



Using Health Impact Assessment to Identify the Best Investment in Energy Efficiency and Health



Despite the recent decrease in the cost of utility service for many Americans, access to reliable, affordable heat, air-conditioning, and lights remains a challenge and an underappreciated social determinant of health related to housing. Renewable energy and sustainability mandates, climate change planning, and infrastructure modernization are transforming how Americans purchase home utility services.

The Challenge

Changes in the ways Americans keep the lights on and heat and cool their homes affect population health, especially for impoverished families and those that have high energy bills compared to their income.

Publicly regulated investor-owned utilities provide much of the residential utility service in the United States with a set rate of return in exchange for providing what is agreed to

be a public service. State public service commissions, together with state legislatures, decide on the rates and terms of utility service, as well as what consumer protections and cost-saving measures, including energy efficiency, should be part of the social contract between utility and consumer. Energy efficiency measures have the potential to benefit consumers by lowering energy costs and improving household quality.

In Connecticut, the Department of Energy and Environmental Protection (DEEP) administers low-income weatherization programs using funds from the U.S. Department of Energy Weatherization Assistance Program and from funding acquired through ratepayer programs. The CT DEEP's Energy Efficiency Board (EEB) oversees weatherization programs supported by ratepayers at two electric utilities (CT Light and Power, United Illuminating).

In 2010, the State of Connecticut's legislature set an ambitious energy efficiency goal to weatherize 80 percent of its housing stock by 2030. Public health practitioners recognized that decisions about how to invest public and utility ratepayer resources to achieve this goal would impact the health of Connecticut residents, especially for low-income households. Yet public health practitioners are not routinely at the table together when decisions are made about low-income energy efficiency programs.

In the fall of 2012, policymakers in Connecticut began considering policy and funding decisions about whether, and to what extent, health and safety measures will be included as part of residential energy efficiency upgrades. The policymakers sought input on how Connecticut can achieve its energy goal and create positive health outcomes while reducing potentially negative impacts on health. These public health and energy efficiency stakeholders needed a forum and a process to make collaborative recommendations that would improve public policy and support their respective goals of protecting families from unsafe housing conditions and improving the energy efficiency of American homes.

The Goal

New Opportunities Inc (NOI), a nonprofit community action agency and weatherization service provider, and the Connecticut Association for Community Action (CAFCA) convened public health and energy efficiency stakeholders to conduct a **rapid health impact assessment**. Health impact assessments (HIA) bring together scientific data, health expertise, and public input to identify the potential—and often overlooked—health effects of proposed new laws, regulations, projects, and programs.¹ The assessments produce information for action around a specific policy or program decision, involving participation by the full range of stakeholders, a systematic and impartial review of the evidence, and dissemination of findings.

The goal of this rapid assessment was to inform policy decision-makers about the health and safety measures that should be included in weatherization efforts funded by the U.S. Department of Energy as well as those funded by the State of Connecticut and local utilities by answering two key policy questions:

- What health and safety measures should be included in state's Department of Energy-funded weatherization work?
- What health and safety measures should be included in state and utility-funded weatherization work?

The stakeholders conducted the rapid HIA over a three-month period using existing data to estimate the likely health impacts of specific health and safety measures, as well as that of weatherization itself, and the estimated cost-benefit ratios for such measures. These analyses inform a priority list of health and safety measures that could be conducted by the energy workforce and achieve significant health benefits with positive cost benefit ratios.

The Approach

The six steps in an HIA include the following:

Screening—determine whether HIA is a useful and feasible approach;

Scoping—develop a theory and a related set of research questions about how the decision affects health and a work plan to test this theory;

Assessment—create a profile of population health conditions and document or predict how health would be changed by the decision being examined;

Recommendations—generate a set of policy-relevant recommendations based on findings from the assessment;

Reporting—develop and present HIA results to decision makers; and

Monitoring—track the influence of the HIA on decision-making and on stakeholders.

