Congressional Testimony before the House Energy and Commerce Subcommittee on Environment, Manufacturing, and Critical Materials

Tracey J. Woodruff, PhD
UC San Francisco Professor and Director, Program on Reproductive Health and the Environment and Environmental Research and Translation for Health (EaRTH) Center

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SUMMARY

Harmful chemicals take a measurable toll on people's health. Exposure to environmental chemicals linked to increased risk of cancer, infertility, low birthweight, asthma, neurological disease, heart disease, kidney problems, and adverse impacts on children's development.[1,2,3]

Environmental regulations have cleaned the environment while the economy has grown. Environmental regulations led to a decrease in 6 different air pollutants by 78% while at the same time ***our GDP increased 304%***.[5]

Environmental regulations are innovation generators – resulting in new businesses, new jobs, and new products that are safer for consumers, workers, and communities.

Health benefits of environmental regulations. The OMB reported that between 2007 to 2016, the annual benefits to the American public of major rules issued by EPA were estimated to range from $194 billion to $687 bill per year (in 2015 dollars).[8]

Americans want safe products. In a nationwide public opinion survey conducted by Lake Research Partners last year, 92% of voters said they agree that the federal government should require products be proven safe before companies are allowed to put them on the market.

TSCA and its importance to Public's Health Congress updated TSCA in 2016 because the law was recognized as inadequate, and they wanted to ensure EPA did a better job of protecting health. EPA needs to use the best and most up-to-date scientific methods to conduct chemical risk evaluations, quantify real-world risks, and protect health.

EPA must use the best available science to protect health When communities are protected, that reduces health care costs, school and work absences, and improves worker productivity, which strengthens our economy.

Ethylene oxide In 2016, after careful analysis, extensive external peer review, and public comment, EPA concluded that inhalation of ethylene oxide is "carcinogenic to humans." EPA now has an opportunity to take a significant step toward reducing exposures to EtO.

PFAS PFAS contaminate many drinking water supplies across the US and PFAS are found in everyone. PFAS increases risk of multiple health problems including kidney cancer, cardiovascular related effects, immune system damage, and decreased fetal growth. EPA proposed drinking water standard for 6 PFAS would provide health benefits as high as $2 billion annually. And more needs to be done to address the over 12,000 PFAS in the market.

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Chairwoman McMorris Rodgers, Chairman Johnson, and Ranking Members Pallone and Tonko, thank you for the opportunity to testify. I am a professor in the Obstetrics, Gynecological, and Reproductive Sciences Department in the School of Medicine at the University of California San Francisco or UCSF. I am also director of the UCSF Program on Reproductive Health and the Environment and the EaRTH Center. We conduct research to understand how industrial chemicals and environmental pollutants impact people's health.

Harmful chemicals take a measurable toll on people's health.

We know that environmental chemical pollution – including harmful chemicals that people are exposed to everyday from breathing air, eating food, drinking water, and using household products – takes a measurable toll on people's health. Because toxic chemicals are so widespread in our environment, these exposures begin during pregnancy and continue after birth and throughout life. Depending on the chemical or pollutant, health impacts include increased risk of cancer, infertility, low birthweight, asthma, neurological disease, heart disease, kidney problems, and a host of adverse impacts on children's development.[1,2,3] This by no means is an exhaustive list.

Environmental regulations came about from necessity. Before the Environmental Protection Agency (EPA) was established and environmental laws including the Clean Air Act and the Clean Water Act were enacted, toxic waste and chemicals were quite literally dumped into our air and

[1] ACOG Committee Opinion No 575. (2013). Exposure to toxic environmental agents. *Fertil Steril, 100*(4), 931-934. doi:10.1016/j.fertnstert.2013.08.043

[2] Diamanti-Kandarakis, E., Bourguignon, J. P., Giudice, L. C., Hauser, R., Prins, G. S., Soto, A. M., . . . Gore, A. C. (2009). Endocrine-disrupting chemicals: an Endocrine Society scientific statement. *Endocr Rev, 30*(4), 293-342. doi:10.1210/er.2009-0002

[3] US Environmental Protection Agency. (2011). Benefits and Costs of the Clean Air Act Amendments 1990-2020, the Second Prospective Study. Availble: https://www.epa.gov/clean-air-act-overview/benefits-and-costs-clean-air-act-1990-2020-second-prospective-study

water unchecked. Just look at a picture of major cities like New York or Pittsburgh before and after the 1970s.[4] The difference is stark.

