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low-income communities of color. Such a framework will encourage the development of research that will increase understanding of social and physical environmental exposures, their unequal distribution across economic and racial/ethnic groups, as well as a more comprehensive understanding of the mechanisms through which they influence health disparities. Evidence-based interventions and policy change to mitigate and prevent, reduce and eventually eliminate these exposures should incorporate attention to the role of social and economic processes that contribute to disparate environmental exposures that lead to disparate health outcomes. Such a framework can guide research that examines and develops an evidence base for policy and programmatic interventions to reduce disparities in social and physical environmental exposures that contribute to health disparities. Topics that we suggest as priorities focus on the intersection of social and built environments for health, and could include, for example: 1) understanding the cumulative impact of neighborhood social and built environments on health outcomes (e.g., independent and joint contributions of crime and pollution to walkability of neighborhoods and related health outcomes); 2) socioeconomic conditions and economic restructuring and their implications for neighborhood stability and siting of polluting land uses (e.g., oil refineries); 3) impact of air quality on physical activity, obesity and cardiovascular disease; 4) the effects of community and policy interventions (e.g., community mobilizing, policy change, green economic development) on environmental conditions and health disparities; 5) economic, social and political processes that shape environmental justice issues (e.g., social and political processes that contribute to disproportionate siting of noxious land uses in low income communities of color); and 6) social and economic impact of environmental pollutants and their cumulative implications for health disparities. Such initiatives could extend or build upon past NIEHS initiatives that explicitly examine the interface of socioeconomic and racial disparities, and the social and physical environments, such as Centers for Population Health and Health Disparities, Environmental Justice: Partnerships for Communication, Health Disparities Program, and the Obesity and Built Environment Program. We also recommend that the PEPH Program's funding initiatives require the dissemination and translation of research findings into programs and policy. Such a requirement will help to assure that the research conducted contributes to actions taken to improve health and reduce inequalities in health. Toward this end, the PEPH Program should build in health literacy components to assure positive health outcomes in communities most negatively affected by environmental exposures. Health literacy efforts should encompass multilevel actions, encompassing actions taken to promote individual health, community level change, and policy change strategies that aim to build capacity to address environmental justice issues. Finally, the PEPH Program could make a valuable contribution to the prevention, reduction or elimination of environmental exposures that contribute to adverse health outcomes in communities through encouraging active engagement of those communities in the research process, and in the development and implementation of programmatic and policy efforts designed to reduce those exposures. Programs that build and sustain the capacity of community-based organizations to take the lead in intervention efforts, to participate in review or proposals, and to take the lead in the development and implementation of proposed activities would help to build and sustain a broad base from which to prevent, reduce or eliminate environmental exposures that contribute to adverse health outcomes, with a particular focus on low income and communities of color currently disproportionately affected. Furthermore, programs aimed at enhancing the capacity of community, health profession and academic/research partners to work effectively together toward these ends are an important component of reaching this goal. This could include the development of funding mechanisms to support training and capacity building efforts aimed at, for example, developing and maintaining successful community-based participatory research

partnerships; and enhancing the competencies of community-based organizations to address environmental issues (e.g., through submission of grant proposals to NIEHS). In the latter instance, the PEHP Program might provide technical assistance to community-based organizations so that they may apply successfully for NIEHS funding, or to academic/research or health professional organizations to build capacity to work effectively in partnership with community groups. Such efforts would build on past NIEHS initiatives such as Environmental Justice: Partnerships for Communication and the Community-based Participatory Research initiative.

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or exposure specific monitoring, this project should not replace occupational exposure monitoring (i.e., annual evaluations and monitoring).

