# Identification of Emerging Risks from THOR data

## Lane event 5th November 2019

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# European context

‘Alert and sentinel approaches for the identification of work-related diseases in the EU’ (EU-OSHA, 2018)

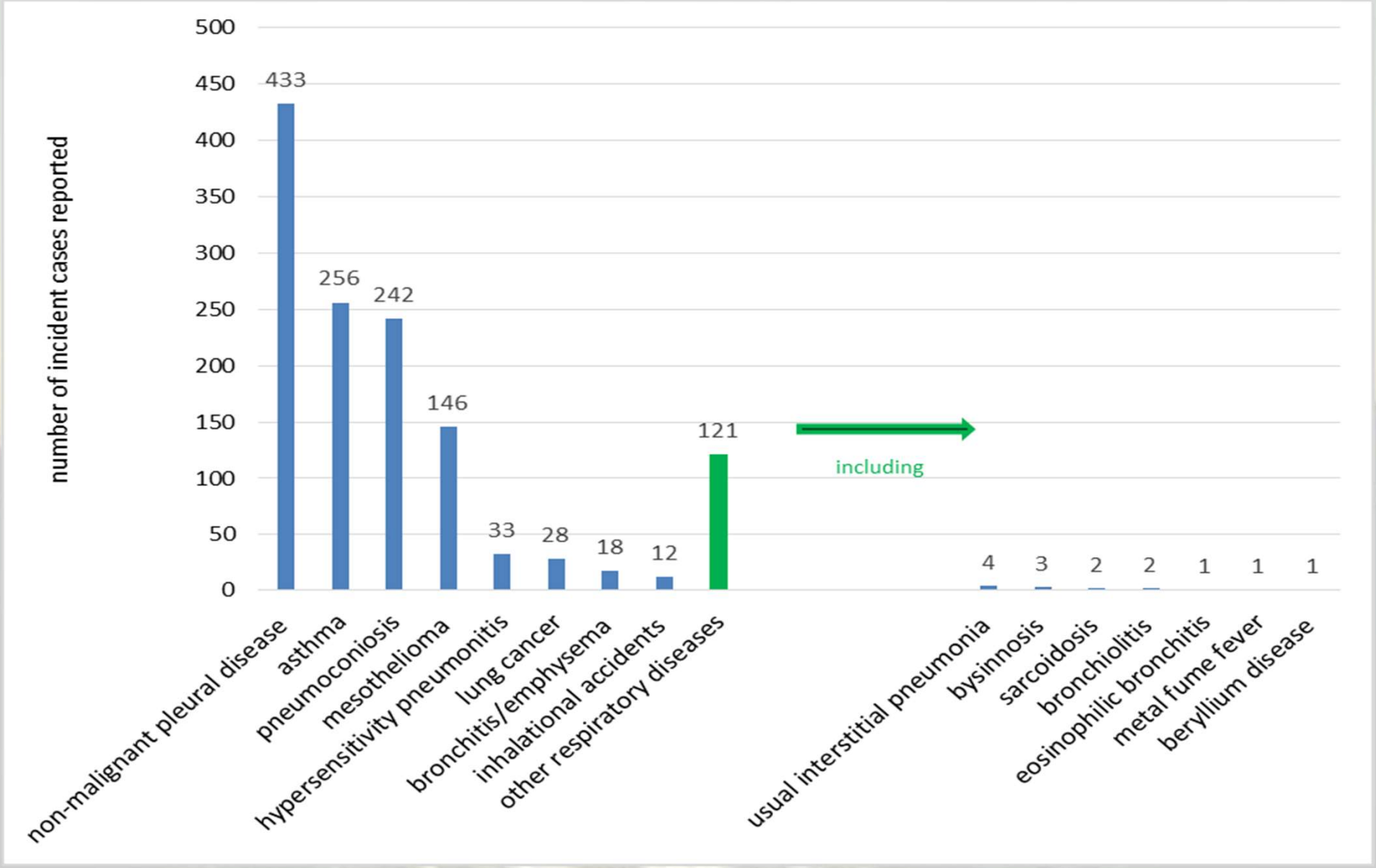
*‘Monitoring reports of work-related diseases that are considered early warning signs can help to identify situations or workplaces where occupational safety and health management needs to be improved’*

