

January 20, 2018

Comments from Academics, Scientists and Clinicians on the New Chemicals Review Program Under the Amended TSCA

Comments submitted online via *Regulations.gov* to docket EPA-HQ-OPPT-2017-0585 (FRL-9970-34) and by email to Greg Schweer, Chemical Control Division (7405M), Office of Pollution Prevention and Toxics, Environmental Protection Agency, 1200 Pennsylvania Ave. NW, Washington, DC 20460-0001; telephone number: (202) 564-8469; email address: schweer.greg@epa.gov.

These comments are submitted on behalf of the undersigned academic, scientists, and clinicians. We declare collectively that we have no direct or indirect financial or fiduciary interest in any chemical under consideration in these risk evaluations. The co-signers' institutional affiliations are included for identification purposes only and do not necessarily imply any institutional endorsement or support, unless indicated otherwise.

We appreciate the opportunity to provide written comments on the U.S. Environmental Protection Agency's (EPA) progress in implementing changes to the New Chemicals Review Program pursuant to the Toxic Substances Control Act (TSCA), as amended by the Frank R. Lautenberg Chemical Safety of the 21st Century Act (Lautenberg TSCA). EPA held a meeting on December 6, 2017 in Washington, D.C., and several of the undersigned attended that meeting. We appreciate this subsequent follow-up opportunity to submit detailed comments and to respond to information shared by EPA and other public commenters during this meeting; we believe this is a critical opportunity for relevant stakeholders to provide input, and we encourage EPA to take the opportunity to review all submitted public comments at this time prior to implementing any changes in the New Chemicals Review Program. As it stands, we are strongly opposed to the EPA's proposed framework for new chemical review and the agency's plans for immediate implementation as presented at EPA's public meeting held in December 2017; further discussion is provided in detail in our comments below.

An important mandate Congress gave to EPA in Lautenberg TSCA is to make an affirmative determination that a new chemical is not likely to present an unreasonable risk, including to susceptible subpopulations, prior to allowing its use.¹ The public expects and the law requires that EPA protect public health, especially the health of susceptible populations, by allowing only chemicals (not selected uses) that are not likely to present risks into commerce. Permitting a chemical to enter commerce confers commercial value and Lautenberg TSCA recognizes it is in the public interest that only chemicals with sufficient information and that are not likely to present risks in all their foreseeable uses should be given this value. Once a chemical enters the market, manufacturers have little control of other conditions of use, so chemicals and *all* of their reasonably foreseeable uses must be evaluated together before being given permission to enter the market. Chemicals without adequate data must be rejected under the law.

¹ 15 U.S.C. § 2604(a)

In fulfillment of this and the other mandates in Lautenberg TSCA, we recommend EPA must:

- 1. Place a halt on the implementation of its proposed framework for new chemicals review as presented at its December 6, 2017 public meeting until the Agency has reviewed and responded to all submitted public comments;**
- 2. Ensure increased transparency of the process that equally involves stakeholders from all groups, such as non-government organizations (NGOs), academics, members of the general community as well as tribal communities and representatives from environmental justice communities;**
- 3. Continue the process of issuing section 5(e) test orders in response to concerns with intended or reasonably foreseen conditions of use of a pre-manufacture notice (PMN) chemical and NOT rely on issuance of Significant New Use Rules (SNURs), which is not a lawful or adequately protective approach;**
- 4. Clearly define what constitutes “adequate information” in the characterization of both hazard and exposure and incorporate definitions that have been established by other government bodies;**
- 5. Incorporate a broader consideration of what constitutes “reasonably foreseen” conditions of use beyond what is stated in the manufacture submission, including engineering controls and other worker protections, to ensure that the public is protected from potential future exposures to these chemicals that may not be disclosed initially within the PMN;**
- 6. Ensure that exposures do not result in unreasonable risks to the general population by higher standards for allowable uncertainty to make the determination of “not likely to present unreasonable risk” as compared to “presents unreasonable risk”;**
- 7. Ensure consideration of all potential vulnerable and susceptible populations and developmental time periods and include or issue test orders for reproductive and developmental toxicity outcomes;**
- 8. Adopt the approach that absence of data does not equate to lack of hazard; EPA should use its test authority to collect sufficient data for determining human health risks;**
- 9. Incorporate modern scientific methods and approaches.**

We are appreciative of the opportunity to provide public input and we look forward to continuing to participate in such opportunities in the future. Please do not hesitate to contact us with any questions regarding these comments.

Sincerely,

Juleen Lam, PhD

Associate Research Scientist, Program on Reproductive Health and the Environment
University of California, San Francisco

Veena Singla, PhD

Associate Director, Science & Policy, Program on Reproductive Health and the Environment
University of California, San Francisco

Tracey Woodruff, PhD

Director, Program on Reproductive Health and the Environment
University of California, San Francisco

Patricia D. Koman, MPP, PhD
President and Senior Health Scientist
Green Barn Research*

Ann Behrmann, MD
Pediatrician, Wisconsin Environmental Health Network
Physicians for Social Responsibility Wisconsin

Phil Brown, PhD
University Distinguished Professor of Sociology and Health Sciences
Director, Social Science Environmental Health Research Institute
Northeastern University

Adelita G. Cantu, PhD, RN
Associate Professor
Alliance of Nurses for Healthy Environments

