



Occupational
Cancer
Research
Centre

The Burden of Occupational Cancer in Canada: an overview of the study

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Les CANCÉROGÈNES professionnels

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Towards a cancer-free workplace



Ontario
Cancer Care Ontario
Action Cancer Ontario



Canadian
Cancer
Society
Société
canadienne
du cancer



Ontario
Ministry of Labour
Ministère du Travail

Estimated* Exposure to Carcinogens in Quebec

Workplace Carcinogen	Cancer Sites**	Exposed
Solar radiation	Basal, squamous cell skin	291,000
Diesel engine exhaust	Lung, possibly bladder	195,000
Radon (>100 Bq/m ³)	Lung	112,000
Benzene	Leukemia, possibly related cancers	93,000
Wood dust	Sinonasal, nasopharyngeal	92,000
Silica (crystalline)	Lung	78,000
Formaldehyde	Nasopharyngeal, leukemia	40,000
UV radiation (artificial)	Ocular (eye)	32,000
Asbestos	Lung, mesothelioma, larynx, ovary	29,000
Chromium (VI) compounds	Lung, possibly sinonasal	27,000
Ionizing radiation	Many types of cancer	7,500



* Based on the 2006 Canadian Census

** Based on IARC/WHO

www.carexcanada.ca



What is Burden of Cancer?

“Burden of cancer” is used to refer to the human impact & the economic costs associated with a specific cause of cancer

It can be measured in terms of:

- Attributable fraction (the proportion of all cancer cases or deaths caused)
- Number of cancer cases or deaths
- Quality of life and years of life lost
- Economic costs

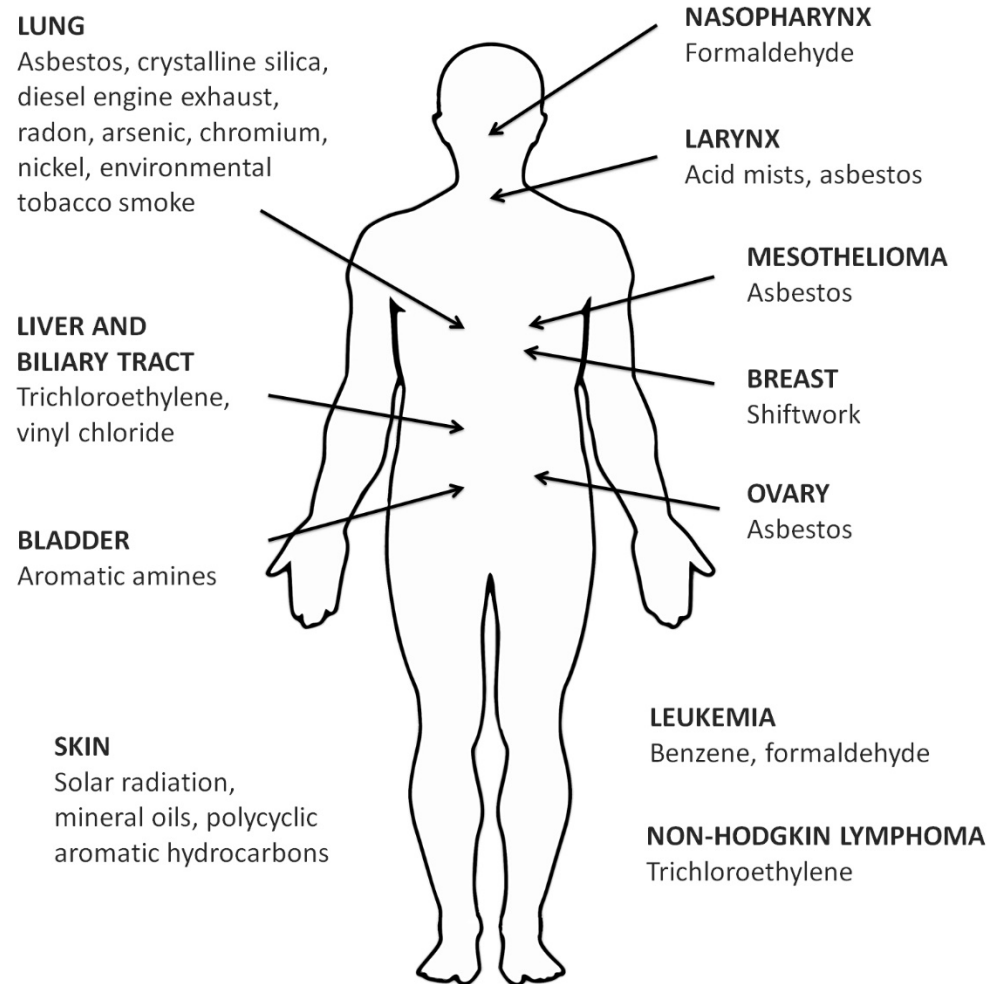
Assessing the Burden of Occupational Cancer in Canada



