

Valerie G. Zartarian, PhD
2024 Presidential Rank Award Nominee

The U.S. Environmental Protection Agency's Office of Research and Development (ORD) nominates Dr. Valerie Zartarian for the prestigious Presidential Rank Award. In addition to her remarkable achievements as an ORD exposure scientist with >60 publications over her career (10 since 2015) on a wide array of environmental public health topics, Dr. Zartarian has excelled as a Senior Research Physical Scientist since being appointed as an executive level Scientific and Professional (ST) in 2015. She exemplifies commitment to public health service by providing impactful research and timely, responsive technical assistance to address environmental public health challenges with creative solutions. Dr. Zartarian led the development and application of innovative exposure models, geospatial mapping approaches, and decision-support tools to identify disproportionately impacted populations and reduce public health risk disparities, with a focus on reducing lead (Pb) exposures in the U.S. and internationally. Dr. Zartarian has consistently strategically leveraged expertise and resources to support decision-making and address Agency priorities. The results of her distinguished career spanning nearly three decades have had significant impact on protecting public health and the environment.

Results of Dr. Zartarian's outstanding achievements as an ST include: advanced exposure science to improve human health risk assessments for multiple environmental issues; initiated EPA climate adaptation research and co-chaired a federal interagency workgroup; led research and technical assistance to identify and address U.S. lead exposure risk hotspots; led state-of-science modeling of children's lead exposures that informed U.S. government regulatory actions; strategically coordinated and aligned EPA Pb research with the Federal Lead Action Plan; and led tools and built partnerships to address lead exposures internationally. Specific examples include:

- **Exposure Science Results to Assess Risks from Multiple Environmental Issues:** Dr. Zartarian led and published research on tribal exposures to methyl mercury; Flint, MI, lead data mapping; a PFAS chemicals literature review and exposure database; exposure analyses for the first school health impact assessment; the modeling chapter of EPA's Guidelines for Human Exposure Assessment; and the activity component for the federal turf field tire crumbs exposure characterization study.
- **Climate Resiliency Results and Interagency Leadership:** Dr. Zartarian built partnerships and communicated climate resiliency needs and results within EPA and with external stakeholders; co-chaired a federal interagency workgroup; and presented at a White House/CEQ climate equity event. She produced flood-vulnerability maps used by Lawrence, MA to inform their comprehensive water strategy, and presented generalizable methods that can be applied in other communities.
- **Lead Exposure Mapping and Interagency Blueprint to Address High Risk Locations:** Dr. Zartarian led, published, and communicated an innovative data mapping approach and a "blueprint" to identify and address U.S. lead exposure risk hotspots, that is informing targeted lead exposure interventions and building capacity by EPA, HUD, and state health departments. Her work in this area (see epa.gov/lead/mapping) is responsive to EPA's Lead Strategy and the Federal Lead Action Plan.
- **Modeling of Children's Lead Exposures to Support National Rulemakings and Policy:** Dr. Zartarian led, published, and implemented the Stochastic Human Exposure and Dose Simulation model for Lead (SHEDS-Pb), used and cited as the basis of children's benefits analyses for EPA's updated national standards for lead in drinking water and dust, and HUD's updated soil lead action level. Her publications were also used more broadly, e.g., by universities and the Minnesota legislature.
- **International Partnerships and Tools to Address Lead Poisoning:** Dr. Zartarian established and co-chaired the cross-US government agencies International Lead Exposure Workgroup under the President's Task Force on Environmental Health Risks and Safety Risks to Children. This interagency coordination mechanism laid the groundwork for the EPA-USAID lead work MOU and the global Partnership for a Lead-Free Future launched at the UN General Assembly. Dr. Zartarian initiated and presented (USG, G7, NGOs, Africa, World Bank) a lead toolkit for low/middle-income countries, being used by UNICEF, USAID, and their missions.
- **Executive Leadership to Protect Public Health:** Dr. Zartarian served in numerous leadership roles, influencing human exposure science implementation. These include: EPA Senior Advisor to Office of Children's Health Protection director; EPA Science-Policy Liaison for US-International Lead Efforts for the Office of International Affairs; President's Task Force on Environmental Health Risks and Safety Risks to Children, Lead Subcommittee, EPA co-chair for International and Mapping working groups; and EPA co-chair for the Environmental Justice Interagency Working Group Climate Impacts Subcommittee.
- **Lead Action Plans and Research Strategy Coordination:** Dr. Zartarian strategically coordinated and leveraged EPA/ORD's Pb research across multiple national research programs and aligned it with the 2018 Federal Lead Action Plan and 2022 EPA Lead Strategy, both of which she co-authored. She presented on ORD's Pb science to EPA's Science Advisory Board and EPA's Children's Health Protection Advisory Committee, and organized and co-led a federal Pb research workshop.