Courtney Carignan, PhD
Assistant Professor
Michigan State University

Robert Gould, MD
Adjunct Associate Professor, School of Medicine, University of California San Francisco
Past President, Physicians for Social Responsibility

Alycia Halladay, PhD
Adjunct Assistant Professor
Rutgers University

Kim Harley, MPH, PhD
Associate Director for Health Effects, Center for Environmental Research and Children's Health
University of California, Berkeley

Cheryl Holzmeyer, PhD
Postdoctoral Research Associate
Air Watch Bay Area

Maeve Howett, PhD, APRN, CPNP, IBCLC, CNE
Clinical Professor and Assistant Dean
University of Massachusetts Amherst

Diana J. Laird, PhD
Associate Professor, Department of Obstetrics, Gynecology & Reproductive Sciences
University of California, San Francisco

Michele Marcus, PhD, MPH
Professor of Epidemiology and Environmental Health, Rollins School of Public Health
Emory University

Rachel Morello-Frosch, PhD, MPH
Professor, School of Public Health, Department of Environmental Science, Policy and Management
University of California, Berkeley

Heather Patisaul, PhD
Professor of Biological Sciences
North Carolina State University

Melissa Pavelack, DO
Pediatric Resident
Advocate Children's Hospital

Joshua F. Robinson, PhD
Assistant Professor, Department of Obstetrics, Gynecology & Reproductive Sciences
University of California, San Francisco

Ted Schettler MD, MPH
Science Director
Science and Environmental Health Network

Patrice Sutton, MPH
Research Scientist
Program on Reproductive Health and the Environment
University of California, San Francisco

Frederick S. vom Saal, PhD
Curators' Distinguished Professor, Division of Biological Sciences
University of Missouri

Marya Zlatnik, MD, MMS
Professor, Maternal Fetal Medicine
University of California, San Francisco

*indicates organizational support

DETAILED COMMENTS

Collectively, as academic and clinical scientists, our goals include creating a healthier environment for human reproduction and development. We achieve this mission by advancing scientific inquiry, clinical care, and health policies and regulations that prevent exposures to harmful chemicals in our environment. This is particularly important during critical life stages, such as pregnancy or during child development, when exposures can have both acute and long-term impacts on individual health, some of which can persist through several generations.

The review of new chemicals and the totality of their uses prior to their entry on the market is an extremely critical opportunity for EPA to prevent potentially harmful exposures of chemicals to people in their homes, workplaces, indoor and outdoor environments. We have seen time and time again examples of chemicals used in household and workplace products and goods whereby thousands and millions of people are exposed, only to ultimately find that these chemicals are harmful to human development, reproduction, and general public health. The process for removing these chemicals from commerce is no simple feat. We are still exposed to and experience harmful health effects from known harmful chemicals like lead, asbestos, and polybrominated diphenyl ether flame retardants from their past and ongoing uses, and exposures are expected to continue for many decades. Therefore, mandates to prevent harmful exposures before they occur through the regulation of new chemicals are critical for EPA to act upon.

We strongly support efforts to improve EPA's New Chemical Review procedures as mandated by Lautenberg TSCA. Such improvements are urgently needed and long overdue, as previously, new chemicals entered the market without adequate review and some were later shown to be toxic, putting both vulnerable and susceptible populations at increased risk. As an example, as part of EPA's assessment of Tetrabromobenzoate (TBB), the Agency concluded in its "Data Needs Assessment" for the brominated phthalates flame retardants cluster in 2015 that TBB "may present an unreasonable risk," along with the identification of critical data gaps and uncertainties;² this same chemical was issued a consent order in 1996 where EPA found that it "may present an unreasonable risk of injury to human health and the environment."³ The San Antonio Statement⁴ also expressed concern about the toxicity of alternative flame retardants, such as TBB, and about exposure of the public and the environment to these compounds. Even so, this chemical was allowed in consumer products and TBB has proliferated to the point that it is now ubiquitous in dust and indoor environments.^{5,6} This highlights the importance and critical need for an effective New Chemicals Review process that thoroughly evaluates available data for new chemicals or requires test data when significant knowledge gaps exist to ensure the safety of chemicals before approving their use or manufacture in the marketplace.

In general, we are fully supportive of a more complete review under the Lautenberg mandates to TSCA that require EPA to make an affirmative finding regarding the chemical's safety ("not likely to present an unreasonable risk"), require test orders for chemicals with insufficient data, consider reasonably foreseen as well as intended uses, and consider susceptible and vulnerable subpopulations. This is required by the Lautenberg TSCA to support a review process that is more thorough and health protective. The end result will be an effective new chemical review process that is more public health protective and consistent with modern scientific principles. However, we have several critical concerns with the Agency's implementation of its framework to the New Chemicals Program that would likely reverse potential progress to date and take a

² U.S. Environmental Protection Agency. 2015. TSCA Work Plan Chemical Problem Formulation and Data Needs Assessment: Brominated Phthalates Cluster Flame Retardants. Available from: https://www.epa.gov/sites/production/files/2015-09/documents/brominated_phthalates_cluster_data_needs_assessment.pdf

³ U.S. Environmental Protection Agency. 2004. Regulation of a New Chemical Substance Pending Development of Information. Available from: https://chemview.epa.gov/oppt_chemical_search/proxy?filename=sanitized_consent_order_p_95_1128.pdf

⁴ DiGangi J, Blum A, Bergman Å, de Wit CA, Lucas D, Mortimer D, Schecter A, Scheringer M, Shaw SD, Webster TF. San Antonio statement on brominated and chlorinated flame retardants. Environmental health perspectives. 2010 Dec 1;118(12):A516-8.

