Better Buildings®
U.S. DEPARTMENT OF ENERGY

Roadmapping Health and Residential Energy Efficiency: Unlocking New Customers and Funding

May 15, 2017

1:30 – 5:00 p.m.

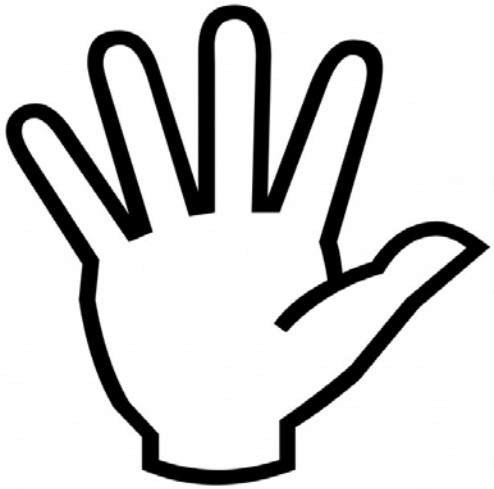
U.S. DEPARTMENT OF ENERGY

Panelists

- Steve Cowell, E4TheFuture, President
- Kevin Kennedy, MPH, CIEC, Children's Mercy Hospitals and Clinics, Director of Environmental Health
- Jonathan Wilson, MPP, National Center for Healthy Housing, Director of Research
- Larry Zarker, Building Performance Institute, Chief Executive Officer
- Moderators:
  - Jonathan Cohen, LEED GA, DOE Lead, Better Buildings Residential Network
  - Ely Jacobsohn, DOE Program Manager, Home Performance with ENERGY STAR

Questions for Audience (Show of Hands)

1. What sector are you from? (State/local gov't, utility, implementer, nonprofit, contractor, other)
2. What is your level of experience with the subject? (Newbie, Somewhat experienced, Solid experience, Expert level)
3. How long have you been working in the field of residential energy efficiency? (0-1, 2-5, 6-10, >10)
4. How long has your program been operating? (0-1, 2-5, 6-10, >10)



Agenda for Workshop

- **Part 1**
  - DOE Health and Home Performance Initiative Description
  - Health and Home Performance Roadmap Update
  - Health and Home Performance Research and Filling Gaps
  - Engaging the Health Sector in Home Performance
  - Engaging Utilities and Regulators about Health
  - Workforce Training and Certification
  - Describing Part 2 Activities
- **Part 2**
  - Breakout Sessions

