Energy Insecurity: A Framework for Understanding Energy, the Built Environment and Health

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The recent occurrence of Hurricane Sandy and other climate change-related calamities prompt us to consider the significance of public health in the aftermath of disaster. However, the field of public health also has a role to play in the awareness, preparedness and deterrence of other environmental matters that affect vulnerable populations on a daily basis. The growing occurrence of extreme weather events attributable to climate change and the parallel surge in energy prices trickle down to formidable health impacts that may prove especially detrimental to vulnerable populations [1]. In instances of extreme cold, poor families often wear hats and gloves at home and use expensive and hazardous electric heaters or cooking stoves to keep cold at bay [2-4]. During heat waves, the elderly and poor are more likely to “sweat it out” or die because they cannot keep their homes adequately cool [5,6]. Furthermore, many low-income households face the “heat or eat” dilemma where they must decide between paying for food or for fuel [7,8]. All the while, economically disadvantaged householders disproportionately occupy housing units with poor air quality and harmful temperature and humidity conditions that result in excess moisture, dampness and mold which then trigger respiratory illnesses such as asthma [9,10].

Housing, Food and Energy: A Trifecta of Basic Needs

The trickle-down effects of climate change are likely to be experienced in the built environments that surround us [11]. Problematic housing deficiencies affected in this process, in turn, translate into severe health consequences that may create or exacerbate risks of respiratory illnesses such as asthma and allergies, nutritional deficiencies, loss of productivity, injury and mortality [12,13]. Social and economic factors restrict housing and neighborhood options and force trade-offs in meeting basic needs such as food, housing and health care that result in housing insecurity and food insecurity [14,15]. In addition, many low-income householders in the US experience a phenomenon called “energy insecurity” [16]. Those impacted by energy insecurity allocate a disproportionate share of their income to utilities-related expenses and encounter inefficiencies in the home such as drafts that create heat-loss and from less efficient appliances. Concomitants of energy insecurity include extreme home temperatures, hazardous heating alternatives and the constant threat of utility shut-offs due to non-payment. This problem is especially acute for low-income residents such as single parents, the elderly, the disabled and others with low or fixed incomes [17,18]. Those facing energy insecurity may be homeowners unable to invest in efficiency upgrades or maybe renters living in housing units where landlords do not pay for the utilities and consequently have very little incentive to create more energy efficient units [19].

Often relegated to the least efficient housing units, low-income householders experience the greatest energy burden due to residence in older housing stocks, long-term disinvestments and lack of maintenance by landlords as well as the use of lower quality materials and less efficient housing structures and appliances [20]. As residential energy costs for heating, cooling and other household needs steadily escalate, the household expenditure differentials between richer and poorer households are becoming more pronounced. For households earning greater than $50,000, residential energy expenditures represent a mere 3 percent of their average after-tax income compared to 33 percent for low-income householders making less than $10,000 [21]. Evidence suggests that young children in energy-insecure homes are more likely to contend with housing and food insecurity, experience fair or poor health, have been hospitalized at least once since birth, and be at risk for developmental delays [16]. Energy insecure householders have been found to eat less as evidenced by a ten percent reduction in caloric intake and weight loss during winter months [7,8]. One strategy that has been proposed to offset the “shock of skyrocketing heating bills” is to increase enrollment in supplemental nutritional assistance programs (formerly food stamps) among eligible families [22]. While this strategy provides an additional income source, it is not a long-term solution. Such an approach merely masks the problem and creates further dependency among low-income householders. In the current economic climate, more sustainable approaches are needed.

Energy efficiency and weatherization are often cited as “low-hanging fruit” that might simultaneously address high energy costs, energy independence and global climate change. While we know these “fruit” produce clear-cut and high yielding benefits compared to other proposed energy or climate change strategies, the health gains linked to energy efficiency remain largely unknown [23]. Despite the obvious and extensive financial, environmental and likely health benefits, low-income householders face key barriers in adopting home energy efficiency and weatherization measures due to high upfront costs and limited decision-making authority as renters. Of particular concern in low-income housing is the occurrence of cumulative housing problems that include not only energy inefficiencies, but also health and safety hazards [24]. According to a recent report that for the first time measured efficiency in private buildings in NYC, the least-efficient residential buildings were located in neighborhoods that also reported the highest asthma rates. When pressed to explain this association, the authors of the report stated only that it “deserves more analysis” [25].

As the impact of global climate change become more apparent, its association with the built environment and the health of vulnerable groups warrants greater attention and innovative approaches toward amelioration and awareness. Indeed, the issue of energy insecurity in particular merits far more attention given its widespread prevalence, its ties to housing instability, food insecurity and health as well as a growing interest in energy solutions within the policy realm. This problem, however, has largely been overlooked in the academic literature and has received inadequate government support in the forms of energy efficiency assistance and policy mandates requiring improved standards in housing for the poor living in the United States.

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Therefore, further evidence is needed to demonstrate the feasibility and impacts of energy-efficiency interventions on the health and well-being of economically disadvantaged households. In addition to further studies, a new approach for translating the research into practice and garnering greater health and energy education opportunities. The community health worker model has been embraced within public health because it has demonstrated significant results when translating health-related knowledge to members of marginalized communities. Greater awareness and energy related linkages to health and the built environment are necessary among those most affected and can be done so through community environmental health workers or "Promotoras Del Ambiente." Combined, these activities will provide new evidence to position energy insecurity as a major public health concern with potential to fuel scalable policy changes.

References

14. Institute of Medicine (2011) Climate Change, the Indoor Environment and Health. Figure 1: Heating Ventilation Air Conditioning (HVAC).