

Occupational exposure to wood dust in EU countries



Timo Kauppinen

**Finnish Institute of Occupational Health (FIOH),
Helsinki, Finland**

**Danish NIOH symposium on occupational health
risks: WOOD DUST, Copenhagen, April 15, 2004**

WOODEX - Exposure assessment team and experts

- ⌘ Finland (FIOH): Timo Kauppinen (Helsinki), Tuula Liukkonen, Irma Welling (Lappeenranta)
- ⌘ France (INRS): Raymond Vincent, Michel Grzebyk (Nancy)
- ⌘ National experts: Gerhard Elsigan (Austria), Violaine Verougstraete (Belgium), Vivi Schlünssen (Denmark), Joachim Wolf, Roland Sonntag, Johannes Schulze (Germany), Anastasia Kikemenis (Greece), Roisin McEneaney (Ireland), Dario Mirabelli (Italy), Robert Goerens (Luxembourg), Hans Kromhout (the Netherlands), Sérgio Miguel (Portugal), Maria Angeles de Vicente (Spain), Nils Plato (Sweden), Andrew Phillips, Peter Griffin, Diane Llewellyn, Nigel Black (the United Kingdom)

WOOD-RISK project



- ⌘ **Exposure assessment (WOODEX)**
- ⌘ Exposure and molecular alterations of sino-nasal cancers
- ⌘ Mechanism of pulmonary inflammation related to wood dust
- ⌘ Risk assessment

Aims of exposure assessment

- ⌘ To assess numbers of workers occupationally exposed to inhalable wood dust by **country**, by **industry**, by major **species** of wood, and by the **level** of exposure in the early 2000s
- ⌘ For prevention, surveillance, risk assessment and other purposes

Some specifications

- ⌘ **Country**: 15 EU member states, 10 new MSs (crude estimates only) + total
- ⌘ **Industry**: 'wood industries' 201, 202, 203, 204, 205, 361; 'non-wood industries' 02, 45, 351, all others + total
- ⌘ **Major species**: pine, spruce, other coniferous, oak, beech, birch, other deciduous, wooden boards
- ⌘ **Level**: <0.5, 0.5-1, 1-2, 2-5, >5 mg/m³

Sources of information

- ⌘ **Statistics on labour force**: EUROSTAT and national sources (EU 15 and NMS 10)
- ⌘ **Company surveys**: species of wood, exposure patterns (GERMANY, FRANCE, SPAIN, FINLAND)
- ⌘ **Country questionnaires**: labour force, species of wood etc (EU 15)
- ⌘ **Exposure measurements**: National registers and surveys (GERMANY, FRANCE, UK, DENMARK, FINLAND), published data
- ⌘ **Expert judgment**: team + national experts

