



Energy Efficiency and Public Health: Leveraging the Links

**Christine Gerbode, Public Health Analyst, Health and Environment
American Council for an Energy-Efficient Economy**

**Building Clean Symposium
Chicago, IL**

November 14, 2019

The American Council for an Energy-Efficient Economy is a nonprofit 501(c)(3) founded in 1980. We act as a catalyst to advance energy efficiency policies, programs, technologies, investments, & behaviors.

Our research explores economic impacts, financing options, behavior changes, program design, and utility planning, as well as US national, state, & local policy.

Our work is made possible by foundation funding, contracts, government grants, and conference revenue.



Presentation Goals: The What, Why, and How of Energy Efficiency Health Benefits

- Health, the Environment, and Energy
- Large-Scale Health Impacts of Energy Reduction
- Localized Impacts: Health, Energy, and the Built Environment
- Leveraging Health Benefits to Support Utility Energy Efficiency Programs

A Holistic View of Health: Different Impacts at Different Scales



Individual
health



Home safety
and comfort



Financial
security



Jobs and
opportunity



Environmental
quality

Social Determinants of Health

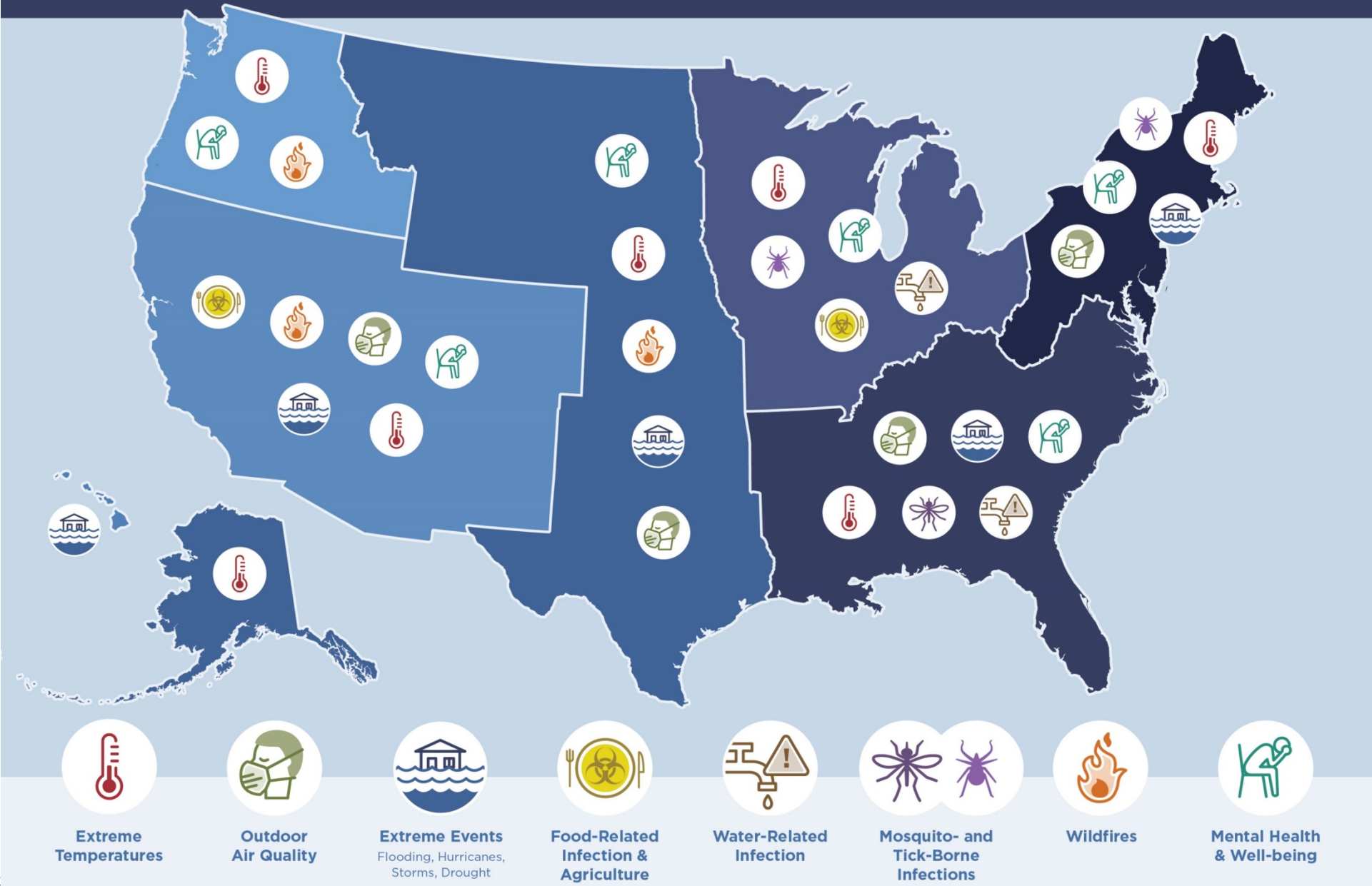
Per the CDC, these include factors related to:

- **Economic Stability**
- **Education**
- **Social and Community Context**
- **Health and Health Care**
- **Neighborhood and Built Environment**

Energy efficiency can play a role in many of these factors!



How Our Health is Harmed by Climate Change: Impacts Differ by Geographic Region



Efficiency Can Get the US Halfway to Paris

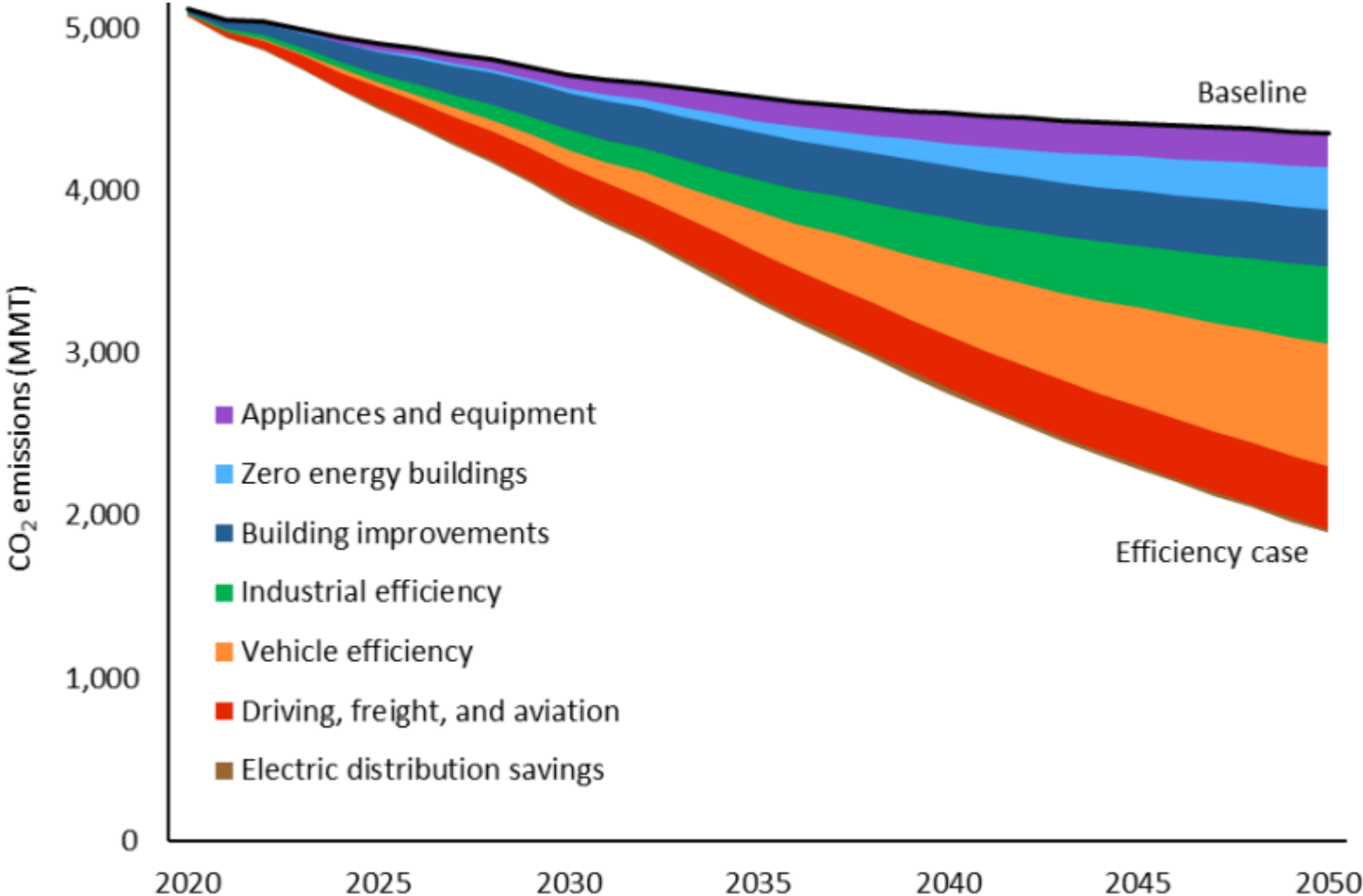
