Eliminating Occupational Cancer

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The world’s seven leading industrial nations have pledged to use their muscle to drive down unsafe and poor working conditions in the world’s supply chains.

In a declaration released on the final day of talks at their summit in Germany on 7 and 8 June, the G7 leaders said they would seek to promote “labour rights, decent working conditions and environmental protection” as key players in global supply chains.

They also committed to support a “Vision Zero Fund”, to be established in cooperation with the International Labour Organisation (ILO), help prevent and reduce work-related deaths and serious injuries by “strengthening public frameworks and establishing sustainable business practices”.

Photograph: German Federal Government/Gottschalk
Eliminating Occupational Cancer

What we know

What action could be taken

Option: Statement by the Collegium Ramazzini

https://goo.gl/fuUXsI
What we know - Facts

• The ILO estimates that each year about **2.3 million workers die** from occupational accidents and diseases\(^1\).

• Of those **666,000 deaths** that are caused by occupational cancer globally every year

• Occupational cancer is the biggest killer at work in High Income Countries (WHO Classification)

• Occupational exposures cause 5.3 - 8.4% of all cancers, and among men 17-29% of all lung cancer deaths

\(^1\) **XX World Congress on Safety and Health at Work: Frankfurt, August 2014**

[https://goo.gl/fuUXsl](https://goo.gl/fuUXsl)
See “Global estimates”: http://goo.gl/0xSHGl
Figure 1  **Global estimated work-related fatalities by region, absolute numbers**

- **EME** - Established Market Economies
- **FSE** - Former Socialist Economies
- **IND** - India
- **CHN** - China
- **OAI** - Other Asia and Island
- **SSA** - Sub-Saharan Africa
- **LAC** - Latin-America and Caribbean
- **MEC** - Middle Easter Crescent

- **Accidents and violence**
- **Diseases of the genitourinary system**
- **Digestive systems diseases**
- **Neuro-psychiatric conditions**
- **Circulatory systems diseases**
- **Respiratory systems diseases**
- **Malignant neoplasms**
- **Communicable diseases**
Industrialised countries had a higher burden from cancers, at 53% and a much smaller attribution from accidents and infectious conditions each at 3%.

Distribution of Work-related illness by WHO regions

See “Global estimates”: http://goo.gl/0xSHGl
Deaths attributed to work, Singapore (Resid.) 869, EU: 192,000 (new!)

- Communicable diseases: 4% (1%)
- Respiratory Diseases: 6% (2.4%)
- Mental Disorders: 32% (28%)
- Genitourinary system: 6% (6%)
- Cancers: 0.3% (0.8%)
- Circulatory diseases: 0.3% (5.7%)
- Digestive systems diseases: 7% (2.5%)
- Accidents and violence: 45% (53%)

Sources: WSH Institute Singapore 2015, Hämäläinen P, Takala J, Saarela KL; TUT, ILO, WHO, EU-OSHA, WSH Institute Singapore, JOEH May 2014, ref. data: MOH/MOM and WHO A region
<table>
<thead>
<tr>
<th>Country</th>
<th>Occupational cancer deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andorra</td>
<td>17</td>
</tr>
<tr>
<td>Austria</td>
<td>1820</td>
</tr>
<tr>
<td>Belgium</td>
<td>2079</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>1445</td>
</tr>
<tr>
<td>Croatia</td>
<td>742</td>
</tr>
<tr>
<td>Cyprus</td>
<td>179</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>2238</td>
</tr>
<tr>
<td>Denmark</td>
<td>1242</td>
</tr>
<tr>
<td>Estonia</td>
<td>292</td>
</tr>
<tr>
<td>Finland</td>
<td>1135</td>
</tr>
<tr>
<td>France</td>
<td>12035</td>
</tr>
<tr>
<td>Germany</td>
<td>17706</td>
</tr>
<tr>
<td>Gibraltar</td>
<td>5</td>
</tr>
<tr>
<td>Greece</td>
<td>2131</td>
</tr>
<tr>
<td>Greenland</td>
<td>14</td>
</tr>
<tr>
<td>Guernsey</td>
<td>13</td>
</tr>
<tr>
<td>Hungary</td>
<td>1808</td>
</tr>
<tr>
<td>Ireland</td>
<td>928</td>
</tr>
<tr>
<td>Isle of Man</td>
<td>18</td>
</tr>
<tr>
<td>Italy</td>
<td>10609</td>
</tr>
<tr>
<td>Jersey</td>
<td>23</td>
</tr>
<tr>
<td>Latvia</td>
<td>491</td>
</tr>
<tr>
<td>Lithuania</td>
<td>694</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>98</td>
</tr>
<tr>
<td>Malta</td>
<td>75</td>
</tr>
<tr>
<td>Monaco</td>
<td>21</td>
</tr>
<tr>
<td>Netherlands</td>
<td>3721</td>
</tr>
<tr>
<td>Poland</td>
<td>7501</td>
</tr>
<tr>
<td>Portugal</td>
<td>2371</td>
</tr>
<tr>
<td>Romania</td>
<td>4233</td>
</tr>
<tr>
<td>San Marino</td>
<td>0</td>
</tr>
<tr>
<td>Slovakia</td>
<td>1150</td>
</tr>
<tr>
<td>Slovenia</td>
<td>442</td>
</tr>
<tr>
<td>Spain</td>
<td>9807</td>
</tr>
<tr>
<td>Sweden</td>
<td>2103</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>13330</td>
</tr>
<tr>
<td><strong>Total EU</strong></td>
<td><strong>102,517</strong></td>
</tr>
</tbody>
</table>
Figure 4 Most frequent carcinogens and exposures at work in the United Kingdom