Figure 1. Overview of the exposure assessment method

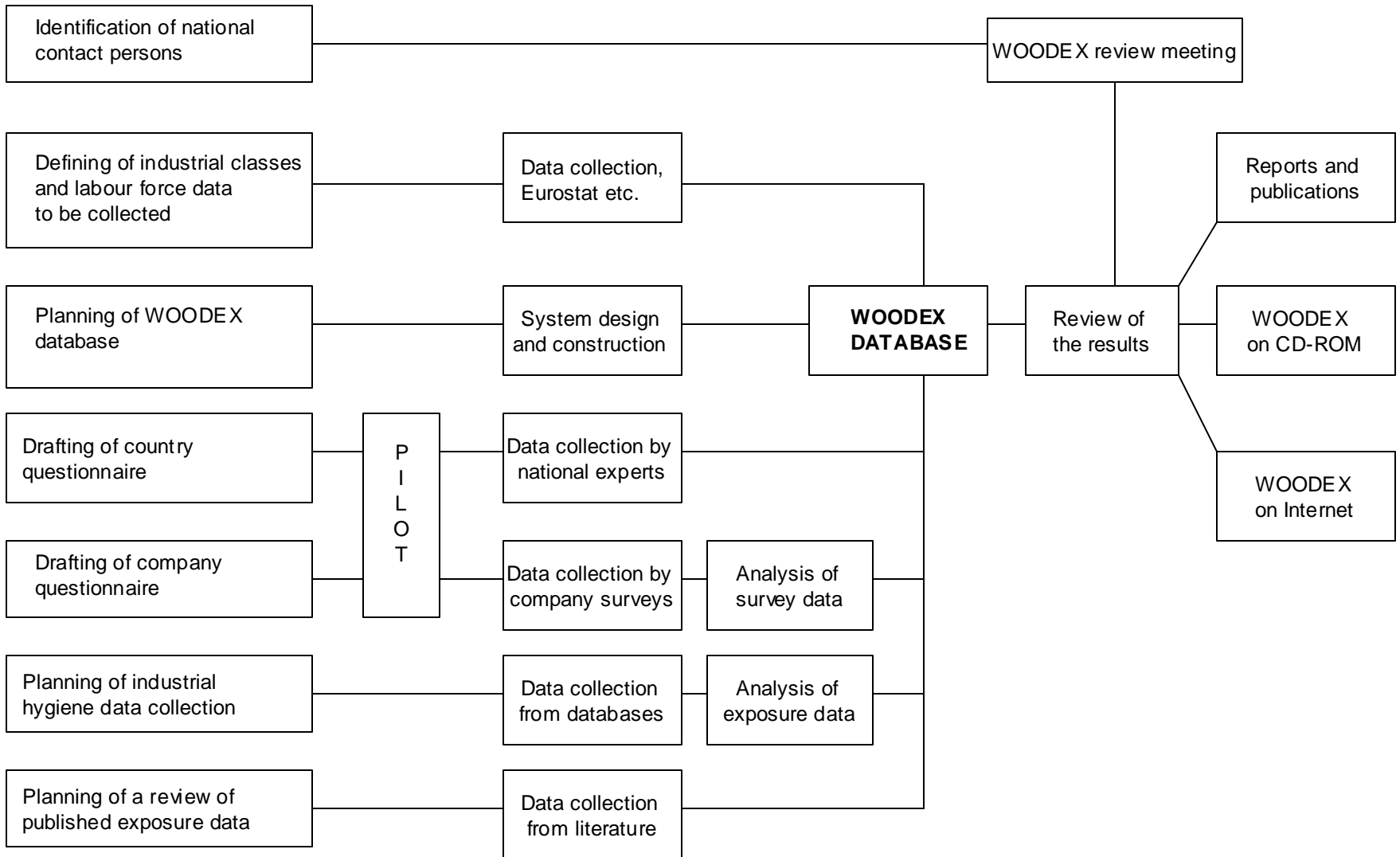
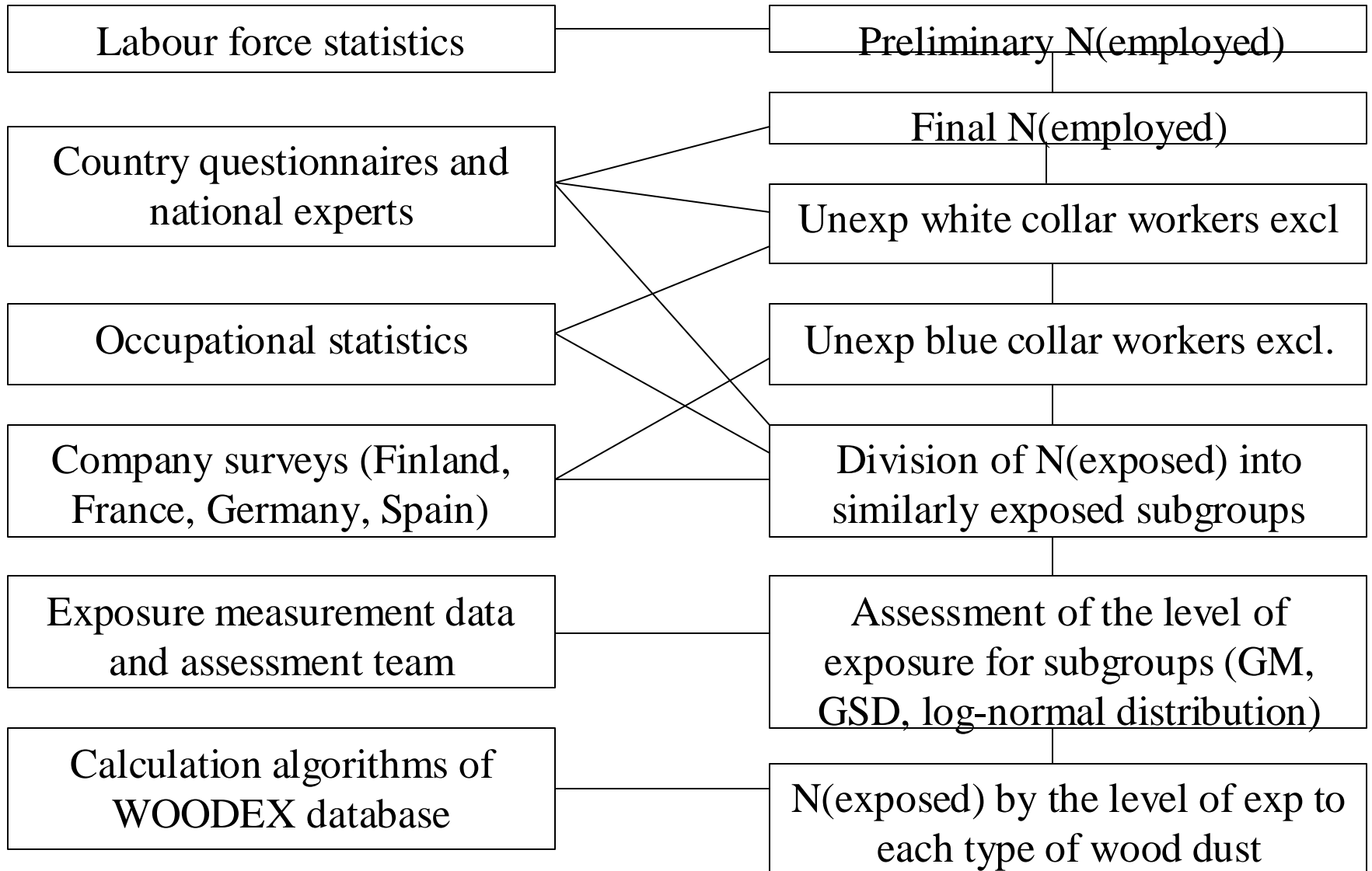


