

Occupational exposures to endocrine disrupting chemicals and cancer risk

Vikki Ho, PhD

Associate Professor, University of Montreal

Co-Scientific Director of the CARTaGENE Study



CanPath

Canadian Partnership
for Tomorrow's Health

Partenariat canadien
pour la santé de demain



Endocrine-disrupting chemicals (EDCs)

“alters function(s) of the endocrine system and consequently causes adverse health effects” (IPCS, 2002)

Sources of exposure :

- Food
- Environment
- Personal care products
- Workplace



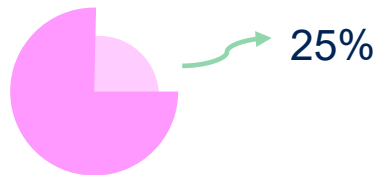
Exposure in some workplaces occurs at much higher levels

Hormone-dependent cancers

- Hormones play essential roles in the development and progression of many cancers

Breast cancer

Most common cancer in women :

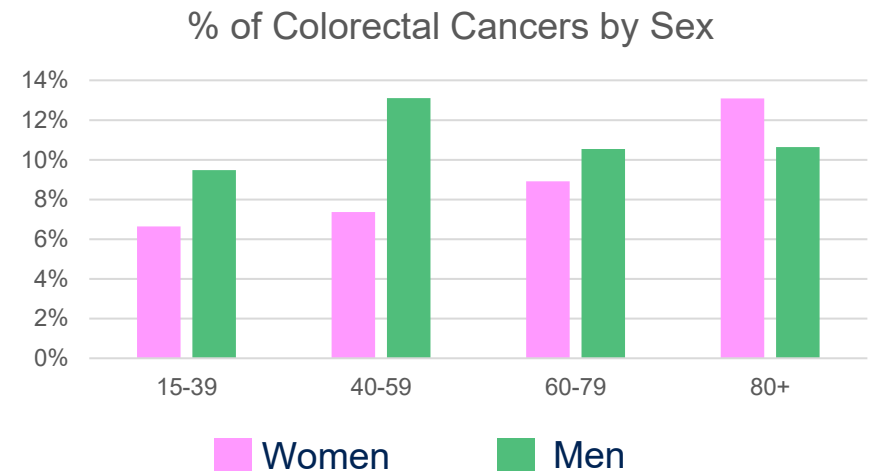


Prostate cancer

Most common cancer in men :

