Re-emergence of old workplace hazards - are we doing enough?

Malcolm Sim

Centre for Occupational & Environmental Health, Monash University, Victoria, Australia

International Commission on Occupational Health - ICOH
Commission Internationale de la Santé au Travail - CIST
Founded in 1906 as Permanent Commission

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18-21 October 2011
Accra, Ghana
Learning From Good Practices in Small Workplaces

ICOH Newsletter

ARBOUW

ICOH announces newly elected officers and board members who will serve for triennium 2012-2015

The Officers are: **President** Dr. Kazutaka Kogi, **Secretary General** Dr. Sergio Iavicoli, **Vice President** Dr. Suvi Lehtinen, **Vice President** Prof. Bonnie Rogers, **Past President** Prof. Jorma Rantanen

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Dublin, Ireland, elected as venue of the 32nd ICOH international congress

ICOH's 32nd International Congress will be held in 2018 in Dublin, Ireland as a result of the vote held in Cancun in conjunction to the 30th ICOH Congress.

ICOH Cancun Charter on Occupation Health for all

During the Second General Assembly on March 23rd 2012, Prof. Jorma Rantanen

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How to use the Private Area


Apply for membership

ICOH 2012, Cancun, Mexico

Affiliate Members

Old Hazards

Theme of my talk today is about 'old' hazards from the perspective of:

- adequacy of controls
- "complacency" factor
- new guises and forms
- exporting hazards to developing countries
- standard setting

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Noise induced hearing loss

- In 2005 financial cost of hearing loss was estimated: $11.75 Billion or 1.4% of GDP (Access Economics)
- 37.1% of Hearing loss in adults is NIHL (Wilson et al, 1998)
- 7% of NIHL is occupational (Nelson et al, 2005)
- Workplace noise has been around since ancient times
- Strong perception that noise exposure is under control
- Well established hierarchy of controls

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Occupational NIHL in Victoria

Aim to analyse the demographic and occupational characteristics of workers claiming for NIHL related Impairment Benefits (IB) and hearing aids (HA) covered by WorkSafe Victoria

Study prompted by dramatic increase in hearing loss claims in Victoria over the last few years

(Institute of Actuaries of Australia 2009)

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Methods

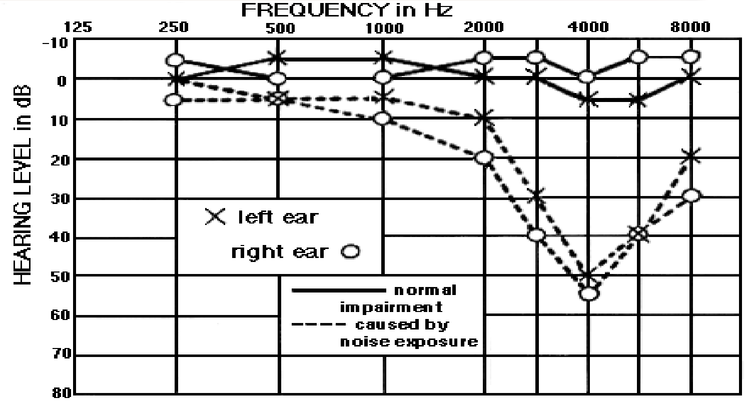
- Data based on computerized claims (excludes Commonwealth employees, sole traders and self Insurers, about 8%)
- Covered period for all claims 12 Nov 1997 (when NIHL claim threshold increased from 7% to 10%) to 30 June 2009
- Claims coded by affliction nature code, deafness code 250 or 771, n=5183 claims
- Excluded 772 due to audio shock,

  206 not related to hearing, 12 disease

  of mastoid and 6 due to trauma
- Payroll used to estimate Workplace size:

  >$1m, $1m to $20 m, >$20m

  (not number of employees)
- Crude industry/occupation categories



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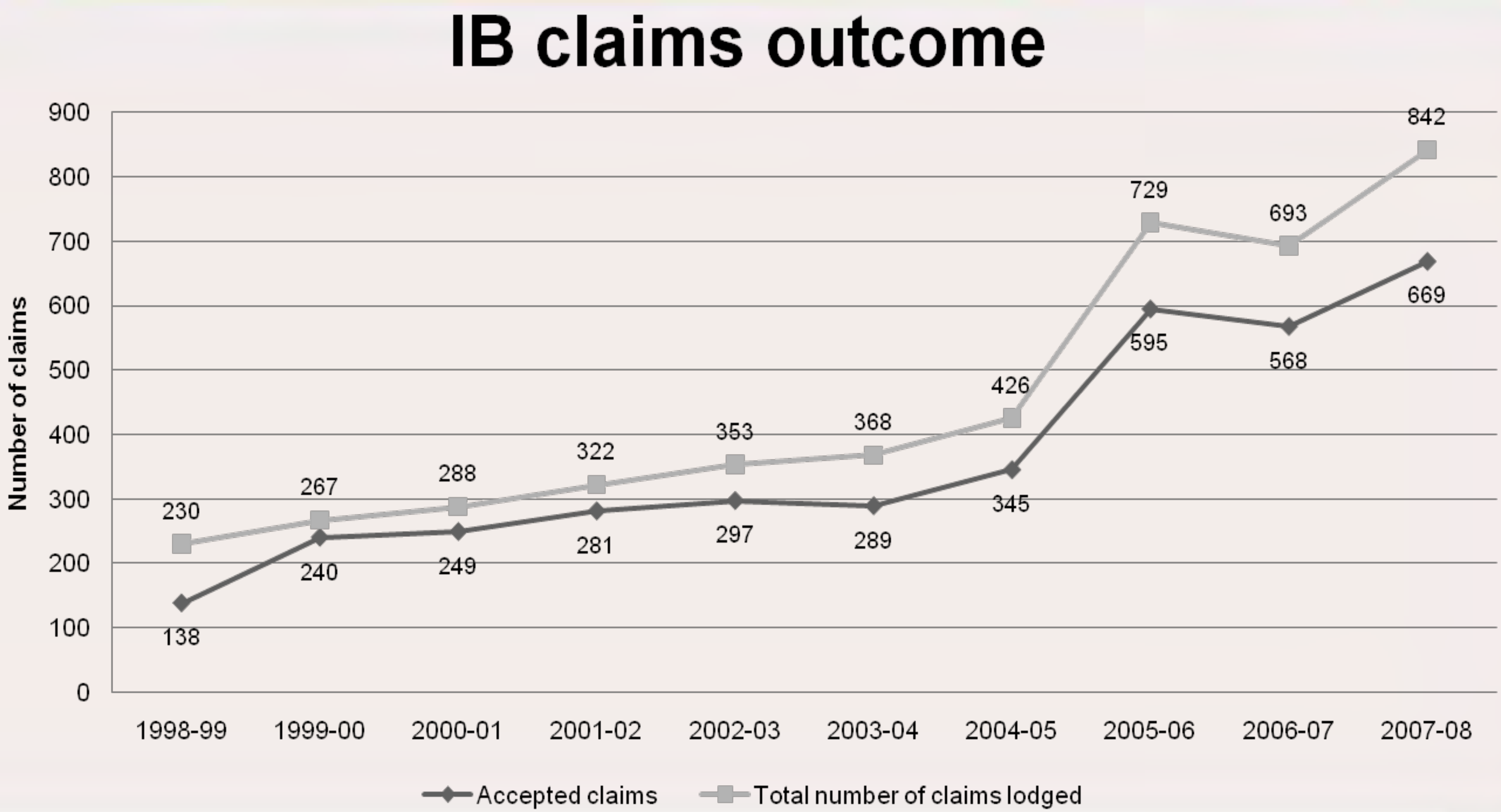
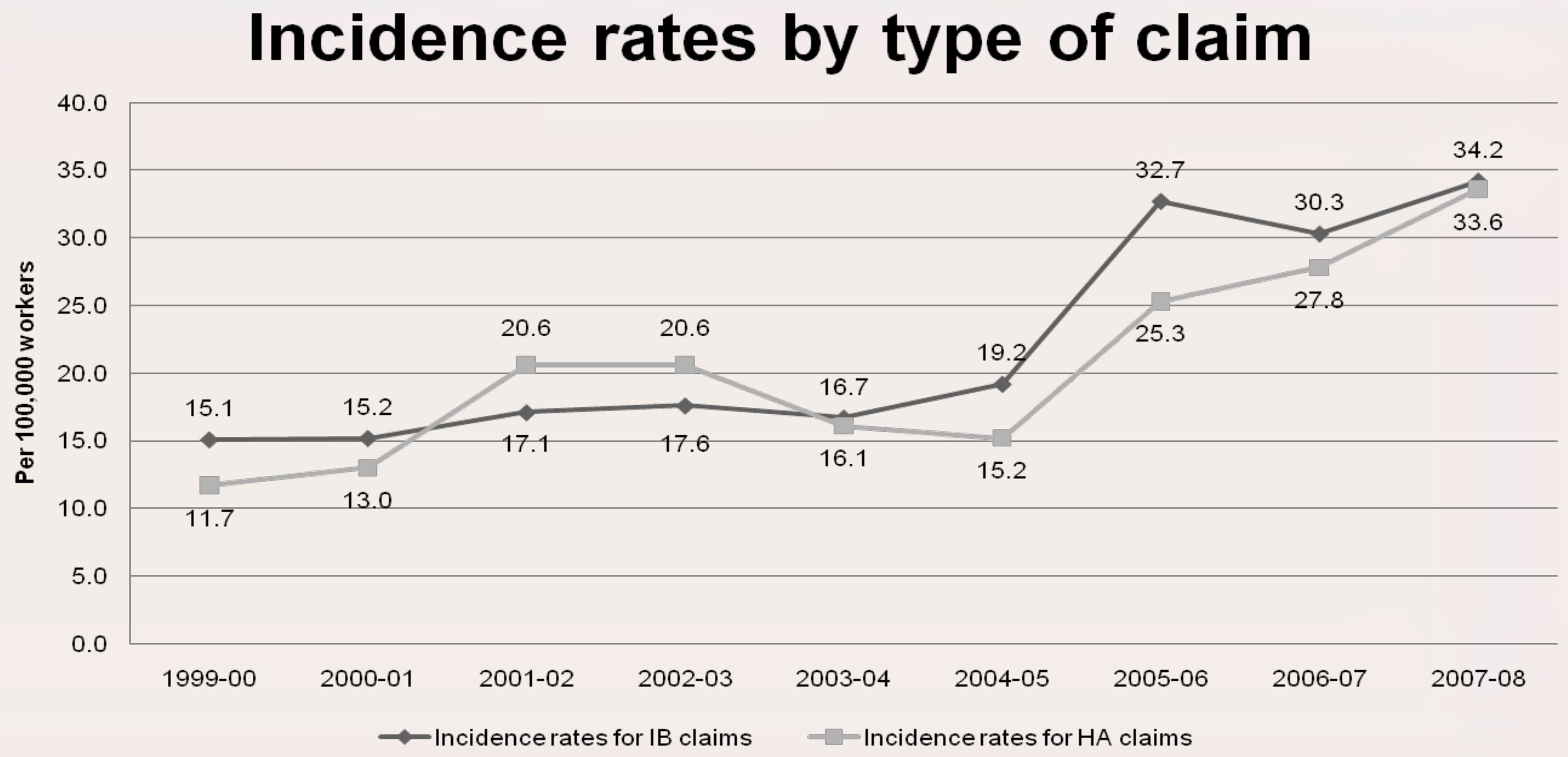
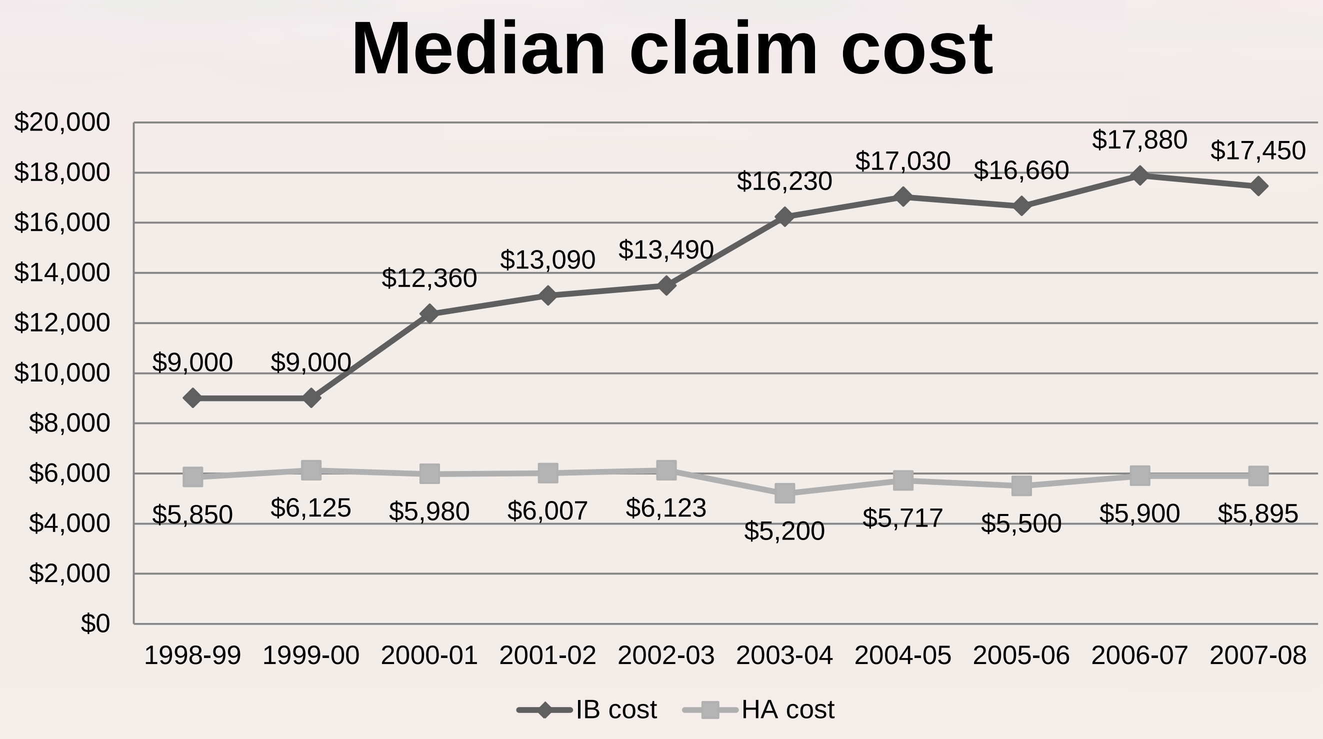
Results



Results 2


Incidence rates by type of claim
Per 100,000 workers
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
15.1
15.2
17.1
17.6
16.7
19.2
32.7
30.3
34.2
11.7
13.0
20.6
20.6
16.1
15.2
25.3
27.8
33.6
Incidence rates for IB claims
Incidence rates for HA claims

Costs


Median claim cost
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
$9,000
$9,000
$12,360
$13,090
$13,490
$16,230
$17,030
$16,660
$17,880
$17,450
$5,850
$6,125
$5,980
$6,007
$6,123
$5,200
$5,717
$5,500
$5,900
$5,895
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
IB cost
HA cost

