The New Zealand Job-Exposure Matrix (NZJEM)

BROHNZ — Building Research in Occupational Health in New Zealand

Andrea 't Mannetje

**Centre for Public Health Research
Massey University
Wellington, New Zealand**

- a cross-classification of occupations (jobs) and exposures
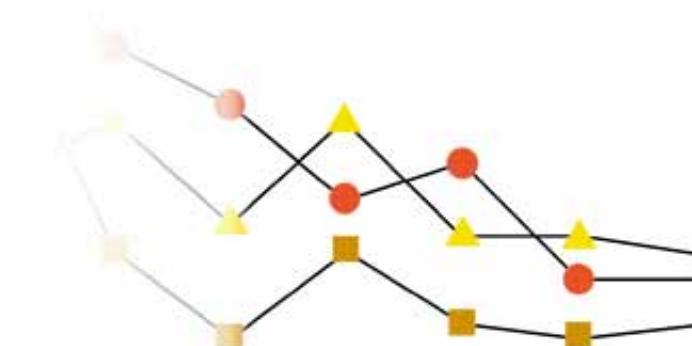
What is a JEM?

	exposure 1	exposure 2	exposure 3	exposure 4	exposure 5
occupation 1					
occupation 2					
occupation 3					
occupation 4					
occupation 5					
occupation 6					
occupation 7					
occupation 8					
occupation 9					
occupation 10					
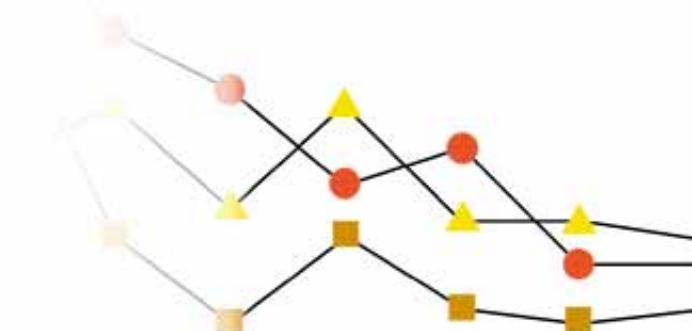
What is a JEM?

	exposure 1	exposure 2	exposure 3	exposure 4	exposure 5
occupation 1					
occupation 2	yes			yes	
occupation 3				yes	
occupation 4				yes	
occupation 5		yes			
occupation 6	yes	yes			yes
occupation 7	yes	yes			yes
occupation 8			yes		
occupation 9			yes		
occupation 10					
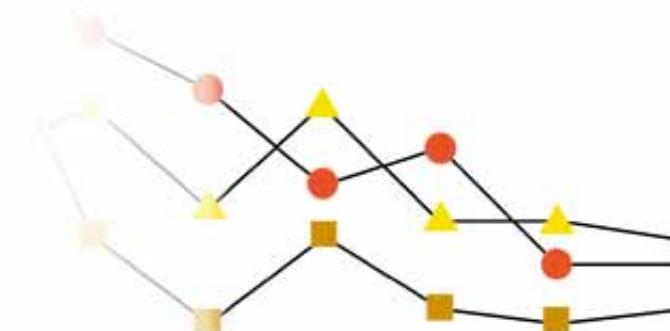
What is a JEM?

	exposure 1	exposure 2	exposure 3	exposure 4	exposure 5
occupation 1					
occupation 2	10%			10%	
occupation 3				10%	
occupation 4				20%	
occupation 5		50%			
occupation 6	75%	50%			80%
occupation 7	75%	50%			50%
occupation 8			15%		
occupation 9			30%		
occupation 10					
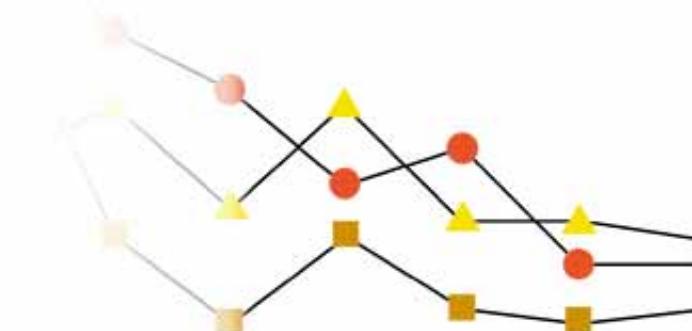
What is a JEM?