Serving in numerous leadership roles, Dr. Zartarian spearheaded and coordinated successful research projects, built vital interagency partnerships, advanced and applied decision-support science, and delivered responsive technical assistance results, e.g. to address Pb exposures at local, state, national, and global scales. She provides peer-reviewed, published science and widespread delivery of scientific solutions that are impactful to domestic and international research and policy programs. Dr. Zartarian led and organized EPA and interagency workshops and "whole of government" conversations, partnered with EPA, HUD, CDC/ATSDR, and state agencies, presented extensively at external scientific peer reviews and conferences, and represented EPA on interagency technical workgroups in the U.S. and internationally.

As a world-renowned expert and highly respected scientist, Dr. Zartarian's accomplishments, awards, and invited presentations, and widespread use of her peer-reviewed, published science are evidence that her expertise is heavily relied upon. Recognitions since 2015 include 4 EPA Gold Medals for Exceptional Service; an EPA Bronze Medal; 2 EPA Exceptional Technical Assistance awards; and an Environmental Justice award. Dr. Zartarian holds a Ph.D. and M.S. in environmental engineering and science from Stanford University, and a B.S. from Princeton University in civil engineering and water resources.

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The U.S. Environmental Protection Agency's Office of Research and Development (ORD) nominates Dr. Valerie Zartarian for the prestigious Presidential Rank Award. In addition to her remarkable career achievements as an exposure scientist on a wide array of environmental public health topics, Dr. Zartarian has excelled as a Senior Research Physical Scientist since being appointed as an executive level Scientific and Professional (ST) in 2015. She is nationally and internationally recognized as an authority in the field of exposure science; particularly, lead exposures to vulnerable populations and has meaningfully advanced the science in this field.

1. PROGRAM RESULTS: Dr. Zartarian has delivered impactful research and responsive technical assistance to address priority environmental public health challenges with creative solutions. She led the development and application of innovative exposure models, geospatial mapping approaches, and decision-support tools. She strategically leveraged expertise and resources to inform stakeholder decisions and address Agency priorities.

Advanced Exposure Science to Improve Human Health Risk Assessments for Multiple Environmental Issues:

Understanding how humans are exposed to chemicals is challenging and critical to assess health risks and inform decisions. Dr. Zartarian produced exposure science results to address some of the most critical chemical exposure issues facing communities across the nation: modeled tribal exposures to methyl mercury from fish consumption (2015 paper); mapped lead exposures in Flint, MI, (2016); developed a PFAS chemicals exposure database (2018); completed an exposure analysis for the first school health impact assessment to prioritize renovation actions (2015 EPA report); led the modeling chapter of EPA's updated 2019 Guidelines for Human Exposure Assessment; and produced activity questionnaires and a videography plan (2016) for the federal tire crumbs (turf) exposure study. Collectively these actions led to broader and improved scientific understanding of chemical exposures nationwide, allowing for informed risk management decisions and actions.

Delivered Impactful Climate Resiliency Results and Co-Chaired Climate Impacts Subcommittee of the Federal Interagency Environmental Justice Working Group:

As part of White House actions to protect communities from health impacts of climate change, Dr. Zartarian was invited by EPA to serve as co-chair of the federal interagency climate justice subcommittee from 2015-16. She established broad partnerships and provided deliverables to CEQ responding to HHS-identified needs. For EPA's "Making a Visible Difference" project in Lawrence, MA she worked with Region 1 to produce vulnerability maps used by the city to inform their comprehensive water strategy (e.g., place water quality monitors in the Merrimack River to protect public health from recreational use bacterial exposures). Dr. Zartarian provided relevant science expertise and tools to address community priorities, integrating science and approaches to mapping, modeling, and resiliency planning to address water-related public health issues; and provided outputs to Lawrence stakeholders that can be modified/applied in other communities with similar issues.