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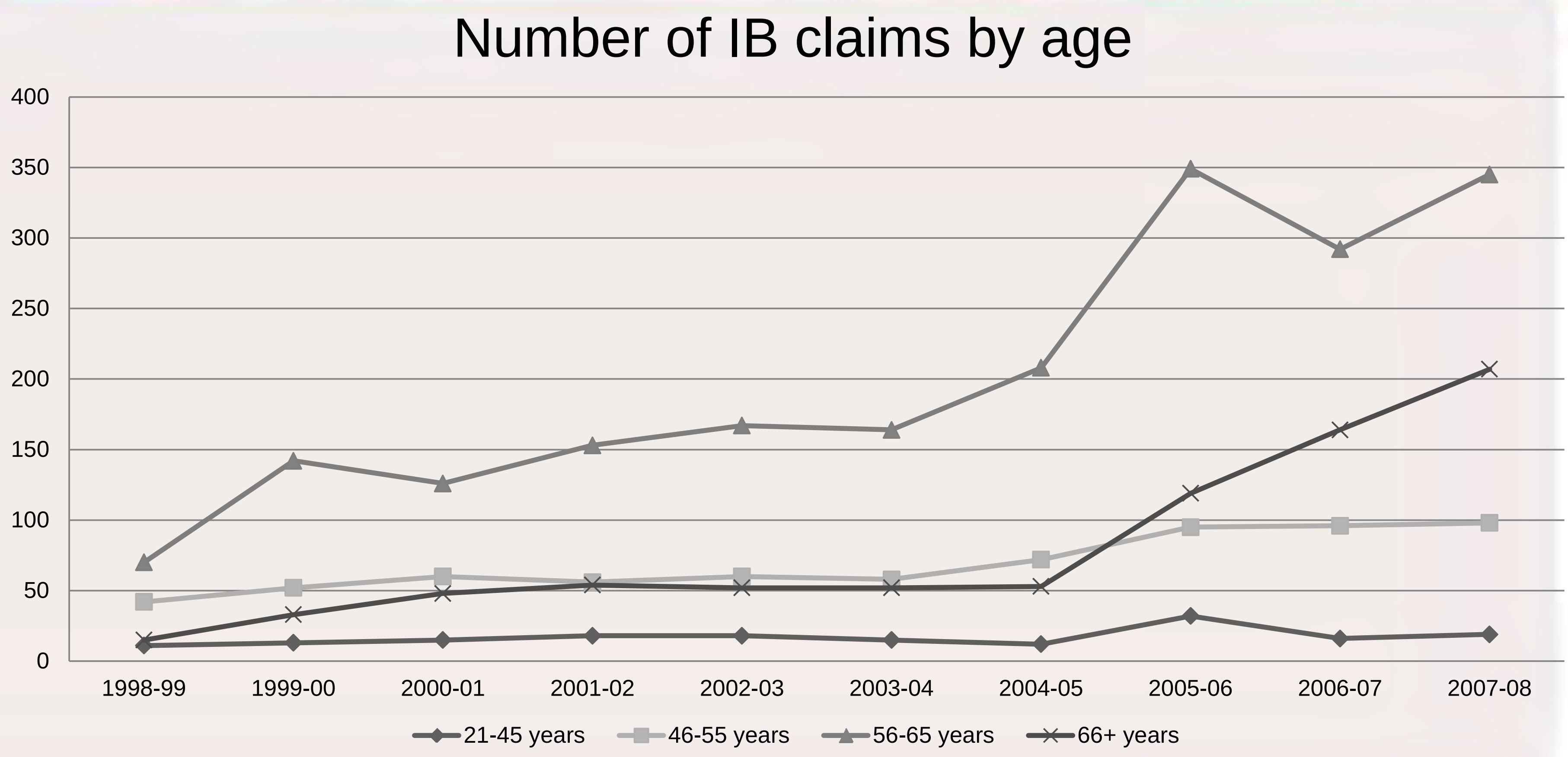
Results 3



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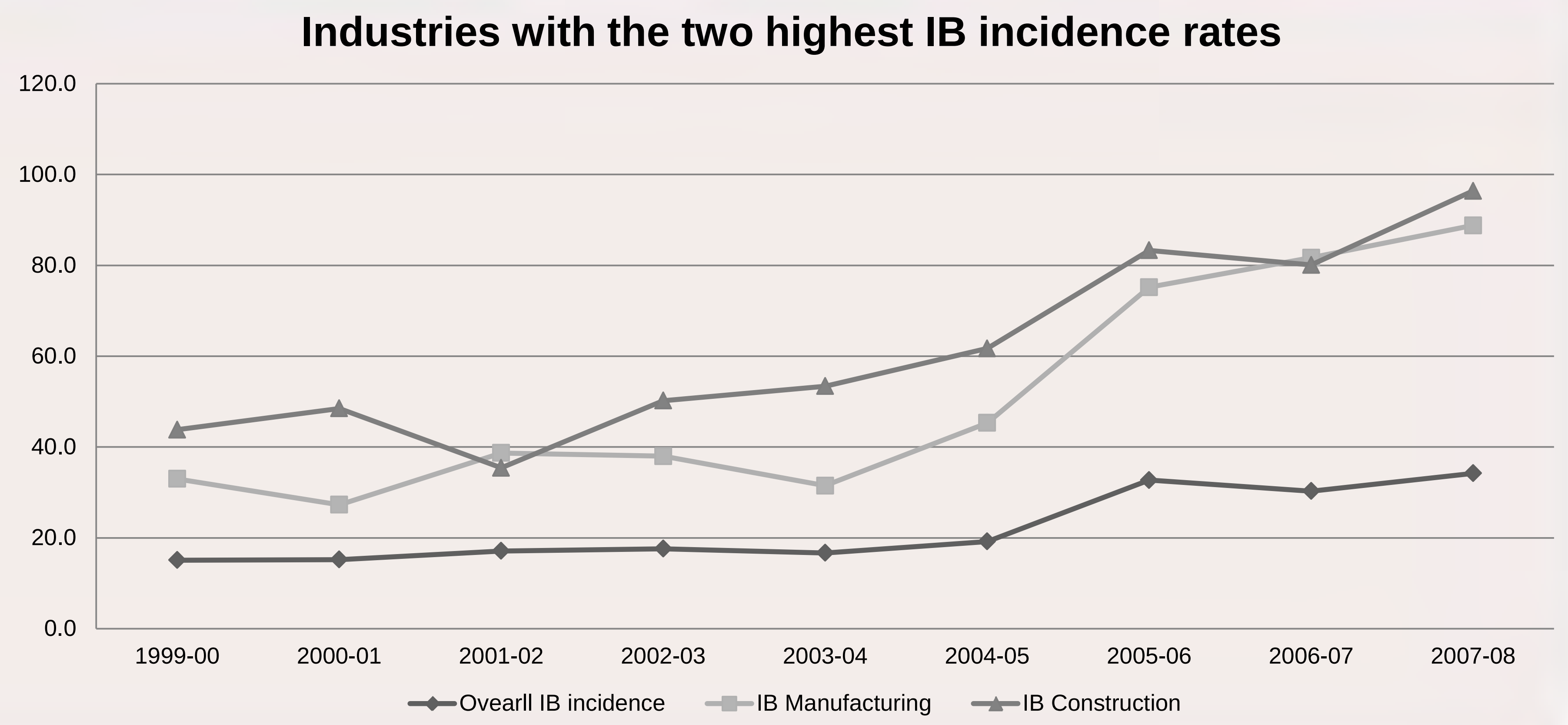
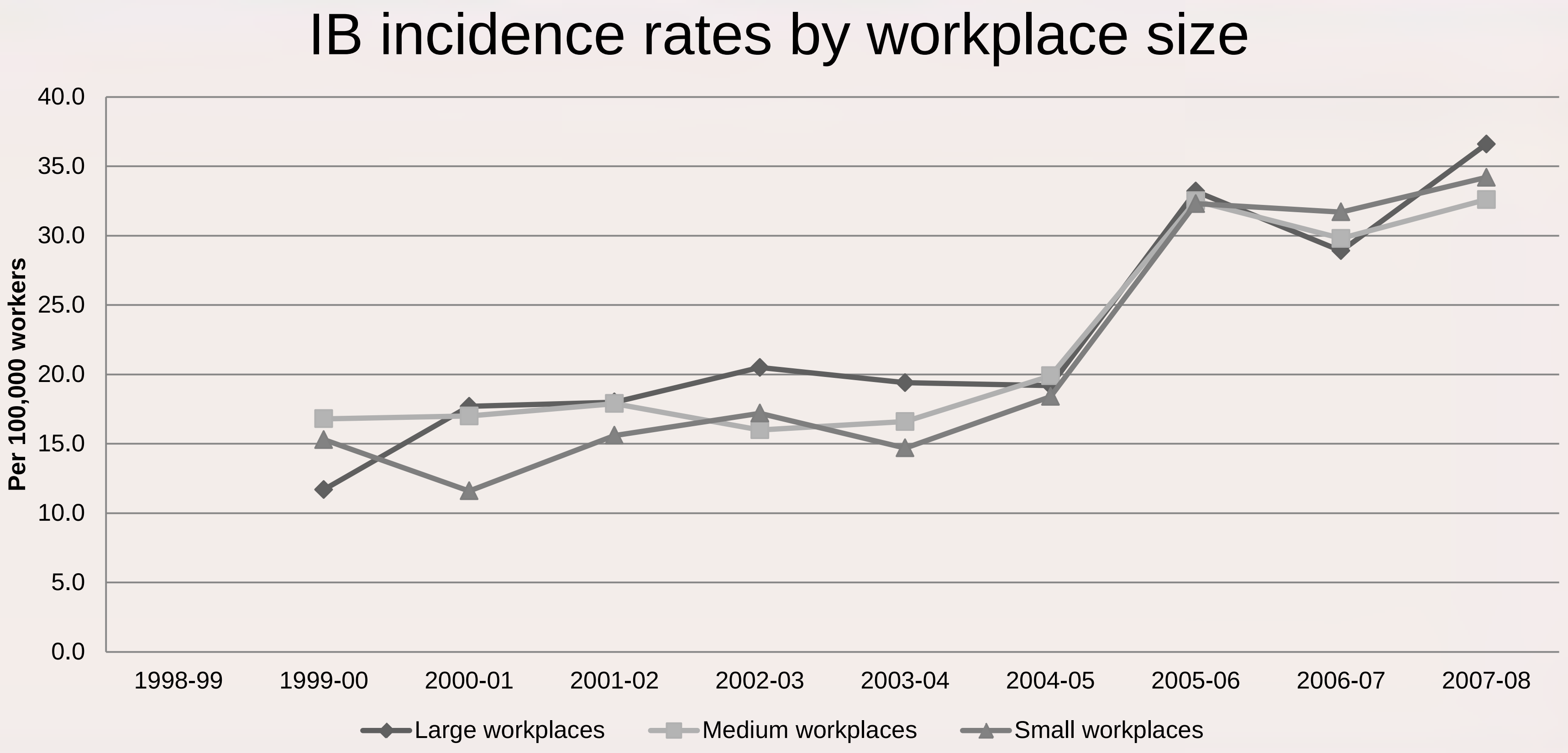
Results



