

All Infrastructure Is Health Infrastructure

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Flint’s water crisis. Texas’ power grid failure. Miami’s Surfside tower collapse.

The nation’s crumbling infrastructure has brought rare bipartisan consensus for legislation to modernize America. In late March, President Biden presented the comprehensive American Jobs Plan that would invest \$2.7 trillion into such infrastructure, but a more curtailed bipartisan framework, the Infrastructure Investment and Jobs Act, has since passed Congress and been signed into law. Much of the debate surrounding these bills centered on the inclusion of human infrastructure within what is traditionally defined as infrastructure, and the resulting acrimony underscored the precarious nature of any potential agreement in a narrowly divided Congress. Infrastructure has often been described in relation to energy, commerce, and transportation, yet these intersections underlie a larger conversation about social determinants of health and the intrinsic connections between infrastructure and human health. Although there has been a dichotomy between traditional infrastructure and human infrastructure, as health care professionals and patient advocates, we must recognize that all infrastructure is fundamentally health infrastructure.

The current administration carefully defined human infrastructure to encompass investments in child care, education, and home- and community-based services (HCBS). Although no previous national legislation considered these services part of American infrastructure, their inclusion in the American Jobs Plan is a reminder of the intrinsic connections between health and infrastructure rather than partisan spending. Indeed, investments to upgrade and build new child care facilities are critical not only because the industry has been decimated by the pandemic but also because access to care and high-quality learning environments are critical to stimulate development and promote health.¹ The current paucity of child care—enough to serve only 23% of infants and toddlers—leads many mothers to leave the workforce and experience economic instability, a well-known social determinant of health.² The American Jobs Plan, moreover, prioritizes educational investments toward improving kitchens to prepare more nutritious meals and enhancing air quality and ventilation systems to protect against environmental health hazards. Given that a majority of American public schools are over 50 years old, asbestos and mold exposure, as well as the 72 million metric tons of

carbon dioxide emitted each year, are significant challenges to child health and education as a foundation for individualization, underscoring the import of modernizing schools.^{3,4} The final component of the American Jobs Plan as it relates to human infrastructure lies in “care infrastructure” and specifically bolstering HCBS. The majority of older adults and persons with disabilities wish to age and live independently, but HCBS are optional services under Medicaid, resulting in poor local care delivery and subsequent barriers of access. Eight hundred thousand people are on state waiting lists, thousands of whom die each year without receiving services.⁵ As such, addressing America’s crumbling care infrastructure may require expansion of access to HCBS and greater support for the direct care workforce, given labor shortages and the need for one million care workers by the end of the decade. These investments will better allow older adults to receive long-term and end-of-life care within their homes and communities rather than institutional settings, which are associated with higher hospital readmissions, increased complications, and unnecessary costs.⁶ Investments into human infrastructure represent an investment into American health.

Importantly, however, the relationships between infrastructure and health extend well beyond what has been labeled human infrastructure; there is a false dichotomy when we separate human infrastructure and physical infrastructure because all infrastructure has concrete consequences for human health and well-being. For instance, modernizing water infrastructure would eliminate lead pipes and protect against a crisis like that in Flint, Michigan, by targeting the 10 million homes that are at risk for lead exposure.⁷ Investments into roads,

bridges, transit, and electric vehicle chargers offer a similar opportunity to invest—or, conversely, regress—in our nation’s environmental health. There are opportunities to reshape the American landscape away from its automobile-centric design and reimagine a more accessible, human-friendly future where walking, biking, and public transport are the norm, not the exception. Simultaneously, there are opportunities to preserve the status quo in which single-occupant mobility predominates and contributes to significant air pollution, poor road safety, and limited physical activity. Infrastructure’s health implications, either constructive or destructive, are unequivocal. Even investments into broadband access, which have received bipartisan support given that they address rural–urban disparities, are intrinsically tied to human health. Beyond being fundamental to accessing online health resources and connecting with medical personnel via telehealth, broadband is known as a “super determinant” of health because it intersects with everything from employment and educational opportunities to the social

context, serving as a platform to engage with the world.⁸ Road, water, and broadband infrastructure is indeed critical infrastructure, in no small part because of its contributions to human health.