Screening

The stakeholders chose a rapid health impact assessment as the optimal method for advising state decision-makers about these critical issues because of the short timetable for decision-making. In addition to New Opportunities, Inc. and CAFCA, the participants in the process included the state's Energy Efficiency Board, the utilities United Illuminating and Connecticut Light and Power, the Lead Action for Medicaid Primary Prevention (LAMPP) project at the Connecticut Children's Medical Center, and the state departments of Public Health, Social Services, and Energy and Environmental Protection.

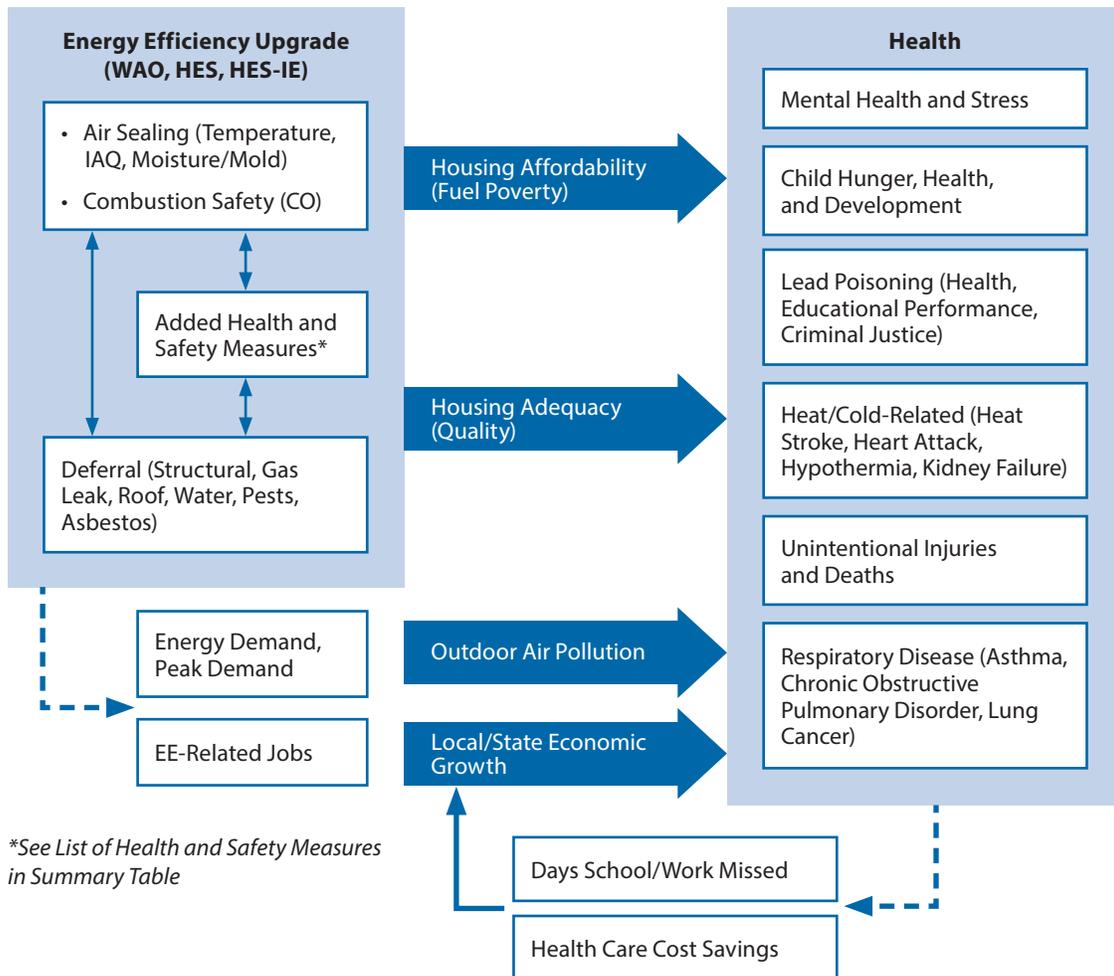
Scoping

A key first task and consistent with the steps involved in conducting a health impact assessment process was to clarify the relationship between home energy use and health. HIAs use "pathway diagrams" to relate exposures to health outcomes.