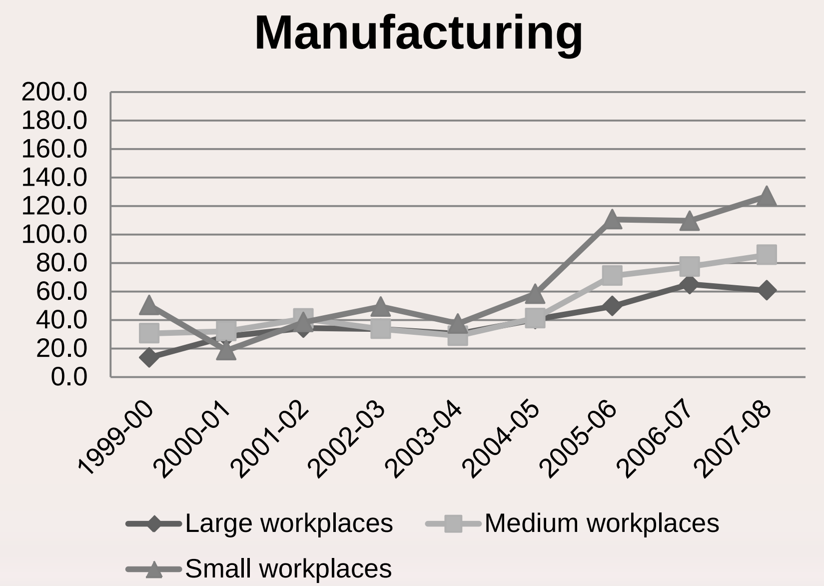
Results

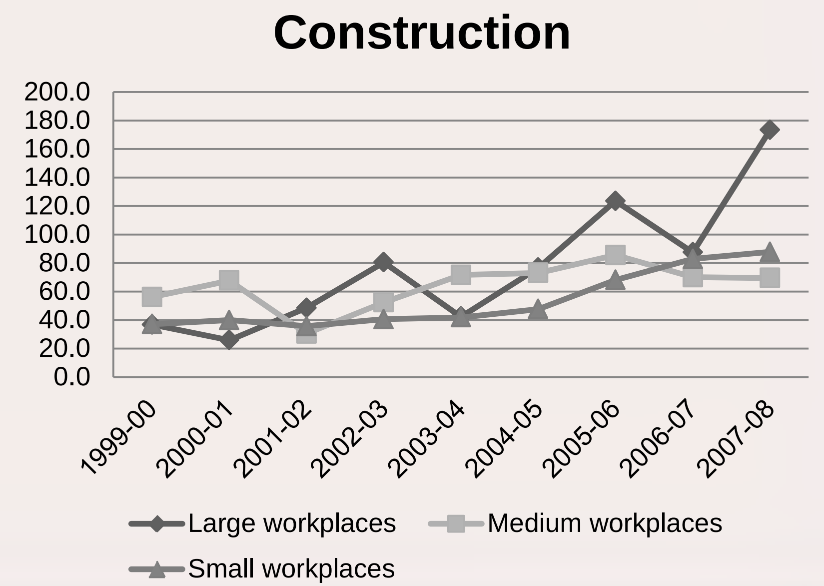

IB incidence rates by workplace size
Per 100,000 workers
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
Large workplaces
Medium workplaces
Small workplaces

Results

Incidence of IB claims by workplace size

- Manufacturing: similar incidence rates at the beginning of the period, higher upward trend in small and medium workplaces from 2003-04 onward
- Construction: increase in small workplaces, steady rates in medium workplaces, upward trend in large workplaces





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Key points

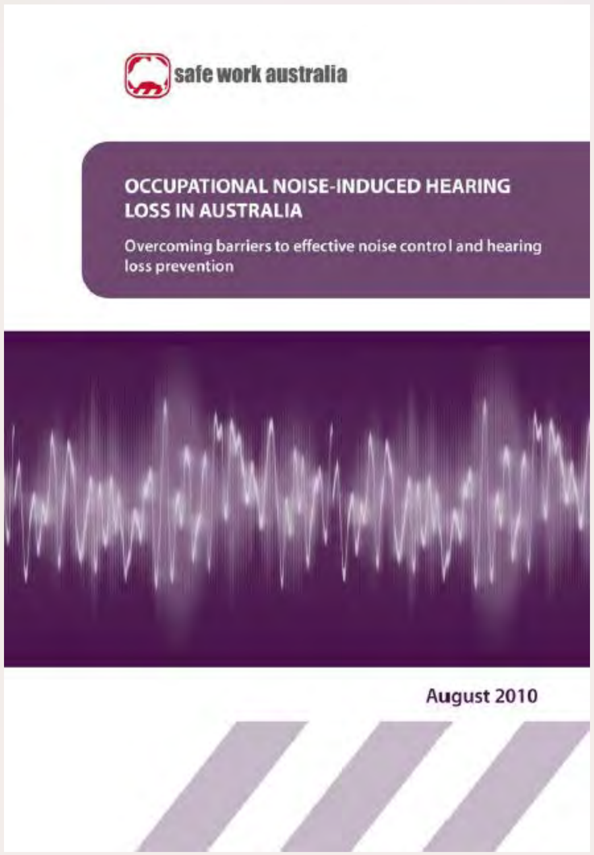
- Despite increase in threshold for accepting NIHL claims, numbers and rates are increasing (particularly over past 5 years)
- Mirrors the situation in several other countries
- Increased awareness to claim? – is so, suggests previous under-reporting, as with most occ diseases
- Increased opportunity and publicity for audiometric testing
- Results suggest noise management programs over past 30 years sub-optimal
- NIHL long latency period - results reflect noise exposure since 1970s/80s
- Need for greater effort in noise conservation programs – younger workers