⁵ Stapleton HM, Allen JG, Kelly SM, Konstantinov A, Klosterhaus S, Watkins D, McClean MD, Webster TF. Alternate and new brominated flame retardants detected in US house dust. Environmental science & technology. 2008 Jul 23;42(18):6910-6.

⁶ Peng H, Sun J, Saunders DM, Codling G, Wiseman S, Jones PD, Giesy JP. Hydroxylated 2-Ethylhexyl tetrabromobenzoate isomers in house dust and their agonistic potencies with several nuclear receptors. Environmental Pollution. 2017 Aug 31;227:578-86.

significant step backwards in protecting health and the environment, which is not permissible under the law.

We strongly recommend the Agency ensures that its implementation of changes to the New Chemicals Program aligns with the mandates outlined in the Lautenberg TSCA, thus supporting the Agency's overall duty to protect public health and prevent harmful exposures to environmental chemicals. In support of this, we make the following recommendations:

1. **EPA should place a halt on the implementation of its proposed framework for new chemicals review as presented at its December 6, 2017 public meeting until the Agency has reviewed and responded to all submitted public comments;**

EPA convened a public meeting on December 6, 2017 to obtain feedback on its proposed framework for new chemical review and has set a deadline of January 20, 2018 for submission of written comments. However, EPA indicated during the public meeting its intent to implement the proposed framework immediately, instead of waiting to receive and review public and stakeholder comments as would be consistent with the Administrative Procedures Act⁷. Several of the commenters at the public meeting raised critical concerns with the framework, highlighting its potential to weaken the required public health protectiveness of the program, counter to the legal requirements and modern scientific principles (as discussed in further detail in our Recommendation #3 below).

To proceed with implementation **prior** to allowing the public and stakeholders to review and provide comment on EPA's approach, particularly in light of the many questions and concerns raised at the public meeting, reflects an alarming indifference to public input and scientific principles. Moving forward with implementation of the framework without consideration of public comments raises serious concerns with EPA's commitment to transparency and meaningful public engagement.

2. **EPA should ensure increased transparency of the process that equally involves stakeholders from all groups, such as non-government organizations (NGOs), academics, members of the general community as well as tribal communities and representatives from environmental justice communities;**

At EPA's public meeting held on December 6, 2017, EPA revealed its efforts to share and pilot the implementation of its proposed Points to Consider Document with the American Chemistry Council, Dow Chemical, and other industry organizations (several of which remained anonymous). At this meeting, several commenters raised concern regarding the fact that the Points to Consider document was shared with industry stakeholders only initially. We are also concerned by this key document being revised according to input from a specific subset of stakeholders in a way that is not transparent. Not only does this grant the industry an opportunity to provide input on how EPA should be assessing and regulating the chemicals they produce for profit (when in fact this should be done by EPA according to its requirements under the law), but

⁷ Pub.L. 79-404, 60 Stat. 237, enacted June 11, 1946

it ignores critical input from other key stakeholders, such as the affected worker population and fence-line communities.

In response to these comments, EPA stated during the public meeting its intent to make the original Points to Consider document and redlined version with edits available to the public. However, to date the only version that has been uploaded to the EPA website is an “Overview of Comments Received on the Draft ‘Points to Consider’”⁸ document. This contradicts EPA’s statements during the public meeting, and this inadequately addresses our concerns with the transparency of the evolution of the Points to Consider document.

We strongly encourage EPA to release the original version of the Points to Consider document along with the redline version documenting all changes that were made in response to the comments received to ensure that other stakeholders have an opportunity to review these files and provide substantive comments that reflect the full history of the evolution of this document. This is essential to ensuring transparency and that these guidelines are not unduly and solely influenced by parties with conflicts of interest and profit motivation in its development. We recommend that in the future, EPA should make it a policy to not discriminately share documents and information with only a subset of stakeholders, and instead take appropriate action to ensure the broad sharing with all stakeholders—this includes the public posting of interim status of new chemical reviews and sharing of preliminary assessments.

Furthermore, we strongly encourage EPA to actively seek the participation and input of members from the public such as fence-line communities living near industries, processing plants, recycling facilities or Superfund sites; other concerned members from the public, such as susceptible or vulnerable populations; occupational workers or tribal communities. These members of the public will be the ones handling or using these chemicals and likely significantly impacted by their adverse health impacts and so we encourage EPA to take their concerns more seriously by actively seeking their participation and input in these processes and incorporate their concerns in its evaluations.

3. EPA should continue the process of issuing section 5(e) test orders in response to concerns with intended or reasonably foreseen conditions of use of a pre-manufacture notice (PMN) chemical and NOT rely on issuance of Significant New Use Rules (SNURs), which is not a lawful or adequately protective approach;

We are strongly opposed to the EPA’s proposed framework for new chemical review presented at its public meeting held on December 6, 2017. During this meeting, several of the commenters raised critical concerns with the framework, highlighting its potential to weaken the recent progress with the program for required public health protections. In particular, EPA is proposing to implement significant changes to the premanufacture notice (PMN) program by: (1) dismantling its longstanding review process and (2) replacing the required issue of section 5(e)⁹

⁸ U.S. Environmental Protection Agency. 2017. Overview of Comments Received on the Draft “Points to Consider” Document. Available from: https://www.epa.gov/sites/production/files/2017-11/documents/overview_of_comments_received_on_ptsc_document_-_11.09.17.pdf

⁹ 15 U.S.C. § 2604(e), referred to as section 5(e) throughout these comments

test orders in response to concerns with intended or reasonably foreseen conditions of use of a new chemical with the issue of Significant New Use Rules (SNURs).