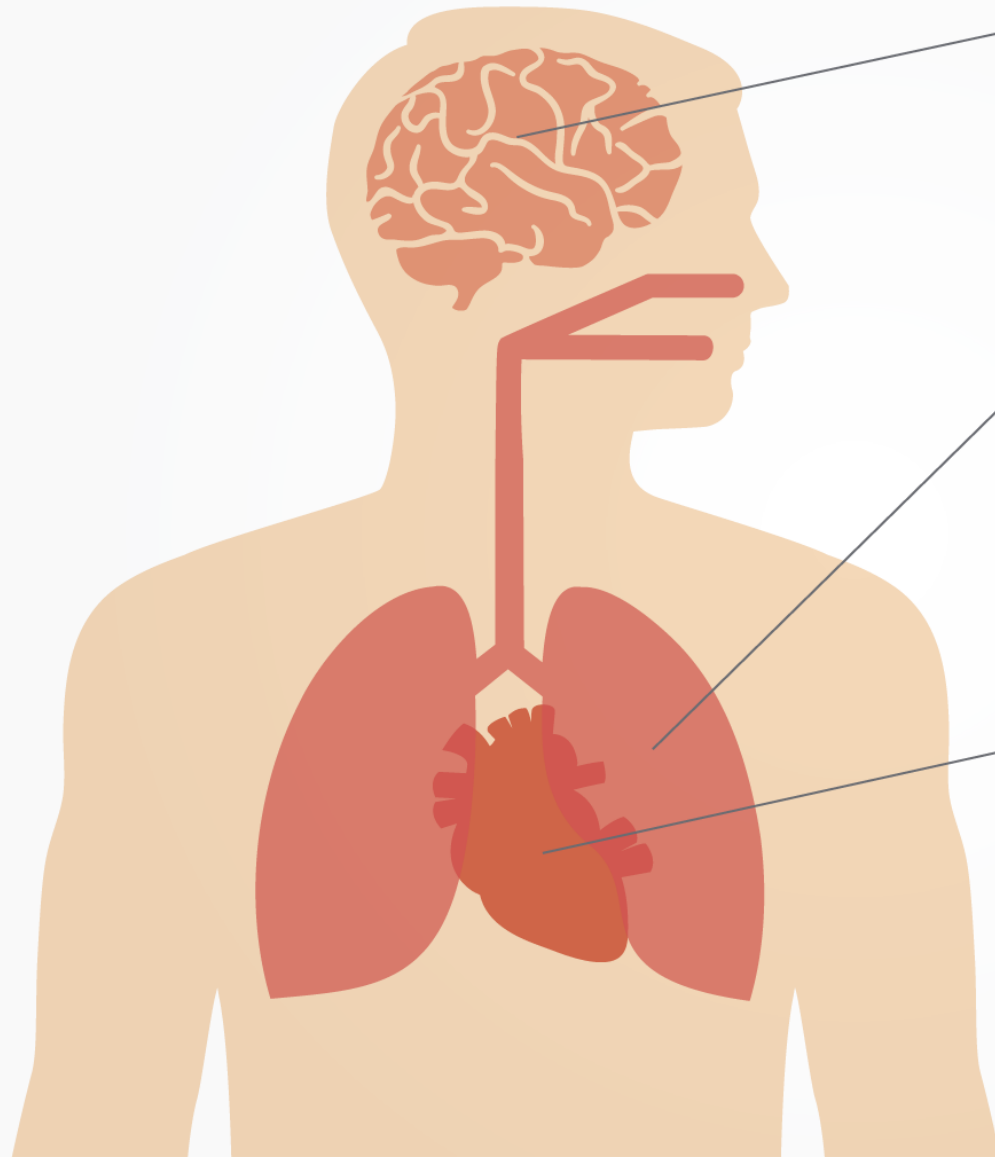


Figure ES1. Reduction in carbon dioxide emissions from combined opportunities

Health Effects of Fossil Fuel Pollutants



BRAIN Mercury and lead target the nervous system, particularly the brain, leading to serious neurological consequences. These include **stroke** and **loss of intellectual capacity**.

