

“...Chair Ayer and committee members,

Thank you for the opportunity to testify today. I am very glad that you are so carefully considering the language in the proposed bill S103.

I support S.103 as passed the House, and wanted to share my perspectives on why I support this bill.

Today I would like to mention 3 specific issues with regard to the discussion of the phrase “weight of the evidence”.

- The preferred terminology to summarize the evidence regarding potential toxicity of chemicals is “evidence integration“, relying on systematic review. “Weight of Evidence” is sometimes also used, but it is not the only, nor is it the preferred, methodology.
- The concept of bias or possible bias is a key element in the systematic evaluation of evidence.
- The evidence review and integration must be made by independent experts who can apply specific criteria and analyses to the evidence.

A systematic review is a scientific investigation that focuses on a specific question and uses explicit, pre-specified scientific methods to identify, select, assess, and summarize the findings of similar but separate studies. The goal of systematic review methods is to ensure that the review is complete, unbiased, reproducible, and transparent.

In practice, the use of the term “weight of evidence” in the literature and by scientific agencies, including EPA, is vague and varied. The 2017 National academy of Sciences report identified the phrase **evidence integration** to be more useful and more descriptive of what is done in an IRIS assessment. (IRIS is the EPA’s Integrated Risk Assessment System). IRIS assessments must come to a judgment about whether a chemical is hazardous to human health and must do so by integrating a variety of evidence.

How the strength of evidence from a study is characterized in a systematic review is related to the concept of bias. The possibility of bias can be from the methodology itself, such as population studied or analysis methods used. For example, if a study is about the risk of cancer following exposure to a chemical, the sample taken from a clinic population who may come in for various complaints will be biased compared to a random sample of the population under study. Also, there can be bias in the authorship or sponsorship. For example, if a study is performed and reported on about the efficacy and safety of a new device, by a doctor who has a financial interest in the company selling the device, the study may have good methodology but the risk of bias must still be taken into account. Likewise, a study on human toxicity of a chemical that is performed by or sponsored by the company manufacturing and selling that chemical has a potential for bias.

A 2017 National Academy of Sciences report said this about the expertise required to do a systematic review: “ The committee found that conducting a systematic review and integrating evidence requires a multidisciplinary approach tailored to the specific review question. In particular, it is essential to have expertise in the conduct of meta-analyses and benchmark dose modeling.”

This review and integration of evidence should be done by a qualified panel of *independent* technical experts with expertise in risk assessment, toxicology, epidemiology and public health.

Given the fact that the Act 188 stakeholder group includes industry representatives and non-scientist advocates, I support the change in S.103 that makes this stakeholder group advisory, rather than relying on that group to make binding recommendations about how to address “chemicals of high concern to children.”

In some cases, which could be possible scenarios that could face the state of Vermont, there may not already exist a scientific review and evidence integration, and this process is probably not viable for emergency or urgent response (i.e., less than a month). A state like Vermont, with limited resources, often relies on research and analyses conducted by other entities, such as another state or federal agency. The language in S.103 allows the state the flexibility to use and review all the available data from

other experts and agencies. The state should then describe the methodology used when a systematic review is not practical, e.g., use of independent expert opinion and use of a structured framework to describe confidence in conclusions – which can be determined even when analysis is not based on a systematic review.

The language in S.103, “independent, peer-reviewed, scientific research” will allow the Department of Health to utilize scientifically appropriate established methodology to assess and review available data on chemicals of concern. As scientific methodologies improve over time, the language in S.103 will allow the Department of Health to update and revise methodologies based on best practices being used in other states and federal agencies.

To conclude, I support the language in S.103 as passed the House, and would be happy to answer any questions.