The 2016 Lautenberg Amendments to TSCA were intended to strengthen the PMN program significantly, requiring EPA to make an affirmative safety finding (“not likely to present an unreasonable risk”¹⁰) for every new chemical prior to entering the marketplace (not merely a subset of a condition of use). EPA must issue an order under section 5(e) to restrict activities involving the chemical and/or require testing if there are any concerns raised during the PMN review period regarding the safety of a new chemical or a lack of sufficient information for an informed risk evaluation where EPA cannot make the determination that the chemical “is not likely to present an unreasonable risk” (including to workers, women or reproductive age, and other vulnerable populations). This is a mandated requirement under the law.

EPA’s proposal to address these concerns instead through the issue of a SNUR is inappropriate; allowing the production and manufacture of a chemical without determining with sufficient evidence that it is unlikely to harm the health or environment violates the Agency’s requirements for new chemical review under the Lautenberg TSCA. As stated in the law, when EPA determines that it lacks sufficient information to make a reasoned evaluation or the substance may present an unreasonable risk, “the Administrator shall issue an order” pursuant to section 5(e). In contrast, in section 5(f)(4)¹¹, the Lautenberg TSCA recognizes that the role of SNURs is to build on section 5(e) orders by extending their requirements to other manufactures and processors, not as a substitution to 5(e) test orders at the onset. As such, EPA’s proposed framework appears to be in violation of this mandated requirement under the Lautenberg TSCA.

We strongly urge EPA to immediately place a halt on the implementation of the new framework until it reviews and responds to public comments and evaluates whether the framework can be reconciled with the mandated requirements under the Lautenberg TSCA. If the Agency proceeds with the proposed framework, we have serious concerns that public health would not be adequately protected as required by law from risky new chemicals, especially susceptible populations.

4. EPA should clearly define what constitutes “adequate information” in the characterization of both hazard and exposure and incorporate definitions that have been established by other government bodies;

The EPA New Chemicals Decision-Making Framework document outlines the working approach to making determinations under Section 5 of TSCA:

Reaching an understanding of what constitutes a reasoned evaluation is central to making sound and transparent determinations. A reasoned risk-based evaluation will generally include adequate information to characterize both hazard and exposure, with an ability to shape those characterizations into

¹⁰ 15 U.S.C. § 2604(a)

¹¹ 15 U.S.C. § 2604(f)

*a quantitative or robust qualitative characterization of risk.*¹²

We recommend that EPA clearly define what constitutes “adequate information” for characterizing both hazard and exposure. EPA’s definition should be informed by, and consistent with, established approaches of other agencies such as the National Toxicology Program (NTP),¹³ the International Agency for Research on Cancer (IARC),¹⁴ and EPA’s own guidelines including the Cancer Guidelines¹⁵. These guidelines clearly define what constitutes the determination of no hazard, such as the requirement for multiple concurring lines of evidence from different species in experimental and/or observational scientific studies.

As an example, in EPA’s Cancer Guidelines the Agency outlines several observations that add significance to tumor findings in informing potential for human carcinogenicity, including “uncommon tumor types; tumors at multiple sites; tumors by more than one route of administration; tumors in multiple species, strains, or both sexes;...; unusual magnitude of tumor response; proportion of malignant tumors; and dose-related increases.”¹⁵ Establishing a clear, defined approach ensures clarity and consistency regarding the level of evidence required for making the determination of no hazard. In keeping with current scientific principles, EPA should use these guidance documents in the development of its definition to determine the quality, level, and source of “adequate information” to make sound and transparent determinations regarding risk.

EPA should also use this opportunity to update their chemical assessment methods and approaches to incorporate modern scientific knowledge gained in the past several decades. Modern methods and approaches have been recommended in detail by the National Academy of Sciences (NAS) in several landmark publications, *Science and Decisions*, *Phthalates and Cumulative Risk*, and *Review of EPA’s Integrated Risk Information System (IRIS) Process*.^{16,17,18} These approaches have been developed and promoted by leading clinical and scientific communities, including health professionals and academics in the U.S. and around the world. These publications compile a wealth of expertise and the most current state of the science that can be specifically and efficiently integrated into EPA’s chemical assessment. These practices, where appropriate, should be incorporated in the evaluation of EPA’s New Chemicals Review process—for instance, treating cancer and non-cancer health endpoints in a scientifically equivalent manner (not assuming a “threshold” response for non-cancer outcomes unless strong scientific evidence exists to demonstrate that it exists), assessing aggregate and cumulative risks to ensure hazard assessments adequately reflect the reality of people’s exposures, and using

¹² U.S. Environmental Protection Agency. 2017. New Chemicals Decision-Making Framework: Working Approach to Making Determinations under Section 5 of TSCA. Available from: https://www.epa.gov/sites/production/files/2017-11/documents/new_chemicals_decision_framework_7_november_2017.pdf