LUNGS Fine particulate matter, sulfur dioxide, and nitrogen oxides contribute to **lung cancer, COPD** (chronic obstructive pulmonary disease), and **asthma**.

HEART Air pollutants such as nitrogen oxides, sulfur dioxide and particulate matter harm cardiovascular health. They contribute to **coronary heart disease**, the leading cause of death in the US, hospitalizations for heart attacks, and **congestive heart failure**.



Saving Energy, Saving Lives

The Health Impacts of Avoiding
Power Plant Pollution with Energy Efficiency

Sara Hayes and Cassandra Kubes

February 2018

Report H1801

Save Energy. *Protect Health.*

Reducing annual electricity use by **15%** with **ENERGY EFFICIENCY** would reduce air pollution, and...

- + Save more than **SIX LIVES** every day
- + Prevent nearly **30,000 ASTHMA EPISODES** each year
- + Save Americans up to **\$20 BILLION** in avoided health harms annually



Health Equity in the Built Environment

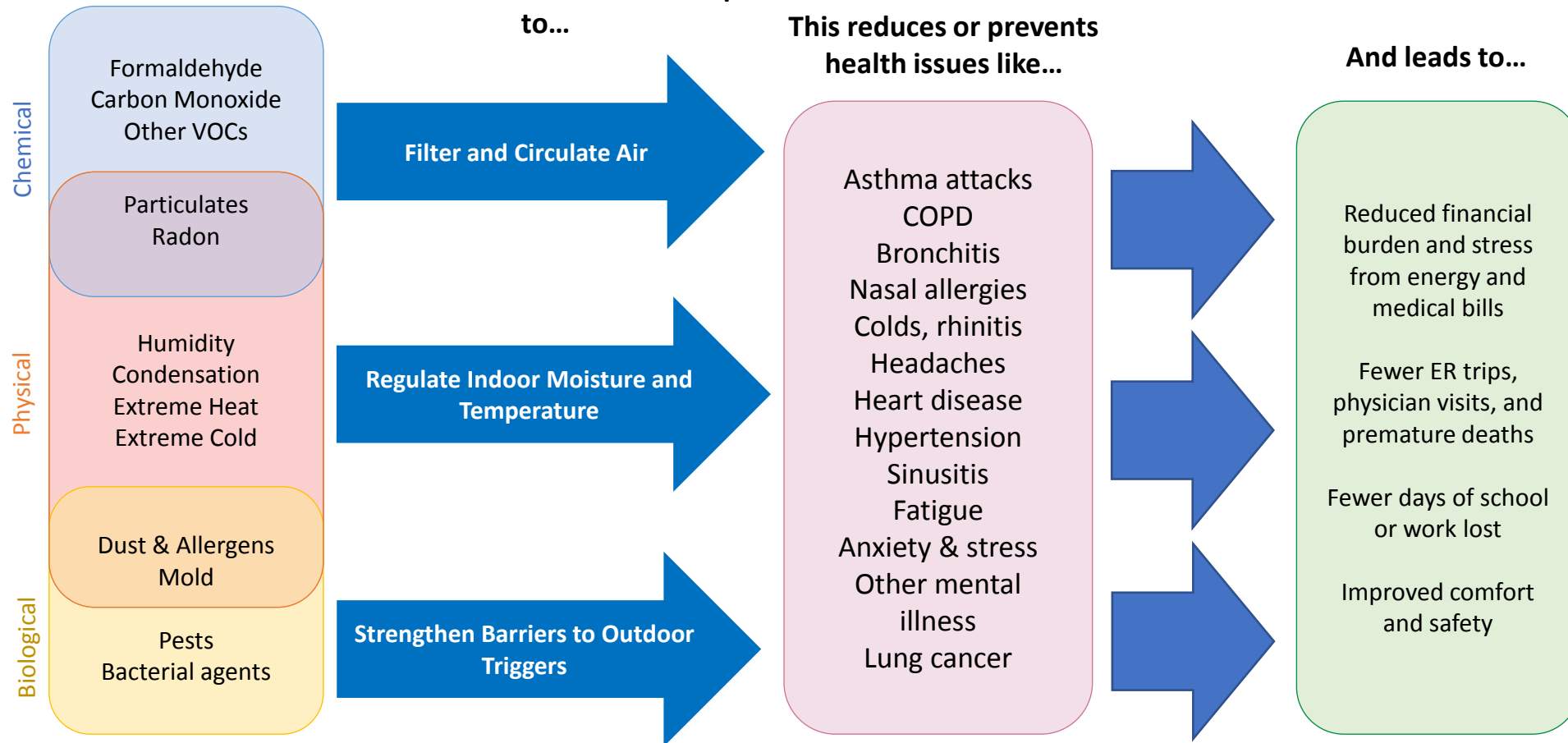
- Over 50% of the US building stock is more than 35 years old
- Low-income populations and people of color live in homes with inadequate housing conditions at disproportionately high rates
- Many of the chronic diseases exacerbated by inadequate housing conditions disproportionately fall on low-income populations and people of color
- Children experience asthma at higher rates than adults
- 40% of asthma risk in children is associated with home exposures (e.g., moisture, thermal stress, pests)
- Seniors are particularly vulnerable to in-home hazards as well