Figure 1 shows the many pathways through which energy efficiency programs can impact health. The four means by which energy efficiency upgrades (depicted on the left hand side of the figure) influence health are depicted as arrows and include housing affordability, housing adequacy or quality, outdoor air pollution, and the local or state economy. Health outcomes are listed in the boxes on the right-hand side of the figure.

¹ *The Health Impact Project* <http://www.healthimpactproject.org/hia>.

Figure 1: Pathways between Energy Efficiency and Health



Young children in fuel-poor homes are more likely to go hungry² and be hospitalized for failure to thrive, their elders are more likely to suffer from excess cold-related deaths during the winter, and die prematurely from heat-related causes in the summer.^{3,4} The use of ovens for heat and candles for light, when electricity is shut off for nonpayment, puts households at risk for carbon monoxide poisoning and fire-related injuries and deaths.⁵

² Bhattacharya J, DeLeire T, Haider S, Currie J. Heat or Eat? Cold Weather Shocks and Nutrition in Poor American Families. National Bureau of Economic Research Working Paper 9004. 2002. <http://www.nber.org/papers/w9004>.

³ Basu R. High ambient temperature and mortality: A review of epidemiologic studies from 2001 to 2008. *Environ Health*. 2009 Sep 16;8:40. doi: 10.1186/1476-069X-8-40.

⁴ Mortimer K, Gordon SB, Jindal SK, Accinelli RA, Balmes J, Martin WJ 2nd. Household air pollution is a major avoidable risk factor for cardiorespiratory disease. *Chest*. 2012 Nov;142(5):1308-15. doi: 10.1378/chest.12-1596.

⁵ Testimony of the National Energy Assistance Directors' Association on the Low Income Home Energy Assistance Program before the Select Committee on Energy and Climate Change, U.S. House of Representatives. September 25, 2008.

Low-income people with difficulty paying rent, mortgage, or utility bills are less likely to have a usual source of medical care and were more likely to postpone treatment and to use the emergency room for treatment.⁶

Substandard housing conditions, such as water leaks and poor ventilation, can result in the growth of mold, dust mites, and other allergens associated with poor health.^{7,8} Indoor allergens and damp housing conditions play an important role in the development and exacerbation of respiratory conditions, including asthma.⁶

⁶ Kushel MB, Gupta R, Gee L, Haas JS. Housing instability and food insecurity as barriers to health care among low-income Americans. *Journal of General Internal Medicine*. 2006; Jan;21(1):71-7.

⁷ National Center for Healthy Housing. *Housing Interventions and Health: A Review of the Evidence*. www.nchh.org/LinkClick.aspx?fileticket=21vaEDNBldU%3d%tabid=229. Published 2009. Accessed December 27, 2012.

⁸ National Academies Press. *Clearing the Air: Asthma and Indoor Air Exposures*. 2000. www.nap.edu/books/0309064961.html/.

Assessment

The work plan for the HIA involved three stakeholder meetings (the first for screening and scoping, the second for review of findings, and the third for review of draft recommendations and communications plan). Specific tasks conducted as part of the assessment included literature reviews, a health profile of Connecticut’s population, and modeling of the likely health and safety outcomes based on evidence from health and safety measures conducted in Connecticut and elsewhere. The HIA team identified four research focus areas:

- Which health and safety measures are likely to produce significant benefits? Which of these have added value for low-income households? Which ones cost relatively little to implement?
- How will a decision to fund Weatherization Plus Health affect the capacity to deliver weatherization services without additional funding for health and safety repairs?

- If the policy goal is to reduce deferral rates, which health and safety interventions should be added to weatherization? What are the health and safety benefits of adding these measures?
- If an expanded set of health and safety measures (Weatherization Plus Health) is not funded under EEB direction, are there other funds available to address these needs?

The Connecticut weatherization and health HIA examined the evidence for 16 health and safety measures conducted as part of energy upgrades. The team examined each repair through a “health disparities” perspective. If a repair could reduce a disproportionate burden or risk for low-income families, a “+” was included in the left hand column in Table 1. The HIA found that the 12 of the 16 health and safety repairs will produce substantial health benefits and can be integrated with energy upgrades using the existing workforce or through coordinated referrals to appropriate professionals.

