

Nazem El Hussein, PhD., representing Health Canada, delivered a technical yet critical keynote detailing how the federal government identifies and regulates toxic chemicals under the Canadian Environmental Protection Act (CEPA) and the Chemicals Management Plan (CMP). His presentation provided a rare look behind the curtain of "risk assessment," the scientific process used to decide which chemicals are safe for public use and which should be restricted. By explaining the mechanics of how Health Canada calculates safety buffers, Dr. El Hussein's presence underscored a growing federal commitment to chemical transparency, while simultaneously highlighting the massive gaps in how our current laws protect the most vulnerable, particularly those living with Multiple Chemical Sensitivity (MCS).

At the heart of the presentation was the concept of the Margin of Exposure (MOE): a mathematical ratio used to determine if a chemical is "toxic." Health Canada arrives at this number by looking at two factors: the hazard (what the chemical does to a body, such as causing cancer or respiratory stress) and the exposure (how much of the chemical a person actually breathes, eats, or absorbs).

**A key feature of the presentation took place when Dr. El Hussein used the analogy of a tiger: a tiger is always hazardous, but your "risk" is low if the tiger is in a cage (low exposure) and high if it is in the room with you. However, for the MCS community, the "tiger" is effectively everywhere (in the air, in cleaning products, and in building materials) making the traditional calculation of risk far more complex than a simple ratio.**

Dr. El Hussein acknowledged a fundamental limitation in the current system: the reliance on animal testing. Current safety standards are largely based on how rats and mice react to high doses of a single chemical. This creates a significant blind spot for MCS because, as Dr. El Hussein admitted, you cannot measure subjective symptoms like headaches, dizziness, or brain fog in an animal. Furthermore, traditional testing often looks at one chemical at a time, whereas the real world involves cumulative effects, the toxic soup of hundreds of chemicals we encounter daily. He highlighted that the recent Bill S-5 amendments to CEPA are a major step forward, as they now legally require the government to consider these cumulative effects and the impact on "disproportionately impacted populations," which includes those with MCS.

The presentation also offered a sobering look at common household products through real-world examples. He discussed MDI, a chemical found in spray polyurethane foam, which Health Canada officially ruled as "toxic" because it is a known respiratory sensitizer that can trigger asthma and hypersensitivity at low levels. This reinforces the conference's call for product transparency and least-toxic product policies; if the government admits these ubiquitous chemicals are sensitizing the population, there is a clear mandate for institutions to switch to safer alternatives. Dr. El Hussein's call for future directions involves moving toward "New Approach Methodologies" which are advanced, non-animal assays that can identify specific biological triggers (like the activation of TRP channels) hypothesized to cause MCS symptoms.

Ultimately, this keynote was an invitation for a more harmonized approach between government, policymakers, scientists, academia and the MCS community. Dr. El Hussein's detailed

explanation of "uncertainty factors", the extra safety margins added to account for the fact that humans are more diverse and sensitive than lab animals, highlights where policy change is needed. If the current safety buffers are not protecting the million-plus Canadians with MCS, then the Target MOE must be raised. By advocating for greater transparency in labelling and more rigorous monitoring of everyday chemicals, Health Canada's contribution to the conference validated the MCS experience as a matter of urgent public health, requiring a shift toward a world where "least-toxic" is the default standard for all.

## References and Reading Materials

- Strengthening Environmental Protection for a Healthier Canada Act (Bill S-5)
- Risk assessment of chemical substances
- Application of weight of evidence and precaution in risk assessment
- Renne RA, Gideon KM, Harbo SJ, Staska LM, Grumbein SL. *Upper Respiratory Tract Lesions in Inhalation Toxicology*. Toxicologic Pathology. 2007
- Wong BA. *Inhalation Exposure Systems: Design, Methods and Operation*. Toxicologic Pathology. 2007
- Screening assessment - Epoxides and Glycidyl Ethers Group (ECCC, HC 2020)
- Screening Assessment for Methylenediphenyl Diisocyanates and Methylenediphenyl Diamines (ECCC, HC 2017)
- Consideration of vulnerable populations in risk assessment
- Combined exposure to multiple chemicals (mixture) risk assessment (ECCC, HC 2026)
- Use of new approach methods (NAMs) in risk assessment