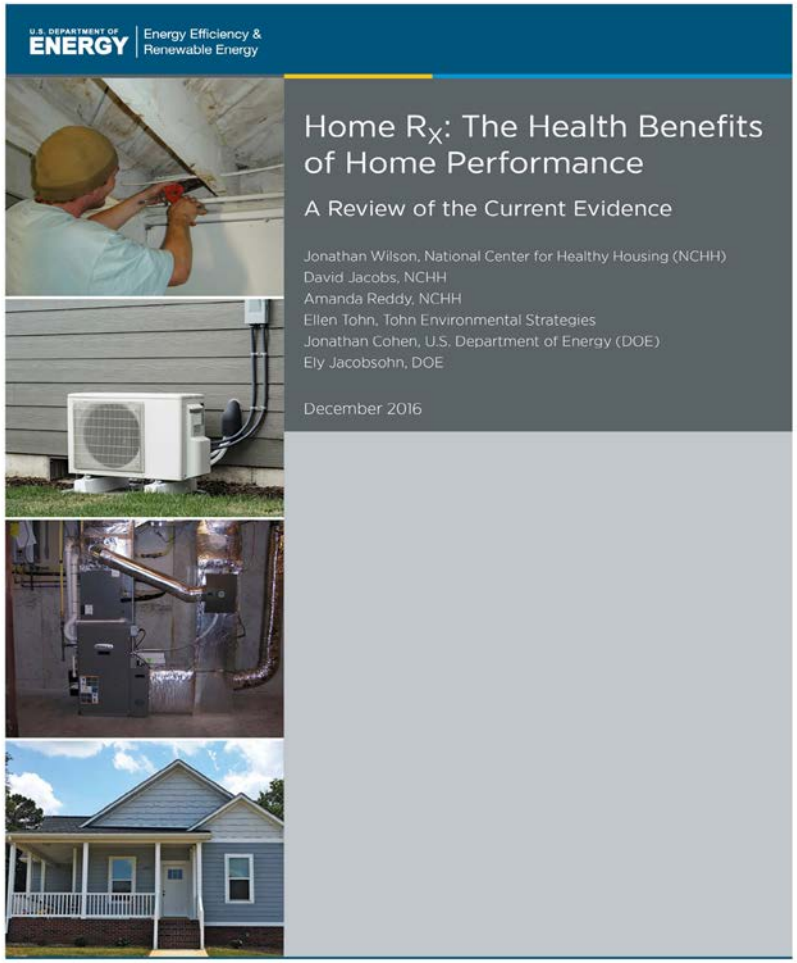
Health and Home Performance Initiative

ID & leverage substantiated benefits to occupant health from home performance improvement activities:

- Literature review (National Center for Healthy Housing)
- Roadmap to leverage home performance-health connection to grow industry
- Create consumer marketing for communication with key stakeholders

DOE Roadmap to Integrate Health & Home Performance

Element	What We Have	What We Need
Goals and Objectives		
Value to Stakeholders		
Workforce Development		
Policy & Regulatory Environment		
Marketing and Demand		
Success Measures		
Research		
Demonstrations		
Standards/Protocols		
Resources		
Funding Development/Access		



DOE Roadmap to Integrate Health & Home Performance

Element	What We Have	What We Need
Goals and Objectives	?	Goals/objectives by stakeholder group, i.e. programs, contractors, homeowners, medical community
Value of Health-EE Integration to Stakeholders	HPC: Standard Practice Manual for Cost Effectiveness (coming soon)	?
Workforce Development	BPI Healthy Home Evaluator	What credentials needed for credibility from medical community and insurance groups?
Policy and Regulatory Environment	?	?

DOE Roadmap to Integrate Health & Home Performance

Element	What We Have	What We Need
Marketing and Demand	HUD: Everyone Deserves a Safe & Healthy Home	Language to manage liability risk
Success Measures	?	?
Research	• DOE Literature Review: Home Rx: The Health Benefits of Home Performance • E4theFuture White Paper: Occupant Health Benefits of Residential Energy Efficiency • WAP Evaluation	?

DOE Roadmap to Integrate Health & Home Performance

Element	What We Have	What We Need
Demonstrations	• Children's Mercy Hospital Kansas City • Allegheny County Dept. of Health	?
Standards/Protocols	Examples from: • Mold/moisture in homes • Formaldehyde in manufactured housing	?
Resources	?	?
Funding Development/Access	?	?

Coming Soon: Part 2 Breakouts

- Break out audience by topic:
  - Value of Healthcare-EE Integration to Stakeholders
  - Workforce Development
  - Policy & Regulatory Environment
  - Access to Funding
- Topics explored based on:
  - Stakeholder views
  - Implementation strategies

Thank You

- Provide feedback on this session in the new Summit App!
- Download the app to your mobile device or go to **bbsummit.pathable.com**
- Stakeholder sign up sheet for involvement and/or updates on DOE Roadmap efforts

Contact: homehealth@csra.com

Questions/Comments?

