Is Home Where the Heart Is?

The Role of Neighborhood in Heart Failure Risk

See Article by Akwo et al

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The proverb "Home is where the heart is" has many meanings and interpretations. However, its meaning certainly incorporates the idea that a home is more than the bricks and mortar of a house, and a neighborhood is more than a cluster of houses situated near one another. Rather, home and neighborhood are places that are intimately tied to our emotions, our social networks, and even our physical health, in particular our heart health. The notion that the places we live have an impact on cardiovascular health is not new. In 1973, Harburg et al[1] linked residence in high- versus low-stress neighborhoods of Detroit with increased risk of hypertension. Building on this research, Haan et al[2] reported an association between living in an impoverished region and increased all-cause mortality, independent of demographic, individual socioeconomic, and behavioral factors. The landmark study by Diez Roux et al[3] in 2001 found that even after controlling for personal income, education, and occupation, living in a disadvantaged neighborhood is associated with an increased incidence of coronary heart disease. Since then, many continue to build on our understanding of neighborhood stress as an independent predictor of cardiovascular health.

The outstanding article by Akwo et al[4] in this issue of *Circulation: Cardiovascular Quality and Outcomes* makes several key contributions to our understanding of the role of neighborhood in health, specifically the risk of heart failure. Key among them is that they took a much-needed look at the association of neighborhood characteristics and risk of heart failure in a population with low socioeconomic status. By conducting this study in a predominantly low socioeconomic status population, the potential for bias from individual socioeconomic status is reduced, allowing for a direct interpretation of associations of neighborhood aspects with heart failure incidence. In fact, the inclusion of individual income and education in the models reported in the current article showed only a modest attenuation of the direct effect of more severe neighborhood deprivation and increased risk of heart failure incidence. The careful and unique population prospective cohort approach taken by Akwo et al[4] further establishes that there indeed is something unique about neighborhoods.

This focus on an underserved population increases the article's relevance to broad public health goals such as the American Heart Association 2020 impact goals to improve the cardiovascular health of all Americans by 20% by 2020.[5] The American Heart Association metrics for cardiovascular health incorporate 2 key domains: health factors (blood glucose, blood pressure, and total cholesterol) and health behaviors (diet, physical activity, smoking, and body mass index). Although there is a strong scientific basis for the impact of these individual-level factors on cardiovascular health, work such as that of Akwo et al[4] provides an

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argument of additional contribution of contextual metrics such as neighborhood conditions, particularly in underserved populations. It seems reasonable to consider that to achieve bold goals such as a 20% improvement in cardiovascular health in all Americans, a better understanding of the elements of one's neighborhood that contribute to these health factors and behaviors is severely needed. One might argue that neighborhood metrics themselves could be added to future definitions of cardiovascular health.

An important methodologic challenge addressed by Akwo et al[4] is how best to measure and define neighborhood. Akwo et al[4] used census tracts as proxies for neighborhood, a reasonable and commonly used approach. Previous studies have found that census tracts are a robust indicator of the contextual components relating to health and that they provide distinct, complementary information to individual-level indicators.[6] Debate continues, however, on the best method for defining residential environments and what an index of neighborhood deprivation really does (and does not) measure. There are many ways to conceptualize a neighborhood, some of which may not be captured by commonly available data resources. The neighborhood deprivation index used by Akwo et al[4] incorporates 11 census tract-level variables in the domains of social indicators, wealth and income, education, and occupation, making excellent use of available data resources. Future work may consider broadening the definition of neighborhood to include factors such as the built environment, access to fresh food, crime levels, excess noise, traffic density, air quality, local public smoking policies, and other social and physical stressors in our residential environments. However, complete and valid data on many of these factors are scarce. Possible areas for future work in advancing options for defining neighborhood suggested by Diez Roux and Mair[7] include greater use of spatial analysis using geographic information system simulation techniques that provide metrics characterizing the built environment and land use. Discrete event simulation modeling of complex systems to create different scenarios may yield new insights into what kind of new data are needed to continue to refine and improve the definition.

Another important contribution of the current study is that it measured risk directly through event analysis of incident heart failure cases. As accurately noted by Akwo et al[4], using medical claims data to classify heart failure events has limitations in terms of validity and in its ability to differentiate heart failure subtypes. However, this method provides an efficient method of capturing events diagnosed in the outpatient setting, where a considerable proportion of events are identified, treated, and managed.

Yet another contribution of the article by Akwo et al[4] is that it challenges us to consider what types of interventions can be developed at the neighborhood level to reduce the burden of heart failure. As the authors note, such upstream measures designed to address the physical, social, and emotional stressors of disadvantaged residential environments have the most potential reverse the growing burden of heart failure in the United States. Work by Akwo et al[4] challenges us to think of new ways to broaden our definition of neighborhood to better characterize and respond to the complex systems and underling mechanisms of the effect of home on heart.

DISCLOSURES

None.

AFFILIATION

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FOOTNOTES

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