# Occupational hazards and physical health of PSPs

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**Canadian Academy of Health Sciences Forum 2022** 



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#### Potential Conflict of interest declaration

- Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST): private not for profit research institute on OHS, funded in large part by the Quebec Workers' Compensation Board (CNESST)
- The content and conclusions in this presentation are my own and do not necessarily represent the official position of the IRSST
- The interpretation of AWCBC data made here are my own and not that of AWCBC or any of its member Boards or Commissions.





#### Of Exposure, Hazard and Risk



Risk = Hazard + Exposure (Risque = Danger + Exposition)





#### **Occupational Risk Prevention**

Risk = Haxard + Exposure

#### **Hierarchy of Controls**



« Workplace safety & health topics: Hierarchy of controls », © NIOSH, 2015 (<u>https://www.cdc.gov/niosh/topics/hierarchy/default.html</u>)

HOWEVER, knowing what risks to expect helps to prevent them!

 $\rightarrow$  Look at compensation statistics





Workers' compensation claims, Canada: all Public Safety Personnel





NB: These are estimations. Some occupational codes include other occupations than those of PSPs

#### Workers' lost-time claims, Québec, 2015-2020 (n=9,914): Public Safety Personnel (except Emergency medical services)





## **Compensation Statistics**



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- Underestimation of sub-chronic & chronic diseases
  - For most conditions, attribution to work exposure is hampered by latency and other factors; e.g. chronic respiratory problems; cancer; noise-induced hearing loss; osteoarthrosis; immunological diseases...
  - Work-relatedness can be recognized when disease/symptom occurs shortly after exposure;
    e.g.: among firefighters, a cardiovascular sign/a myocardial infarction at work or just after fire combat
  - In QC statistics, 2015-2020, among 9,914 claims: 16 cancers, 4 mesotheliomas, 7 asbestosis (n=24 in firefighters, 1 armed forces, 1 private police officer, 1 security guard)
- Comparisons between jurisdictions: risky
  - Definitions/reference periods are not identical
    - between compensation boards
    - with AWCBC statistics



Categories of occupational hazards (International Labour Organisation, ILO)



## **Chemical Hazards in Public Safety**

- Combustion products
  - Exposures: fires (buildings, forest/bush, vehicles...)
  - CO → cardiovascular effects, hearing toxicity...
  - Polycyclic aromatic hydrocarbons (PAHs), dioxins, furans  $\rightarrow$  cancer
  - Heavy metals  $\rightarrow$  various ailments (nervous, respiratory, urinary...)
- Diesel engine emissions & air pollution → lung & bladder cancers, respiratory problems
- Tear gas, pepper spray → irritation & immunological effects (allergies, irritation dermatitis...)
- Others: asbestos (building fire/collapse) → mesothelioma; cyanoacrylates (instant glue to detect latent prints) → mucosal irritation, skin/respiratory allergies...
- Occupations: first responders, firefighters, armed forces, police & correctional officers, forensic professionals...



Pompiers combattant un incendie à Château-Richer, QC Image: Antoine Letarte, CC BY 3.0



U.S. Environmental Protection Agency, https://commons.wikim edia.org/w/index.php?c urid=3867874

#### Physical Hazards in Public Safety

- Noise  $\rightarrow$  Noise-induced hearing loss (NIHL)
  - Exposures: motorcycling, fire range, emergency horns, screams & shouting...
  - Co-exposure to certain toxic chemicals (solvents, arsenic, CO...) → 7 NIHL
- Radiation  $\rightarrow$  several cancers
  - Ionizing: scanner machines (ex. customs)
- Outdoor environments (cold, heat, sun exposure ) → rhumatoid arthritis; skin cancers (sun)
- Vibrations → ↘ of sensation in fingers & grip strength; circulatory, digestive, muscular & back problems
  - Exposures: motorcycling, chainsaw
- Occupations: firefighters, armed forces, police officers, professional divers, security guards, park/forest wardens...





# **Biological Hazards in Public Safety**

- Contact with infected persons
  - Blood-borne pathogens (broken skin, wounds, mucous membranes) → viruses: hepatitis, AIDS; bacteria: Methicillin-resistant Staphylococcus aureus (MRSA)
  - Air-borne pathogens (inhalation) →viruses: influenza, COVID-19, measles; bacteria: tuberculosis
- Contact with contaminated surfaces/materials
  - Blood-borne pathogens (broken skin or mucosal contact) → viruses: hepatitis B, AIDS; bacteria: Methicillin-resistant Staphylococcus aureus (MRSA)
  - Air-borne pathogens → viruses: *influenza*, COVID-19, measles; fungal/bacterial endotoxins (fungi developing on confiscated goods)
- Occupations: first responders & paramedics, correctional & police officers, customs officers









## Healthcare complications and solutions

# Challenges

- Multitude of hazards for both physical and psychological health of PSPs
- Work-relatedness of diseases/injuries not always obvious
  - May not impede treatment, but could reduce effectiveness of prevention and makes it more difficult to obtain compensation

## **Nº 1 solution =** Prevention!

## • Where to start?

- Hazard identification: ITEM (Individual Task Environment Material)
- Risk analysis to prioritize interventions (from zero tolerance risks to desires to improve well-being), and risk management

# • Winning condition

• Active participation of all concerned parties!





#### Many thanks for your attention!

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## Additional slides

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#### Definitions

- Front-line PSPs (NOC group 43):
  - Police officers (except commissioned), Firefighters, Non-commissioned ranks of the Canadian Forces

# • PSP

- Law & by-law enforcement: correctional facility officers, park/forest wardens, customs/border officers
- Emergency medical services: dispatchers, paramedics, emergency technicians, search and rescue personnel
- Other protection personnel: security guards and officers (hospitals, banks, airport...), forensic professionals



## Front-line public protection services, Lost-time claims, 2019 (source of injury)



Source : Association of Workers' Compensation Boards of Canada (AWCBC) 2022, Special output – 2019





#### Cancer: expert & systematic reviews

# • Firefighters (International Agency for Research on Cancer, IARC, 2022)

- Mesothelioma, bladder cancer (sufficient evidence in humans)
- Non-Hodgkin lymphoma, cancers of the colon, skin, prostate and testes (limited evidence in humans)
- Firefighters & police officers (Sritharan et al., 2022)
  - Prostate cancer: firefighters: & police officers (43-47% increased risk)
  - Colon cancer: firefighters: & police officers (39% increased risk)
  - Skin melanoma: firefighters: & police officers (223% increased risk)
  - Pancreas, testis, kidney, NHL, leukaemia: firefighters
  - Thyroid, bladder, female breast cancer: police officers