	exposure 1	exposure 2	exposure 3	exposure 4	exposure 5
occupation 1					
occupation 2	10%; 1 mg/m3			10%; 10 ppm	
occupation 3				10%; 50 ppm	
occupation 4				20%; 50 ppm	
occupation 5		50%; 100 ppm			
occupation 6	75%; 3 mg/m3	50%; 50 ppm			80%; 1 mg/m3
occupation 7	75%; 3 mg/m3	50%; 50 ppm			50%; 3 mg/m3
occupation 8			15%; 1 mg/m3		
occupation 9			30%; 4 mg/m3		
occupation 10					
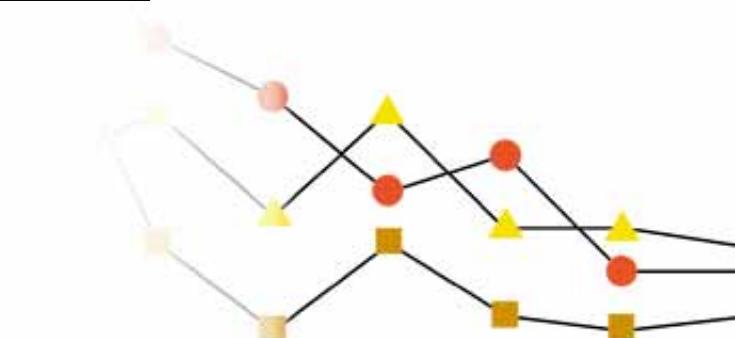
- exposure assessment tool for epidemiological studies, based on the recorded occupation of the study participants
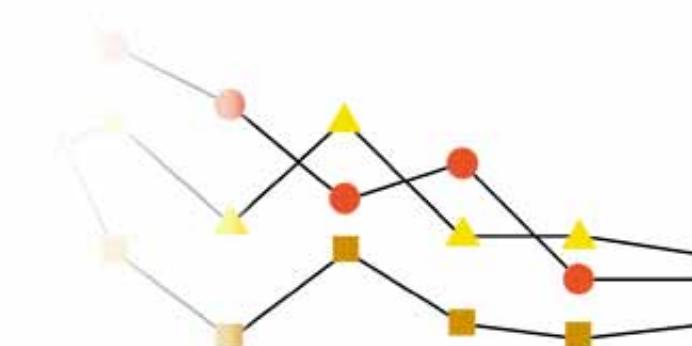
- USA   Hoar *et al*   1980
- UK   Pannett *et al* (MRCJEM)   1985
- Finland   Kauppinen *et al* (FINJEM)   1992
- USA   NIOSH NOES-based JEM   2001
- France   Gueguen *et al* (SUMEX)   2004
- etc.
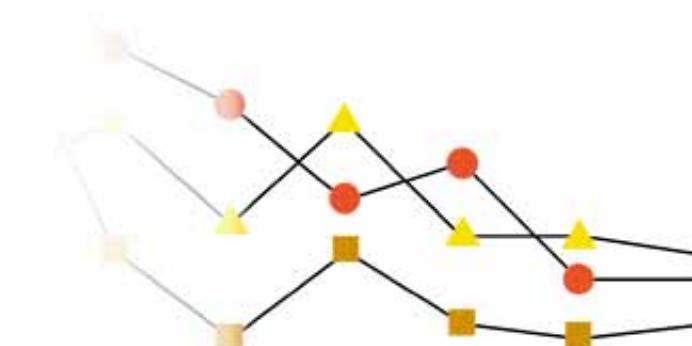
- from exposure assessment tool for epidemiological studies