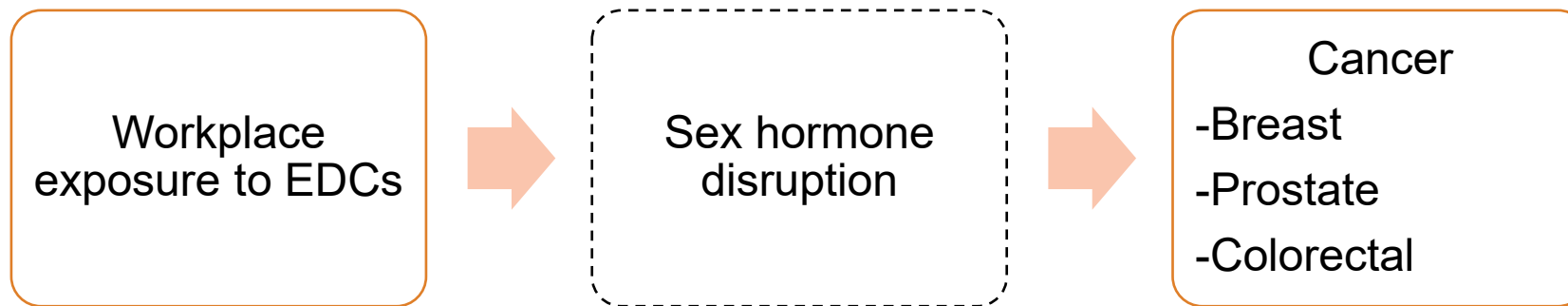


Colorectal cancer



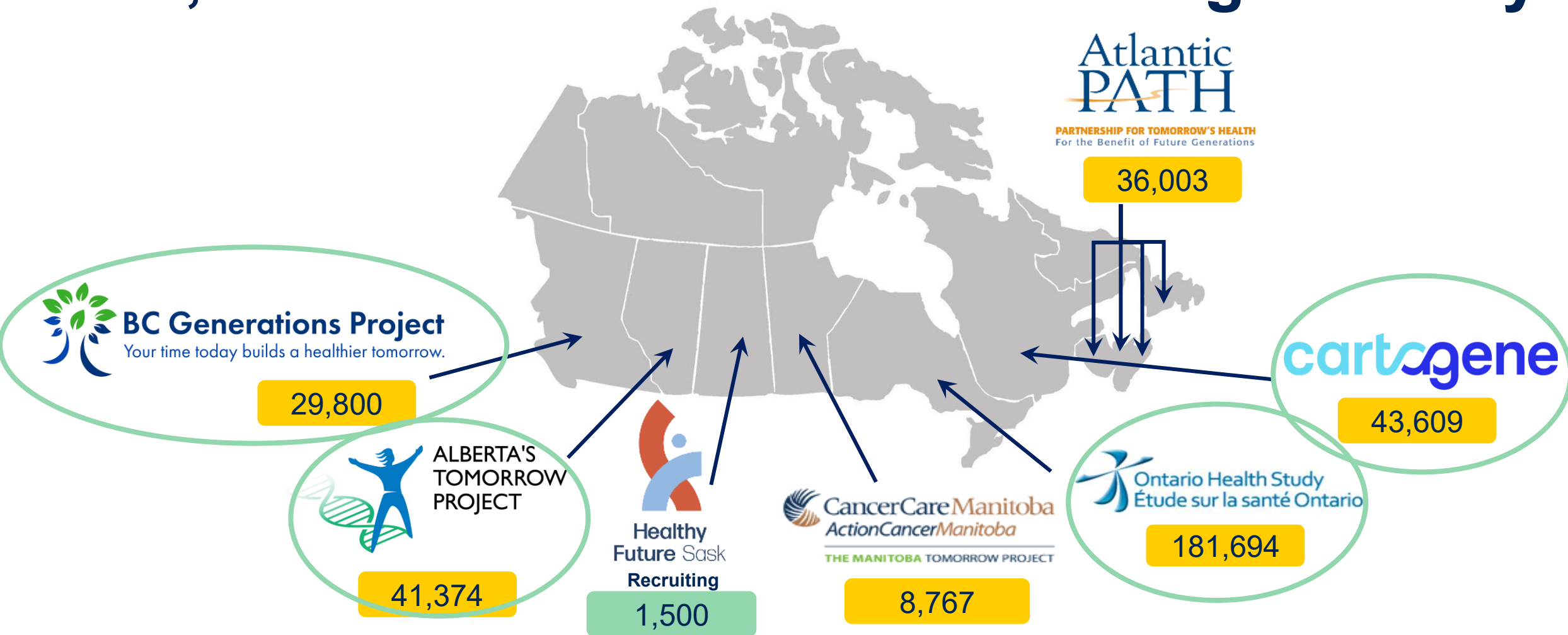
Study objective & hypothesis

To investigate whether occupational exposure to EDCs is associated with the risk of breast cancer, prostate cancer and colorectal cancer



Sex differences

330,000 Canadians are followed longitudinally



Methods Overview

Eligibility criteria

- 30-74 years old
- Resident of one of the collaborating provinces
- Be able to complete the questionnaire (English or French)

Data collection

- Questionnaires (longest-held job)

Linkage to provincial cancer registries

Overview of occupational exposure assessment approaches

	Method	Strengths	Weaknesses
Expert assessment	Experts assign participants' occupational exposures	Considered as the gold standard	Long and costly; quality depends on the experts and available data
Job exposure matrix (JEM)	Fixed set of rules to associate a list of exposures to any occupational code	Cheap and quick	Dependent on the quality of available data, only provide average estimate of exposure

Occupational Exposure to 17 EDCs

Canadian Job Exposure Matrix (CANJEM)

