Message

From: Cascio, Wayne [Cascio.Wayne@epa.gov]
Sent: 1/30/2021 5:20:48 PM
To: Orme-Zavaleta, Jennifer [Orme-Zavaleta.Jennifer@epa.gov]
CC: Holt, Kay [Holt.Kay@epa.gov]
Subject: RE: Follow Up to Discussion
Attachments: Weaver Environ Epi 2019 Neighborhood SES PM2.5 CV DM.pdf; Mirowsky JESEE 2017 Residential SES CV Metabolic Health.pdf; aging-v12i23-202341.pdf; Rappold EST 2017 Community Wildfire Vulnerability Index.pdf; Ward-Caviness Epigenetics Neighborhood disadvantage.pdf

Jennifer – On Friday I had a long conversation with Charles Lee on the topic of EJ. With the Agency's new found interest in EJ he asked that I write a summary of our conversation as a starting point to develop an approach to summarize existing evidence and generate new evidence to support policy and rule changes that would incorporate evidence of social factors interacting with environmental exposures to cause health inequities. The text I intended to send him is below. I'm sharing with you first so that if any of it gives you pause you can modify. There are no promises here, what I wrote just acknowledges some of our previous work, the importance of the problem and the value of working to find solutions. Wayne

Charles – I very much appreciated the discussion yesterday. Here are my thoughts after some consideration. I've also included a series of papers produced by CPHEA researchers that address environmental justice issues. This is a representative selection of papers, and in no way is exhaustive. Let me know your thoughts about the text that follows. Best wishes, Wayne

There is ample evidence that systemic racism has historically contributed to health inequities as measured by health outcomes as well as opportunities for disease prevention and health promotion; and the availability, accessibility and affordability of quality education, healthcare, and safe and healthy housing. Implicit among these key social determinants of population health is also the quality of the environment. Disproportionate exposures to environmental toxins are more frequently present among those who live in predominantly minority urban and rural communities. The impact of such exposures within these communities and their attendant health risks, as well as the moral impetus for societal acknowledgement and mitigation are the basis of Environmental Justice and the search for equitable solutions.

Numerous published scientific studies have defined the extent of disproportionate exposure and risk within these disadvantaged communities. More recently, increased availability of data sources and application of novel experimental and statistical methods is beginning to shed new light on the societal factors most important to identifying the most fundamental causes of disparities. Comprehension of these factors is essential for finding durable solutions to environmental justice issues. Factors like residential segregation, historical residential redlining, and a multitude of social factors that increase psychosocial stress are emerging as key determinants of disparate health outcomes.

For the last five years the Office of Research and Development has supported research that has specifically sought to identify root causes of inequities in health outcomes. This award winning research has been published in the nation's highest quality public health, environmental health and clinical research journals. In brief, ORD researchers have clearly identified social determinants of health as playing a key role in health inequities among specific populations. However, recent research has identified molecular markers of mortality that are present among the residents of disadvantaged neighborhoods that can be mitigated in part by greenspace features. ORD scientists have also shown that the magnitude of the adverse health impact of a specific concentration of air particle pollution is greater in disadvantaged neighborhoods. As ORD's work continues the products will assessing the evidence, identifying evidence gaps, making assessments and conducting solutions-driven science, clearly communicating the evidence and limitations, and advocating for environmental health equity in the implementation of environmental policy assessments and support the National Research Programs and Offices and Programs ability to conceptualize the ways to mitigate environmental inequities and the adverse consequences of systemic racism.

ORD has the ability to respond to President Biden's administration's call to address environmental justice issues. ORD scientists have the know how to better define the fundamental causes of human health inequities that are driven my environmental and social factors. Scientific and statistical methods are available to disentangle the various factors that contribute disproportionately to disadvantaged as well as other communities. Still, the roots of systemic racism and environmental injustice are deep, and identifying solutions will go beyond the science and recommendations by ORD. Therefore, environmental health and public health professionals, risk assessors, clinicians, health care systems, other guideline groups, professional societies, research funding agencies, public health agencies and practitioners, and policy makers must collectively address the key issues that perpetuate systemic racism and environmental injustice in the US. Within our small microcosm of the US EPA that will entail bringing in our Offices and attorneys to explore how the data that is now emerging might be incorporated into policy and rulemaking. As we move into the development of the next StRAP there should be greater opportunity to expand this work.

Wayne

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From: Lee, Charles <Lee.Charles@epa.gov>
Sent: Friday, January 29, 2021 9:44 PM
To: Cascio, Wayne <Cascio.Wayne@epa.gov>
Subject: Follow Up to Discussion

Hi Wayne

Here are a number of the articles I mentioned today. The key one is attached. This is Rachel Morello Frosch's article that found a correlation between measures of residential segregation and cancer risk associated with ambient air toxics. This is the article which gave rise to my thinking about environmental effects modification by social factors. Citations for this and other relevant articles are below.

- Morello-Frosch, Rachel, and Bill M Jesdale. "Separate and unequal: residential segregation and estimated cancer risks associated with ambient air toxics in U.S. metropolitan areas." *Environmental health perspectives* vol. 114,3 (2006): 386-93. doi:10.1289/ehp.8500

- Morello-Frosch, Rachel, and Edmond D Shenassa. "The environmental "riskscape" and social inequality: implications for explaining maternal and child health disparities." *Environmental health perspectives* vol. 114,8 (2006): 1150-3. doi:10.1289/ehp.8930

- Bell, Michelle L and Francesca Dominici, "Effect Modification by Community Characteristics on the Short-Term Effects of Ozone Exposure and Mortality in 98 US Communities," *American Journal of Epidemiology*, Vol 167, No. 8, DOI: 10.1093/aje/kwm396, February 25, 2008

- Nordone, A, et.al., "Associations between historical residential redlining and current age-adjusted rates of emergency department visits due to asthma across eight cities in California: an ecological study," *Lancet Planet Health 2020*; 4: e24–31, https://www.thelancet.com/action/showPdf?pii=S2542-5196%2819%2930241-4

- Hoffman, Jeremy S, Vivek Shandas, and Nicholas Pendleton, "The Effects of Historical Housing Policies on Resident Exposure to Intra-Urban Heat: A Study of 108 US Urban Areas," *Climate*, January 13, 2020, https://www.mdpi.com/2225-1154/8/1/12/htm

I look forward to getting copies of the articles you shared with me. Also, can you write me a short response (no more than one or two paragraphs) regarding the thought piece that I shared with you stating why and how this idea of environmental effects modification by social factors can be a salient area of research. This would help me construct a short piece introducing the concept to new leadership in OP.

Best
Charles

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