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Assessment of environmental hazards/ patient exposures and effective responses/ plans for care
Prevention through support of behavioral changes which help to preserve natural resources, individual & public health & immunity
All hazards disaster preparation & response
Global health & disease issues which increase hazards to all
Climate change issues

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21
Climate change and human health effects – there are constant questions about how the environmental changes and to what degree these changes and over what period of time these changes will impact personal health. Linking the anthropogenic causes and changes in environmental conditions is important.
Nanotechnologies and chemical development has been demonstrated to have important impact on economics; we do not always have a clear idea of how these innovations, once adopted and put into "production and use" impact human health. More attention needs to be given to this area.
Since Consumer Product Safety Commission seems unable to address many of the concerns with products that pose threats to health and safety of the public, perhaps this is another area of focus.

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would be a theme that could lead to guidance on what levels are acceptable and what types of administrative or engineering controls could be included in transformational projects that would help to achieve them.

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2) Prioritizing communities with variations in race and SES--so that we can work to disentangle the roles of race and class.
3) Encouraging community-level exposure assessment as pilot studies--including biomarkers and personal exposure monitoring to gain a strong sense of community-level exposures. These would require substantial funds to allow adequate characterization of community (N~200-300).
4) Follow-up the pilot studies with hypothesis-driven assessment of exposure-disease relationship (N~1000-2000). Hypotheses cannot be determined until community exposure assessment is conducted.

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NIEHS should not fund more biomedical research on century old hazards such as lead, asbestos, mercury, etc. If the focus is environmental public health, then NIEHS should support programs that lead to public health solutions to the many well known hazards that are responsible for thousands of death. New areas that need support include nanotechnology, smart growth, design for the environment, green building, sustainable development, organic food production, etc. More research needs to be done about the alternatives to the existing unhealthy production and consumption systems. NIEHS would have to support policy research to generate new knowledge that would allow us to move in a different direction, toward healthy cities, healthy schools, healthy hospitals, healthy buildings, healthy supermarkets, healthy workplaces, etc.

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51
The first theme that needs to be stressed is the simple connection between humans and their environments. While this may seem simplistic, this connection usually is missed by lay audiences of all ages. In addition, the following themes/issues are relevant: everything is a chemical—exposures are what make the dierence (the NIEHS triangle model); there are two (or more) sides to almost every environmental debate; scientific knowledge changes over time, and these changes affect our knowledge about environmental connections to health; genetic susceptibiliites play an important role in how individual organisms react to exposures; there are ways in which a person can reduce his or her exposures to harmful elements in the enviroment (sunscreen, diet, etc.). Finally, general scientific literacy is crucial to promote better understanding and decision-making by people of all ages.

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52
While the focus of our earlier comments is on process, we also believe that the content of PEHP projects should be shaped to address NIEHS' core mission. One important area of focus should be on emerging environmental pollutants, including endocrine disrupting compounds, with a goal to provide the knowledge base for precautionary environmental health policies and interventions. Our interest in breast cancer makes us keenly aware of the difficulties of conclusively linking specific chemical exposures with a disease end point. We know breast cancer is multi-factorial with risk factors that occur over many decades of the life cycle. Thus, we urge NIEHS to fund studies that focus on exposure to chemicals for which there is a plausible biological link to disease, even if the proposed study does not directly include a human health end point. We also encourage
development of new personal exposure measurement and biomonitoring techniques and studies of cumulative impact and effects of mixtures. In addition to basic science, PEHP should include translational research focused on environmental public health policy, including recommendations for individual behavior, corporate practices, and regulation. Translational research will have great impact if it translates science into public health policy rather than adding to already over-burdened medical care systems.
In some cases, this research may be fundamentally descriptive, and only loosely hypothesis-driven. The enormous public investment in the human genome project must be matched by mapping of environmental exposures and discovery of their biological effects, including effects on gene expression, hormone signaling, and so on.