¹³ National Toxicology Program, Office of Health Assessment and Translation. 2015. Handbook for Conducting a Literature-Based Health Assessment Using OHAT Approach for Systematic Review and Evidence Integration. Available from: https://ntp.niehs.nih.gov/ntp/ohat/pubs/handbookjan2015_508.pdf

¹⁴ IARC (International Agency for Research on Cancer). 2006. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Preamble. Available: <http://monographs.iarc.fr/ENG/Preamble/index.php>

¹⁵ U.S. Environmental Protection Agency, 2005. Guidelines for Carcinogen Risk Assessment. Available from: https://www.epa.gov/sites/production/files/2013-09/documents/cancer_guidelines_final_3-25-05.pdf

¹⁶ National Research Council. *Science and Decisions: Advancing Risk Assessment*. Committee on Improving Risk Analysis Approaches Used by the U.S. EPA, Board on Environmental Studies and Toxicology, and Division on Earth and Life Studies. 2009. Washington, D.C. National Academies Press.

¹⁷ National Research Council. *Phthalates and Cumulative Risk Assessment: the Task Ahead*. 2008. Washington, D.C. National Academies Press.

¹⁸ National Research Council. *Review of EPA’s Integrated Risk Information System (IRIS) Process*. 2014. Washington, D.C. National Academies Press.

science-based defaults as recommended by the NAS to incorporate factors that reflect the range of variability and susceptibility in the population to ensure risks are not underestimated.

5. EPA should incorporate a broader consideration of what constitutes “reasonably foreseen” conditions of use beyond what is stated in the manufacture submission, including engineering controls and other worker protections, to ensure that the public is protected from potential future exposures to these chemicals that may not be disclosed initially within the PMN;

The EPA New Chemicals Decision-Making Framework document outlines the working approach to making determinations under Section 5 of TSCA:

In general, EPA considers the intended conditions of use to be the circumstances around manufacture, processing, distribution in commerce, use, or disposal as stated in the submission, original or amended. Such circumstances include engineering controls and other worker protections described in the submission.¹⁹

We disagree with this approach and strongly recommend EPA incorporate a broader consideration of the intended conditions of use than what is stated in the PMN submission. Manufacturers have a commercial incentive to minimize the conditions of use at the time of submission and decades of history support that market conditions expand the use of chemicals. Simply accepting the claims of intended conditions of use stated in the manufacturer’s PMN submission leaves the possibility of failing to account for reasonable foreseeable uses and potential exposures that might occur under additional circumstances that may likely occur in manufacturing, processing, or distribution. For instance, failing to account for potential domestic exposures of asbestos (e.g., washing of worker overalls or children’s exposure from their parent’s work clothes) has led to mesothelioma deaths in the families of exposed asbestos workers.²⁰ Failure to account for these potential exposures has serious and long-lasting implications for a broader set of populations who will not be adequately protected from adverse health effects.

When evaluating new chemicals, we strongly encourage EPA to take into consideration **all** potential and feasible conditions of use and **not** exclude exposure routes because it is assumed there are exposure controls in place. These controls are not guaranteed and may change in the future, so to assume zero exposure via these routes would be inappropriate and a failure to adequately ensure public health protection.

EPA must forecast reasonably foreseen conditions of use that more accurately reflect opportunities for public exposure to these chemicals, failure of which would lead to greater exposures that potentially invalidates EPA’s determination of “not likely to present unreasonable risk.” To make this determination, as mandated by Lautenberg TSCA, the Agency must base this on sufficient information to establish that there is not unreasonable risk of injury to health or the

¹⁹ U.S. Environmental Protection Agency. 2017. New Chemicals Decision-Making Framework: Working Approach to Making Determinations under Section 5 of TSCA. Available from: https://www.epa.gov/sites/production/files/2017-11/documents/new_chemicals_decision_framework_7_november_2017.pdf

²⁰ Gee D, MacGarvin M, Stirling A, Keys J, Wynne B, Vaz SG. Late lessons from early warnings: the precautionary principle 1896-2000. Harremoës P, editor. Luxembourg: Office for Official Publications of the European Communities; 2001 Jan 1.

environment of all circumstances under which a chemical substance is intended, known or reasonably foreseen to be manufactured, processed, distributed in commerce, used or disposed of. EPA must aggregate these conditions of use for a chemical, as required by law. Dividing conditions of use or failing to consider all reasonably foreseeable conditions of use underestimates the exposure and risk; this is not in keeping with modern scientific principles.²¹ We strongly encourage EPA to incorporate a broader consideration of the intended conditions of use than what is stated in the PMN submission to more accurately reflect opportunities for public exposure to these chemicals.

Furthermore, EPA should always account for scenarios where personal protective equipment may not be used, fails, or is not used as specified. It is incorrect to assume that engineering controls and other worker protections will always be in place or that personal protective equipment and other occupational safeguards will always be available and used correctly. As a recent example, there have been at least thirteen investigated bathtub fatalities associated with use of methylene chloride stripping agents where protective equipment, including a respirator, either was not used or was inadequate to protect against methylene chloride vapor.²² Studies have similarly repeatedly documented low personal protection compliance in the workplace.^{23,24,25,26} Furthermore, this places a higher burden on people with less education, lower income, and less advanced literary skills, who will be at the highest risk for misusing products.^{27,28} These individuals also disproportionately bear the burden of exposures to multiple environmental hazards and the resulting health impacts; thereby placing further burden on this already stressed susceptible subpopulation.^{29,30,31,32} These subpopulations may experience higher rates of adverse health effects due to higher rates of pre-existing chronic conditions such as asthma, obesity, diabetes, and cardiovascular disease.^{33,34} These vulnerabilities coincide with social stressors such as poverty, poor housing, reduced access to nutritious foods and health care,

²¹ National Research Council. *Science and Decisions: Advancing Risk Assessment*. Committee on Improving Risk Analysis Approaches Used by the U.S. EPA, Board on Environmental Studies and Toxicology, and Division on Earth and Life Studies. 2009. Washington, D.C. National Academies Press.