The \$1.2 trillion bipartisan infrastructure bill makes vital investments into physical infrastructure while largely leaving out human infrastructure. This separation reinforces an artificial divide between physical and human infrastructure and ignores the inextricable connections of both types of infrastructure to the fabric of American society. A framing that brings together physical and human infrastructure under the banner of health infrastructure would offer an opportunity to robustly address various social determinants of health and extend unifying focus to this historic investment. When policymakers debate and consider infrastructure, they must do so in a framework that considers the short- and long-term consequences on patient health, as well as how the project can maximize community benefit (Box 1).

Such a framework can be considered a continuance of the “Health in All

Policies” (HiAP) approach, which endorsed intersectoral collaborations to address health disparities.⁹ HiAP projects have seen great success internationally. For instance, Finland’s North Karelia Project reduced the nation’s coronary heart disease burden by engaging community organizations, dairy and meat producers, and schools. Similarly, Thailand mandated Health Impact Assessments at every level of government to combat emerging health challenges caused by air pollution, pesticide contamination, coal-fired power plants, and other environmental hazards. In the United States, California’s Health in All Policies Task Force spearheaded the first efforts to integrate transportation, housing, affordable healthy food, safe neighborhoods, green space, and policies’ health consequences into state programs. However, HiAP implementation has been more fragmented across the United States as a whole. A national HiAP approach to traditional and human infrastructure would not only better reframe the debate and deconstruct this false dichotomy but also provide a template

BOX 1— Key Actions for Developing Infrastructure Legislation

Action	Example
Delineate the communities affected, the existing health challenges they face, and how the infrastructure will immediately ameliorate or exacerbate these health challenges.	With proposals to build new freeways and housing developments, the first questions on the table should be, “Which neighborhoods will be displaced in the process? Who lives in these neighborhoods? Who will be the beneficiaries of the new housing developments? Will these infrastructural changes make it easier or more difficult for current residents to access employment opportunities and health care facilities?”
Consider long-term health consequences associated with infrastructural investments.	Although freeways may serve as connections to jobs and produce economic growth in distressed communities, the resultant pollution from largely external traffic and deleterious health consequences may outweigh any short-term benefits.
Engineer infrastructure projects to simultaneously provide communities multiple benefits.	With new freeway construction comes opportunities to reroute underground pipes to provide communities with cleaner drinking water, among other projects. Additionally, after the freeway has been constructed, can local community members be hired to regularly maintain the pavement, thereby minimizing greenhouse gas emissions from vehicles?
Scale successful infrastructure initiatives from the local and state levels based on evidence of tangible and quantifiable health benefits.	In the late 1990s, the New Communities Program in Chicago, Illinois was implemented, ¹⁰ which focused on engaging residents in the preparation of a community quality-of-life plan, as well as early childhood development and youth programs across 5 programmatic domains: housing and real estate, connection to regional economies, family income and wealth generation, education, and public health and safety. This model is now operating in almost 100 neighborhoods in 24 other metropolitan areas.

for greater intersectoral collaborations that could advance public health in the United States.

With infrastructure ubiquitously occupying news cycles and Washington alike, medical professionals have a responsibility to frame infrastructure as a medical concern and guide future discussions toward health considerations. Infrastructure can be a vehicle to make historic investments into American health, but doing so will require that legislators actively make these connections and strengthen all future infrastructure bills to that end. **AJPH**

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CONFLICTS OF INTEREST

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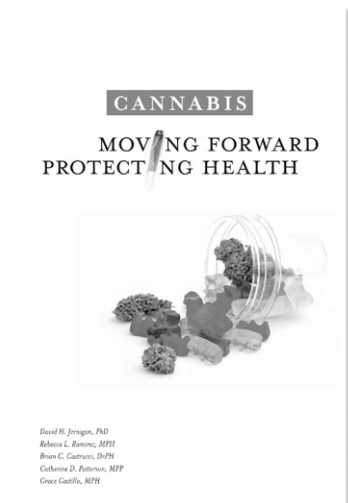
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