***RNV3P (France)***
***SIGNAAL (Netherlands/Belgium)***
***SUVA (Switzerland)***
***THOR (UK)***

# THOR approach to sentinel cases

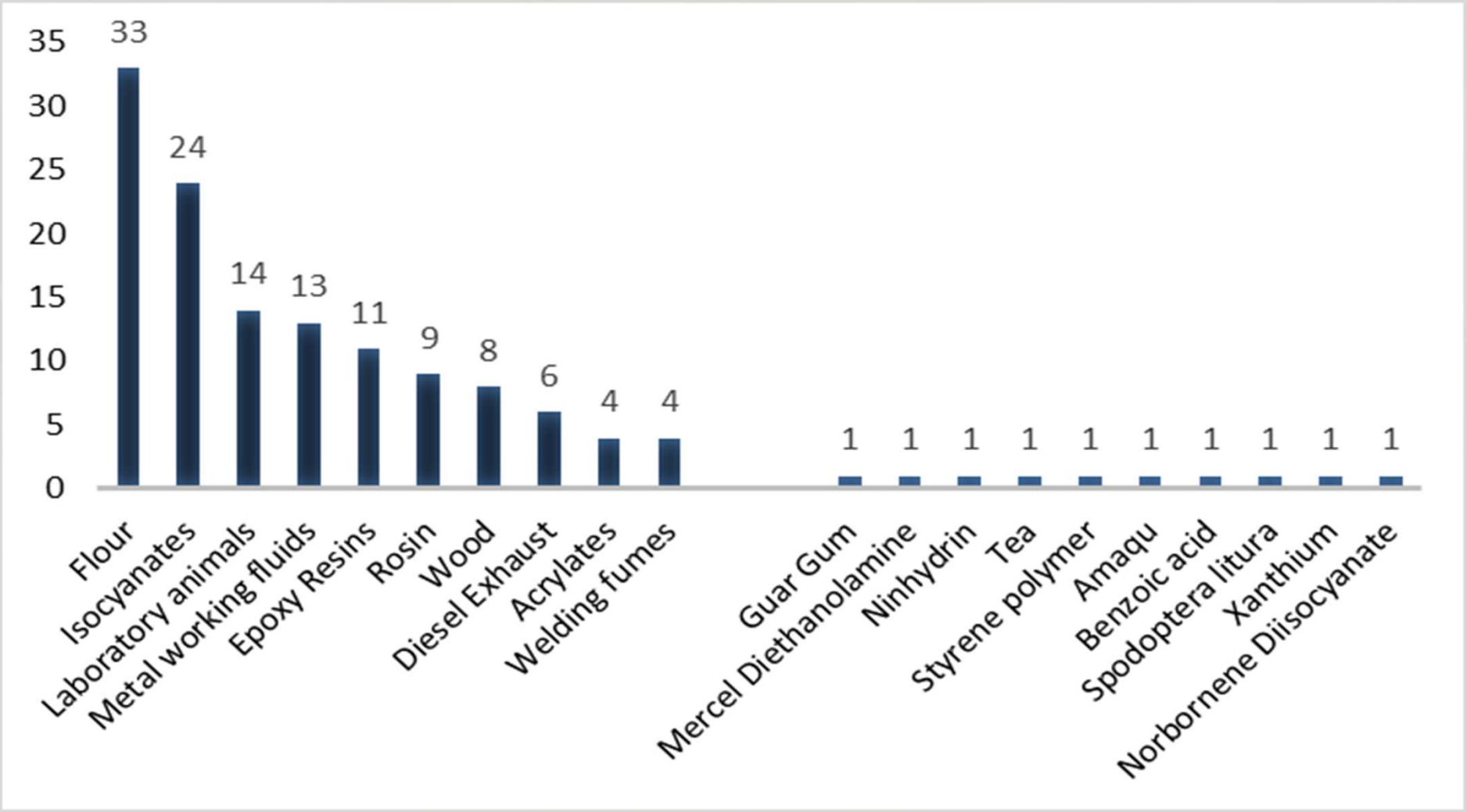
| | |
|---|---|
| 2015-17 | Hierarchical approach to identify rare diseases or combinations of causative exposures or agents / job or industry. Supplemented by literature searches and other tools e.g. QSAR for asthmagens.<br>*Zhou et al. Paper submitted.* |
| 2018-19 | Similar approach plus interrogation of THOR database for previous reports and consideration of liaison with the reporter |
| 2020 - | Plan to formalise protocol with automation of THOR searches and process for liaising with reporting physicians |