Jonathan Wilson

National Center for Healthy Housing

U.S. DEPARTMENT OF ENERGY

Research Findings: Health Benefits of Residential Energy Efficiency

Jonathan Wilson, Director of Research

May 15, 2017

National Center for
HEALTHY HOUSING

Literature Review Overview

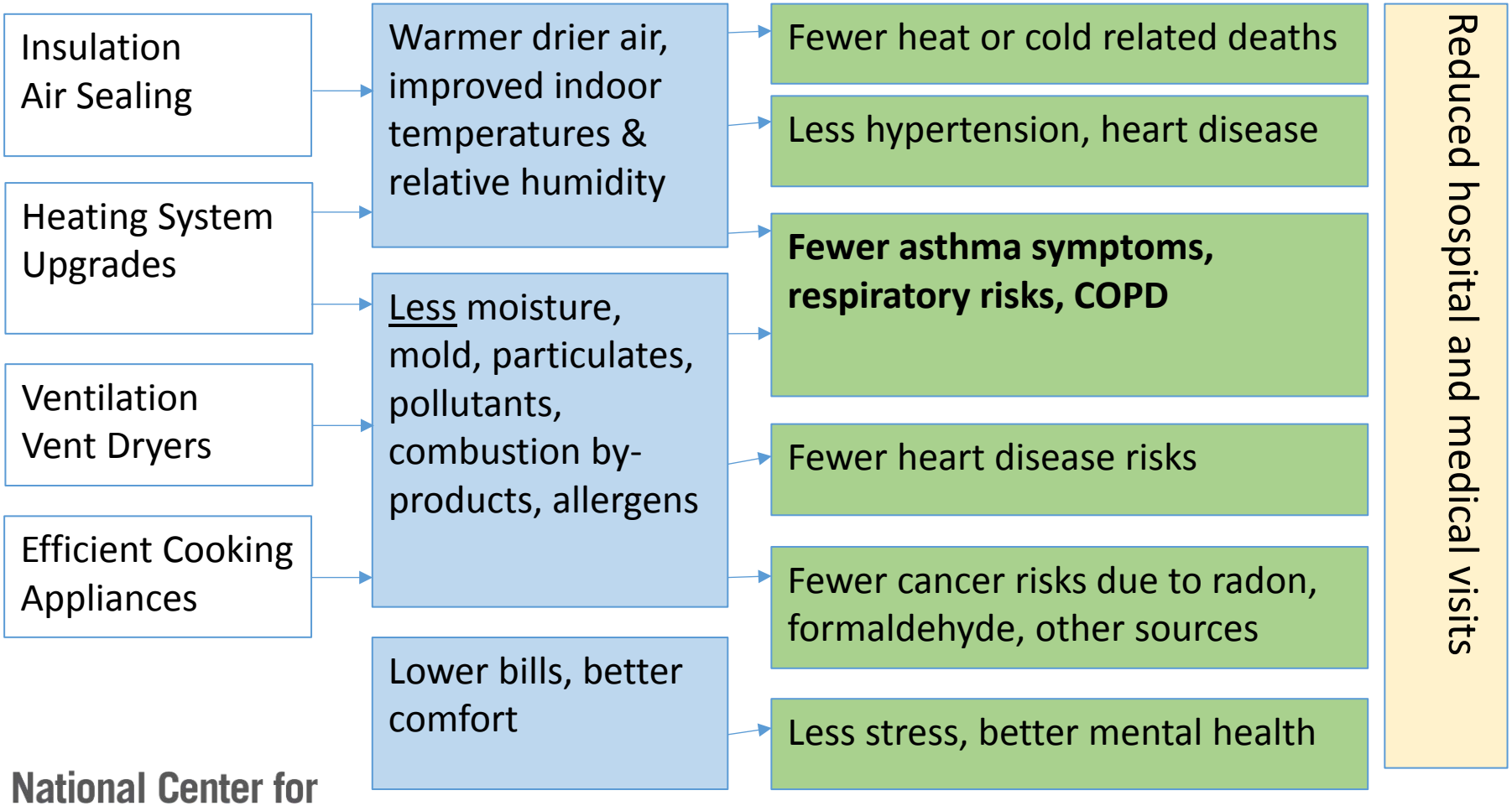
- **Goal**:
  - Investigate impact of home performance measures on resident health
- **Objectives**:
  - Build the case for contractors and home performance advocates so they can:
    - Educate home performance clients
    - Educate current funders (utilities, DOE)
    - Educate medical community

Studies Considered

- 40 Studies met criteria for inclusion
  - Base energy efficiency: 6
  - Enhanced energy efficiency: 7
  - Green construction: 9
  - Ventilation: 8
  - Supplemental Services: 10

    (Room air cleaners, wood stove replacement, gas stove replacement)

How energy efficiency can reduce health risks



National Center for HEALTHY HOUSING

Observed Effects

Reduced Respiratory & Allergy Symptoms	Other Health Improvements	Reduced Emergency Dept. Visits or Hospitalizations	Indoor Environmental Conditions
Allergies	Headaches	Asthma	Moisture
*Asthma**	Hypertension	Other respiratory	Condensation
Colds	Thermal stress		VOCs
Sinusitis	Overall health		*Formaldehyde*
Throat irritation	Mental health		*Radon*
Wheeze			

Italics: some negative outcomes VOCs: Volatile Organic Compounds

* The majority of studies reported asthma improvements; one study documented mixed results