85% of the cancer cases come from the top ten chemical agents.
Figure 5 Mesothelioma and related asbestos-related lung cancer mortality and proposed groups

per million population

WHO Mortality Database, ICD 10: C45 Mesothelioma, ICD 9: 163 Malignant Neoplasm of Pleura
Australia: National Cancer Statistics Clearing House of Australian Institute of Health and Welfare (AIHW)

Sources: Figure elaborated by Sugio Furuya, additions by Takala and Goh 2014. The last figure for Italy is taken from Takahashi et al.
U.K. Exposure

U.K. Deaths

Mesothelioma deaths

Today U.K

U.K. 2005

Thailand exposure, moving average

Thailand deaths, estimate

http://goo.gl/hnEKnC
Historical Consumption of Asbestos and Mesothelioma in Singapore

- Max 12,035t (1970)
- Max 8,671t (1975)
- Year 2015-2020
- Year 2020-25

Source: R. Virta, United States Geological Survey, U.S. Department of Interior

* Exports bigger than imports
Example of poor GBD emphasis on work exposures
Combined effect of exposures to asbestos and smoking on lung cancer

Age-standardized lung cancer death rates

<table>
<thead>
<tr>
<th>Death rate (per 100,000)</th>
<th>Non-smoker</th>
<th>Smoker</th>
</tr>
</thead>
<tbody>
<tr>
<td>No asbestos</td>
<td>11</td>
<td>123</td>
</tr>
<tr>
<td>Asbestos</td>
<td>58</td>
<td>602</td>
</tr>
</tbody>
</table>

Attributable Fraction, AF is based on risk ratio, RR

\[ AF = \frac{(RR - 1)}{RR} \]

AF Principle

Statement proposing a global programme to “Eliminate Occupational Cancer”

Introduction

Calling action by **ILO and WHO e.g. to** include such programme in the newly endorsed **G7 Vision Zero Fund**, and the forthcoming action plans.

**Raising concerns** on the alarming rate of global occupational cancer incidence and mortality,

**Requesting EU and other regional bodies, governments, businesses and workers, and all other stakeholders**, including ICOH, IALI, IOHA, ISSA, IOSH to take action now;

**Calling for intensification of research and R2P2**

**Setting up a specific coordinating body**

**Starting global action** programmes to use best practices known to reduce the exposures, such as the U.K.’s “No Time to Lose” – Campaign;

Intensify the programmes and efforts to **eliminate all use of asbestos globally** following the CR past resolutions;

Ask all interested parties to **endorse this CR Statement**
Thank You
Concepts for measuring the Burden

\[ YLL = N \times L \]
Years of Lost Life, \( N \) = deaths, \( L \) = lost years

For cancer (UK): 19.8 years (average age ~60 years)
For injuries (UK): 45.3 years (average age ~35 years)

\[ YLD = I \times DW \times L \]
Years Lived with Disability
Measure of the burden due to early loss of full function

\( I \) = Number of incident cases
\( DW \) = Disability weight (0...1)
\( L \) = Average number of years affected

\[ DALY = YLL + YLD \]
Disability Adjusted Life Years
How to calculate the Burden of work

**YLL = N x L**

- We can easily count the lost years from GBD/IHME from the two numbers per country/region: all deaths and YLLs
- Number of fatal cases either from statistics and registers, such as mesothelioma deaths, or
- Using Attributable Fraction, AF\text{work} for each disease/disorder and apply that to best all deaths number to the disorder concerned

\[ YLD = I \times DW \times L \]