Environmental regulations have cleaned the environment while the economy has grown.

Here is the great news. Environmental regulations and a clean environment are not only good for people's health, but also the economy. Environmental regulations led to a 78% decrease in 6 different air pollutants ($PM_{2.5}$ and PM_{10}, SO_2, NO_x, VOCs, CO and Pb) while at the same time ***our GDP increased 304%,*** which shows that a healthy environment and a healthy economy go hand in hand.[5] This success is due to both environmental regulations and American innovators who developed technological advances to make this possible – whether developing cars that are less polluting and more energy efficient or finding ways to reduce the amount of toxic chemicals released by polluting factories.

Environmental regulations are innovation generators – resulting in new businesses, new jobs, and new products that are safer for consumers, workers, and communities. For example, after it was discovered formaldehyde was harming people exposed in trailers sheltering people who lost their homes in Katrina, the EPA regulated formaldehyde in pressed wood products[6] and the manufacturing of pressed wood products without formaldehyde has increased as a result. The soy-based adhesive industry, which has a number of manufacturers based in the US, is predicted to grow almost 8% a year in terms of revenue over the next decade, largely replacing petrochemical-based adhesives as a more environmentally-friendly alternative.[7] This growth would result in economic boons for domestic soybean farmers and could foster a "renewable and reliable" supply within the United States.[8]

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[4] See Attached Infographic: EPA and the Economy.

[5] US Environmental Protection Agency. (2011). Benefits and Costs of the Clean Air Act Amendments 1990-2020, the Second Prospective Study. Availble: https://www.epa.gov/clean-air-act-overview/benefits-and-costs-clean-air-act-1990-2020-second-prospective-study

[6] 15 U.S.C.§2697

[7] Grand View Market Research. Wood Adhesives Market Size, Share & Trends Analysis Report By Product (Urea-formaldehyde, Soy-based), By Application (Flooring, Furniture), By Substrate, By Region, And Segment Forecasts, 2023 – 2030. Available: https://www.grandviewresearch.com/industry-analysis/wood-adhesives-market

[8] (2020, May 13). *Performance and Sustainability: Soy-Based Adhesives and Sealants Excel in Wide-Ranging Applications*. ASI Adhesives & Sealants Industry. Retrieved October 17, 2023, from https://www.adhesivesmag.com/articles/97755-performance-and-sustainability-soy-based-adhesives-and-sealants-excel-in-wide-ranging-applications

Health benefits of environmental regulations

In addition to jobs and safer products, environmental regulations can lead to enormous societal benefits from reductions in health conditions like asthma, heart disease, cancer, and more. For example, EPA's revision of the annual air quality standard for fine particulate matter last done in 2013 is estimated to provide health benefits to the American public of $4 billion to $9 billion every year.[9] The Office of Management and Budget reported that over a 10-year span – fiscal years 2007 to 2016 – the annual benefits to the American public of major rules issued by EPA were estimated to range from $194 billion to $687 billion per year, as reported in 2015 dollars. Virtually all of these benefits were from the reduction of health risks due to lowered pollutant emissions driven by EPA regulations.[10] And these benefits were many times the estimated costs of roughly $50 billion per year.

Americans want safe products

In addition to clean air and water, environmental regulations also lead to safer consumer products, which is what Americans want. In a nationwide public opinion survey conducted by Lake Research Partners last year, the overwhelming majority of respondents – including Republicans, Democrats, and Independents – say they want companies and the government to ensure that products are safe BEFORE they are put on the market. In fact, 92% of voters agree that the federal government should require products be proven safe before companies are allowed to put them on the market and 93% agree it is important for companies to keep harmful chemicals out of everyday products – even if it increases the cost of those products.

The majority of survey respondents also think that chemical regulations are not strong enough and they hold manufacturers and the federal government most responsible for ensuring that products and chemicals are safe. The survey also showed widespread support for the goal of the Toxic Substances Control Act or TSCA.