²² Morbidity and Mortality Weekly Report (MMWR). 2012. Fatal Exposure to Methylene Chloride Among Bathtub Refinishers—United States, 2000-2011. Available from: <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6107a2.htm>

²³ MacFarlane E, Chapman A, Benke G, Meaklim J, Sim M, McNeil J. Training and other predictors of personal protective equipment use in Australian grain farmers using pesticides. *Occupational and environmental medicine*. 2008 Feb 1;65(2):141-6.

²⁴ Reynolds SJ, Tadevosyan A, Fuortes L, Merchant JA, Stromquist AM, Burmeister LF, Taylor C, Kelly KM. Keokuk County rural health study: self-reported use of agricultural chemicals and protective equipment. *Journal of agromedicine*. 2008 Apr 18;12(3):45-55.

²⁵ Perry MJ, Marbella A, Layde PM. Compliance with required pesticide-specific protective equipment use. *American journal of industrial medicine*. 2002 Jan 1;41(1):70-3.

²⁶ Strong LL, Thompson B, Koepsell TD, Meischke H. Factors associated with pesticide safety practices in farmworkers. *American journal of industrial medicine*. 2008 Jan 1;51(1):69-81.

²⁷ U.S. Environmental Protection Agency. 2016. "The Effectiveness of Labeling on Hazardous Chemicals and Other Products." Office of Chemical Safety and Pollution Prevention. RIN 2079-AK07.

²⁸ Hadden SG. Regulating product risks through consumer information. *Journal of Social Issues*. 1991 Apr 1;47(1):93-105.

²⁹ Brulle RJ, Pellow DN. Environmental justice: human health and environmental inequalities. *Annu. Rev. Public Health*. 2006 Apr 21;27:103-24.

³⁰ Morello-Frosch R, Zuk M, Jerrett M, Shamasunder B, Kyle AD. Understanding the cumulative impacts of inequalities in environmental health: implications for policy. *Health affairs*. 2011 May 1;30(5):879-87.

³¹ Payne-Sturges D, Gee GC, Crowder K, Hurley BJ, Lee C, Morello-Frosch R, Rosenbaum A, Schulz A, Wells C, Woodruff T, Zenick H. Workshop Summary: Connecting social and environmental factors to measure and track environmental health disparities. *Environmental research*. 2006 Oct 31;102(2):146-53.

³² Vesterinen HM, Morello-Frosch R, Sen S, Zeise L, Woodruff TJ. Cumulative effects of prenatal-exposure to exogenous chemicals and psychosocial stress on fetal growth: Systematic-review of the human and animal evidence. *PLoS one*. 2017 Jul 12;12(7):e0176331.

³³ Kannan S, Misra DP, Dvonch JT, Krishnakumar A. Exposures to airborne particulate matter and adverse perinatal outcomes: a biologically plausible mechanistic framework for exploring potential. *Ciencia & saude coletiva*. 2007 Dec;12(6):1591-602.

³⁴ Wasilevich EA, Lyon-Callo S, Rafferty A, Dombkowski K. "Detroit - The Epicenter of Asthma Burden". *Epidemiology of Asthma in Michigan*. Bureau of Epidemiology, Michigan Department of Community Health, 2008.

and psychosocial stress, which further exacerbate adverse effects from environmental exposures such as air pollution.^{35,36}

6. EPA should ensure that exposures do not result in unreasonable risks to the general population by higher standards for allowable uncertainty to make the determination of “not likely to present unreasonable risk” as compared to “presents unreasonable risk”;

The EPA New Chemicals Decision-Making Framework document outlines the working approach to making determinations under Section 5 of TSCA:

While under section 5 both “presents” and “not likely” determinations must be made through a reasoned evaluation, the wording of “present unreasonable risk” is less equivocal than “not likely to present unreasonable risk.” This suggests that the level of uncertainty in a reasoned evaluation to inform a “not likely” determination could be greater than that in an evaluation to inform a “presents” determination.³⁷

We interpret this statement to mean that EPA is willing to allow for more uncertainty to exist when making the determination that something is “not likely to present unreasonable risk” as opposed to the level of uncertainty required to make the determination of “presents unreasonable risk.” We strongly disagree with this approach. Lautenberg TSCA requires that EPA now make an affirmative determination for new chemicals to enter the market. The determination of “not likely to present unreasonable risk” equates to a decision that the chemical is safe and presents minimal risk to the general population, as well as susceptible and vulnerable populations. This “not likely” determination will likely lead to subsequent resulting exposures to these populations.