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There are many themes that this program should address. I believe that the program should having a funding approach that focuses holisitically on how the environment impacts health. The program should move away from a reductionistic, biomedical approach and put a lower priority on individual level factors such as health behaviors and genetics with a focus on context. The program understand the importance of the social, physical and built environments in impacting and driving population, neighborhood, and individual level health. The program should fund work that assesses the intersectionality of environmental and social determinants of health, disproportionate burdens and impacts of land uses, environmental health hazards, and pollution on communities of color, poor and disadvantaged populations, ,marginalized and disenfranchised groups such as Native Americans and immigrant groups who all can be classified

as vulnerable populations. More work needs to be invested to research the impact of the environment on the health of susceptible populations such as children particularly children with underlying health conditions and elderly, indigent, and medically underserved populations. Elderly populations are particularly important because of the aging of baby boomers in this country.
This program should focus on funding research that performs more comprehensive exposure assessment that takes into account cumulative impacts and aggregate exposures for disparately burdened populations from multiple emission sources, across multiple pathways, and through air, water, and soil media. This research needs have the study and reduction of environmental health disparities as a primary focus. PEHP should fund research on the built environment, urban planning and transportation issues such as diesel exhaust, pollution and schools, pollution and birth outcomes and maternal health, neighborhood health (brownfields, green space, active living, physical activity, obesity, diabetes, cardiovascular disease, asthma, indoor air pollution). More funding should look at the impacts of climate change on air pollution levels and health risks of vulnerable communities. There is a strong need for NIEHS PEHP to fund goods movement research (ports, ships,
diesel truck traffic, transportation hubs and expansion, railways/railyards) and related industries and emissions. In addition, more funding is needed for agricultural issues and rural health such as industrial animal production, pesticides, food safety and microbes, water pollution from runoff. NIEHS could partner with USDA and FDA on this work. More funding needs to be invested in research on natural, man-made, and technological disasters such as hurricanes, fires, floods, chemical spills, etc. NIEHS could work with NSF to fund this work. Additionally, there is a need for more work on the relationship between non-compliance with environmental laws by pollution-intensive facilities, or compliance in non-attainment or areas with heavy industries. and impacts on exposure, community health, and health disparities and also policy.
This program should definitely focus on traditional EJ issues such as landfills, incinerators, traffic pollution, Superfund sites, sewage treatment plants, coal-fired plants, chemical production facilities. In addition, this program should fund new areas of EJ inquiry in urban environments such as crime and violence, smart growth, sprawl. access to healthy food and public transit, fast food restaurants and liquor stores, parks, green space, etc and how these things drive chronic disease, air pollution levels, negative quality of life, and negative mental health outcomes.
This program should try to fund systems research, research that is ecological or multi-level in nature, and research that focuses on intervention, translation, dissemination, and replication. A major objective of this program should be more capacity-building, infrastructure development, and training for community-based organizations.

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consequences of exposure to lead, mercury, hazardous drugs (NIOSH – Alert), pesticides, cleaning agents, glutaraldehyde, formaldehyde. Since they are not educated by their employers or during their nursing education so this would be a great place to start as noted above.

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64
The PEHP should be clear about how it is defining "environmental." The environmental work of many agencies at the federal level stops short of exploring toxic chemicals and radiation while focusing solely on lifestyle exposures like smoking, diet and exercise. While all of these exposures are important, it is critical that we begin to study and appreciate the complexity of environmental public health and help the public understand that in almost all cases, health is determined by a combination of genetics and many environmental exposures. Themes that are important to cover are: complexity, interactions (synergistic and cumulative effects), low dose exposures, endocrine disruption, the importance of prevention (not detection and screening but truly preventing disease), epigenetics and precautionary approaches to public health.

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vector control, food safety and protection, water pollution, general environmental health, workforce development, hazardous materials and toxic substances.

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Again, since our primary area of focus is Brownfields, we would encourage NIEHS to consider exploring all of the environmental impact issues (i.e., research issues, health outcomes, etc.,) surrounding Brownfields projects.

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Health outcomes: across the entire life course (not single outcomes) Do not address: single exposures or single outcomes in isolation (most exposures do not occur in isolation!)