# Hierarchical approach to **disease** frequency SWORD 2015-17 Zhou et al

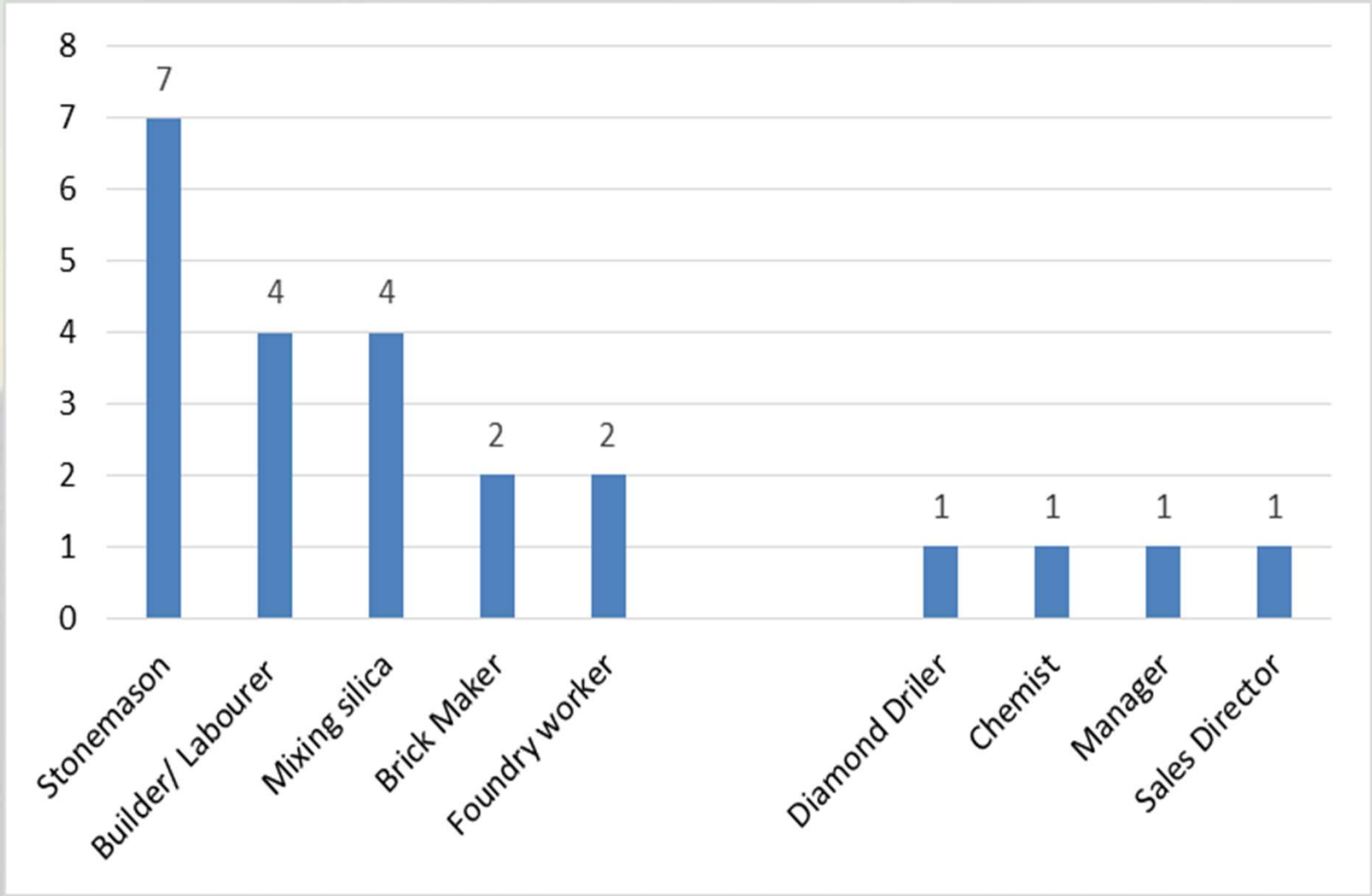


# Hierarchical approach to **causes** of a specific disease (Occupational Asthma) SWORD 2015-17

Zhou et al



# Hierarchical approach to **exposure circumstances** for a recognised disease of known cause (silicosis) SWORD 2015-17 Zhou et al



# THOR - where do we look?

Databases

- SWORD
- EPIDERM
- OPRA
- THOR-GP
- THOR-Extra

Which columns?