This project is funded by Canadian Cancer Society Research Institute Multi-Sector Team Grant #701285



Canadian Cancer Society
Société canadienne du cancer



This project is a national collaborative effort with:



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The *IARC Monographs* identify environmental factors that can increase the risk of human cancer. These include chemicals, complex mixtures, occupational exposures, physical agents, biological agents, and lifestyle factors. National health agencies can use this information as scientific support for their actions to prevent exposure to potential carcinogens.

Interdisciplinary working groups of expert scientists review the published studies and evaluate the weight of the evidence that an agent can increase the risk of cancer. The principles, procedures, and scientific criteria that guide the evaluations are described in the [Preamble](#) to the *IARC Monographs*.

**DIESEL AND GASOLINE
ENGINE EXHAUSTS
AND SOME NITROARENES**

IARC Monograph

**NON-IONIZING
RADIATION,
PART 2: RADIOFREQUENCY
ELECTROMAGNETIC FIELDS**



A National Occupational & Environmental Carcinogen Exposure Surveillance Project for the prevention of cancer

Based at:

1. Faculty of Health Sciences, Simon Fraser University
2. School of Population and Public Health,
University of British Columbia
3. Occupational Cancer Research Center,
Cancer Care Ontario

CANADIAN PARTNERSHIP
AGAINST CANCER



PARTENARIAT CANADIEN
CONTRE LE CANCER

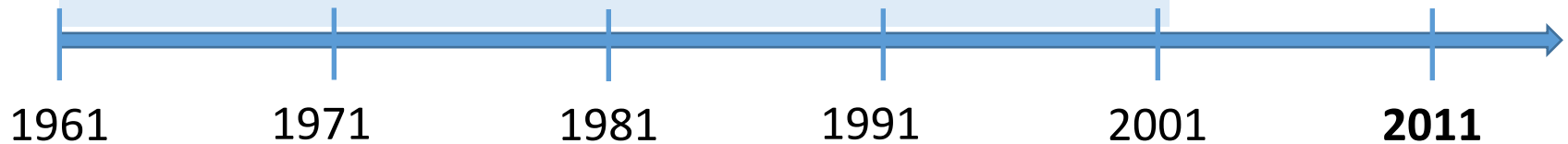


Challenge: Estimating History of Exposure among the General Population



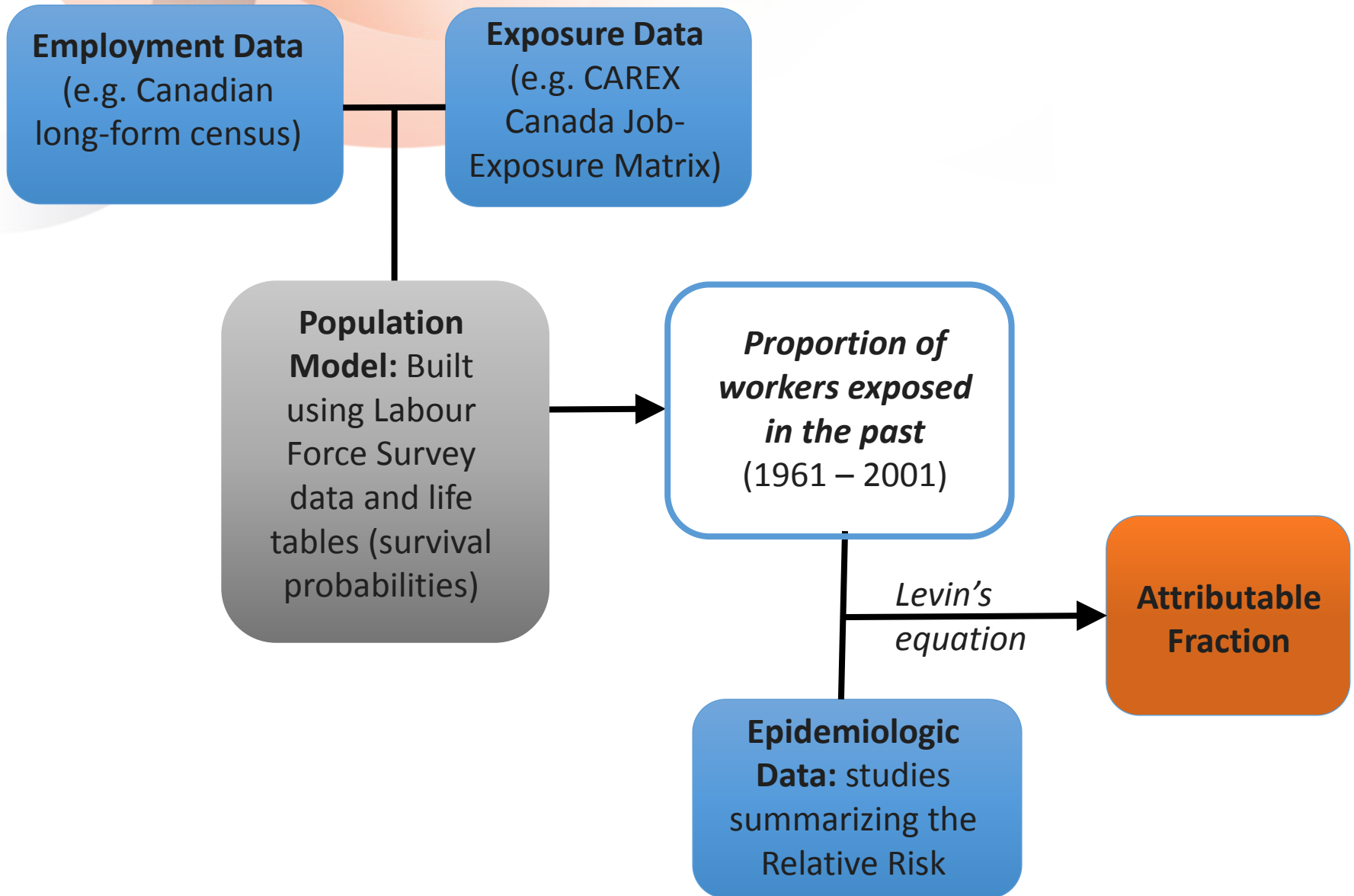
Identify everybody exposed in all exposure circumstances by sex, industry, occupation, and level of exposure (& for our project, province and age)

At Risk of Cancer



Risk Exposure Period

How Do we estimate burden?