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[9] 78 FR 3086

[10] Office of Management and Budget. *2017 Report to Congress on the Benefits and Costs of Federal Regulations and Agency Compliance with the Unfunded Mandates Reform Act*. Table 1-1. https://www.whitehouse.gov/wp-content/uploads/2019/12/2019-CATS-5885-REV_DOC-2017Cost_BenefitReport11_18_2019.docx.pdf. Note: annual benefits estimate reported in 2015 dollars.

TSCA and its importance to American's Health

TSCA is the law that governs the manufacturing, use, and distribution, and disposal of most chemicals in commerce in the United States. The law gives EPA the authority to evaluate chemicals for health risks, to manage those risks, and to issue regulations designed to protect people from harm. This is important as, while there has been great progress on some environmental pollutants, people continue to be exposed to a cocktail of toxic chemicals in food, water, personal care products, homes, communities, and workplaces that put our health at risk, particularly for groups who are more susceptible to harm from chemical exposures like young children and communities in proximity to clusters of polluting facilities.[11,1213] Congress updated TSCA in 2016 because the law was recognized as inadequate. For example, EPA was struggling to ban extremely dangerous substances like cancer-causing asbestos. Among the goals of the new law was to ensure that EPA did a better job of protecting the health of vulnerable populations like pregnant women, children, and workers from harmful chemicals and make sure that chemical risk determinations were made without considering the cost to the regulated community.

EPA must use the best available science to protect health

The updated law also required EPA to select 10 existing chemicals to work on first, and my organization has been closely monitoring EPA's risk assessments for each of these chemicals. We have urged EPA to use the best and most up-to-date scientific methods to conduct chemical risk evaluations, quantify real-world risks, and protect health. For example, in 2019, after much review and public pressure, EPA banned the deadly chemical methylene chloride from consumer paint stripping products, but left commercial use in place, which continues to leave workers at risk. It is important that EPA finalize the strongest rule possible to protect workers

[11] Buckley, J. P., Kuiper, J. R., Bennett, D. H., Barrett, E. S., Bastain, T., Breton, C. V., Chinthakindi, S., Dunlop, A. L., Farzan, S. F., Herbstman, J. B., Karagas, M. R., Marsit, C. J., Meeker, J. D., Morello-Frosch, R., O'Connor, T. G., Romano, M. E., Schantz, S., Schmidt, R. J., Watkins, D. J., Zhu, H., … Woodruff, T. J. (2022). Exposure to Contemporary and Emerging Chemicals in Commerce among Pregnant Women in the United States: The Environmental influences on Child Health Outcome (ECHO) Program. Environmental science & technology, 56(10), 6560–6573. https://doi.org/10.1021/acs.est.1c08942

[12] Woodruff, T. J., Zota, A. R., & Schwartz, J. M. (2011). Environmental chemicals in pregnant women in the United States: NHANES 2003-2004. Environmental health perspectives, 119(6), 878–885. https://doi.org/10.1289/ehp.1002727

[13] US Centers for Disease Control and Prevention. National Report on Human Exposure to Environmental Chemicals. Available: https://www.cdc.gov/exposurereport/index.html

and communities from high risks of cancer and liver disease, as well as death from paint stripping applications. This type of regulation would promote improved health of workers as well as community residents who live near where these chemicals are being released. When workers and communities are protected, that reduces health care costs, school and work absences, leads to more productive workers and improved life outcomes for exposed children - all of which strengthen our economy.

Regulating 6 PFAS in drinking water out of potentially thousands

Under the Safe Drinking Water Act, EPA took steps this year to regulate 6 PFAS, short for per- and poly-fluorinated substances also known as "forever chemicals," which represent a class of more than twelve thousand chemicals used in cookware (Teflon), clothing, rain gear, firefighting foam, and many other uses. The National Academy of Sciences, Engineering and Medicine have identified that PFAS can increase the risk of a host of serious and irreversible health problems including kidney cancer, cardiovascular related effects, damages to the immune system, and decreased fetal growth.[14] Other associated health effects include pregnancy-induced hypertension[15], breast cancer[16], thyroid disease,[17] and liver injury in children that is linked non-alcoholic fatty liver disease,[18] a disease that now affects 1 in 10 children in the United States.[19] But because our system to regulate harmful chemicals like PFAS allows companies to put products in the marketplace before ensuring they are safe, we are seeing large scale contamination of PFAS in drinking water around the country and the world.

