Concept Clearance

Branch: Population Health Branch

Council Period: June 2019

Concept Title: "Research to Action: Assessing and Addressing Community Exposures to Environmental Contaminants"

Introduction

We are proposing the renewal of the Research to Action (R2A) program. The R2A program promotes and advances academic-community partnerships to address environmental health concerns of diverse communities and to ensure authentic community participation in research leading to public health actions. The program has evolved from an R21 solicitation (RFA, 2008) to two iterations of an R01 solicitation (PA, 2012 and 2016) that requires the environmental health problem and development of research questions be informed by community members or organizations. All projects must demonstrate an established community-university collaboration, utilize multidisciplinary teams to address the many interacting factors contributing to environmental health risks, and disseminate findings and conduct public health actions that are culturally appropriate for the communities and subpopulations involved in the research.

Background information: Environmental threats such as the rapidly increasing number of fracking operations in the US and the numerous communities who have discovered lead, PFAS and other types of chemical or metal contamination in local water sources, suggest that continued and well-publicized exposure to toxic substances will remain a major public health issue (Denham et al, 2019; Rappazzo et al, 2017; Boronow et al. 2019). This will be true not only for those at the lowest socioeconomic status and for specific ethnic and racial subpopulations but for entire communities or regions. GenX and other chemicals released into local North Carolina rivers, for example represents an indiscriminate exposure that has affected many diverse communities and populations in the State. The media attention to this environmental disaster and to other natural and manmade disasters in the US has greatly increased public interest in environmental health research which the Research to Action program is poised to help address.

However, environmental risks continue to disproportionately affect certain ethnic and racial subpopulations. These environmental health disparities, which cannot be fully explained by socio-cultural or behavioral factors, persist throughout the United States. In Ohio, for example, a recent study showed that Class II wells that receive fracking wastewater are disproportionately situated in lower-income and rural communities, areas with the greatest social vulnerability (Kunkel, 2019). And in areas such as Appalachia, public health studies have focused primarily on the known impacts of coal mining to the general population but have not fully explored the contributions of socioeconomic status, built environment, and food deserts, personal exposure, and other sources of air, water and soil pollution, thus limiting the ability to identify causal relationships between environmental and social conditions and public health (Krometis et al., 2017). Research in air pollution worldwide has likewise revealed the disproportionate effects on certain subgroups defined by sociodemographics (race/ethnicity, age, sex and socioeconomic status [SES]), geographic location (rural vs. urban), comorbid conditions and economic conditions, all factors which contribute to the adverse cardiovascular effects of exposure to ambient air pollution (Tibuakuu et al., 2018).

The Research to Action program is therefore targeted to addressing not just environmental threats but environmental health disparities. Since the 1990s, numerous studies have demonstrated the ongoing health disparities experienced by African-Americans, particularly those living in inner cities – this awareness of disparities was coupled with a growing awareness of the role of social determinants of health (SDOH). And recent studies by NIEHS funded investigators are confirming that environmental health disparities in exposures to drinking water contaminants (e.g. nitrates) are related to race and ethnicity (Schaider et al., 2019) or to air pollution exposures from the built environment, goods movements or proximity to major roadways (Burwell et al, 2017; Wilson et al, 2015). Although genetics can account for some of the disparities (Daya and Barnes, 2019), other known causes of these disparities include multiple and chronic environmental exposures, and SDOHs e.g., socioeconomic status, the built environment, population density, noise and violence and access to nutritious affordable food. Many low SES populations experience these disparities however, studies have also shown that racial discrimination, and even perceived racial discrimination, is a potent stressor that has been linked to psychosocial stress and poor physical health (Baraja et al, 2019), adding yet another factor to heightened risks for disease among African-Americans. Several of the R2A projects have been addressing the multiple exposures and social conditions that inner city African-Americans (AA) experience over time. In one of these studies, the effects of unregulated metal recycling on air quality in low SES neighborhoods in Houston is being explored. In another R2A study the PI has coupled with local AA community leaders, academic investigators and public health practice partners in research that is culminating in the development and implementation of a public health action plan that reduces exposure to air pollutants, specifically sources of PM2.5 and mitigates the adverse health effects of such exposures.

Another particularly vulnerable subpopulation are immigrants. Environmental health disparities remain high among Latinx (a gender-neutral version of Latino or Latina) groups migrating to the US to work in farming, industry and domestic cleaning jobs as these occupations are often the most harmful in terms of environmental exposures. Research to Action projects and other NIEHS funded research among farmworkers has shown the consistently negative impacts of pesticide exposure among workers (Stein et al., 2016; Arcury et al., 2018) as well as their family members (Vidi et al., 2017). And, a recently funded R2A study is exploring ways to mitigate the multiple chemical exposures domestic cleaners typically experience in their jobs.

Although, many ethnic and racial subpopulations in the US experience disproportionate exposures to environmental risks, Native Americans remain among the most vulnerable of populations (Abbasi, 2018; Kunitz et al., 2014). Twenty-five percent of Superfund sites have been identified on tribal lands; climate change is rapidly damaging indigenous inhabited ecosystems in the Arctic, Gulf of Mexico and American Southwest among other regions; and increased resource extraction in proximity to tribal communities continues to expose these populations to ongoing and multiple exposures that threaten health (Byrne et al., 2018; McOliver et al, 2015). Native Americans living near abandoned uranium mines, for example, have an increased likelihood for kidney disease and hypertension, and for developing multiple chronic diseases linked to their proximity to the mine waste (Lewis et al., 2017).

The Research to Action program, with its requirement to engage with local community members and organizations, is thus uniquely poised to not only address environmental exposures affecting health, but to doing so in a culturally appropriate manner for specific racial/ethnic subpopulations, as well as for low SES, rural remote or inner-city communities.

We believe that the R2A program exemplifies the importance of community involvement in environmental health research and will continue to reach the most vulnerable subpopulations and address some of the more severe environmental health disparities in the US. The program additionally represents a validated approach for sustaining public health actions in vulnerable communities and for raising the environmental health literacy of affected community members (as well as stimulating interest in students in STEM topics).

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Research Goals and Scope

The research goals and scope remain the same as the previous Program Announcements.

The two main objectives are:
1) to conduct research to collect and characterize information about environmental health concerns of significance to a community and
2) to develop and implement a strategy to translate and disseminate research findings to community members, public health professionals and/or policymakers to support an action that will ultimately promote the reduction of exposure and reduce the health impact from environmental stressors.

To meet these stated objectives, applicants should propose Community Engaged Research (CEnR) projects that incorporate three elements - research, community engagement and public health action. Evaluation is an optional element.

Mechanism and Justification

Due to recent changes in NIH policy about Program Announcements, we are requesting consideration of an annual Request for Applications (RFA) for the Research to Action (R2A) program.

Through an annual receipt date, the program will continue to provide flexibility to respond to emerging concerns and may also stimulate interest in new communities to build capacity to address their local concerns

We are proposing an R01 mechanism for this RFA and a timeline as follows:

Jun 2019	Present program concept to NAEHS Council
Sep 2019	Publish FOAs
Nov 2019	Receipt of applications
Spring 2020	Reviews
Sep 2020	Present program plan to NAEHS Council
Late Fall (FY2021)	Awards

- **Mechanism:** R01
- **FOA:** RFA issued for 3 years
- **Anticipated number of awards:** 5-6
- **Total cost for program:**
  - $500,000 per award for 5 years
  - $3 million total annually