

July 16, 2014

Nick Abraham  
Legislative Clerk  
Committee on Energy and Commerce  
2125 Rayburn House Office Building  
Washington, DC 20515

**Re:** Response to questions from Congressional Hearing  
on Chemical Safety legislation

**Via email:** [Nick.Abraham@mail.house.gov](mailto:Nick.Abraham@mail.house.gov)

Dear Nick,

Thank you again for having invited me to respond to the questions submitted by members of the Subcommittee on Environment and the Economy in follow-up to my testimony of March 12, 2014 on the Chemicals in Commerce Act. I am pleased to do so.

- 1. Do you have concerns about this definition in the current draft of the chemicals in Commerce Act of the term “potentially exposed subpopulation”?** I do have concerns about this definition. The term “vulnerable populations” has been widely used and has come into common usage over the past two decades to refer to the groups within the American population who are understood to be at heightened risk to toxic chemicals in the environment and in consumer products. These vulnerable groups include infants, children, pregnant women, workers and the elderly. I would prefer to use the well-established and widely accepted term “vulnerable population” rather than to introduce a new and possibly confusing term such as “potentially exposed subpopulation”.
- 2. Do you have concerns about creating a new term, rather than using the term “vulnerable populations,” which has been widely used?** Yes I have concerns about creating a new term for the reasons expressed above in my response to question #1.
- 3. In terms of health effects, does the body distinguish between exposures from intended and unintended uses?** The human body makes no distinction whatsoever between exposures from intended and unintended uses of chemicals. Indeed, many industrial and consumer chemicals that are added to consumer products can enter the human body via a number of routes and pathways some of which may be intended and some unintended. Once in the human body, chemicals from all of these sources interact with one another to produce cumulative and synergistic effects regardless of their source of origin. This principle was established many years ago in studies of children exposed to lead. It was been reaffirmed in studies of children exposed to pesticides, plastics, chemicals, and endocrine disrupting chemicals.

4. **Is there a biological justification for excluding exposures from some sources, such as automotive parts?**  
There is no justification whatsoever for excluding exposures from some sources, such as automotive parts.
5. **Is there a biological justification for considering only those exposures that are significant on their own, as opposed to in aggregate?** There is no justification whatsoever for this distinction. Infants, children, workers, the elderly, and all Americans are exposed to multiple chemicals from many sources. National surveys conducted by the Centers for Disease Control and Prevention (CDC) demonstrate that detectable levels of several hundred synthetic chemicals are found today in the bodies of virtually all Americans. Pediatricians and research scientists strongly suspect that these various chemicals interact within the human body in various and complex ways to produce adverse effects on health and development. One of the great problems that impedes medical research in this area and interferes with proper medical care of infants, children and pregnant women exposed to synthetic chemicals is that very little information is available on the potentially toxic effects of many of these chemicals. This lack of information reflects the weaknesses in the chemical testing requirements of the Toxic Substances Control Act of 1976. I detail these weaknesses in the attached article that Dr. Lynn Goldman of George Washington University and I published in 2011 in the peer reviewed biomedical journal, *Health Affairs*.
6. **In your view, is it important that aggregate exposures to chemicals be considered in assessing their safety?**  
It is absolutely essential that aggregate exposures to chemicals be considered in assessing their safety. Multiple examples have been documented of harmful interactions between chemicals in the human body. Many years ago, for example, cigarette smoke and asbestos were shown to interact powerfully in the causation of lung cancer. The U.S. Environmental Protection Agency has documented interactions among organophosphate pesticides in causing neurotoxicity. Undoubtedly many more interactions among chemicals in the human body to produce adverse effects remain to be documented. For this reason it is important that aggregate exposures to chemicals be considered in assessing their toxicity.
7. **In terms of health effects, can all mixtures be understood simply by assessing the health effects of the mixture's components?** The health effects of exposures to mixtures cannot be understood simply by assessing the health effects of their components. As I note in my response to the preceding question (#6) instances have been well documented in medicine in which chemicals have interacted synergistically to produce adverse effects in which the total effect is greater than the sum of the parts. Undoubtedly additional examples of synergistic interaction remain to be discovered. However, these interactions will not be discovered until strong and enforceable legislature requiring the testing of chemicals for toxicity and requiring assessment of interactions among potentially toxic chemicals is enacted by United States Congress and signed into law by the President.

In conclusion, I would like to urge that examination of the consequences of chemical exposures on human health and development be central to any effort to reform chemical policy in the United States. Chemical policy legislation is, in fact, public health legislation. Exposures to toxic chemicals have been responsible for numerous public health disasters in the past ranging from cancer caused by asbestos, birth defects caused by thalidomide, cancer caused by diethylstilbestrol, and mental deficiency caused by lead. These diseases are not only tragic. They are also extremely costly as is detailed in the attached article in *Health Affairs* by Trasande and Liu. Many of these tragic episodes could have been avoided if premarket testing of chemicals for safety had been mandated and enforced in the United States and if industrial chemicals were required to undergo the same level of scrutiny as pharmaceutical chemicals. I therefore urge the Congress to make consideration of public health, and especially consideration of the health of infants and children, a central element of your deliberations on this important legislation.

Thank you again for having asked me to address these questions. Please do not hesitate to come back to me with further questions or to request further elucidation of the answers I have provided herein.

Sincerely,



Philip J. Landrigan, MD, MSc