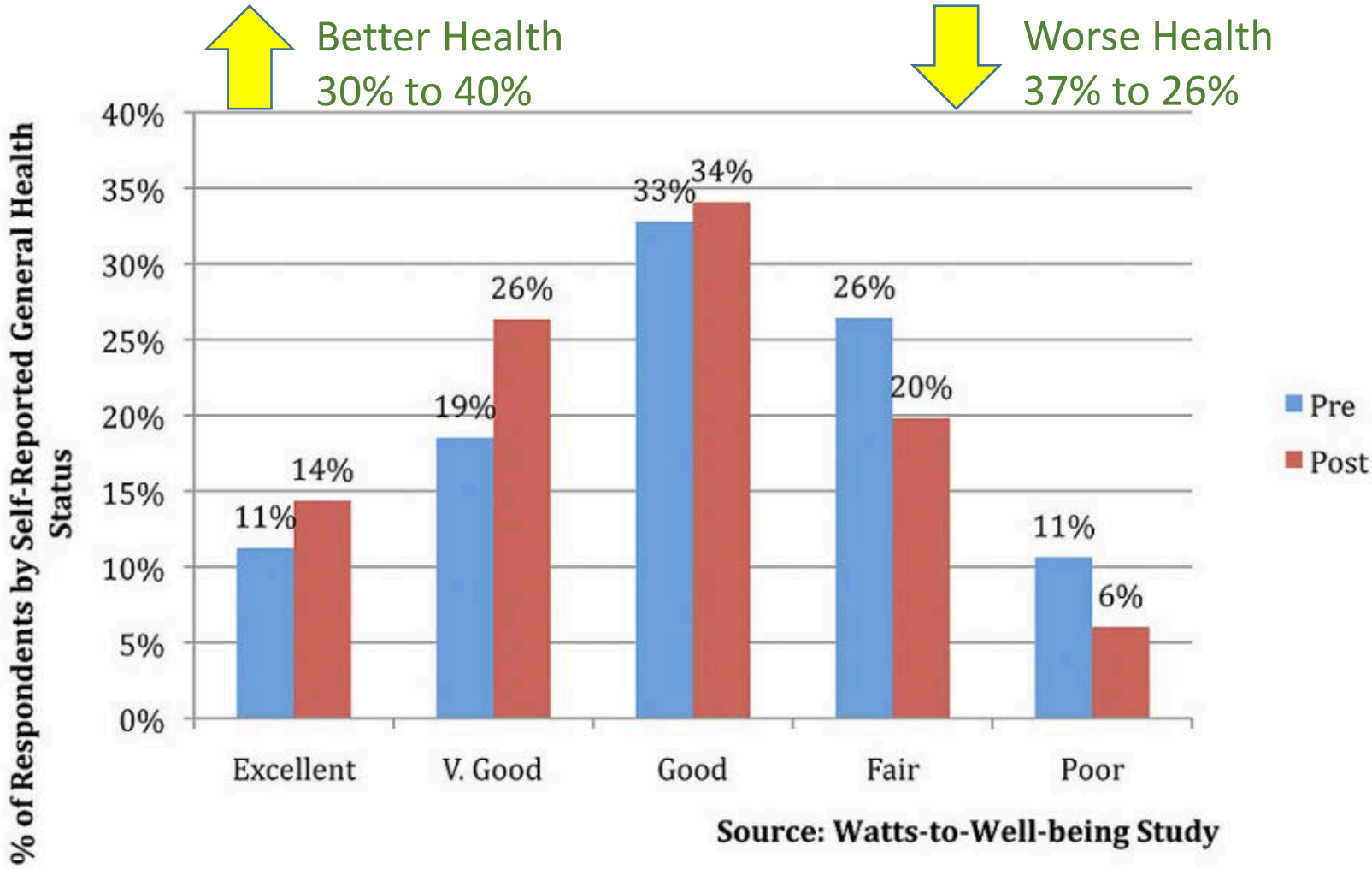
National Center for
HEALTHY HOUSING

Documented Health Benefits of Energy Efficiency

- Occupants experience fewer respiratory-related Emergency Dept visits after energy efficiency (EE) (National Evaluation of WAP)
- Occupants report better control of their asthma (Breysse)
- Occupants report better physical and mental health after EE (multiple studies)