Figure 2. Exposure assessment in the wood industries (NACE Rev1 201-205 and 361)



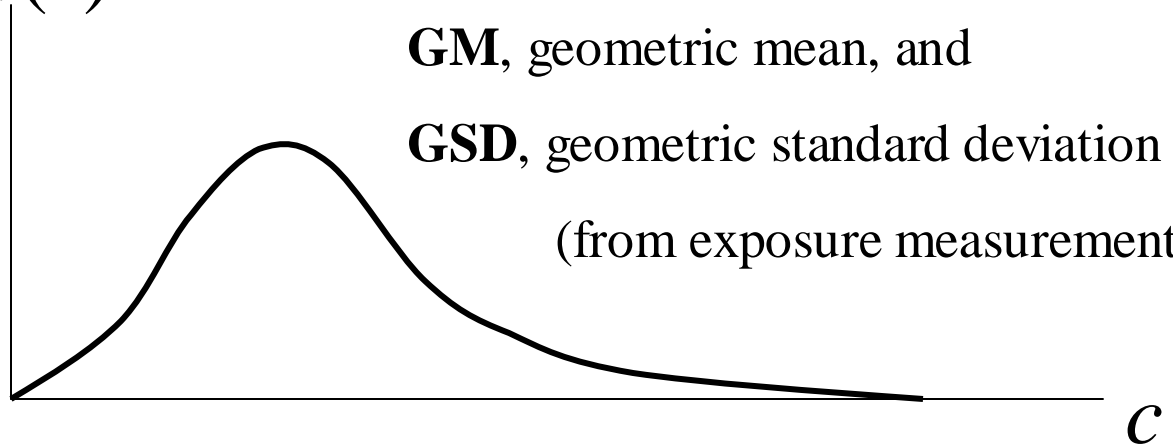
Lognormal Distribution

In WOODEX:

$N(c)$ = N of daily exposures

c = level of exposure, mg/m³