Monash Centre for Occupational and Environmental Health

Cochrane review

- Recent Cochrane systematic review showed a lack of good evidence for effectiveness of interventions to prevent occupational NIHL (Verbeek *et al*, 2009)
  - There is low quality evidence that legislation can reduce noise levels in workplaces.
  - The effectiveness of hearing protection devices depends on their proper use.
  - There is contradictory evidence that HLPPs are effective in the long-term.
- David Michaels OSHA in 2010 acknowledged ineffectiveness of noise control programs, proposed changes withdrawn 2012

Barriers to effective noise control programs



Focus groups workers/employers:

- an over-reliance on personal hearing protectors
- infrequent and improper use of personal hearing protectors,
- lack of prominence of noise as a serious work health and safety issue
- insufficient knowledge of the effects of loud noise on hearing and hearing loss on quality of life
- belief that noise control costs too much
- belief that hearing loss is inevitable
- work cultures that are resistant to change
- small or medium-sized businesses

Occup Environ Med 2001;58:68-72

HEALTH EFFECTS OF SHIFT WORK AND EXTENDED HOURS OF WORK

J M Harrington

INTRODUCTION

"Normal" hours of work are generally taken to mean a working day with hours left for recreation and rest. Rest is a night time activity, work a daytime activity. This review is concerned with those who work other schedules either on shifts or with extended hours which transcend the day-night work-sleep pattern.

HEALTH EFFECTS

Box 2: Summary of health effects of shift work

- Reduction in quality and quantity of sleep
- Widespread complaints of "fatigue"
- Anxiety, depression, and increased neuroticism
- Increasing evidence of adverse cardiovascular effects
- Possible increase in gastrointestinal disorders
- Increased risk of spontaneous abortion, low birth weight, and prematurity

Shift/night work and cancer

- IARC Group 2A carcinogen 2007 Monograph

 (Straif et al, Lancet Oncology 2007)

- “sufficient evidence in experimental animals for the carcinogenicity of light during the daily dark period (biological night)”

 “limited evidence in humans for the carcinogenicity of shift-work that involves nightwork”

- Melatonin suppression implicated
- In Australia 16% of workers do night work

(Aust Bureau Stats)

- Important implications for design of work patterns
- Cancer ‘more important’ than older outcomes

smh.com.au
The Sydney Morning Herald

Cancer risk prompts call for review of shift work

Kate Benson Medical Reporter
January 8, 2008

ONE of Australia's biggest unions has called for a review of working hours after a United Nations report found people who work night shifts have a higher risk of contracting cancer.

Better shift work metrics

Review

Considerations of circadian impact for defining 'shift work' in cancer studies: IARC Working Group Report

Richard G Stevens,[1] Johnni Hansen,[2] Giovanni Costa,[3] Erhard Haus,[4] Timo Kauppinen,[5] Kristan J Aronson,[6] Gemma Castaño-Vinyals,[7] Scott Davis,[8] Monique H W Frings-Dresen,[9] Lin Fritschi,[10] Manolis Kogevinas,[11] Kazutaka Kogi,[12] Jenny-Anne Lie,[13] Arne Lowden,[14] Beata Peplonska,[15] Beate Pesch,[16] Eero Pukkala,[17] Eva Schernhammer,[18] Ruth C Travis,[19] Roel Vermeulen,[20] Tongzhang Zheng,[21] Vincent Cogliano,[22] Kurt Straif[22]

For numbered affiliations see end of article.

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or Kurt Straif, International Agency for Research on Cancer, World Health Organization, Lyon Cedex, France; straif@iarc.fr

Accepted 18 August 2010
Published Online First
20 October 2010

ABSTRACT
Based on the idea that electric light at night might account for a portion of the high and rising risk of breast cancer worldwide, it was predicted long ago that women working a non-day shift would be at higher risk compared with day-working women. This hypothesis has been extended more recently to prostate cancer. On the basis of limited human evidence and sufficient evidence in experimental animals, in 2007 the International Agency for Research on Cancer (IARC) classified 'shift work that involves circadian disruption' as a probable human carcinogen, group 2A. A limitation of the epidemiological studies carried out to date is in the definition of 'shift work.' IARC convened a workshop in

What this paper adds

- The International Agency for Research on Cancer has classified 'shift work that involves circadian disruption' as a 'probable human carcinogen, 2A.'
- 'Limited' human evidence was based on a series of epidemiological studies using crude definitions of 'shift work' that are difficult to compare.
- This paper provides a consensus report on what aspects of shift work should be captured in future epidemiological studies.
- The policy implications of an increased risk of

Occupational diseases in China

- 80% are pneumoconioses
- 5% acute and chronic poisonings
- 5% are 'other'
- Very few occupational cancers identified
- Little recognition of occupational dermatitis, NIHL, asthma, MSDs...........
- Have established occupational disease standards
- Large, extensive network of occ medicine clinics
- Recognition of occ diseases and targeting prevention programs remain major challenges

Rapid Industrialisation in Asia

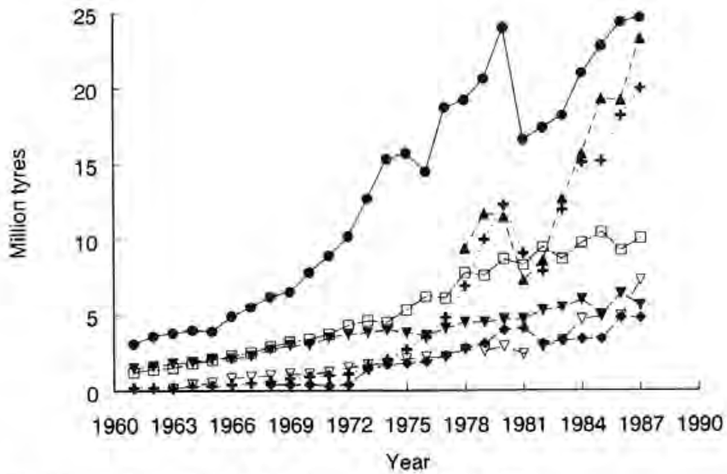
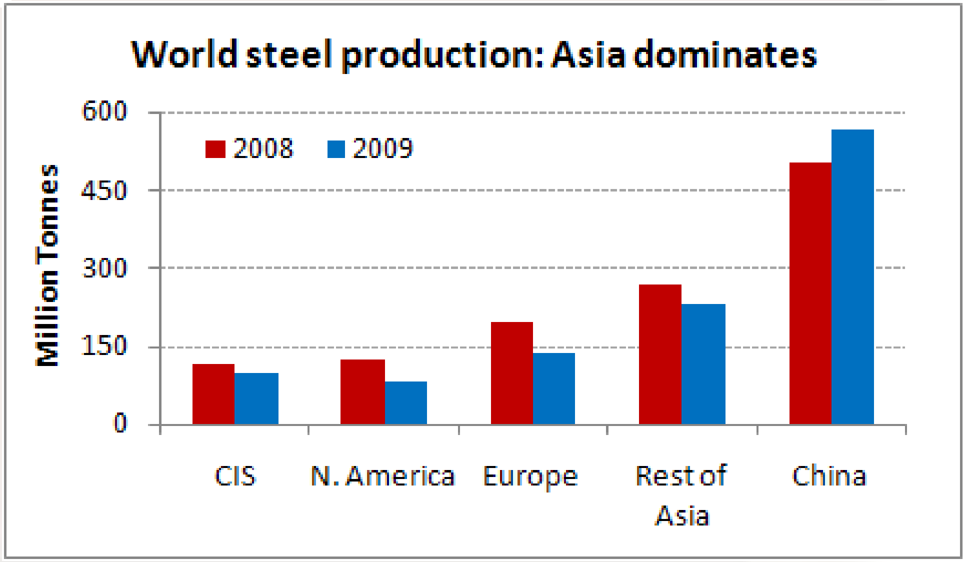