National Center for HEALTHY HOUSING

EE = Health Improvements



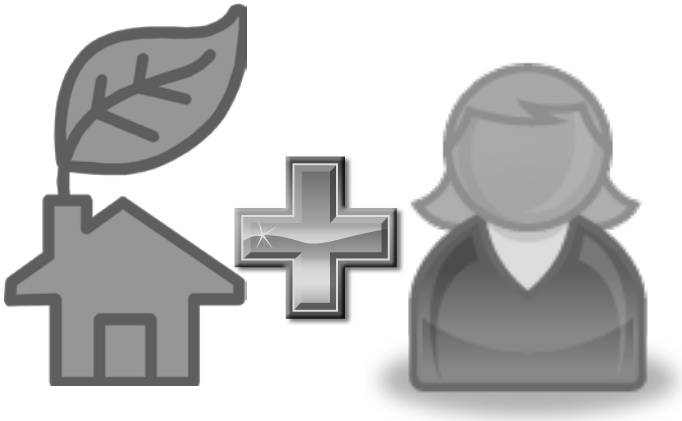
National Center for HEALTHY HOUSING

Source: Wilson J, Dixon SL, Jacobs DE, Breysse J, Akoto J, Tohn E, Isaacson M, Evens A, Hernandez J (2014). Watts-to-Wellbeing: does residential energy conservation improve health? *Energy Efficiency*, 7(1), 151.

Weatherization “Plus”

