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Challenges to an integrated population health research agenda: Targets, scale, tradeoffs and timing

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> "'But if I ran the zoo, … I'd make a few changes. That's just what I'd do … .'"
>
> (Giesel, 1950)

Applied to the context of population health research, Dr. Seuss' book, "If I Ran the Zoo" provokes an important question about health care resources allocation. If given the opportunity to 'run the zoo,' do population health researchers have the evidence needed to make decisions that will maximize positive health outcomes for all people? The answer is, "Not yet." Although translating the existing evidence on social and behavioral determinants of health and health inequities into effective action could achieve large population health gains (Commission on Social Determinants of Health (2008)) – Galea et al. estimated that eliminating excess deaths associated with limited education would save 245,000 lives annually in the United States (2011) – evidence gaps hamper the development of a coherent strategy for improving population health and achieving health equity. In this commentary, we discuss challenges in the development of a unified strategy for population health research that can inform policy and practice.

This paper emerged from discussions with two interdisciplinary working groups convened to advise a new National Program of the Robert Wood Johnson Foundation (RWJF) on research priorities. *Evidence for Action: Investigator-Initiated Research to Build a Culture of Health* (E4A) is designed to develop the evidence base aligned with RWJF's vision of building a national "culture of health" (RWJF, 2015). E4A supports innovative, rigorous research on the impact of programs, policies, and partnerships on health and well-being, with a particular focus on research that advances health equity. The focus of the new national program reflects the growing relevance of individual and community-level determinants of health to multi-sectoral stakeholders in health research and an emphasis on bridging initiatives related to population health and health care.

The working groups included scholars and practitioners from health services, public health, social and behavioral determinants of health, and health policy. Participants discussed existing evidence and evidence gaps related to policies, programs, and systems with the greatest potential to advance population health and health equity, and how the evidence could be best applied and disseminated. Reflecting the diverse perspectives of the working group members, discussions coalesced around tensions and dilemmas in four areas: the relative effectiveness of interventions targeting individuals versus systems (*target* debates); whether intervention models are most useful when developed for local, state, or federal jurisdictions (*scale* debates); accounting for unintended

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consequences, spillovers and *tradeoffs*; and determining when there is sufficient evidence to inform action (*timing* debates).

1. Reconciling targets: individual versus system interventions

Practitioners and researchers concerned about social determinants of health (SDOH) and health inequities often invoke the metaphor of "upstream" versus "downstream" health interventions. This metaphor is used inconsistently and has been critiqued for conflating distinct concepts such as spatiotemporal scale, level, and causal strength (Krieger, 2008). The metaphor conveys a powerful intuition, however, that there are important differences in the potential impacts of interventions targeted toward systems (e.g. legal, social, environmental, health services) that influence individuals' experiences and outcomes, and those targeted towards individuals (e.g. knowledge, skills, behavioral choices, treatments). Seminal papers have argued for the importance of each level; some argue that individuals' behavioral factors are the "actual causes" of morbidity and mortality, while others conceptualize systems, culture and contextual characteristics as the "causes of the causes" of these outcomes (Braveman and Gottlieb, 2014; Galea et al., 2011; Link and Phelan, 1995; McGinnis and Foege, 2004; McGinnis et al., 2002).

Systems interventions potentially affect more people and may have a greater overall impact than individual interventions. Directly intervening on individuals, however, may be more efficient if programs target those identified as being at high risk (Campbell and Robertson, 2007; Herbst et al., 2007). As one moves towards interventions that are either more temporally or causally distal from individual health outcomes, it can be more challenging to provide rigorous evidence of causal impact. However, quasi-experiments—for example, using comparisons across places that have different policies or that have implemented policies at different points in time—can provide important effectiveness evidence (Almond et al., 2011; Avendano et al., 2015; Case, 2004; Cylus et al., 2014; Glymour et al., 2008; Hoynes et al., 2015; Rossin, 2011).