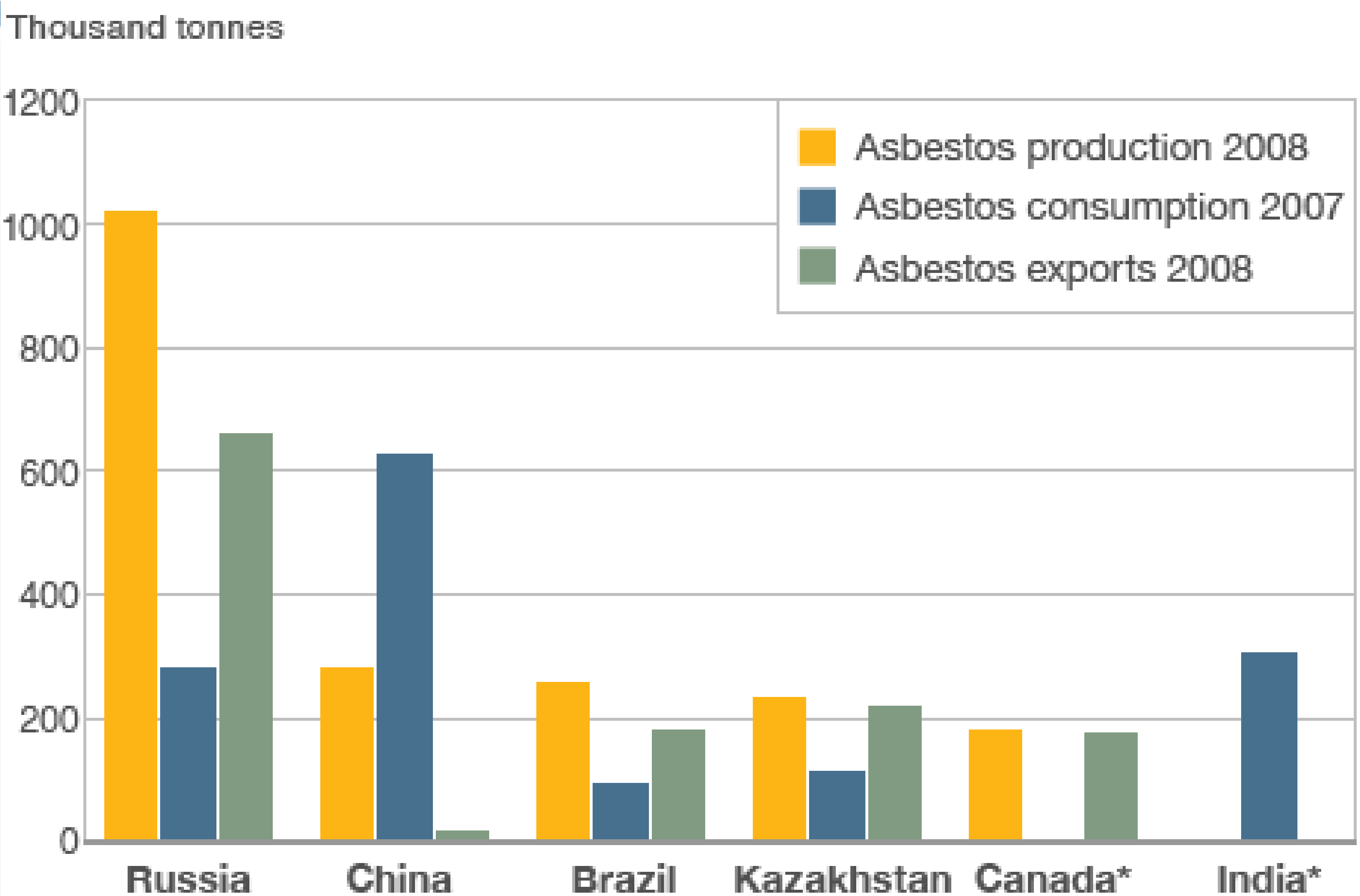
Figure 2. Tyre production in selected countries, 1961–87

From: United Nations (1971, 1987)

●, Brazil; ▲, China; ▼, India; +, Republic of Korea; □, Mexico; ▽, Turkey



Asbestos production, consumption and export



* Some data not available

Source: ICIJ

and Environmental Health

Table 1. Recent trend in mortality from pleural mesothelioma[a] in men.

Country (code)	Period MR[b] (no.[c]) (deaths/million/year)	APC[d] [%/year (95% CI)]	Trend[e]	Male population[f] (million)
Asia				
Israel (ISR)	5.5 (5)	6.6 (–14.9 to 33.4)	↔	3.1
Japan (JPN)	4.8 (9)	3.9 (2.6 to 5.2)	↑**	61.4
Eastern Europe and Southern Europe				
Croatia (HRV)	8.8 (9)	11.0 (2.7 to 20.0)	↑**	2.2
Czech Republic (CZE)	3.2 (9)	6.3 (–1.7 to 15.0)	↔	5.0
Hungary (HUN)	2.5 (8)	11.0 (3.3 to 19.3)	↑**	4.9
Poland (POL)	2.0 (6)	5.2 (–5.2 to 16.7)	↔	18.7
Romania (ROU)	1.9 (6)	1.2 (–11.2 to 15.3)	↔	10.9
Spain (ESP)	5.7 (6)	0.7 (–6.6 to 8.7)	↔	19.8
Northern Europe and Western Europe				
Austria (AUT)	7.8 (4)	–5.9 (–20.9 to 12.0)	↔	3.9
Denmark (DNK)	12.9 (6)	4.6 (–6.5 to 16.9)	↔	2.6
Finland (FIN)	12.6 (9)	–0.3 (–3.9 to 3.6)	↔	2.5
France (FRA)	12.7 (4)	–1.0 (–14.7 to 14.9)	↔	28.7
Germany (DEU)	12.0 (7)	3.3 (–0.8 to 7.6)	↑*	40.1
Iceland (ISL)	10.1 (7)	–1.4 (–28.8 to 36.5)	↔	0.1
Lithuania (LTU)	2.0 (5)	12.3 (–34.3 to 92.1)	↔	1.6
Luxembourg (LUX)	12.7 (7)	5.4 (–11.0 to 24.8)	↔	0.2
Netherlands (NLD)	30.0 (9)	0.0 (–1.5 to 1.6)	↔	7.9
Norway (NOR)	12.7 (9)	–2.7 (–7.5 to 2.3)	↔	2.2
Sweden (SWE)	12.8 (6)	3.5 (–2.0 to 9.2)	↔	4.4
United Kingdom (GBR)	31.1 (4)	0.5 (–4.0 to 5.3)	↔	29.1
Americas excluding South America				
Canada (CAN)	10.3 (4)	5.6 (–7.4 to 20.4)	↔	15.1
Cuba (CUB)	0.6 (4)	5.2 (–36.1 to 73.2)	↔	5.6
Mexico (MEX)	2.2 (6)	2.9 (–7.2 to 14.2)	↔	49.4
United States of America (USA)	9.0 (4)	0.8 (–2.4 to 4.1)	↔	135.1
South America				
Argentina (ARG)	2.5 (7)	8.9 (3.3 to 14.7)	↑**	18.6
Brazil (BRA)	0.5 (6)	9.0 (0.1 to 18.7)	↑**	87.3
Chile (CHL)	3.1 (7)	3.3 (–8.1 to 16.2)	↔	7.5
Ecuador (ECU)	0.5 (4)	16.4 (–37.5 to 116.7)	↔	6.3
Uruguay (URY)	2.3 (5)	13.6 (–43.7 to 129.2)	↔	1.6
Oceania				
Australia (AUS)	25.5 (6)	4.6 (–0.6 to 10.1)	↑*	9.5
New Zealand (NZL)	20.5 (4)	10.4 (–10.3 to 35.7)	↔	1.9

[a]See "Materials and Methods" for our definition of mesothelioma. [b]Period MR from 1996 to 2005, age-adjusted to the world population of 2000. [c]Number of years with available data. [d]APC, together with its 95% CI and *p*-values, were calculated with Joinpoint software. [e]Trend: ↑ when APC > 0 ($p < 0.10$); ↓ when APC < 0 ($p < 0.10$); ↔ when $p > 0.10$ for APC. [f]Average of male national population from 1996 to 2005. *Marginally significant ($0.05 < p < 0.10$). **Statistically significant ($p < 0.05$).