Led Lead (Pb) Exposure Mapping and Interagency Blueprint to Address U.S. High Lead Exposure Locations: While average U.S. blood lead levels have declined in recent decades, millions of children and adults are still at risk to serious health impacts from various sources of lead exposure (e.g., paint, soil, drinking water, air). Limited data on lead sources and blood lead levels across the country make it challenging to identify communities with disproportionate exposures. The Federal Lead Action Plan and EPA Lead Strategy call for a coordinated science-based approach to identify communities at risk and improve their health outcomes. Dr. Zartarian spearheaded a project across federal, state, and local agencies, advancing the science and our abilities to identify high lead exposure locations across the U.S. She led a productive research team, managed extramural resources, leveraged in-house expertise, and collaborated with partners in EPA regions and offices, HUD, CDC, ATSDR, and state health departments. The team applied innovative analytical methods, using existing data on children's blood lead levels, housing age, socio-demographics, and the environment to

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generate the first of its kind statistical lead exposure hotspot maps. Dr. Zartarian responded to technical assistance requests from 7 EPA regional offices (maps for 25 states); delivered results for EPA Lead Strategy performance metrics; and produced an analytic “blueprint” to aid states and others in prioritizing lead mitigation and prevention actions. She engaged and collaborated with partners in federal, state, and local agencies to implement the approach and showcase the benefits of its use, building capacity across the public health practice community. She first-authored a 2022 federal lead mapping state-of-the-science overview paper and a 2024 “U.S. Lead Exposure Hotspots Analysis”; the latter and the interagency science-based blueprint she leads were highlighted in a 2024 White House fact sheet for continuing the agencies’ commitment to advancing whole of government efforts focusing lead actions in disproportionately impacted locations. Currently she is leading an invited paper for the Environmental Justice journal, with examples of successful blueprint implementation and mapping to inform government decisions. Most importantly, EPA program offices are using these published maps to more effectively target resources and lead exposure interventions under the agency’s drinking water programs (e.g., prioritizing lead service line replacements and technical assistance) and lead-based paint programs (e.g., outreach and investigations). HUD is using them to inform community grants efforts. EPA regions and state partners (MI, WV, TN, others) are using them to help prioritize locations for prevention/intervention activities and increase blood lead testing surveillance.

Led State-of-Science Modeling of Children’s Lead Exposures to Inform U.S. Government Regulatory Actions:

Understanding children’s exposure to lead from multiple sources, i.e., the impact of different scenarios on blood lead levels, is a critical piece of the economic and benefits analyses conducted to support EPA regulations. Assessing lead exposure is complex and challenging, as it needs to account for variability in environmental media concentrations, exposure factors, and population activity patterns. In 2016, EPA’s Office of Water sought Dr. Zartarian’s technical assistance to inform a health-based benchmark for lead in drinking water. Responsive to this critical agency need, she developed, led, and implemented EPA’s Stochastic Human Exposure and Dose Simulation model for Lead (SHEDS-Pb). That model underwent external peer review in 2017 as part of a Highly Influential Scientific Assessment. Dr. Zartarian published three papers on this work and responded to 2021-22 assistance requests from EPA’s Office of Chemical Safety and Pollution Prevention and HUD. Her results provided the scientific basis of benefits analyses for EPA’s updated national standards for lead in drinking water and dust, and HUD’s national soil lead action level update. EPA’s Lead & Copper Rule is expected to prevent up to 200,000 IQ points lost in children, among other benefits. EPA’s Dust-Lead Hazard Standards updates are expected to reduce the lead exposures of up to nearly 1.2 million people every year.