Skin Cancer due to Solar UV, Canada



Exposure Assessment

*Proportion of
workers exposed
(1961 – 2001)*

11% of the 2011 population, or
2.6 million current or former workers

Attributable Cancers

Basal Cell Carcinoma

2,845 BCC
AF = 5.3%



2,551 BCC
AF = 9.0%



295 BCC
AF = 1.2%

Squamous Cell Carcinoma

1,710 SCC
AF = 9.2%

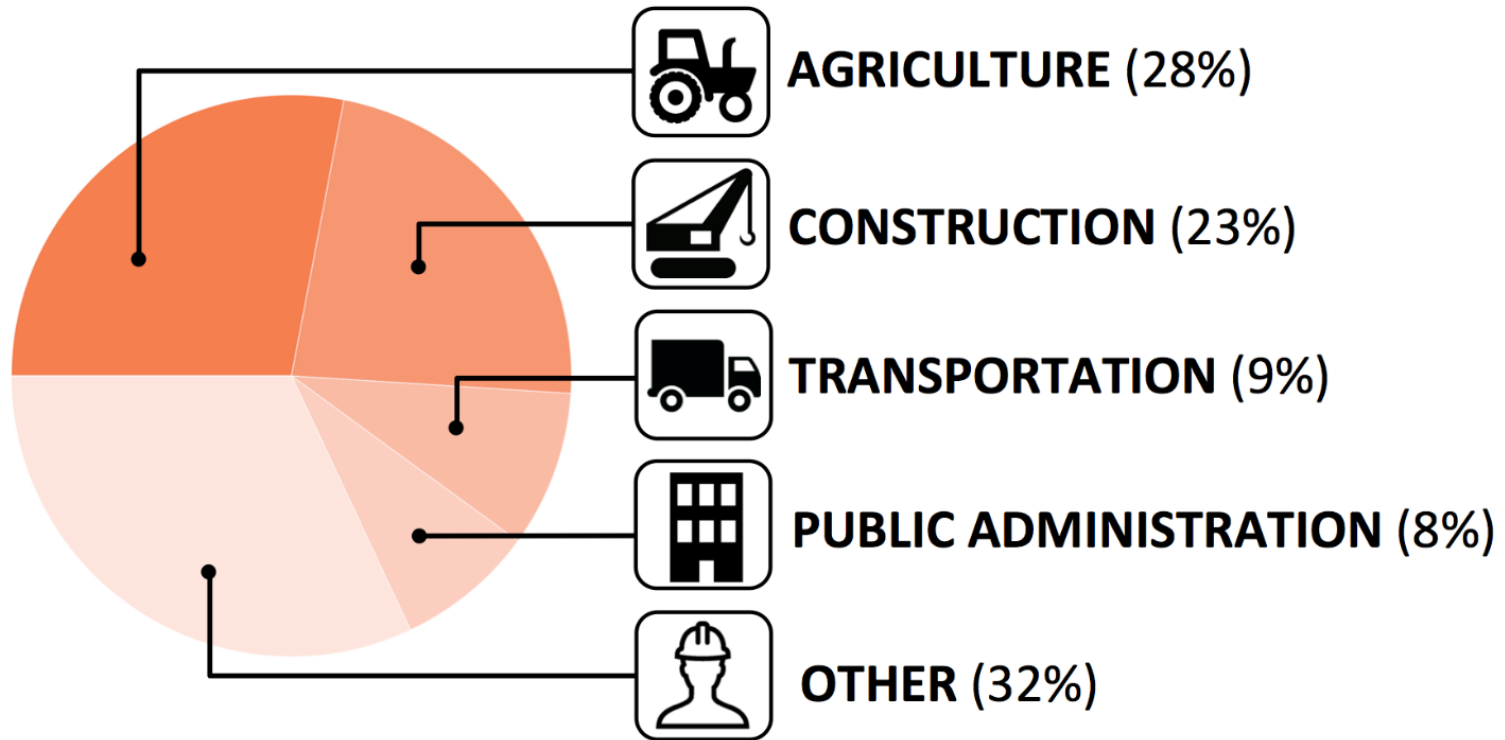


1,589 SCC
AF = 14.0%





121 SCC
AF = 1.7%

