암 발굴율 **78%** 증가
- 2nd year
  - 2019년 연구 시작 후 적극적인 석면 폐암 대상자 발굴이 이루어짐
    석면관련 폐암 의심환자/ 기간내 폐암진단환자 비율 : 0.46% → 0.97%
  - 사업 전후 석면폐암 발굴 **111%** 증가

- 3rd year (후향 n=22,843, 전향 = 3,846)

  - 후향적인 검토 건수가 기존에 비해 저조
  - **석면관련 폐암 의심환자/ 기간내 폐암진단환자 비율 : 0.27% → 0.62%**
  - 사업 전후 석면폐암 발굴 **121.4%** 증가

Conclusion

- 후향적 CT 판독결과 review로 석면관련 질환 발굴 향상
- 전향적인 CT 판독 교육 및 협력체계 구축으로 후향적 결과에 비해 100%이상 석면관련질환 발굴 확인

→ 개인적인 질환 발굴 노력 뿐만 아니라 시스템 구축을 통한 환경성 질환 발굴 체계 구축이 필요