Spearheaded International Partnerships and Tools to Address Lead Exposures: One in two children in low- and middle-income countries (LMICs) have high blood lead levels that pose risks of neurological, cognitive, and physical damage, and death (UNICEF). A World Bank study estimated that in 2019, lead exposure caused 5.5 million adult deaths from cardiovascular diseases and had a global cost of US\$6 trillion, with most of the impact in LMICs. In 2023-2024, Dr. Zartarian served as the EPA Science-Policy Liaison for US-International Lead Efforts, supporting EPA’s Office of International Affairs. She established and co-chaired the International Lead Exposure Workgroup with 8 agencies, under the President’s Task Force on Environmental Health Risks and Safety Risks to Children. This U.S. lead coordination mechanism was mentioned in the 2023 White House lead fact sheet and laid the groundwork for the EPA-USAID lead work Memorandum of Understanding and the USAID-led Partnership for a Lead-Free Future (launched at the 9/24 UN General Assembly). Dr. Zartarian co-initiated with UNICEF a toolkit for LMICs, pulling together a cross-agencies team to leverage expertise and broadly communicate the effort. Based on her work with EPA and U.S. lead strategies, she developed an action-focused logic model for low- and middle-income countries that was featured in international lead discussions (e.g., 2023 G7 lead technical workshop) and is being used by USAID and their missions. She also strategically brought forth lead in drinking water as a priority source consideration for international lead discussions.

2. STATURE IN PROFESSIONAL FIELD: Dr. Zartarian is consistently recognized nationally and internationally as a leader and authority in the field of exposure science; particularly, lead exposures to vulnerable populations. She has influenced

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scientific and decision-making communities in government, academia, and NGOs and is regularly sought as an advisor and consultant on technical matters of critical public health importance.

Invited Expertise and Engagement with the Scientific Community in the U.S. and Internationally:

Dr. Zartarian's expertise is recognized by the scientific community via the numerous requests for engagement in working groups and invitations to present her work. Requestors include scientific advisory boards (i.e., 2019 EPA's Children's Health Protection Advisory Committee, and Centers for Disease Control and Prevention (CDC) Lead Exposure Prevention Advisory Committee), interagency committees and workgroups (i.e., 2024 President's Task Force on Children's Environmental Health Risks and Safety Risks), and state and local agencies (i.e., Environmental Council of the States, and National Association of City and County Health Officials). Her expertise is also recognized outside of the U.S. She was invited to present to the Advancing the Pace of Chemical Risk Assessments workgroup (2017); the United Nations Environment Program's 2024 "Consultations in Africa region towards a coordinated, multi-sectoral lead management approach" and the 2024 Center for Global Development Lead workgroup roundtable on source apportionment modeling. These domestic and international engagements led to stronger interagency lead collaborations in the U.S. on lead mapping and modeling to inform decisions, and to high level coordination efforts to address lead poisoning globally.

Published Highly Cited and High Impact Journal Papers:

Dr. Zartarian has led and coauthored >60 peer-reviewed published works in her career; since 2015, 10 papers with >260 citations. These presentations describe exposure science for PFAS, methyl mercury and lead. She developed four publications on advancing the science and capacity building for identifying U.S. high lead exposure locations (see epa.gov/lead/mapping) and these approaches are now being used by federal and state partners across the country. In 2017, she published "Children's Lead Exposure: A Multimedia Modeling Analysis to Guide Public Health Decision-Making" in the high impact journal of Environmental Health Perspectives. EPA's Office of Water used the results from this publication and cited it in their Lead and Copper Rule technical support documents as the basis for economic benefits analyses. Its broader impact is demonstrated by the number of citations (122) and downloads from the journal (~10,000). The model described in the publication was also used by academia (e.g., Johns Hopkins course) to show students how to conduct lead exposure modeling. Lastly, the Minnesota Department of Health's Assistant Commissioner Dan Huff presented the results of this publication to the Minnesota Legislature's Health and Finance Policy Committee and Senate's Health and Human Services Committee to provide context for bills introduced into the legislature, emphasizing that reducing lead exposure from water presents an opportunity to reduce the overall amount of exposure for a large portion of the population.

Dr. Zartarian coauthored the "Modeled Impacts of Drinking Water Pb Reduction Scenarios on Children's Exposures and Blood Lead Levels" paper (2020), which provided additional results to inform the technical support documents that served as the basis for economic benefits analyses for the Lead and Copper rule. EPA's Office of Chemical Safety and Pollution Prevention used the model described in her 2023 journal publication "Children's Lead Exposure in the U.S.: Application of a National-Scale, Probabilistic Aggregate Model with a Focus on Residential Soil and Dust Lead (Pb) Scenarios" in the technical support document for EPA's rule that lowered the national dust-lead hazard standards under the Toxics Substances Control Act. In addition, HUD is using the results from this publication to update their soil lead action level. Dr. Zartarian's publications produced results identifying lead exposure hotspots and estimates of children's blood lead levels for various exposure scenarios used directly in federal agencies' decision-making for widespread benefits to public health.