Advocates of upstream or systems interventions argue that social policies and conditions reducing disease incidence will have greater enduring value since they remove future populations from the risk pool needing intervention or treatment (Kaplan, 2000; Syme, 2008; Weintraub et al., 2011). Systems interventions often focus on population-wide prevention, consistent with Geoffrey Rose's "population paradox" that reducing the risk a little for everyone in the population can have greater total benefits for some outcomes than large reductions for a small fraction of people who are at very high risk (Rose, 1985, 1992). For example, removing lead from gasoline and paint dramatically reduced population exposure to lead and had larger overall impacts than identifying and treating individual children with high blood lead levels (Lin-Fu, 1982; Pirkle et al., 1994).

An individual versus systems focus has historically differentiated clinical health care from public health (Schoenbach and Rosamond, 2000). The United States health care delivery system largely has focused on individual level curative interventions. That singular focus is one reason that medical care is estimated to account for only 10–20% of health outcomes (McGovern et al., 2014). Given this limited impact, increasing access to traditional medical care alone will be insufficient to eliminate social inequities in health. Fortunately, the Affordable Care Act and other innovative policies are stimulating new approaches to health care.

The current health care system involves about $2.7 trillion in annual expenditures (Centers for Medicare and Medicaid Services, 2014) and over 18 million workers (Centers for Disease Control and Prevention, 2014), and could be a powerful ally in addressing SDOH. The health care system's human, social, and financial infrastructure could deliver better outcomes with greater integration along the spectrum of upstream and downstream interventions (Berwick and Hackbarth, 2012; Cantor et al., 2011; Keehan et al., 2011). Engaging the health care system in addressing SDOH may help shift more resources towards evidence-based population health interventions. While not a panacea, widespread engagement with the health care system offers unrivaled opportunities to connect people with the resources they need to stay healthy – whether those needs are primarily related to traditional medical care or extend more broadly to social services needs. Three quarters of American adults have at least one medical provider visit annually (O'Hara and Caswell, 2012). In addition, health care delivery systems can systematically collect social information. Integrated data systems that track social and clinical measures could inform and stimulate upstream intervention approaches in addition to enabling better care and providing researchers with new evidence on the impacts of relevant interventions and treatments (Adler and Stead, 2015; Gottlieb et al., 2015).

The tendency to pit systems-approaches against individual-approaches fails to recognize the value and sometimes necessity of a multi-faceted strategy – one that incorporates interventions at both the systems and individual levels. For example, tobacco use is strongly shaped by social norms, costs, and legal access; policies addressing these factors at the population level have been shown to be effective. However, individual variance persists: in the same society, with the same costs and policies, some people smoke while others do not (Leventhal et al., 1987; Wilkinson and Abraham, 2004). Effective interventions will need to address multiple levels, modes, components, and actors, and will require knowledge of factors affecting individual choice as well as those affecting the social patterning of tobacco use (Vlahov et al., 2004).

Some tensions regarding the preferred level of intervention reflect disciplinary traditions and values. One concern voiced by advocates of upstream interventions is that efforts focused on the individual may deflect attention from the role of social and governmental institutions and policies and reduce the likelihood of action at the systems level (Brownell et al., 2010; Fisher et al., 2011). A second concern is that focusing on individual behaviors may unjustly "blame the victim" if individuals responding to adverse environmental conditions with health-damaging behaviors are seen as somehow culpable for doing so.

A "behavioral justice" framework may help to reconcile these perspectives. Borrowing heavily from the environmental justice movement, behavioral justice emphasizes that health behaviors may reflect personal decisions informed by knowledge and values, but these choices are often severely constrained by available social, economic, or environmental resources (Adler and Stewart, 2009). Given the importance of behavior in determining health outcomes (McGinnis and Foege, 2004; McGinnis et al., 2002), a behavioral justice framework requires that all individuals have access to the systems or structural resources needed to be able to make healthy choices, at which point consideration of individual responsibility and choice becomes relevant. Thinking of health determinants and interventions in terms of behavioral justice may support decisions to integrate interventions at multiple levels, including individual and systems changes.

2. Reconciling scale: local, state and federal interventions

Issues involving place and scale are related to the tension between individual and system level interventions but have distinct characteristics. Improving population health in communities across the country will undoubtedly require local, regional, and federal efforts, but we have limited evidence regarding which level is most effective for any given problem. Federal initiatives, such as Medicare reimbursement policies or IRS community benefit laws, may have