- to multi-purpose occupational exposure information system

Example of a JEM: FINJEM

|	A	B	C	1960- 1984			1985- 1994		
	Agent		Occupation	proportion exposed	level of exposure		proportion exposed	level of exposure	
3	ANIMAL DUST	024	Veterinarians	100%	0.05	mg/m3	100%	0.05	mg/m3
4	ANIMAL DUST	300	Farmers, silviculturists, horticulturists	74%	0.02	mg/m3	74%	0.01	mg/m3
5	ANIMAL DUST	305	Livestock breeders	100%	0.02	mg/m3	100%	0.01	mg/m3
6	ANIMAL DUST	306	Fur farmers	100%	0.38	mg/m3	100%	0.38	mg/m3
7	ANIMAL DUST	310	Farm workers	62%	0.03	mg/m3	62%	0.01	mg/m3
8	ANIMAL DUST	312	Fur farm workers	100%	0.38	mg/m3	100%	0.38	mg/m3
9	ANIMAL DUST	319	Other occupations in agriculture	63%	0.05	mg/m3	63%	0.03	mg/m3
10	ANIMAL DUST	600	Fibre processors	11%	1.00	mg/m3	10%	1.00	mg/m3
11	ANIMAL DUST	601	Spinning machine operators	5%	1.00	mg/m3	5%	1.00	mg/m3
12	ANIMAL DUST	611	Furriers	100%	0.70	mg/m3	100%	0.70	mg/m3
13	ANIMAL DUST	615	Industrial sewers etc.	4%	0.60	mg/m3	4%	0.60	mg/m3
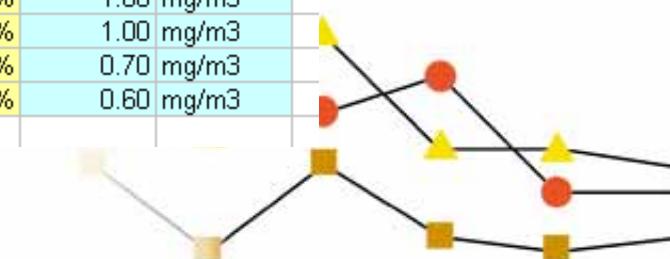
- need for accessible New Zealand-specific occupational exposure data

- to be used as occupational exposure assessment tool for epidemiological studies

- to be used as a comprehensive and accessible database with national occupational exposure information (policy making, risk assessment, hazard surveillance)

► multipurpose information system such as FINJEM
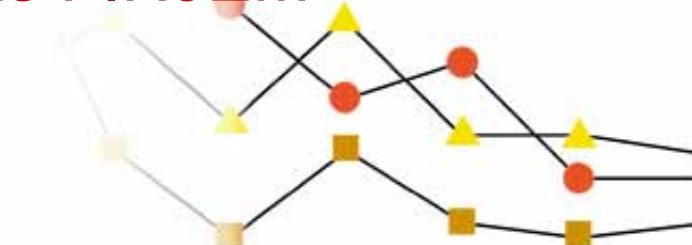
- lack of occupational exposure data available in New Zealand, *because*:

  - New Zealand does not have a strong history of collecting   occupational exposure data, and;

  - there has been no effort to centrally store and conserve occupational exposure data.
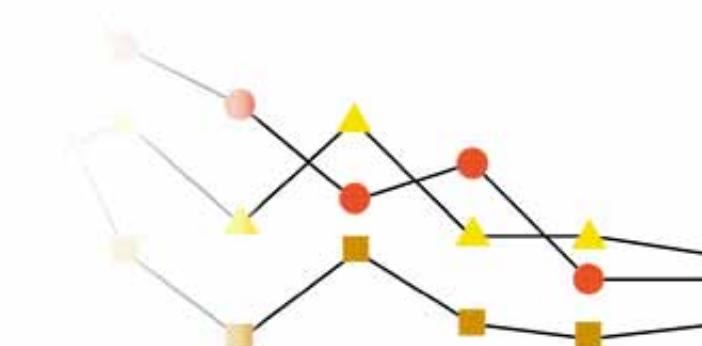
- GPJEMs from overseas

- information from 'the burden study' (occupational exposure survey)

- evaluation NZ expert

NZJEM methods

Existing GPJEMs

↓

Recode occupation to NZ classification

↓

↓

% exposed
level of exposure
changes over time
differences between industries
sources of information