Executive Leadership to Guide Actions Related to Exposure Reductions: Dr. Zartarian served in numerous influential leadership roles where she facilitated the implementation of exposure mapping and modeling research. She served as the EPA Science-Policy Liaison for US-International Lead Efforts (EPA Office of International Affairs; part-time 2023-2024) where she initiated and co-chaired the U.S. International Lead Exposure Workgroup, then served as senior advisor to the

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EPA Office of Children’s Health Protection director (part-time, 2024-present) leading high-stakes dialogue to define and implement programs pertaining to priority areas of the President’s Task Force on Environmental Health Risks and Safety Risks to Children. She presented on behalf of EPA to state and local health agencies at CDC’s annual Childhood Lead Poisoning Prevention Program grantees meeting, on the importance of blood lead data and EPA’s Lead Action Plan, including data integration mapping and pilots, to help prioritize investments in lead mitigation activities. These pilots are underway and are demonstrating the benefit of the research.

Strategically Coordinated and Aligned EPA Lead (Pb) Science with the Federal Lead Action Plan: Lead is a widespread neurotoxin that can cause serious irreversible health effects in children and adults. There is no safe level of lead exposure, and many data gaps and research needs remain to solve this critical problem. In 2017, Dr. Zartarian identified the need and strategic opportunity to coordinate and leverage EPA’s Pb research efforts across national research programs for greater impact to support agency decisions. She proposed her vision to senior leadership, who appointed her as ORD’s first Executive Lead for Pb. In this role, she served as the EPA Co-Chair for the 2018 Federal Lead Action Plan Goal 4 Writing Team, under the purview of the President’s Task Force on Environmental Health Risks and Safety Risks to Children. Dr. Zartarian aligned ORD’s Pb science with this plan and presented the systems approach to address the goal, presenting these to EPA’s Science Advisory Board and Children’s Health Protection Advisory Committee. This included organizing a Federal Lead Research Workshop which informed the 2024 five-year update to Federal Lead Action Plan. She also served as coauthor of the 2022 EPA Lead Strategy and coordinated research with the strategy goals. Internal to EPA she led Pb mapping and modeling research coordination workshops. These coordinated efforts ensured that the latest science supported rule-making, e.g. the Lead and Copper rule, and EPA actions, e.g., EPA’s Local Lead Action Plan Guide which provides resources, science translation, and best practices to inform lead reduction actions.

Providing Leadership on Climate Justice Research: Dr. Zartarian co-chaired the Climate Impacts Subcommittee of the Federal Interagency Environmental Justice (EJ) Working Group and gathered feedback on deliverables at the White House/CEQ Champions of Change Climate Equity Event (2016). She pioneered research on the mapping of climate impacts and EJ, and presented in multiple venues a national map of flood zones, vulnerable communities, and contaminated sites. She then spearheaded incorporation of climate adaptation research at EPA as a cross-cutting research priority within the Office of Research and Development.

Major honors, awards, and recognitions since 2015: Dr. Zartarian has received major honors and awards that demonstrate exceptional service and breadth of her contributions to human exposure science and environmental public health protection:

- EPA Gold Medal nomination for EPA Lead Strategy team (2022)
- EPA Gold Medal for Region 1 Lead Compliance Action Team (2021)
- EPA Gold Medal for Drinking Water Lead Action Plan Team (2019)
- EPA Gold Medal for Federal Action Plan to Reduce Childhood Lead Exposures Team (2018)
- EPA Bronze Medal for Region 5 Regional Lead Strategy Team (2020)
- EPA Exceptional Technical Assistance awards for supporting lead work in EPA’s Office of Chemical Safety and Pollution Prevention and Office of Water (two awards in 2020)
- EPA New England Environmental Justice award for building a sustainable community coalition (2016)