Highline Communities, King County, WA

STUDY GROUP:
WEATHERIZATION PLUS
COMMUNITY HEALTH
WORKER

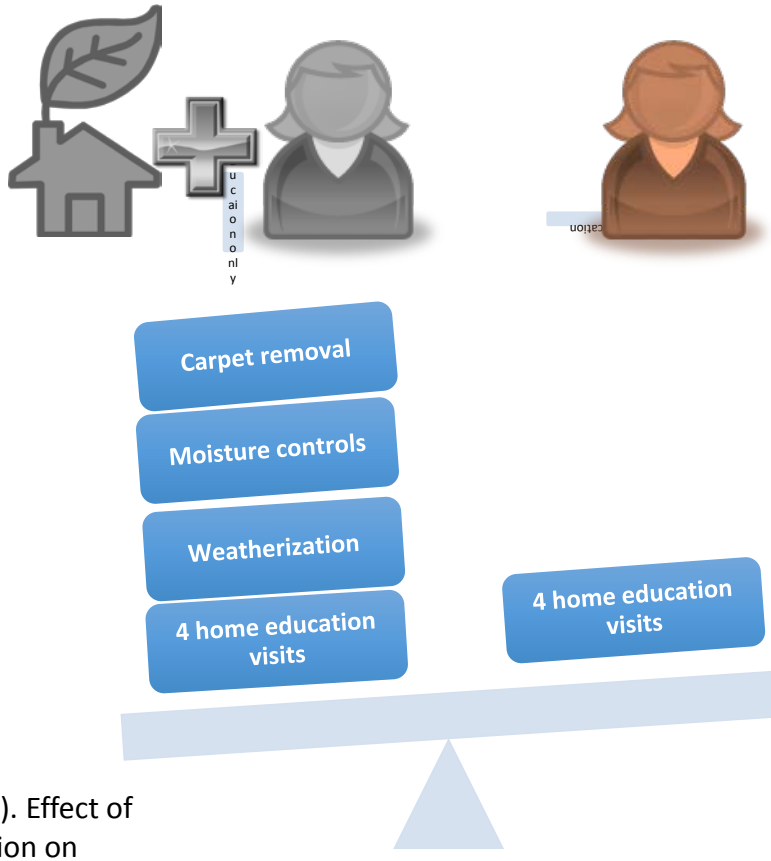


COMPARISON GROUP:
COMMUNITY HEALTH
WORKER ONLY

National Center for
HEALTHY HOUSING

Examples of Services Provided

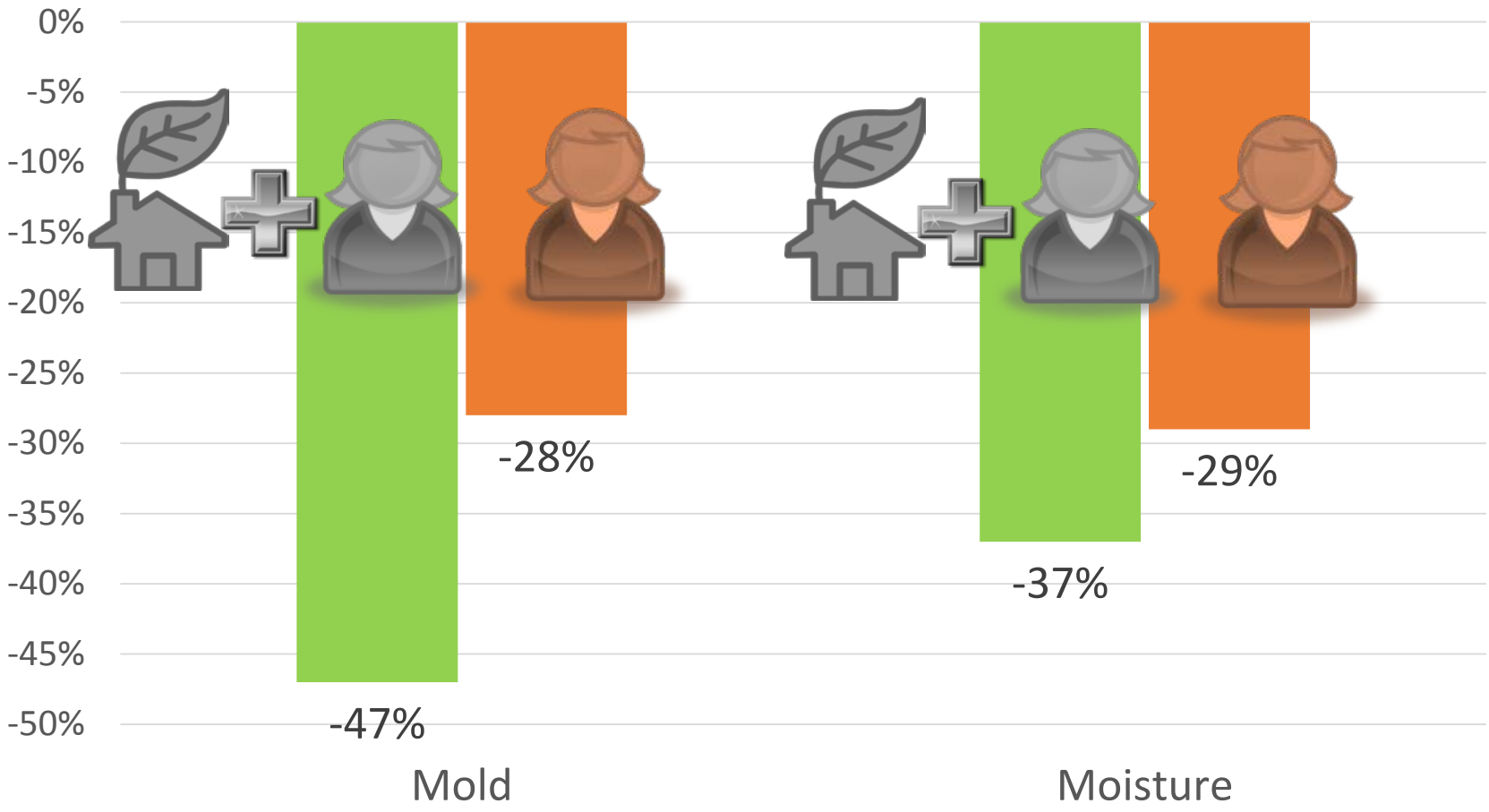
- Standard weatherization +
- 61% new bath fans - most with timer
- 61% carpets removed
- 26% vapor barriers in crawl space
- 24% kitchen range fans
- Other measures as needed
- $4200/apartments (11)
  $6300/duplex or homes (23)



Source: Breysse J, Dixon S, Gregory J, Philby M, Jacobs DE, Krieger J. (2014). Effect of weatherization combined with community health worker in-home education on asthma control. *American Journal of Public Health*, 104(1), 57.