- Take all YLD’s from GB/IHME
- Apply AF\text{work} to these YLD’s, note that AF\text{work morbidity} may be somewhat different from those of AF\text{work mortality}

\[ \text{Daly} = \text{YLL} + \text{YLD} \]

Disability Adjusted Life Years

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal cord lesion at neck level (treated)</td>
<td>0.369</td>
</tr>
<tr>
<td>Gout, acute</td>
<td>0.293</td>
</tr>
<tr>
<td>Hearing loss, complete</td>
<td>0.033</td>
</tr>
<tr>
<td>Major depressive disorder, moderate episode</td>
<td>0.406</td>
</tr>
<tr>
<td>Asthma, uncontrolled</td>
<td>0.132</td>
</tr>
<tr>
<td>Heart failure, severe</td>
<td>0.186</td>
</tr>
<tr>
<td>HIV/AIDS cases, receiving ARV treatment</td>
<td>0.053</td>
</tr>
<tr>
<td>AIDS cases, not receiving ARV treatment</td>
<td>0.547</td>
</tr>
<tr>
<td>Back pain, chronic, without leg pain</td>
<td>0.366</td>
</tr>
<tr>
<td>Diarrhea, mild</td>
<td>0.061</td>
</tr>
<tr>
<td>Fracture of pelvis (short term)</td>
<td>0.390</td>
</tr>
</tbody>
</table>

Source: Driscoll T. Presentation  Oct 2014, originally From Saloman et al, 2012 - Lancet
Deaths in men in 2010 by age, Western Europe

- Injuries = 14.4%
- CVD, \(\text{AF}_{\text{work}} = 14.4\%\)
- Cancer, \(\text{AF}_{\text{work}} = 13.8\%\)
- Communicable, \(\text{AF}_{\text{work}} = 13.3\%\)

AF = Attributable Fraction, re work
GBD = Global Burden of Disease
Deaths in 2010 by age, Singapore

- CVD, $AF_{work} = 13.1\%$
- Injuries
- Cancer, $AF_{work} = 8.4\%$
- Communicable, $AF = 9.48\%$

AF = Attributable Fraction, re work

GBD = Global Burden of Disease and Injury

IHME = Institute for Health Metrics and Evaluation
DALYs in women in 2010 by age, Western Europe

Injuries
Musculoskeletal, $AF_{work} = 37\%$

Mental health, $AF_{work} = 30+\%$

CVD, stress $AF_{work} = 7.9\%$

Cancer

DALY = Disability Adjusted Life Years

http://www.healthmetricsandevaluation.org/gbd/visualizations/regional
DALYs in women in 2010 by age, Singapore

- Injuries
  - Musculoskeletal, AF= 37%
  - Mental health, AF= 30+ %
  - CVD, stress AF= 7.9 %

DALY= Disability Adjusted Life Years

http://www.healthmetricsandevaluation.org/gbd/visualizations/regional
Deaths, Western Europe, selected causes by GBD

- Occupational cancer
- Occupational injuries
Deaths U.K. selected causes by GBD

UK: 8,010 deaths/year

Occupational cancer
Why IHME/GBD numbers differ from ILO, why not endorsed by WHO

**Risks at work not included so far**

- Heart and circulatory diseases, stroke, chemicals, ETS, stress and night work, shift work, overwork, long working hours, noise, heat, humidity…
- A number of cancers: breast, oesophagus, stomach, liver, cervix, pharynx, bladder, skin.. carcinogens such as tetrachloroethylene, trichloroethylene, cobalt…
- Alzheimers, Parkinson’s disease
- Pesticide poisoning
- Tuberculosis, silico-tuberculosis, pneumococcal disease (ETS)
- Tropical diseases, malaria, dengue, schistosomiasis…
- Other infectious agents, bacteria, viruses, animals and insects
- Lead
- Needle-stick injuries
- Work-related Traffic Injuries

**Populations not included under occupational risks**

- Migrant workers
- Informal sector workers
- Self-employed, subsistence farmers
- Child labour

**Serious under-estimates:** injuries, violence, asbestos, lung cancer, radon silica, PAH, diesel, ETS...
GBD: Deaths at Work in Singapore
The world’s seven leading industrial nations have pledged to use their muscle to drive down unsafe and poor working conditions in the world’s supply chain. In a declaration released on the final day of talks at their summit in Germany on 7 and 8 June, the G7 leaders said they would seek to promote “labour standards”.

They also committed to support a “Vision Zero Fund” to be established in cooperation with the International Labour Organisation (ILO), which would provide financial assistance to countries seeking to improve their working conditions.