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The information listed in 1 and 2 is needed for high priority pollutants, not those where exposures have diminished to levels that do not constitute high risk. Therefore, a need exists to prioritize such exposures; a suggestion is PM2.5, phthalates, perfluorinated chemicals, and certain phenols where some or even most human exposures in the US are very high today. Let us downsize research on Pb and PCBs, and leave them to the enforcement agencies to keep low.

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It is of critical importance that we understand how the role of the social as well as the physical environment impact health and how the interaction of the two may contribute to differential exposures to environmental hazards or protective factors, and that we understand how social inequalities may interact with environmental exposures to modify (exacerbate or reduce) their effects on health. We need to understand how income inequalities and racial inequalities (separately and together) influence exposures to environmental health threats as well as access to resources with which to protect health in the face of those threats. We need to examine how risk and protective aspects of the social and physical environment: a) may be more prevalent in some neighborhoods than others and why; b) may interact with other factors to compound the effects of exposure; and c) may result in greater exposure of some groups based on, for example, location, economic status, ethnicity. In order to gain this understanding, it is necessary that the communities experiencing these inequalities and health disparities be actively involved in identifying the issues and diseases of importance to their communities, and to work in partnership with scientists in conducting the basic and intervention research efforts required.
We also believe that research on the interaction of genetics with physical and social environment is an important area of research in all populations. However, we do express concern about undertaking research in this area without participation of community members in the research design, particularly with populations who experience social inequalities and who thus may be less powerful and more vulnerable to researchers' requests. Based on our discussions about including a genetic focus in our work, we suggest that conducting research that examines gene-environment interaction will be of greater research and ethical rigor if done through the use of a community-academic partnership approach that allows community participation in the research decision-making process.
Finally, we are, by the nature of our name, particularly interested in environmental factors affecting asthma and feel that while much has been learned in this area, much remains to be learned, particularly about threshold effects of exposures (e.g. PM, ozone), how those threshold effects interact with social environmental factors, and how these findings may be used to design individual, community and policy interventions to reduce asthma exacerbation.

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• Interactions between social and physical factors need to be investigated. This will require more social science collaboration.
• There needs to be more emphasis on intervention studies as these studies will lead to translatable results. Clinical practice guidelines require high quality intervention (trials) evidence to change clinical practice recommendations.
• Basic mechanistic studies are of lower priority.

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letters have been published in the learned literature to date, none of them has addressed the fundamental issue, namely: To what extent, if any, are occupied dwellings contaminated with mercury as a result of its ritualistic uses in Caribbean and Latino communities? Environmental Health Perspectives later published "Assessing Elemental Mercury Vapor Exposure from Cultural and Religious Practices" (Riley et al. 109:8: August 2001 http://www.ehponline.org/members/2001/109p779-784riley/riley.pdf); "Subcutaneous Injection of Mercury: "Warding Off Evil" (112:13 September 2004 http://www.ehponline.org/members/2004/6891/6891.pdf ; and "Comparison of Indoor Mercury Vapor in Common Areas of Residential Buildings with Outdoor Levels in a Community Where Mercury Is Used for Cultural Purposes." (Garetano et al. 114:1 January 2006 http://www.ehponline.org/members/2005/8410/8410.pdf). However none of these papers answered the aforementioned question.

Several biomarker studies looking for elevated urinary mercury levels attributable to ritualistic exposure have been performed, but none of them made a serious attempt to correlate mercury vapor levels in dwellings with biomarker UMLs. ("Mercury Exposure in an Urban Pediatric Population" Ozuah et al Ambulatory Pediatrics 3:1 January-February 2003 http://www.mercurypoisoningproject.org/pdf/oct2003ozuah.pdf ; "Exposure assessment of young children living in Chicago communities with historic reports of ritualistic use of mercury" Rogers et al., Clinical Toxicology, March 2007; Rogers et al "Mercury Exposure in Young Children Living in New York City" Rogers et al Journal of Urban Health: Bulletin of the New York Academy of Medicine [late] 2007. Two of the three studies found children with high UMLs, but none of the three measured mercury vapor levels in the children's homes.