Table 1: Sixteen Health and Safety Measures to Improve Energy and Health

Measures (+ Addresses Health Disparity)	Reduce Deferrals	Enhance Energy Saving	Significant Health Benefit	Health Benefit: Cost
Repairs Reduce Deferrals, Save Energy, and Improve Health				
Minor Moisture Repairs (needed for energy work) +	✓	✓	✓	X \$1.14/1
Asbestos Abatement (non-intact and needed for energy work)	✓		✓	Data not available
Gas Leak Detection and Repair	✓			X likely >\$1/1
Knob and Tube Wiring Repair (needed for energy work)	✓			Data not available
Air Sealing with Pest Exclusion +		✓	✓	X likely >\$1/1
Window Replacement of Leaded Single Pane +		✓	✓	X likely >\$1.79/1 (includes energy benefits)
Repairs Create Significant Health Savings				
Injury Prevention/Minor Home Repairs +			✓	Data not available
Radon Testing +			✓	X \$51/1
Radon Mitigation (if work increases radon > EPA threshold) +			✓	X \$47/1
Remove Unvented Gas Appliances			✓	X likely >\$1/1
Smoke Alarms +			✓	X \$33/1
Smoking Cessation Client Education and Referral +			✓	X likely >\$1/1
Repairs Recommended by EPA Protocols				
Carbon Monoxide Detectors +				X \$1.25/1
Ventilation Upgrades				Data not available

The HIA Recommendations

Using these findings, the HIA team and key stakeholders developed seven recommendations to assist policymakers as they considered which health and safety measures to include in state-, federally-, and utility-funded weatherization work in Connecticut. The HIA team and stakeholders then ranked these recommendations based on feasibility of implementation in the current political and economic climate.

1. Ensure that the Connecticut Weatherization plan submitted to DOE in 2013 provides the flexibility to undertake priority health and safety repairs allowed by DOE.
2. Fund energy efficiency programs fully to achieve both energy and health and safety benefits.
3. Refer Connecticut residents who receive Department of Social Services benefits to energy efficiency programs, leveraging existing state investments in population health.
4. Provide funding and financing to resolve the health and safety issues that would otherwise cause eligible households to be deferred from weatherization.
5. Incorporate priority health and safety repairs into energy efficiency programs using a combination of energy efficiency funds, financing, and/or other resources. Give priority to repairs that produce a net positive health and energy cost-benefit.
6. Identify sustainable funding sources to address additional priority health and safety repairs that yield significant health benefits and which can be undertaken by the energy efficiency workforce and related professions.
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The Impact

When a weatherization professional visits a home to complete energy upgrades and repairs, they are often faced with substandard housing conditions. Their options are grim: They can defer weatherizing the home until the conditions are addressed

"I witness first-hand on a daily basis the numerous health hazards we are living with, from low-level gas leaks, CO, asbestos, mold, lead. The Health Impact Assessment...shed an important light on this topic and brought it to the forefront of our industry and we applaud this important effort."

- Peter Callan, Chairman of the Home Performance Alliance of Connecticut and principal of Lantern Energy



Audience members at the HIA presentations

by the homeowner or another program, or they can dip into scarce weatherization resources to improve the conditions. Any improvements must be eligible activities under weatherization rules and within the scope of the program's budget.

The HIA process and findings have already yielded substantial outcomes by engaging the public and key stakeholders in better understanding the connection between health and weatherization activities. In addition, the rapid HIA has helped leverage significant new funding for local stakeholders to expand and sustain the integration of weatherization and healthy homes measures across the state, as part of the Weatherization Plus Health pilot:

- Connecticut's Department of Social Services has made a \$250,000 award to New Opportunities, Inc., using a federal Community Services Block Grant (CSBG), for two energy efficiency projects that will test and evaluate methods to address childhood asthma and fall hazards for elders.
- A competitive \$2 million state bond-funded award has been made to LAMPP to expand its work linking weatherization with healthy homes interventions. This award is part of a \$13.2 million for affordable housing and neighborhood revitalization across the state.