Diagnosis

Suspect Agent

Exposure circumstances

- Industry
- Job
- Source of Agent (EPIDERM)
- First onset of exposure (SWORD)

# Potential categories of emerging risk

Diagnosis

Suspect agent

Job / Industry

*1. An emerging disease?*

*2. A recognised disease not previously attributed to occupation?*

*3. A novel cause of a recognised occupational disease?*

*4. Novel exposure circumstances for a recognised occupational disease?*

*5. Novel exposure circumstances for a recognised cause of a recognised occupational disease?*

# Process 2018-19

1. Quarterly review of cases by THOR research clinician
2. Identification of rare or novel diagnoses / agent / exposure circumstances
3. Interrogation of THOR database for similar previous case reports
4. Systematic literature search
5. Use of corroborative tools e.g. QSAR
6. Consider further enquiry to reporting physician
7. Consider alert to OH professionals in quarterly report where appropriate

# 1. An emerging disease?

- *<u>Possible sentinel case reports SWORD 2019:</u>*

- *Diagnosis:* *Inducible Laryngeal Obstruction (ILO) – 2 cases*
- *Jobs:* *Teacher, Clerical Officer*
- *Industries:*
- *Suspected Agents:* *Whiteboard cleaner, Perfumes*

No previous cases of ILO found on interrogation of THOR databases

# ILO – an emerging occupational disease?

Literature Search

1983 – 'Vocal-cord dysfunction presenting as asthma'. *NEJM 1983;308:1566-1570*

1998 - Irritant-associated vocal cord dysfunction. 10/11 cases occupational *J Occup Environ Med 1998; 40: 136–143.*

2017 – 'Inducible laryngeal obstruction: an official joint European Respiratory Society and European Laryngological Society statement.'
Eur Respir J 2017; 50: 1602221

Further details of the case warranted? No

Importance? Moderate – partial occupational aetiology recognised

Further action?: Alert for future case reports
Awareness raised through quarterley report

# 2. A recognised disease with an emerging occupational cause?

*Possible sentinel case report OPRA 2019:*

| | |
|---|---|
| *Diagnosis:* | *Rheumatoid arthritis* |
| *Job:* | *Stone crusher* |
| *Industry:* | *Roadstone construction* |
| *Suspected Agent:* | *Silica* |

| THOR Database search for: | OPRA | THOR-GP |
|---|---|---|
| Diagnosis: Rheumatoid arthritis | 4* | 3* |
| Diagnosis: Rheumatoid arthritis<br>Suspected agent: silica | 0 | 0 |
| | | |

*Likely Work **aggravated** RA in context of stress / physical tasks

# Rheumatoid arthritis and silica

- Several epidemiological studies linking silica exposure with rheumatoid arthritis
- More recent focus on ACPA positive RA shows stronger association than ACPA negative
- No previous individual case reports where causation attributed to silica exposure.

# 3. A novel cause of a recognised occupational disease?

*Possible sentinel case report :*

| | |
|---|---|
| *Diagnosis:* | *Occupational asthma* |
| *Job:* | *Materials Technician* |
| *Industry:* | *Education* |
| *Suspected Agent:* | ***Sericin*** |

| THOR Database search for: | SWORD | OPRA |
|---|---|---|
| Previous OA cases attributed to sericin | 0 | 0 |

# Sericin – an emerging asthmagenic risk?

- Literature review showed that silk has been a common cause of OA in Japan
- Enquiry to reporting physician revealed that the exposure was historic

# 4. A known occupational disease due to an established cause presenting in a previously unrecognised workplace context

*Sentinel case report EPIDERM 2018:*

| | |
|---|---|
| *Diagnosis:* | *Allergic contact dermatitis* |
| *Job:* | *3D Printer* |
| *Industry:* | *Printing* |
| *Suspected Agent:* | *Epoxy Resins* |

| THOR Database search for: | EPIDERM | OPRA |
|---|---|---|
| Contact dermatitis attributed to Epoxy Resins | 616 | 122 |
| Epoxy Resin contact dermatitis in Printing industry | 2 | 0 |
| Epoxy Resin contact dermatitis in 3D Printers | 1 | 0 |

## 3D printing – an emerging risk for epoxy resin dermatitis?

Plausibility? – Literature Search

- '3D Printing and Additive Manufacturing – The Implications for OSH':

'*Plastic chemicals, such as epoxy resins, are being utilised in stereolithography as well as for surface treatment of printed objects. These may cause allergic contact dermatitis.'*

- A new application for epoxy resins resulting in occupational allergic contact dermatitis: the three-dimensional printing industry

Contact Dermatitis 2017;77:325–351

Further details of the case warranted? Yes, exposure circumstances

Importance and need for further action?:

- High
- Alert mechanism required for future similar reports
- Awareness of potential hazards in 3D printing needs raising

## Future developments to process for identification of emerging risks from THOR

- Automation of searches for previous cases
- Creation ‘alert’ mechanisms for further cases
- Need to formalise processes for seeking further information from reporting physician

**Acknowledgements**