$N(c)$



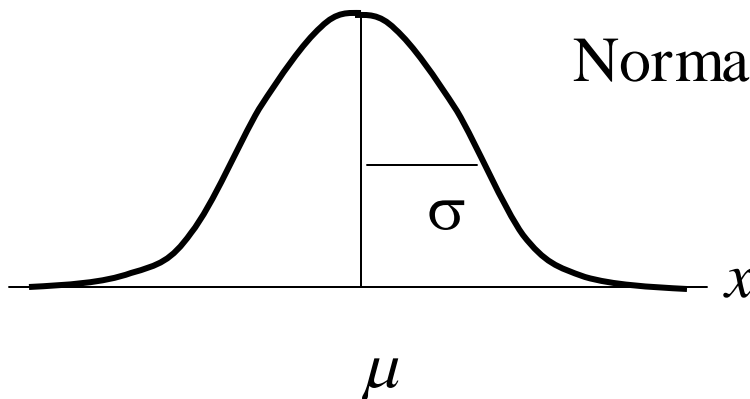
Lognormal distribution specified by

GM, geometric mean, and

GSD, geometric standard deviation

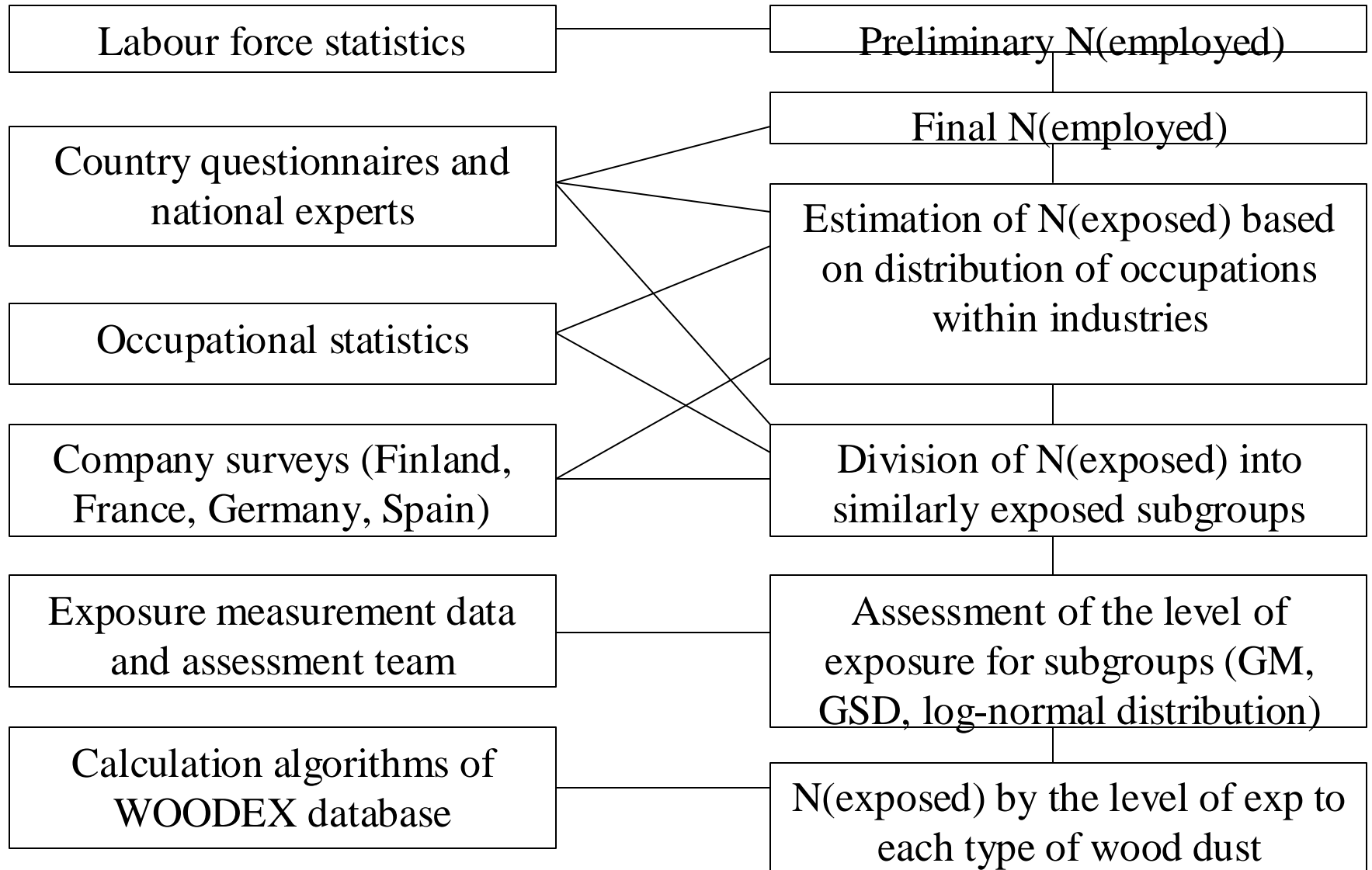
(from exposure measurements)