Skin Cancer due to Solar UV, by industry, Canada

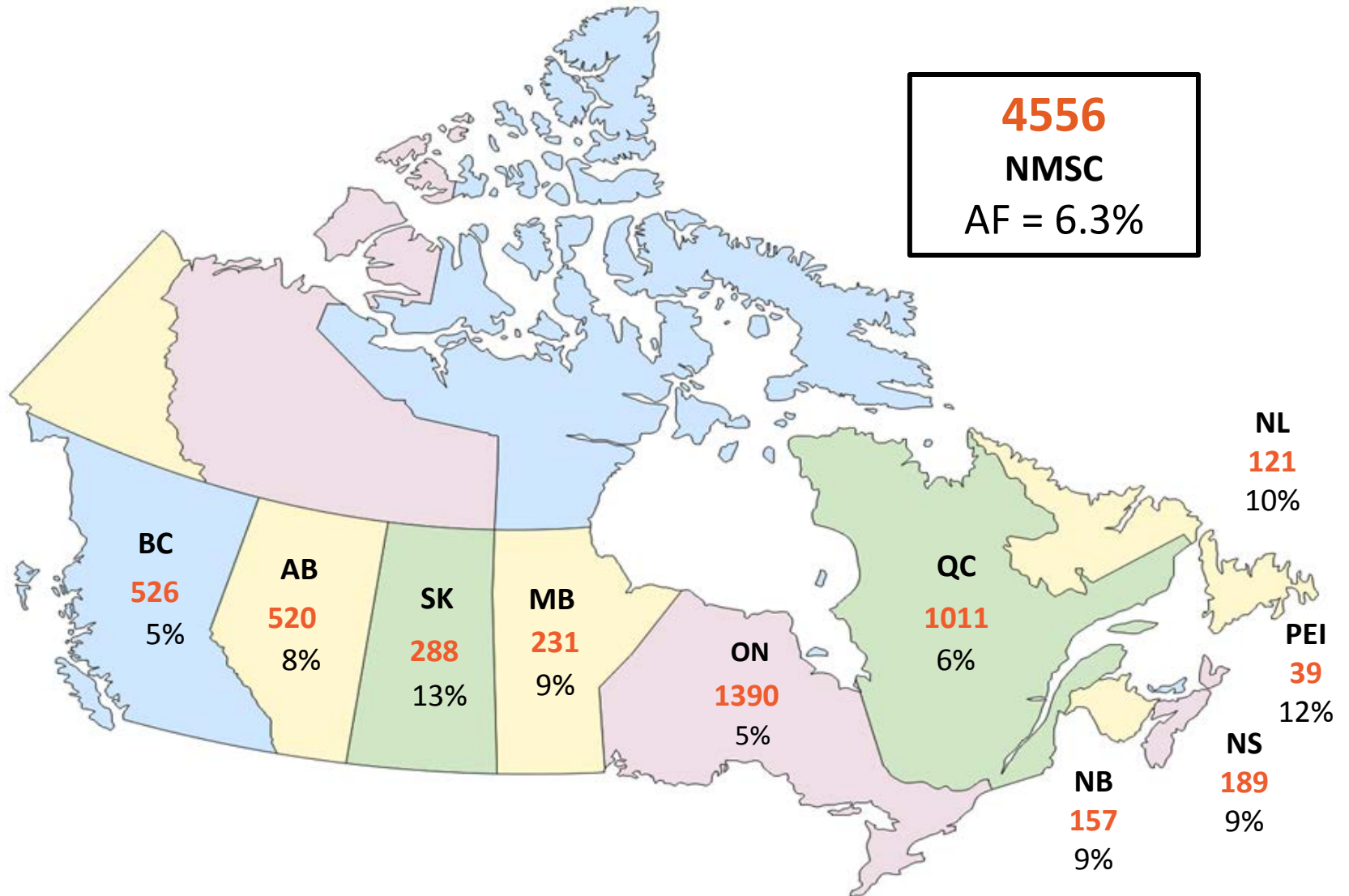


4556
NMSC
AF = 6.3%

 **4140**
AF = 4.7%

 **415**
AF = 0.3%

Skin Cancer due to Solar UV, by province



Economic Burden

The economic burden of newly diagnosed occupational cancers in 2011 includes all current and future costs incurred by the afflicted workers, their families, communities, employers and society at large. These include:

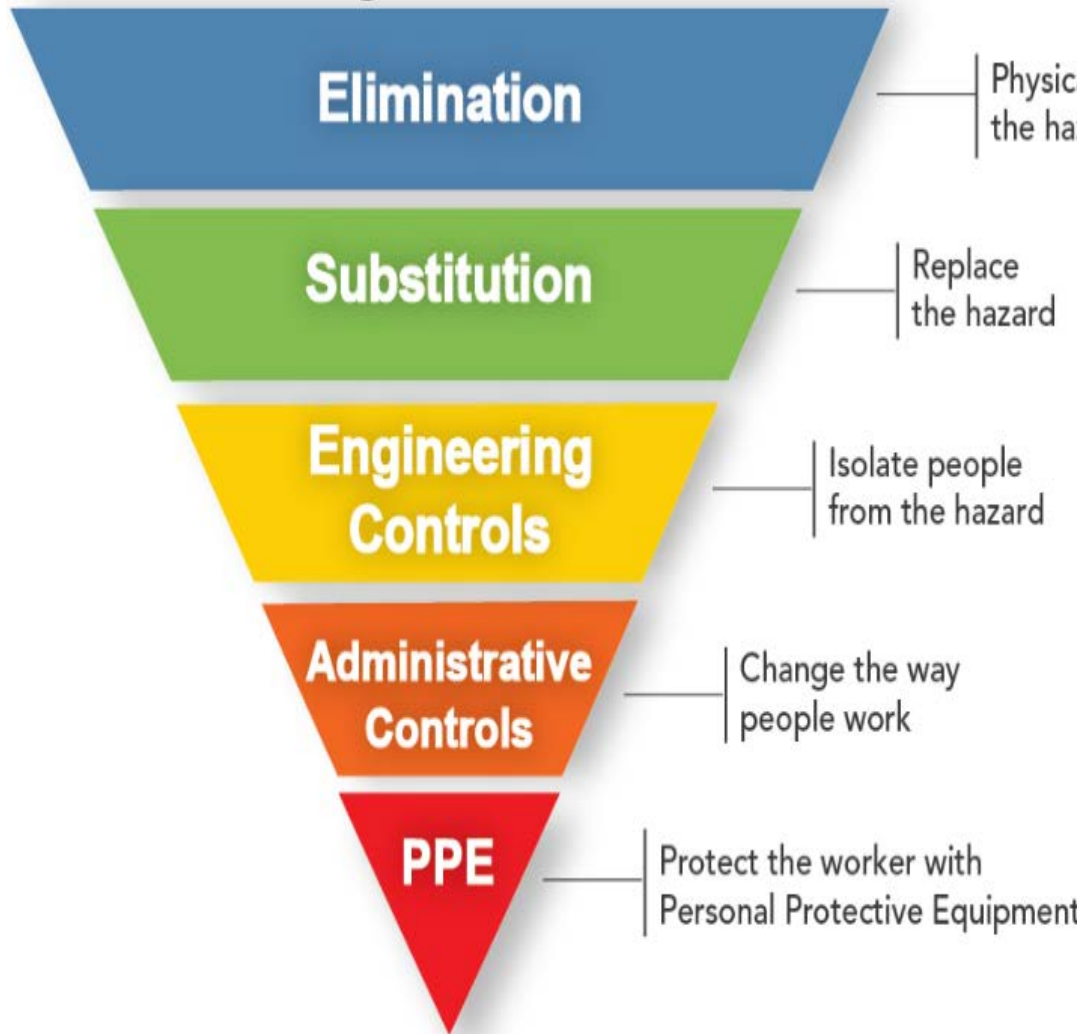
- ***Health care and administrative costs:*** paid by society at large, unless a workers' compensation claim is accepted.
- ***Informal care giving and out-of-pocket costs:*** includes out-of-pocket healthcare, travel costs associated with medical treatments, and informal care giving time from family or community members.
- ***Output and productivity losses:*** lost wages for worker due to time loss associated with illness or death and costs for employers due to lost output and productivity from lost time & worker replacement.
- ***Health-related quality of life losses:*** these are costs incurred by the worker and their family.

Hierarchy of Controls (from NIOSH)

Most effective



Least effective



Role of Burden of Cancer:

- Stimulating regulation and policy changes (OELs, labeling, toxic use reduction...)
- Stimulating voluntary actions by employers or workers
- Raising awareness on occupational cancer issue

Early Recognition and Screening

Examples of Reducing the Impact of Solar UV on Skin Cancer (and Heat Stress)



Elimination

- Perform work at night to avoid the sun
- Prefabrication of construction in shelters or buildings

Engineering Controls

- Worksite or vehicle shade structures

Administrative Controls

- Schedule outdoor work to avoid the 11:00 AM-3:00 PM period
- Training and education

Use personal protective equipment

- Wear protective clothing with a high UV protection factor, such as long-sleeved shirts or wide-brimmed hats with neck flaps to reduce exposure
- Sunscreen

Assessing Exposure to Estimate the Burden of Occupational Cancer



- Industrial chemicals (e.g. benzene & formaldehyde)
- Metals (e.g. chromium, nickel & cadmium)
- Dusts and fibres (e.g. asbestos & crystalline silica)
- Radiation (e.g. radon & solar U.V at work)
- Combustion products (e.g. diesel engine exhausts)
- Exposure circumstances (e.g. shiftwork, welding, painting)



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Thank you for your attention!

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