Therefore, we recommend that EPA require a higher bar of evidence for making a determination of “not likely to present unreasonable risk” compared to the determination of “presents unreasonable risk,” in light of these consequences resulting from the former determination. To reduce uncertainties and to determine the level evidence required to make such determinations, EPA should incorporate newer scientific principles, as we outline below in Recommendation #9.

Furthermore, in the event of existing uncertainty EPA should use its authority to require section 5(e) test orders for new chemicals which lack sufficient information for EPA to make its determination. It is an inappropriate strategy to simply accept a higher level of uncertainty in making the determination of “not likely to present unreasonable risk” in lieu of utilizing EPA’s mandated test order authority to require data to minimize such uncertainties. Without such, EPA

³⁵ Bower KM, Thorpe RJ, Rohde C, Gaskin DJ. The intersection of neighborhood racial segregation, poverty, and urbanicity and its impact on food store availability in the United States. *Preventive medicine*. 2014 Jan 31;58:33-9.

³⁶ Kannan S, Dvonch JT, Schulz AJ, Israel BA, Mentz G, House J, Max P, Reyes AG. Exposure to fine particulate matter and acute effects on blood pressure: effect modification by measures of obesity and location. *Journal of Epidemiology & Community Health*. 2010 Jan 1;64(01):68-74.

³⁷ U.S. Environmental Protection Agency. 2017. New Chemicals Decision-Making Framework: Working Approach to Making Determinations under Section 5 of TSCA. Available from: https://www.epa.gov/sites/production/files/2017-11/documents/new_chemicals_decision_framework_7_november_2017.pdf

will not be able to ensure that the health of the general population, as well as susceptible and vulnerable populations, is adequately protected.

7. EPA should ensure consideration of all potential vulnerable and susceptible populations and developmental time periods and include or issue test orders for reproductive and developmental toxicity outcomes;

EPA is now mandated by Lautenberg TSCA to specifically consider and protect against risks for susceptible or vulnerable populations. We are fully supportive of this new provision, and encourage EPA to consider for every new chemical review: (1) occupational exposures that are often at much higher levels than the general public, both acutely and chronically and can be concurrent with other chemical exposures at the workplace;³⁸ (2) fence-line communities who also face multiple exposures to multiple chemicals and suffer from many chronic health conditions and disparities;^{39,40,41,42} (3) sensitive time periods during life, such as preconception, pregnancy, and during childhood;⁴³ and (4) variability in human responses.⁴⁴ These evaluations should be clear and transparent, and focus on protecting the health of those who are most vulnerable or susceptible.

Furthermore, we strongly encourage EPA to take advantage of its authority to use test orders for new chemicals which lack information regarding reproductive and developmental toxicity outcomes. Without such, it will be impossible for EPA to ensure that the health of susceptible and vulnerable populations is adequately protected.

8. EPA should adopt the approach that absence of data does not equate to lack of hazard; EPA should use its test authority to collect sufficient data for determining human health risks;

Limited or no data is a common obstacle that limits EPA's ability to evaluate the potential risk, particularly for new chemicals entering the marketplace. Under the old TSCA law, existence of no data was essentially treated as if there was no safety concern and many chemicals have entered commerce with little to no information regarding toxicity. However, there is no shortage of examples of chemicals lacking initial safety data that were later shown to be hazardous to human health—unfortunately, often times after people were already exposed and impacted adversely. This illustrates the important fact that **absence of data does not equate to lack of**

³⁸ Hines CJ, Jackson MV, Deddens JA, Clark JC, Ye XY, Christianson AL, Meadows JW, Calafat AM. *Urinary Bisphenol A (BPA) Concentrations among Workers in Industries that Manufacture and Use BPA in the USA*. *Annals of Work Exposures and Health*. 2017. DOI: <https://doi.org/10.1093/annweh/wxx021>

³⁹ Brulle RJ, Pellow DN. Environmental justice: human health and environmental inequalities. *Annu. Rev. Public Health*. 2006 Apr 21;27:103-24.

⁴⁰ Morello-Frosch R, Zuk M, Jerrett M, Shamasunder B, Kyle AD. Understanding the cumulative impacts of inequalities in environmental health: implications for policy. *Health affairs*. 2011 May 1;30(5):879-87.

⁴¹ Payne-Sturges D, Gee GC, Crowder K, Hurley BJ, Lee C, Morello-Frosch R, Rosenbaum A, Schulz A, Wells C, Woodruff T, Zenick H. Workshop Summary: Connecting social and environmental factors to measure and track environmental health disparities. *Environmental research*. 2006 Oct 31;102(2):146-53.

⁴² Vesterinen HM, Morello-Frosch R, Sen S, Zeise L, Woodruff TJ. Cumulative effects of prenatal-exposure to exogenous chemicals and psychosocial stress on fetal growth: Systematic-review of the human and animal evidence. *PLoS one*. 2017 Jul 12;12(7):e0176331.

⁴³ U.S. Environmental Protection Agency. 2013. *America's Children and the Environment (ACE)*, Third Edition. Available from: <https://www.epa.gov/ace>

⁴⁴ National Research Council. *Science and Decisions: Advancing Risk Assessment*. Committee on Improving Risk Analysis Approaches Used by the U.S. EPA, Board on Environmental Studies and Toxicology, and Division on Earth and Life Studies. 2009. Washington, D.C. National Academies Press.

hazard or risk. The only appropriate interpretation of a data void is that the hazard and risks are unknown, and when this is the case EPA should explicitly specify how it plans to address these data voids and obtain the data needed to make scientifically-based decisions.