$$C \sim \text{Lognormal} \Rightarrow X = \ln(C) \sim \text{Normal}$$



Normal distribution

Figure 3. Exposure assessment in the non-wood industries (NACE Rev1 02, 45, 351 and others)



Occupational exposure limit

- ⌘ EU: occupational exposure limit for hardwood dust 5 mg/m³ (inhalable dust)
- ⌘ EU: hardwood dust may cause cancer
- ⌘ EU/SCOEL: 0.5 mg/m³, health-based exposure limit
- ⌘ WOODEX: estimates daily (8-hour time-weighted average) exposure to inhalable wood dust

Preliminary results

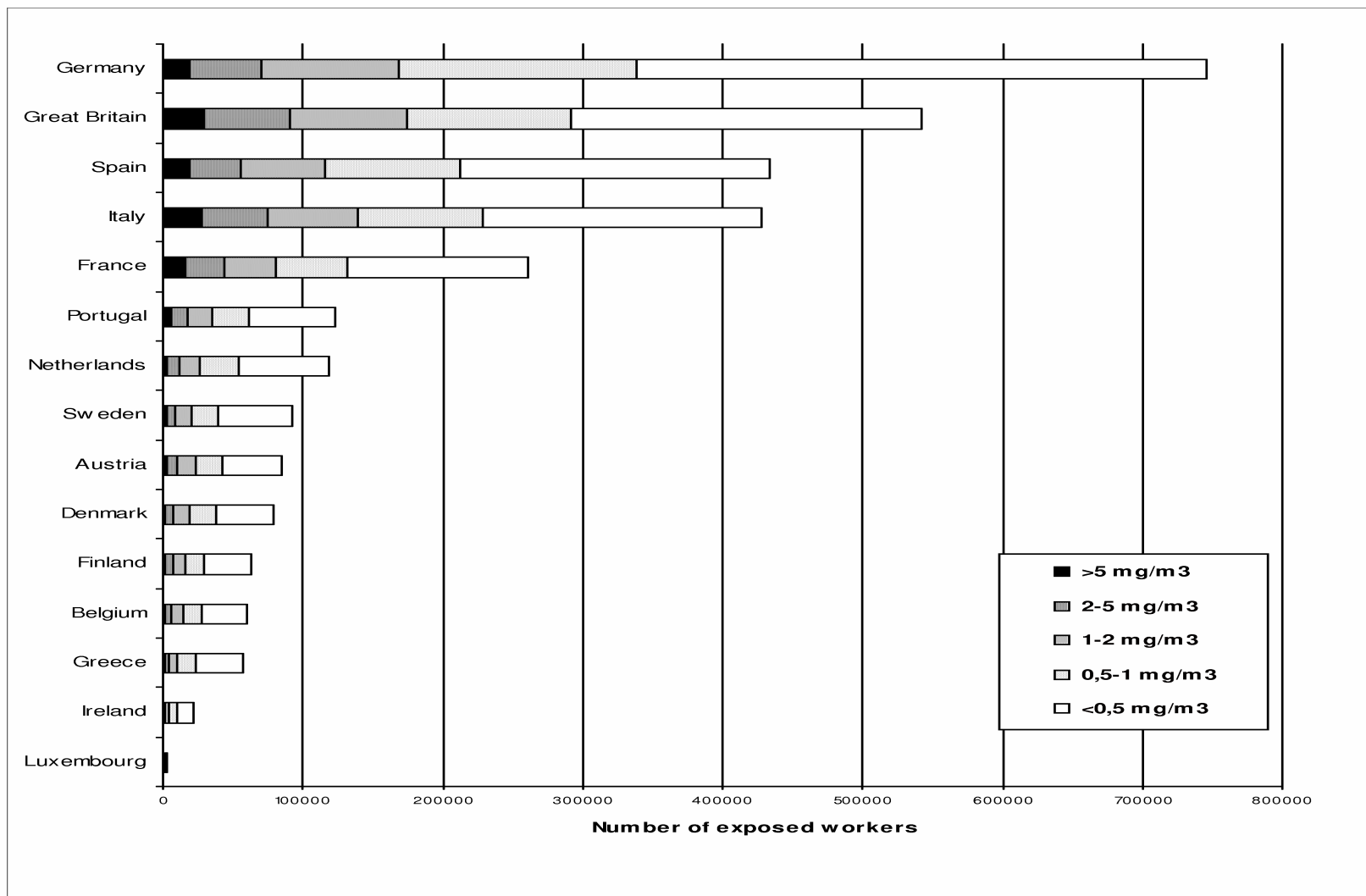
- ⌘ EU 15: About 3 million exposed workers (2% of the employed)
- ⌘ About 1.5 million exposed to low levels (<0.5 mg/m³)
- ⌘ About 0.2 million exposed to high levels (>5 mg/m³), esp in furniture industry
- ⌘ Data on exposure to major species still incomplete; construction woodwork still to be re-assessed; crude data on new member states to be added