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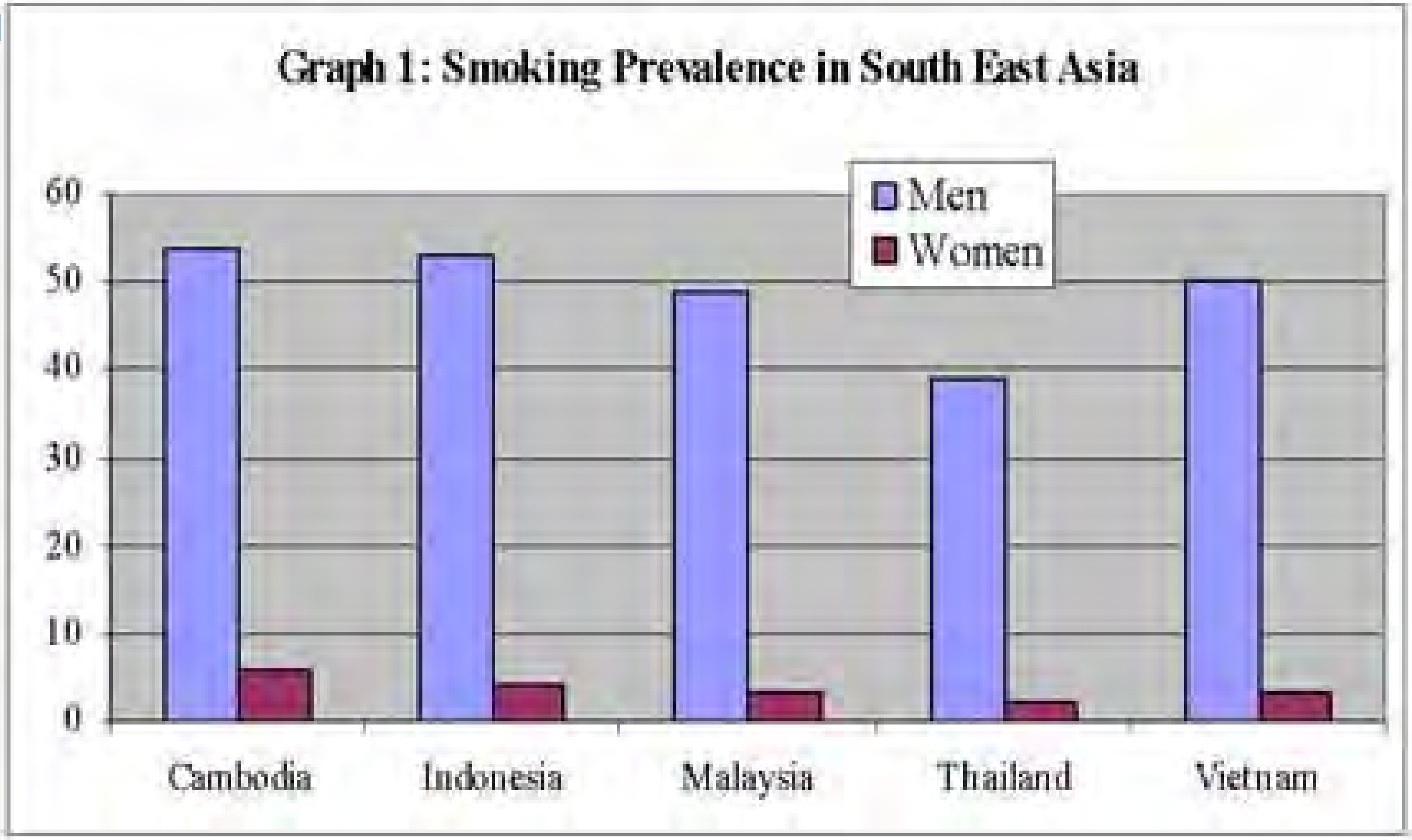
Nishikawa et al. *Recent Mortality from Pleural Mesothelioma, Historical Patterns of Asbestos Use, and Adoption of Bans: A Global Assessment. Environ Health Perspect* 116:1675–1680 (2008)

Lung cancer and asbestos

Multiplicative relationship between occupational asbestos exposure and cigarette smoking



Source: Tobacco Control Country profiles, SEATCA & NIS Tobacco survey, 2004

Asbestos use in asia

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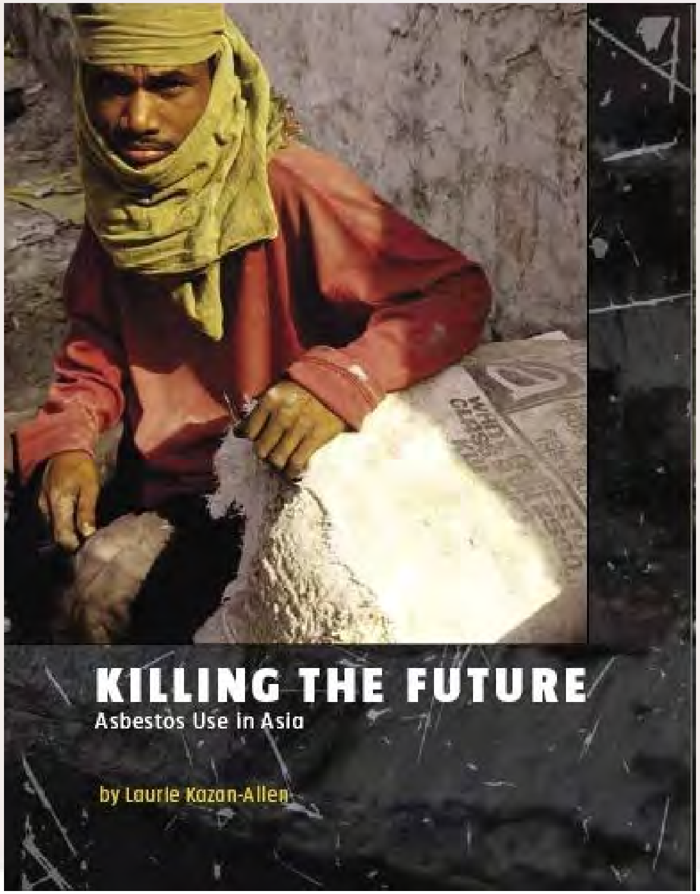

- Asbestos bans in developed countries have lead to increased marketing of asbestos in developing countries, especially china and India
- Highlights misinformation about dangers of chrysotile asbestos
- Highlights lack of exposure data and data on asbestos related disease in these countries
- Advocates for a total worldwide ban on asbestos use

- 2000: EU Ban on asbestos use
- 2003: UN proposal to ban importation of chrysotile asbestos
- Canada and other countries continue to block proposal because of strong asbestos lobby
- Argue that chrysotile asbestos can be used safely in industrialising countries

Table 4. Operation-wise average fiber concentration in processing plants in Rajasthan [27]

S. No.	Operation	Average fiber concentration (f/cc)	8 h exposure concentration (f/cc)	Annual exposure concentration (f/cc)
1	Feeding	2.69	2.37	1.94
2	Bagging	6.42	5.65	4.63
3	Carrying	2.83	2.49	2.04
4	Miscellaneous			
	– Office	0.20	0.18	0.14
	– Rest room	0.75	0.66	0.54
	– Outside plant	0.61	0.54	0.44

Joshi and Gupta. Asbestos in developing countries: magnitude of risk and its practical implications. Int J Occ Med Environ Health 2004; 17:179-85

Occupational exposure limits—at the crossroads

Malcolm R Sim

Setting occupational exposure limits (OELs) for hazards in the workplace has been an integral component of worker health protection programs for many decades. These OELs have been established by many authoritative bodies around the world, such as the Threshold Limit Value Committee (TLV) of the American Conference of Governmental Industrial Hygienists (ACGIH). The traditional approach has been to develop OELs by expert review of the available evidence, and set levels based primarily on health considerations. OELs, such as the TLVs, are usually used to guide occupational health practitioners in the assessment and control of workplace hazards, although some regulatory authorities use OELs as legal standards.