The closest that researchers have come to making these measurements was a study by the New Jersey Department of Environmental Protection, which measured mercury vapor believed likely to be from its ritualistic use, not in occupied dwellings, but in public hallways into which Caribbean-Latino-occupied apartments opened into. ("Cultural Uses of Mercury in New Jersey: Research Project Summary" Stern et al. NJDEP May 2003 http://www.state.nj.us/dep/dsr/research/mercury-cultural.pdf ; also in Garetano Op. cit.) This inconclusive investigation, after finding highly elevated mercury vapor levels emanating from thresholds of apartments, failed to even attempt to measure the levels inside the dwellings, or to inform the occupants of the risks they incurred from the elevated levels of mercury vapor detected.

The same neuropsychological assessment battery (or elements of it) as were and are employed in the Faeroe and Seychelles Islands studies of methylmercury exposure can be applied to measuring the neuropsychological and neuro-physiological sequelae of these domestic mercury and mercury vapor exposures, in order to elucidate in- utero as well as post natal damage.

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live (literally) and the impact of other aspects of their environment on health (e.g., land use, air quality, built environment), that is, putting residential neighborhoods at the hub.
Using such a broad framework as the overall guide for determining specific scientific themes, exposures and health outcomes to study, we suggest the following topics as priority areas to address: 1) cumulative health outcomes (e.g., asthma, CVD, diabetes) associated with poor air quality, including diesel exhaust; 2) the reduction of the impact of lead exposure and it's implications on health; 3) impact of hazardous waste sites and abandoned industrial facilities on community health; 4) impact of abandoned/vacant housing and the demolition of these houses on community health (e.g., asbestos, lead); 5) health implications of clean up of Browns fields sites and their use for community gardening/farming; and 6) the relationship between the social environment, built environment and green way development and health.
In addition to these specific research topic areas, we recommend that the PEPH Program's funding initiatives require the dissemination and translation of research findings into programs and policy. Such a requirement would go a long way in ensuring that the research conducted has an impact on improving health status and reducing health inequalities. Related to this point, we suggest the PEPH Program build in a health literacy component into its activities. Here again, improved health literacy will contribute to positive health outcomes in the communities most effected by the negative impact of environmental exposures.
Another area in which the PEPH Program could make a valuable contribution to the field is through supporting efforts aimed at enhancing the capacity of community, health care professional and academic/researcher partners to work together effectively to promote and advance partnerships for environmental public health. This could include the development of funding mechanisms to support training and capacity building efforts aimed at, for example, developing and maintaining successful community-based participatory research partnerships; and enhancing the competencies of community-based organizations to address environmental issues (e.g., through submission of grant proposals to NIEHS). In the latter instance, the PEHP Program might provide technical assistance to community-based organizations so that they may apply successfully for NIEHS funding.

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benefits. Focusing on these health outcomes will provide additional information that will help investigators pinpoint more exactly the optimal balance between fish consumption health risks and health benefits.

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were high due to emissions from the 9/11 event. Other assessments would include greenhouse emissions from hospitals and other incinerators and rural methane emissions. This research needs to first be conducted and databases established and shared with relevant constituencies in order to inform critical policy decisions needed to reduce U.S. greenhouse emissions.
The NIEHS-WETP should be commended on the wide range of training subject matter it enables its grantees to cover in the current training programs, while keeping to the core mission of 1910.120 education and training.

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and other related issues in keeping with the current trend on climate control and the effects of global warming.

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Two of the schemes that are important to developing positive outcomes are 1) develop methods of communication for dissemination of the information to policy makers, 2) to develop a strategic plan with policy makers for addressing the public health concerns. Utilizing the effective leadership and research of all of the partners and collaborators is essential. For example, promoting the need to addressing cumulative risk assessments prior to allowing air quality permits, conducting a community risk assessment prior to approval of a new development, or defining the criteria for a "vulnerable Community" are regulations which can be modeled after current regulations or laws in other states.

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