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[14] National Academies of Sciences, Engineering, and Medicine. 2022. Guidance on PFAS Exposure, Testing, and Clinical Follow-Up. Washington, DC: The National Academies Press. https://doi.org/10.17226/26156.

[15] Preston EV, Hivert MF, Fleisch AF, Calafat AM, Sagiv SK, Perng W, Rifas-Shiman SL, Chavarro JE, Oken E, Zota AR, James-Todd T. Early-pregnancy plasma per- and polyfluoroalkyl substance (PFAS) concentrations and hypertensive disorders of pregnancy in the Project Viva cohort. Environ Int. 2022 Jul;165:107335. doi: 10.1016/j.envint.2022.107335. Epub 2022 Jun 6. PMID: 35696844; PMCID: PMC9348856.

[16] Cathey, A.L., Nguyen, V.K., Colacino, J.A. et al. Exploratory profiles of phenols, parabens, and per- and poly-fluoroalkyl substances among NHANES study participants in association with previous cancer diagnoses. J Expo Sci Environ Epidemiol 33, 687–698 (2023). https://doi.org/10.1038/s41370-023-00601-6

[17] Derakhshan, A., Kortenkamp, A., Shu, H., Broeren, M. A. C., Lindh, C. H., Peeters, R. P., Bornehag, C. G., Demeneix, B., & Korevaar, T. I. M. (2022). Association of per- and polyfluoroalkyl substances with thyroid homeostasis during pregnancy in the SELMA study. Environment international, 167, 107420. https://doi.org/10.1016/j.envint.2022.107420

[18] Midya, V., Colicino, E., Conti, D. V., Berhane, K., Garcia, E., Stratakis, N., Andrusaityte, S.,Basagaña, X., Casas, M., Fossati, S., Gražuleviciene, R., Haug, L. S., Heude, B., Maitre, L., McEachan, R., Papadopoulou, E., Roumeliotaki, T., Philippat, C., Thomsen, C., Urquiza, J., …Valvi, D. (2022). Association of Prenatal Exposure to Endocrine-Disrupting Chemicals With Liver Injury in Children. JAMA network open, 5(7), e2220176. https://doi.org/10.1001/jamanetworkopen.2022.20176;

[19] Yu, E. L., & Schwimmer, J. B. (2021). Epidemiology of Pediatric Nonalcoholic Fatty Liver Disease. Clinical liver disease, 17(3), 196–199. https://doi.org/10.1002/cld.1027.

PFAS are often referred to as "forever chemicals" because they do not breakdown easily and they accumulate in both our bodies and the environment. In our recent studies, we found PFAS in 96-100% of pregnant woman we tested.[20] A 2020 Environmental Working Group study identified PFAS contamination in the drinking water supplies for more than 200 million people living in the United States,[21] and PFAS contamination has devastated communities in New Hampshire, New York, North Carolina, Ohio, and more. Our concern is that EPA is regulating only 6 PFAS in drinking water when there are now over twelve thousand chemicals identified in the class.

I am one among hundreds of scientists who have urged EPA to regulate PFAS as a class of chemicals rather than one at a time. This would be a more efficient and effective way of regulating and protecting people from their associated health harms.[22] That said, EPA's proposed rule to control only 6 PFAS in drinking water would provide health benefits as high as $2 billion (central estimate: $1.2 billion) every year and represents an important step forward in addressing the health risks of forever chemicals.[23]

Ethylene oxide

Under the Clean Air Act, EPA is proposing to update its regulation of ethylene oxide (EtO), which is used to sterilize medical equipment. In 2016, after careful analysis, extensive external peer review, and public comment, EPA concluded that inhalation of ethylene oxide is "carcinogenic to humans." Studies have also found that ethylene oxide is associated with increased risk of neurological, respiratory, and reproductive harm.[24,25] Multiple communities across the U.S. are exposed to dangerous levels of ethylene oxide, and recent reports have found that similar to