Review by industrial hygienists

↓

Validation based on survey data

↓

NZJEM with easy data look-up and report generating possibilities
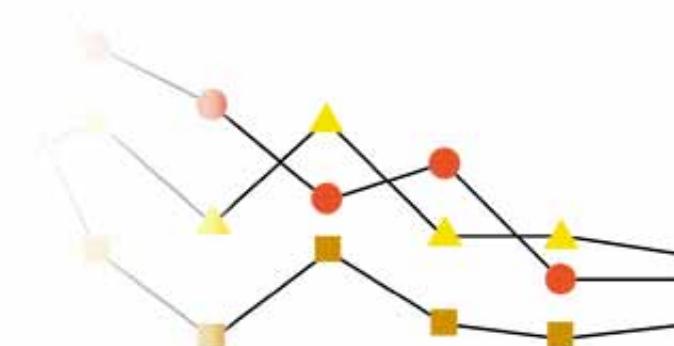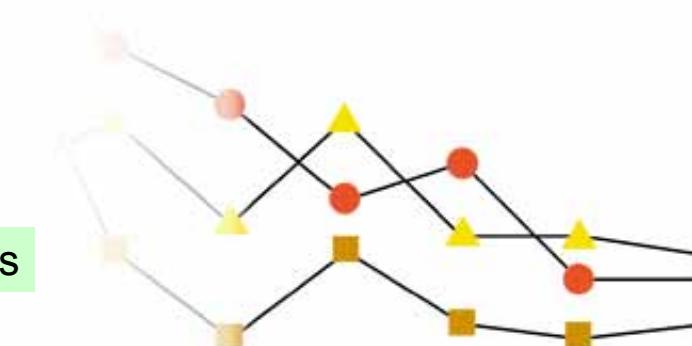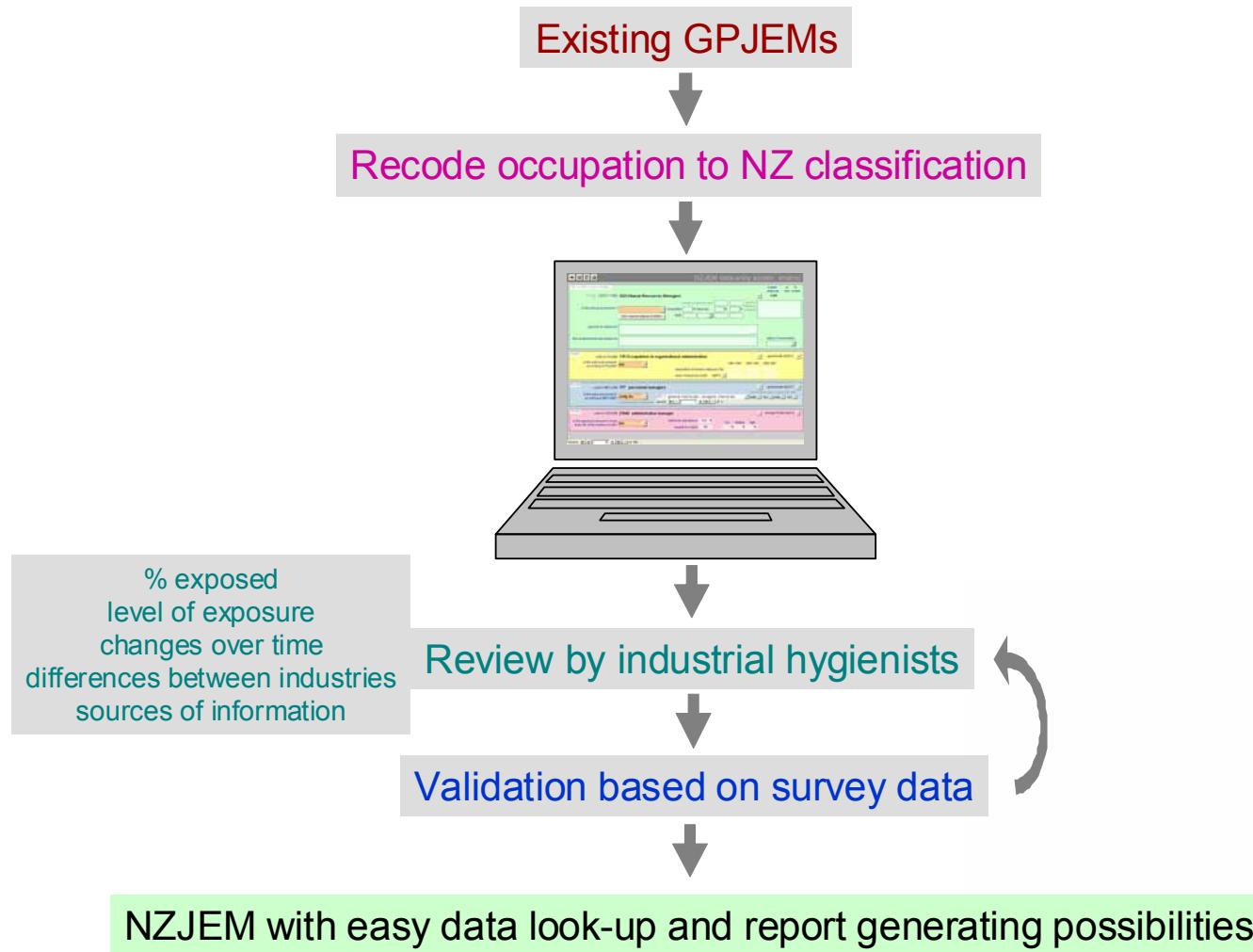
- we used 3 JEMs from overseas:

  - MRCJEM (UK)
  - FINJEM (Finland)
  - CEEJEM (Europe)

BROHNZ — Building Research in Occupational Health in New Zealand

Occupations VIEW: wood dust

683 of 956 records in NZJEM

	number employed	% men	% women
3-digit NZSCO 1999: **742-Cabinet Makers and Related Workers**	4,743	90	10

is the exposure present ?: **yes**

click if exposure depends on industry

change in exposure after: ___ ___

proportion: 91 % exposed ___ % ___ %

cause of change in exposure:

level: 2 mg/m3

sources of exposure: sawing, planing, turning and sanding of wood.

type of wood dust: 2-both soft and hard wood

this assessment was based on: Professional judgement

status of assessment: 0- not finished

FINJEM

code in FINJEM: **676-Cabinetmakers and joiners etc.**

good fit with NZSCO

is the exposure present according to FINJEM?: **yes**

	1960-1984	1985-1994	1995-1997
proportion of workers exposed (%):	100.0	100.0	
level of exposure (unit): mg/m3	1	1	

MRCJEM

code in MRCJEM: **058 cabinet makers**

good fit with NZSCO

exposure before 1950: exposure after 1950:

is the exposure present according to MRCJEM?: **only in:** 472 furniture and upholstery

most high most high

scroll to see list of industries: Record: 1 of 247   No Filter   Search

CEEJEM

code in CEEJEM: **81000 cabinetmakers and related woodworkers**

good fit with NZSCO

is the exposure present in more than 5% of the workers in job?: **yes**

exposure prevalence: 92.0 %

based on n jobs: 200

| low	medium	**high**
27.7 %	54.3 %	17.9 %
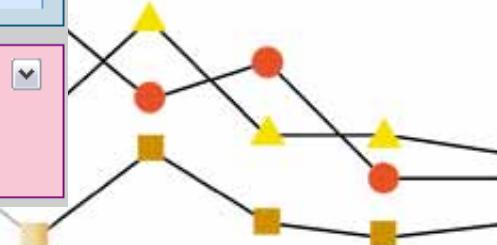
- extract wood dust exposure data from Burden study