Presentations on the HIA drew a diverse audience from medical institutions, federal agencies, state agencies, private energy contactors, community action agencies, and private nonprofits.

The key decision-makers in Connecticut, including the Energy Efficiency Board, DEEP, and DEEP's advisory Energy Efficiency Board, were actively engaged in the HIA process and committed to understanding and considering the HIA findings.

DEEP fully supported the inclusion of health and safety components into weatherization activities following the release of the HIA findings. DEEP Commissioner Daniel Esty requested that the HIA team make a formal presentation during the Energy Efficiency Board's monthly meeting on April 10, and NOI issued formal invitations from his office to federal, state, and local partners from the energy, housing, and health sectors to attend.

In addition, the Connecticut Academy of Science and Engineering used the HIA as part of a study for the General Assembly and state agencies regarding the value of HIA as a tool for Connecticut decision-makers. The Academy's study staff have invited the rapid HIA team to present on its work next October at the annual meeting of the state public health association.

Finally, the National Association for State Community Services Programs (NASCSPP) will use the HIA as a centerpiece for HIA training and technical assistance for the Weatherization Assistance Program network as part of the Weatherization Plus Health initiative.

Reporting and monitoring are the last steps of a traditional HIA. For this rapid HIA, these duties are split between New Opportunities, Inc., the Connecticut Association for Community Action (CAFCA) at the local level, and NASCSPP at the national level. Reporting beyond the testimony before decision-makers this spring is being led by New Opportunities, Inc., as it plans follow-up meetings with state legislative staff, public officials, and prospective funders; one focus for reporting activity will be to implement one of the HIA's recommendations for a state-level task force to identify and develop sustainable revenue sources for an integrated weatherization and healthy homes approach. NASCSPP staff are delivering presentations about the rapid HIA, and about HIA more generally, to its network of federal officials at the national and regional level, the network of state, territorial, and tribal weatherization programs and the nearly 900 local subgrantees who operate weatherization programs in the field.

The HIA monitoring plan outlines a series of questions related to the process of decision-making that the HIA was intended to address, the outcomes of decision-making, and the tracking of other outcomes related to the HIA. NASCSPP is collaborating closely with both NOI and CAFCA to make a quarterly monitoring report, based on follow-up to these questions, to be shared with the HIA stakeholders in Connecticut, as well as the funders.

Conclusions and Portability

This HIA process provided an opportunity for weatherization and healthy homes stakeholders in Connecticut to help inform investment decisions to help the state meet its goal of weatherizing 80 percent of the housing stock by 2030, while simultaneously protecting and promoting health. The participants found the HIA to be a powerful tool for engaging decision-makers and stakeholders in considering the potential health impacts of proposed policies, plans, and programs. Indeed, the process of the HIA can be as important as the findings and outcomes. The findings produced through this the HIA offer a series of evidence-based recommendations for maximizing the positive impact of weatherization while minimizing adverse consequences.

Weatherization Assistance Program grantees and their local subgrantees may want to consider an HIA as a tool to help provide input to state public service commissions, residential utility

providers, or others deliberating on the value of health and safety as an integral part of crisis fuel assistance, regulated utility consumer protections, and residential energy efficiency upgrades. Weatherization and healthy home stakeholders nationally can use the methodology outlined in the HIA to produce locally relevant data to inform their weatherization investment decisions.

In this example, healthy homes and weatherization stakeholders, decision-makers, and the public were brought together to engage in dialogue regarding programmatic and funding decisions in a way that had never occurred previously. The final HIA product reflects the depth and diversity of the stakeholders involved in the process. HIA practitioners need to ensure that their process engages the full range of stakeholders potentially impacted by the decision at hand. Cost- and net benefits of potential weatherization plus health interventions will need continued analysis and study on the local level.

For more information about the Connecticut Weatherization HIA, visit <http://newoppinc.org/sites/default/files/pdf/hia-report-2013.pdf>.

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