OELs have been criticised for not isation and Restriction of Chemical substances, widely known as REACH.

For many years, recommendations for OELs in Europe have been made by the Scientific Committee on Occupational Exposure Limits.[2] Under REACH, Derived No Effect Levels (DNELs) are required to be developed for those chemicals where use is greater than ten tonnes per year. The setting of DNELs uses a very different approach from that used to set OELs; identifying no effect levels and then applying a series of pre-set adjustment factors. Concern has been expressed that this approach will lead to substantially lower workplace exposure limits than derived using the traditional OEL approach. For example, a recently published calculation for styrene estimated that the DNEL was likely to be at least an order of magni-

use. In the absence of clear direction and leadership regarding OELs, many larger companies in the US now set their own internal values.

What about the situation in newly industrialising countries? In many South American countries, TLVs are generally used, although keeping these up to date is a major challenge. In Brazil, for example, almost all of the 33 regulatory exposure standards are based on the 1976 TLVs. In the Asia Pacific region, it has been shown that there is considerable variability in both the approach to setting OELs and the numerical levels across different countries, often by more than an order of magnitude for carcinogens such as asbestos and silica.[4]

A further factor leading to reduced use of OELs is the increasing application of control banding, which has become popular, especially in the United Kingdom following the introduction of the Control of Substances Hazardous to Health (COSHH) Regulations and Workplace Exposure Limits (WELs), based on maximum exposure levels. Control banding advocates the application of a set of risk reduction measures for identified cate-

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Survey of OELs in the Asia Pacific

Aim of the study

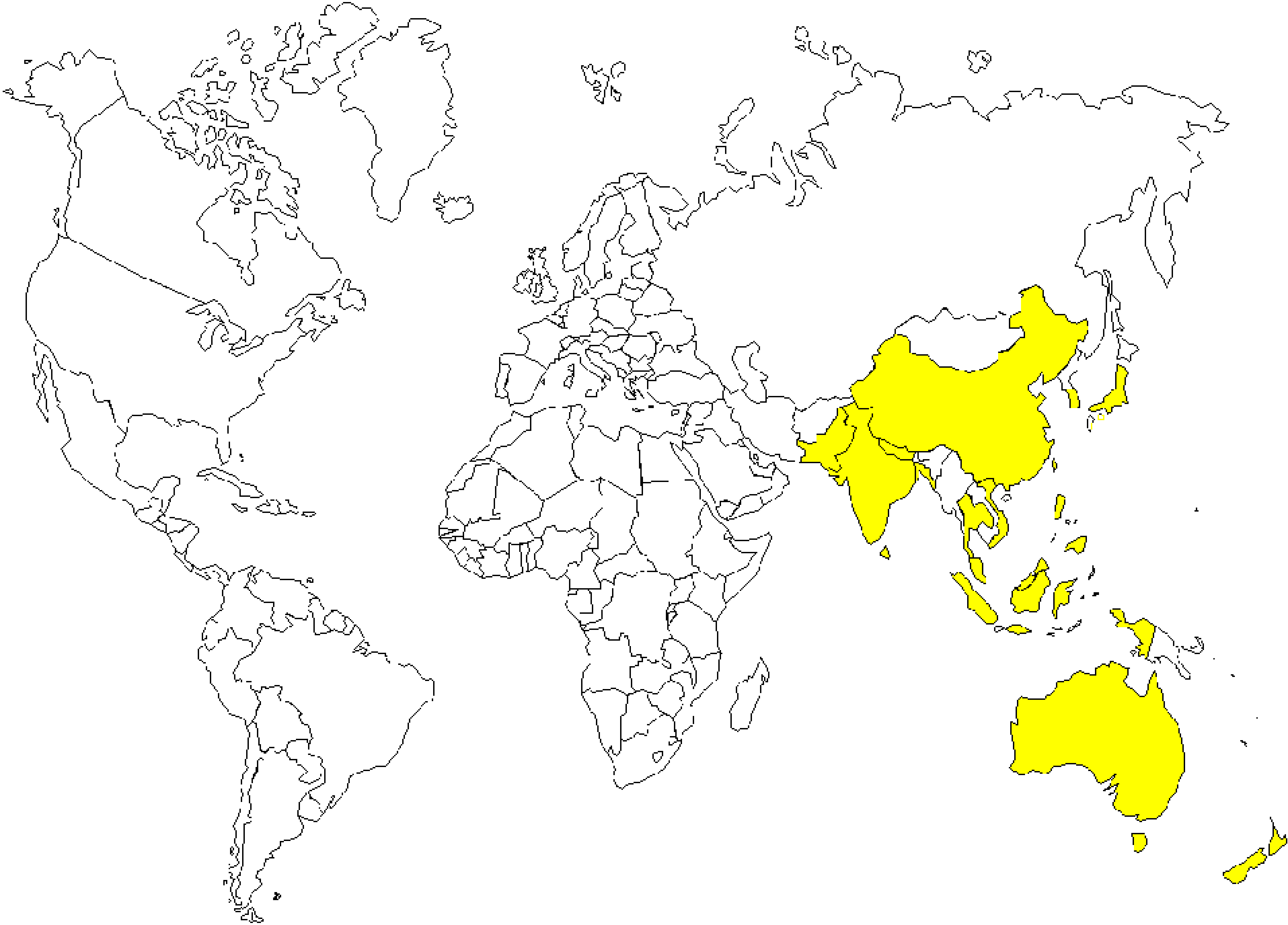
- To study OELs for pesticides, other chemicals and physical agents in countries of the Asia Pacific region

Study design

- Electronic questionnaire sent by email

Study setting

- 24 countries in the Asia Pacific region
- Academic and government occupational health Professionals were contacted



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OELs for chemical carcinogens in the Asia-Pacific

Substance	No (%) of countries with OELs	Median (mg/m^3)	Range (mg/m^3)	ACGIH ref -2010 (mg/m^3)
Chrysotile Asbestos	18 (81.8)	0.325 f/ml	0.1-5 f/ml	0.1 f/cc
Crocidolite Asbestos	16 (72.7)	0.1 f/ml	0.003-5 f/ml	0.1 f/cc
Crystalline silica	16 (72.7)	0.05	0.03 - 10	0.025
Chromium VI (WS)	14 (63.6)	0.05	0.01-0.5	0.05
Arsenic	14 (63.6)	0.01	0.01-0.5	0.01
Nickel - Elemental	14 (63.6)	1.0	0.01- 1.5	1.5
Nickel inorganic (WI)	14 (63.6)	0.5	0.05 - 1	0.2
Carbon tetrachloride	16 (72.7)	5 ppm	0.1-31	5 ppm
Benzene	16 (72.7)	1 ppm	0.5-32	0.5 ppm

Table of Contents

PL-7-05 Ken Takahashi

The Asian Initiative to Stop the Spread of Asbestos-related Diseases in the Region, A Proposal

Ken Takahashi

Department of Environmental Epidemiology, University of Occupational and Environmental Health, Japan

Some successes, especially in South Korea and Thailand, but larger countries remain a challenge

Re-emergence of old workplace hazards - are we doing enough?

EPICOH 2.0.13

IMPROVING THE IMPACT

18 - 21 JUNE 2013 UTRECHT, THE NETHERLANDS

http://www.epicoh2013.org/