- **Unexposed**
- **Possibly exposed**
- **Exposed**

1. Any

2. Mode of action

- Estrogenic
- Anti-estrogenic
- Anti-androgenic

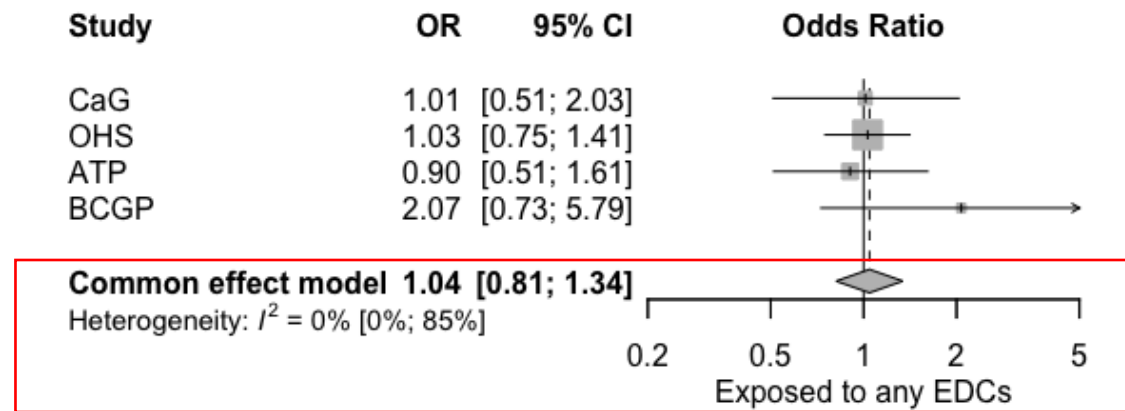
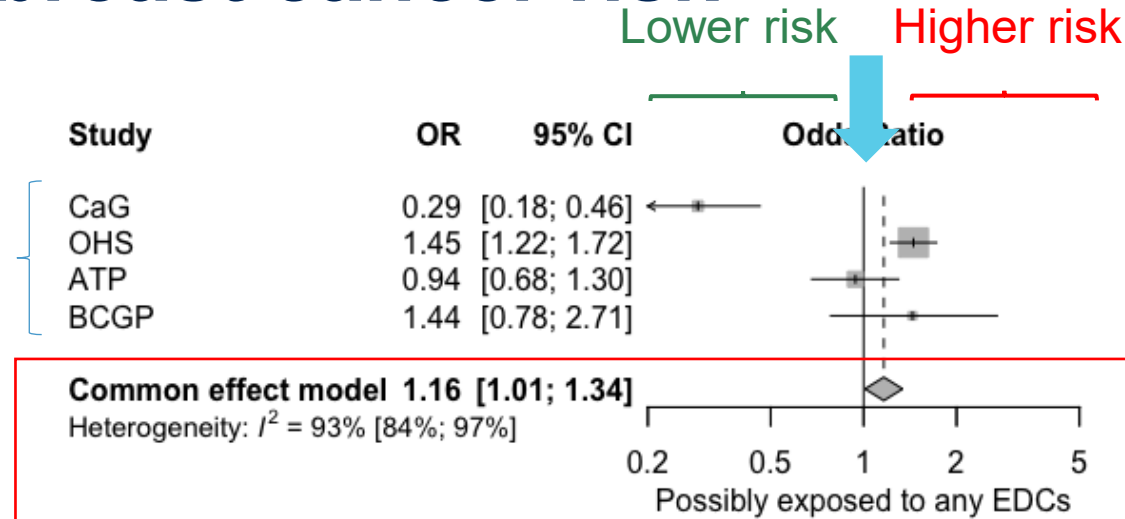
- Aluminum
- Arsenic
- Polychlorinated biphenyls (PCBs)
- Biphenol A (BPA)