In situations where data are lacking, EPA should proactively outline existing data gaps and explicitly state where data are most needed so as to facilitate the external development and design of studies that will generate these data in a timely manner. This is consistent with other programs such as California and European programs. Timely generation of health and toxicity data for new chemicals is critical for ensuring that those posing a risk to human health are prohibited from entering the market. Furthermore, EPA should also utilize their authority to require testing of chemicals and issue orders requiring testing for new chemicals. These test orders should outline the most relevant test models, exposure pathways, health outcomes, and target populations (including any vulnerable or sensitive populations) anticipated to support the generation of high-quality and relevant evidence to support timely decision-making. A potential approach to this includes developing “completeness metrics”—a list of physical characteristics, health endpoints, subpopulations, etc. deemed important to assess, then track how many of these could be assessed based on the available data and provide a public summary characterizing the “completeness of the database” for each chemical. EPA has adopted similar approaches in the past, for instance using published criteria to evaluate the data adequacy in its brominated phthalates Data Needs Assessment.⁴⁵

As required by law, EPA should only approve a new chemical if there is sufficient evidence to conclude that the chemical does not pose an unreasonable risk, including to highly exposed, susceptible, or vulnerable populations. Furthermore, we encourage EPA to explore all potential routes of exposure, including considering chemical fates and transformations in the environment and the human body, such as degradants and metabolites. Because chemical uses can change over time, hazard information should also be weighed more heavily than exposure information. When scientific information indicates that a chemical has a high potential for hazard, this should be sufficient for EPA to take action. The resulting decision should not rely heavily on exposure estimates, as future exposure to the chemical may very well change as a result of changes in how, where, and how much of the chemical is used in products and manufactured.

9. EPA should incorporate modern scientific methods and approaches.

EPA’s “Draft Points to Consider” document (November 9, 2017) discusses quantitative human health risk assessment methods, but only highlights points of departure (POD) such as no observed adverse effect level (NOAEL), lowest observed adverse effect level (LOAEL) or benchmark dose lower bound (BMDL) and their use in the Margin of Exposure approach (MOEs). Otherwise, if a POD is not available, EPA suggests that a qualitative risk finding may be made. We disagree that these are the only two approaches for assessing human health risk.

⁴⁵ U.S. Environmental Protection Agency. 2015. TSCA Work Plan Chemical Problem Formulation and Data Needs Assessment: Brominated Phthalates Cluster Flame Retardants. Available from: https://www.epa.gov/sites/production/files/2015-09/documents/brominated_phthalates_cluster_data_needs_assessment.pdf

The TSCA amendments provide an opportunity for EPA to update their chemical assessment methods and approaches to incorporate modern scientific knowledge gained in the past several decades. As discussed earlier in Recommendation #4, modern methods and approaches are recommended and discussed in detail by the NAS in several landmark publications, *Science and Decisions*, *Phthalates and Cumulative Risk*, and *Review of EPA's Integrated Risk Information System (IRIS) Process*.^{46,47,48} Further, these methods and approaches have already been developed and evaluated, by U.S. government agencies like NTP⁴⁹ and the European Union in its implementation of REACH [See: http://ec.europa.eu/environment/chemicals/reach/reach_en.htm]. EPA should utilize this existing knowledge and practice and not have to reinvent the wheel, but instead immediately begin incorporating these best practices and lessons learned from other government bodies. This will maximize efficiency and expedite the implementation process, allowing EPA to focus on other aspects of chemical assessment that warrant further attention.

Of particular note, EPA should not use MOE approaches, as these are simply the POD (e.g., LOAELs, NOAELs or BMDLs) divided by exposure values and compared to a combination of the uncertainty factors. The MOE is not an actual estimate of risk, as it does not provide any information about the potential risk at various exposure estimates. Rather, it is another version of the “bright line” approach similar to the Reference Dose (RfD), which the NAS recommended moving away from.⁴⁵ Furthermore, the EPA cannot conduct a benefits analysis using solely the MOE because there is no accompanying dose-response information. We strongly advise against representing the MOE as an estimate of risk and encourage EPA to incorporate the discussion of alternative available analytical methods to develop quantified estimates of risk that can be of use to both risk managers and decision-makers within its “Points to Consider” document.

We are very appreciative for the opportunity to provide public input and we are looking forward to continuing to participate in such opportunities in the near future. Please do not hesitate to contact us with any questions regarding these comments.

⁴⁶ National Research Council, *Science and Decisions: Advancing Risk Assessment*, ed. Committee on Improving Risk Analysis Approaches Used by the U.S. EPA, Board on Environmental Studies and Toxicology, and Division on Earth and Life Studies. 2009, Washington, D.C.: National Academies Press.

⁴⁷ National Research Council, *Phthalates and cumulative risk assessment: the task ahead*. 2008, Washington, D.C.: National Academies Press.

⁴⁸ National Research Council, *Review of EPA's Integrated Risk Information System (IRIS) Process*. 2014, National Academies Press: Washington, DC.

⁴⁹ National Toxicology Program, *Handbook for Conducting a Literature-Based Health Assessment Using OHAT Approach for Systematic Review and Evidence Integration*, U.S. Department of Health and Human Services, Editor. 2015, Office of Health Assessment and Translation, Division of National Toxicology Program, National Institute of Environmental Health Sciences.