Source: ACEEE <https://aceee.org/topics/health-environment>

EE Health Benefits for Building Occupants

Common health stressors in homes include...



Braiding Funding: What Else Could Weatherization Programs Do in the Home?

- Weatherization:
 - Energy burden
 - Heat and cold stress
 - Air quality (indoor and outdoor)
 - Pest exclusion
- Weatherization Plus: other in-home interventions
 - Other asthma triggers
 - Trip-and-fall hazard mitigation
 - Carbon monoxide and smoke detectors
 - Mold and pest/allergen remediation

Why Measure and Monetize Health Benefits?

- Account for participant health impacts in cost-effectiveness tests
- Target programs to households most in need
- Attract interest and build cross-sector partnerships with health care partners
- Unlock additional funding
- Maximize participant health benefits
- Increase participation through marketing

Measuring Health Outcomes

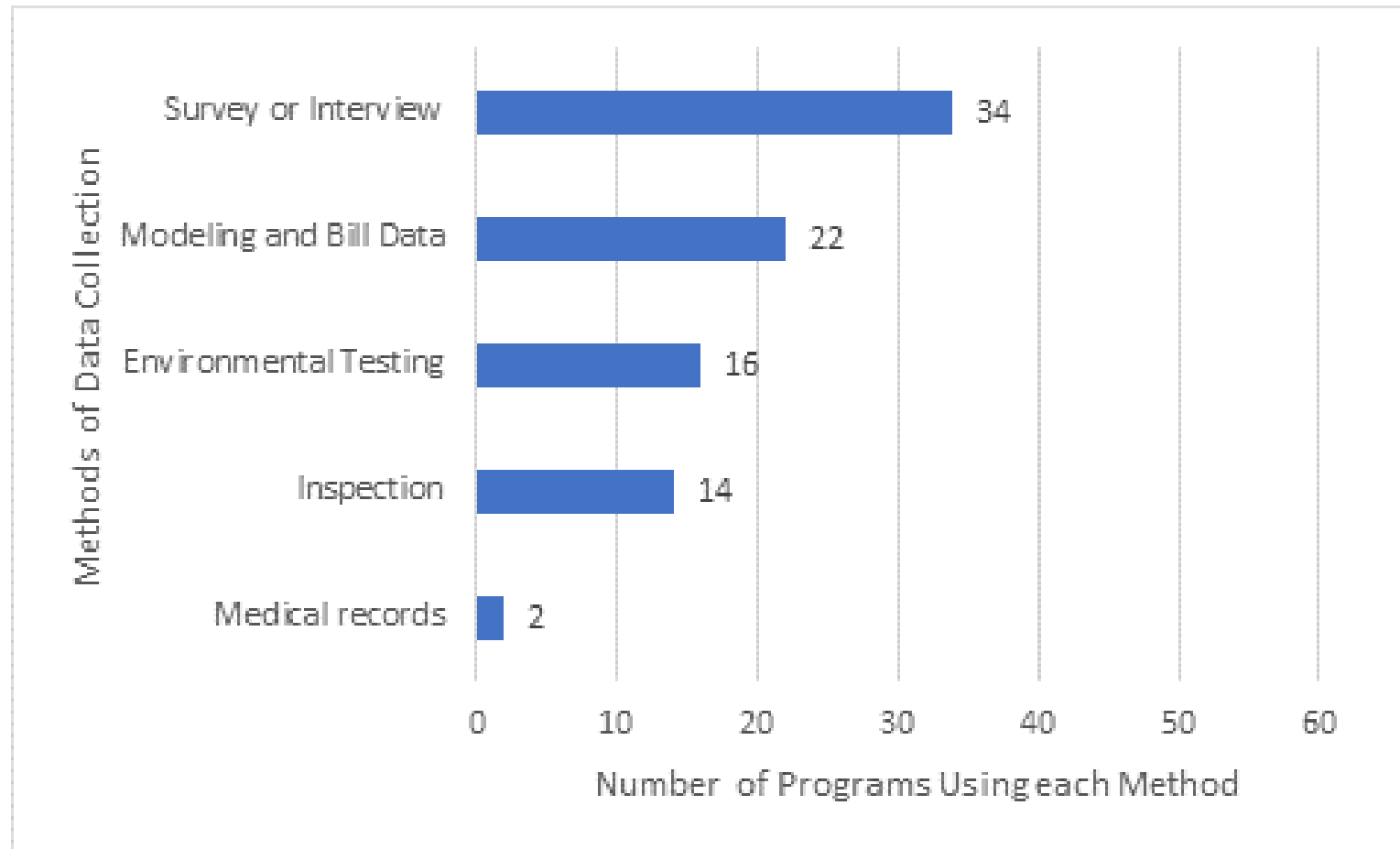
Methods:

- Reviewing medical records
- Conducting a survey or interview
- Visual inspection
- Environmental testing
- Modeling and estimating health outcomes for participants

ACEEE's recent report on how programs are tracking outcomes, and opportunities to improve:

Room to Improve

Methods of data collection from a review of 63 weatherization plus health programs across the US



Source: ACEEE, "Protecting the Health of Vulnerable Populations with In-Home Energy Efficiency: A Survey of Methods for Demonstrating Health Outcomes"

Valuing Health Outcomes and Braiding Funding

- Several forthcoming ACEEE reports to be published next year – be on the lookout!
- If we can better value health outcomes of energy efficiency programs, we can use this to braid funding and pool resources with health sector partners
- Result: Better outcomes for vulnerable populations, better use of resources for advocates, programs, and funders

Concluding Thoughts

- Energy efficiency can provide positive health outcomes for program participants
- There are a variety of methods to track and value these health outcomes
- Understanding and valuing health outcomes can help to expand program reach, attract new partners, and unlock health funding streams



2020 Conference on Health, Environment, and Energy

Hyatt Centric French Quarter

New Orleans, LA

January 21, 2020 to January 23, 2020

Register: <https://aceee.org/conferences/2020/chee>

Thank you!

Christine Gerbode
ACEEE
cgerbode@aceee.org



Monetizing Health Outcomes

- Measurement methods and data collection form the basis of monetizing the health outcomes
- A variety of health outcomes can be monetized
 - e.g. reduced thermal stress, asthma symptoms, lost work days, trip and fall injuries, home fires, CO poisonings, etc.
- Several studies have calculated the value of health outcomes for participants of weatherization programs

Considerations for Monetizing Health Outcomes

- Data collection
 - Primary and secondary sources
 - Accessibility
- Methodology
 - Varying degrees of rigor
- Look to other states, examples include:
 - States incorporating health in cost-effectiveness tests
 - Efficiency Vermont Healthy Homes Initiative
 - New York State Healthy Homes Pilot Program

Sample of Monetized Health Outcomes

Health Outcome	Total without avoided death benefit (first year benefits per weatherized unit)	Total with avoided death benefit (first year benefits per weatherized unit)	Source of \$ savings
Reduced asthma symptoms	\$202.00 - 332.00	\$202.00 - 332.00	Lower medical costs
Reduced cold-related thermal stress	\$17.28 - 38.20	\$35.64 - 854.56	Lower medical costs and avoided premature death
Reduced heat-related thermal stress	\$8.52 - 35.28	\$28.52 - 231.86	Lower medical costs and avoided premature death
Fewer missed days at work	\$20.25 - 186.81	\$20.25 - 186.81	Increased wealth due to fewer sick days/reduction in lost income

Source: Tonn, B., et al. 2014. Health and Household-Related Benefits Attributable to the Weatherization Assistance Program” https://weatherization.ornl.gov/wp-content/uploads/pdf/WAPRetroEvalFinalReports/ORNL_TM-2014_345.pdf; Three3 and NMR Group entitled, “Low Income Single Family Health and Safety Related Non Energy Impacts Study” <http://ma-eeac.org/wordpress/wp-content/uploads/Low-Income-Single-Family-Health-and-Safety-Related-Non-Energy-Impacts-Study.pdf>