- upload this in the ACCESS data-file

- re-evaluation by expert

Building Research
in Occupational Health
in New Zealand
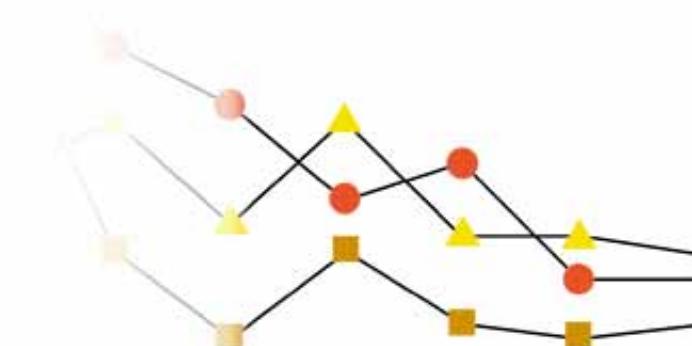
Occupations VIEW: wood dust

604 of 956 records in NZJEM

4-digit NZSCO 1999: **7124-Painters and Paperhangers**

number employed: **13,902** | % men | % women

old NZJEM assessment

is the exposure present ?: **no**

change in exposure after: | | cause of change in exposure:
proportion: % exposed | % | %
level: mg/m3

sources of exposure:

type of wood dust:

this assessment was based on:

status of assessment: 1- finished

---YES--- **48 %** 12 / 25 (n exposed / n total)

Data from BURDEN study

new NZJEM assessment

change NZJEM assessmen?: yes

is the exposure present ?: **yes**
change in exposure after: | | cause of change in exposure:
proportion: 50 % exposed | % | %
level: 0.1 mg/m3

sources of exposure:

type of wood dust:

this assessment was based on: Burden study data

status of assessment: 1- finished

Record: I◄ ◄ 50 of 62 ► ►I ▼ Filtered Search
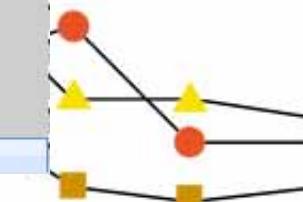
Wood dust exposed occupations in NZJEM

	level (mg/m3)	% exposed
824-Wood Products Machine Operators	0.71	96
742-Cabinet Makers and Related Workers	2	91
711-Building Frame and Related Trades Workers	2	83
814-Wood-Processing and Papermaking Plant Operators	0.5	82
613-Forestry and Related Workers	1	50
712-Building Finishers and Related Trades Workers	? .05	45
713-Electricians	0.05	33
315-Safety and Health Inspectors	0.05	25
915-Labourers	0.4	25
113-Senior Business Administrators	0.05	14
611-Market Farmers and Crop Growers	0.05	13
214-Architects, Engineers and Related Professionals	0.05	10
121-General Managers	0.05	9
612-Market Oriented Animal Producers	0.05	8
122-Specialised Managers	0.05	6
829-Assemblers	0.1	6
833-Agricultural, Earthmoving & Other Materials-Handling Equipment Operators	0.75	5

- total number of wood dust exposed workers: 97,000

- 5.6% of total working population

- males: 9%; females: 2%
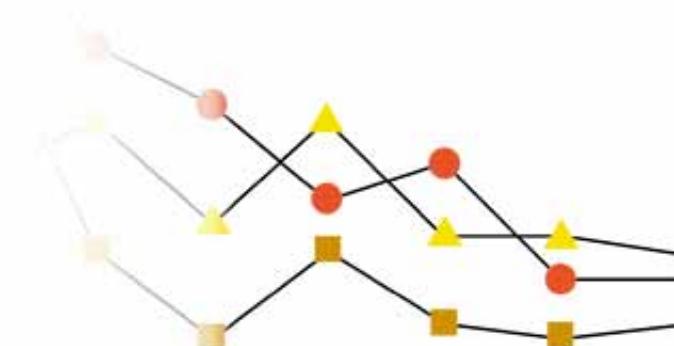
- Add other exposures to NZJEM, including chemical, biological and physical exposures.

- Updating exposure data: if new exposure data become available

- Updating occupational classifications (i.e. if a new occupational classification is introduced, cross-classifications between the old and new versions of NZSCO will be included)

- Updating labour statistics: as new labour statistics become available (reflecting changes in the occupational profile of New Zealand, which may in turn affect the total number of workers exposed)

Acknowledgements

BROHNZ Building Research in Occupational Health in New Zealand