- Cadmium
- Carbon disulfide
- Copper
- Ethylene glycol
- Lead

- Mercury
- Perchloroethylene
- Phenol
- Phthalates
- Styrene

- Toluene
- Trichloroethylene
- Xylene

Occupational exposure to any of our 17 selected EDCs and breast cancer risk

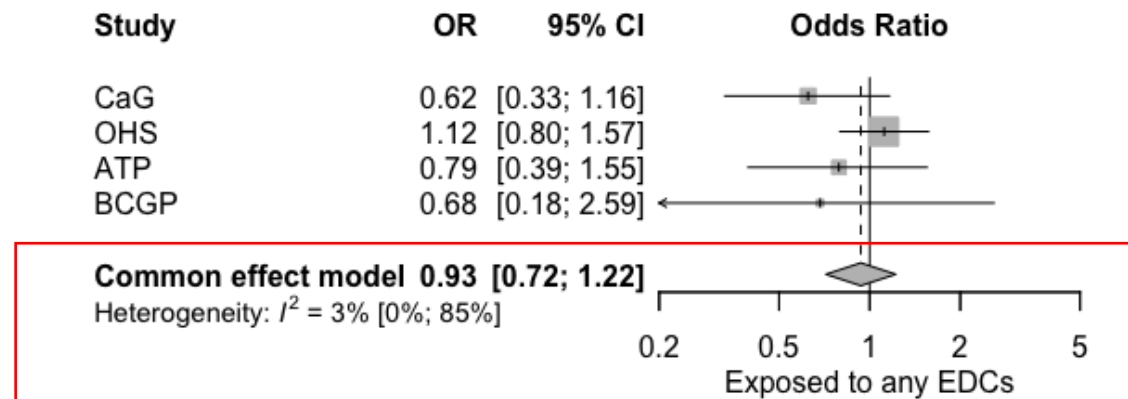
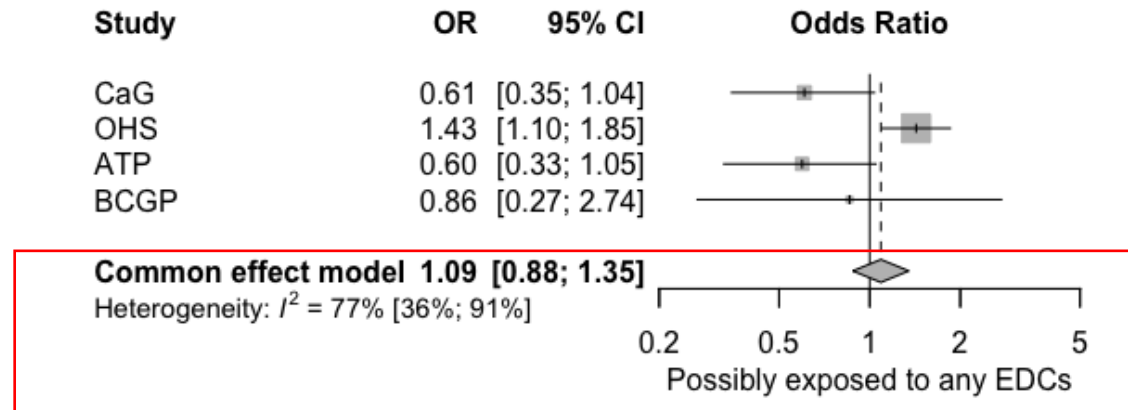


Occupational exposure to EDCs by mode of action and breast cancer risk

OR > 1.00 ~ Higher Risk

	Any of the 17 EDCs	Estrogenic EDCs	Anti-estrogenic EDCs	Anti-androgenic EDCs
Unexposed	ref (1.00)	ref (1.00)	ref (1.00)	ref (1.00)
Possibly exposed	1.16 (1.01-1.34)	1.27 (1.14-1.43)	1.24 (1.10-1.65)	1.21 (1.07-1.37)
Exposed	1.05 (0.82-1.34)	1.93 (0.86-4.30)	0.98 (0.75-1.27)	0.86 (0.66-1.13)

Occupational exposure to any of our 17 selected EDCs and prostate cancer risk



Occupational exposure to EDCs by mode of action and prostate cancer risk

OR > 1.00 ~ Higher Risk

	Any of the 17 EDCs	Estrogenic EDCs	Anti-estrogenic EDCs	Anti-androgenic EDCs
Unexposed	ref (1.00)	ref (1.00)	ref (1.00)	ref (1.00)
Possibly exposed	1.09 (0.88-1.35)	1.17 (1.01-1.36)	0.99 (0.83-1.19)	1.02 (0.84-1.24)
Exposed	0.94 (0.72-1.22)	1.15 (1.08-1.23)	0.95 (0.73-1.22)	0.92 (0.70-1.19)