Woodex: Level of exposure by country

2.4.2004

European Union 15

WOOD Wood dust

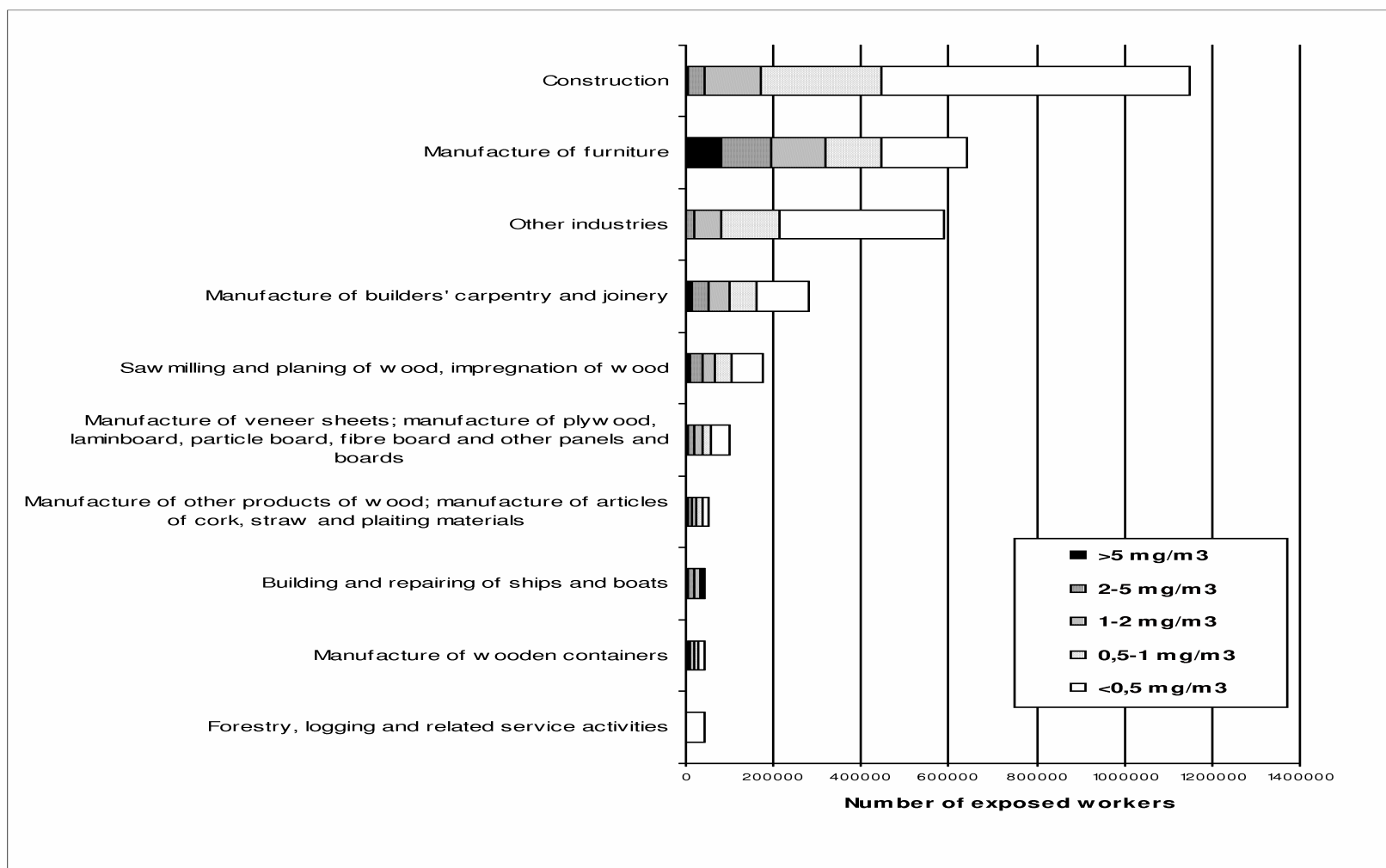


Woodex: Most common industries by level

2.4.2004

European Union 15

WOOD Wood dust

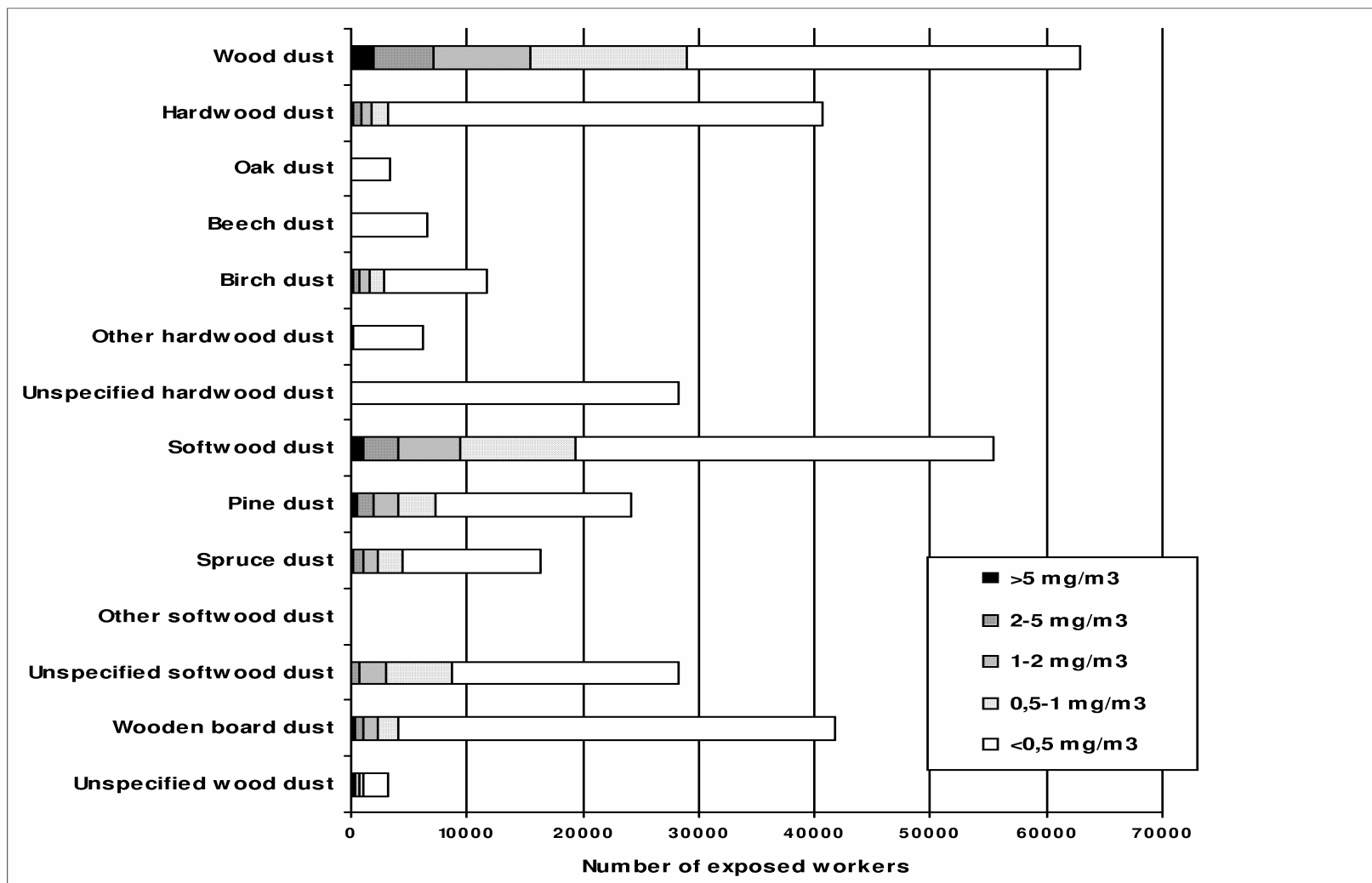


Woodex: Level of exposure by agent

2.4.2004

Finland

The numbers of workers exposed to different species of wood (e.g., oak, beech, birch, pine, spruce) may be underestimates due to lack of data. This is the case especially if a substantial part of workers are exposed to unspecified softwood dust, unspecified hardwood dust or unspecified wood dust. These classes include unknown amounts of workers exposed to specific species of wood.



Reporting of WOODEX in 2004

- ⌘ 1 report on exposure in EU (15+10)
- ⌘ 15 country reports of EU 15 countries
- ⌘ 10 country reports of new member states (EU 10, crude estimates only)
- ⌘ 1 report on country questionnaire surveys (4 EU countries)
- ⌘ 1 report on exposure measurement data
- ⌘ website and CD (FIOH etc)
- ⌘ data be used in WOOD-RISK database