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[20] Padula, A. M., Ning, X., Bakre, S., Barrett, E. S., Bastain, T., Bennett, D. H., Bloom, M. S., Breton, C. V., Dunlop, A. L., Eick, S. M., Ferrara, A., Fleisch, A., Geiger, S., Goin, D. E., Kannan, K., Karagas, M. R., Korrick, S., Meeker, J. D., Morello-Frosch, R., O'Connor, T. G., … program collaborators for Environmental influences on Child Health Outcomes (2023). Birth Outcomes in Relation to Prenatal Exposure to Per- and Polyfluoroalkyl Substances and Stress in the Environmental Influences on Child Health Outcomes (ECHO) Program. *Environmental health perspectives*, *131*(3), 37006. https://doi.org/10.1289/EHP10723

[21] Andrews, D.Q., Naidenko, O.V. (2020). Population-Wide Exposure to Per- and Polyfluoroalkyl Substances from Drinking Water in the United States. *Environmental Science & Technology Letters* 7 (12), 931-936. DOI: 10.1021/acs.estlett.0c00713

[22] Maffini, M. V., Rayasam, S. D. G., Axelrad, D. A., Birnbaum, L. S., Cooper, C., Franjevic, S., MacRoy, P. M., Nachman, K. E., Patisaul, H. B., Rodgers, K. M., Rossi, M. S., Schettler, T., Solomon, G. M., & Woodruff, T. J. (2023). Advancing the science on chemical classes. *Environmental health : a global access science source*, *21*(Suppl 1), 120. https://doi.org/10.1186/s12940-022-00919-y

[23] U.S. EPA. PFAS National Primary Drinking Water Regulation Rulemaking. March 29, 2023. 88 FR 18638. Table 66.

[24] Toxicological Profile for Ethylene Oxide. Atlanta (GA): Agency for Toxic Substances and Disease Registry (US); 2022 Aug. Chapter 2, Health Effects. Available from: https://www.ncbi.nlm.nih.gov/books/NBK589511/

[25] USC Environmental Health Centers. (2023). Infographic: Ethylene Oxide. Available: https://envhealthcenters.usc.edu/2023/01/new-infographic-ethylene-oxide.html

many of polluting industries, these facilities often operate in and around low-income communities and communities of color.[26] EPA now has an opportunity to take a significant step toward reducing exposures to cancer-causing EtO.

I know you have witnesses here today representing industries concerned about the regulation of EtO and other chemicals. It is important to hear from all affected stakeholders, however, it is also integral that we health and environmental regulations used independent scientific analysis free of financial conflicts of interest (COI), or a strong bias toward the perspective of regulated industries that may have a vested interest in minimizing EPA's regulation of hazardous materials and products. Research, and more specifically systematic reviews which are a highly rigorous type of research, have established an association between financial conflicts of interest and recommendations or research outcomes that favor the interests of the industry providing financial support. [27,28,29] I encourage you to read our recent paper, The Devil They Knew, which analyzes internal industry documents from PFAS manufacturers and shows that the industry knew about PFAS health harms decades before the public.[30] This analysis is a small example of our work to make transparent that financial interests can trump public health interests, undermine scientific integrity, and block health-protective chemical regulations. It also demonstrates why it is essential to have a strong EPA and a strong chemical regulatory process to help protect people and communities from the impacts of harmful chemicals, which, in turn, ensures a strong economy.

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[26] Union of Concerned Scientists. (2023). Invisible Threat, Inequitable Impact. Available: https://www.ucsusa.org/resources/invisible-threat-inequitable-impact; https://blog.ucsusa.org/dminovi/ethylene-oxide-interactive-map/

[27] Nejstgaard CH, Bero L, Hróbjartsson A, et al. Association between conflicts of interest and favourable recommendations in clinical guidelines, advisory committee reports, opinion pieces, and narrative reviews: systematic review. BMJ2020;371:m4234.pmid:33298430

[28] Coyne DW. Influence of industry on renal guideline development. Clin J Am Soc Nephrol2007;2:3-7, discussion 13-4. doi:10.2215/CJN.02170606 pmid:17699377

[29] Lundh A, Lexchin J, Mintzes B, Schroll JB, Bero L. Industry sponsorship and research outcome. Cochrane Database Syst Rev2017;2:MR000033.pmid:28207928

[30] Gaber, N., Bero, L., & Woodruff, T. J. (2023). The Devil they Knew: Chemical Documents Analysis of Industry Influence on PFAS Science. *Annals of global health*, *89*(1), 37. https://doi.org/10.5334/aogh.4013