	Any of the 17 EDCs	Estrogenic EDCs	Anti- estrogenic EDCs	Anti- androgenic EDCs
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**Occupational
exposure to
EDCs and
colorectal
cancer risk**



Specific EDCs of Interest

Breast and Prostate cancers

Metals

- Aluminum
- Arsenic
- Lead
- Mercury
- Cadmium
- Copper

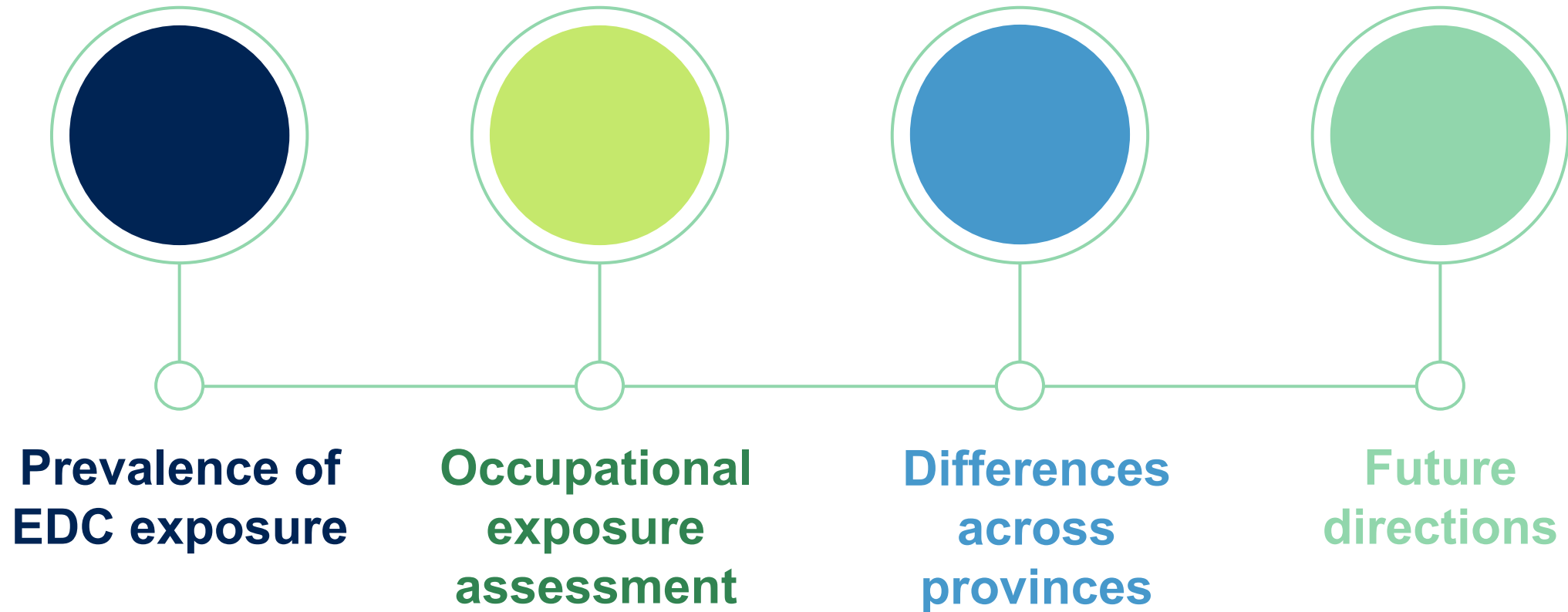
Organic liquids, vapours (solvents)

- Ethylene glycol
- Perchloroethylene
- Phenol
- Toluene
- Trichloroethylene
- Xylene

Manufacturing of plastics, etc

- BPA

Discussion



Thank you!

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Co-Authors

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