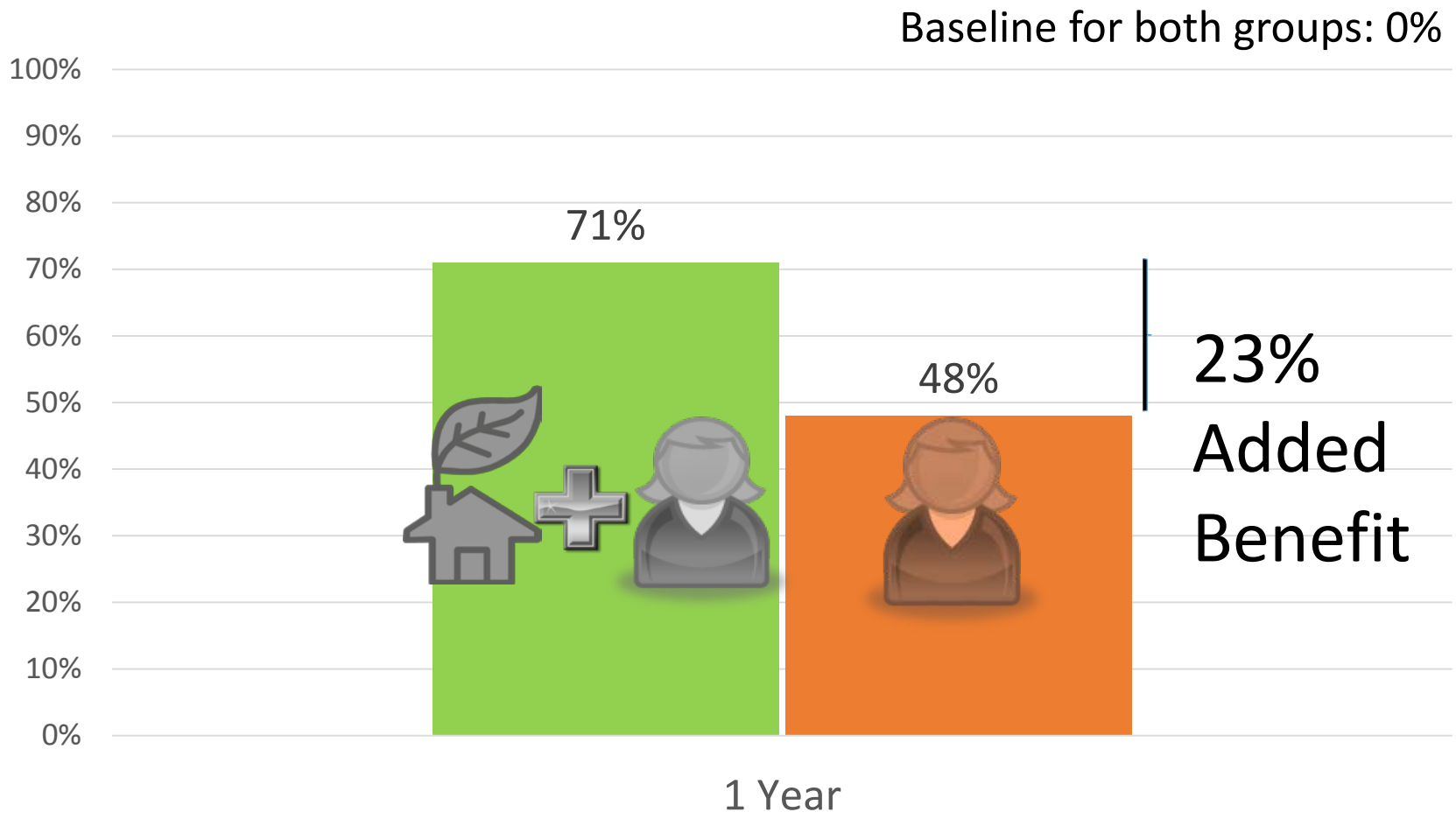
National Center for HEALTHY HOUSING

Study Outcome:
Changes in Mold and Moisture



National Center for
HEALTHY HOUSING

Study Outcome: % of Children with Well-Controlled Asthma



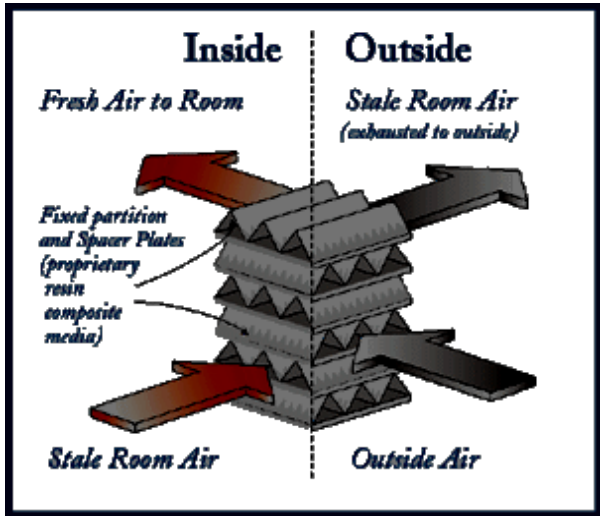
National Center for HEALTHY HOUSING

Ventilation

- Eight studies of ventilation systems were considered
- Indoor environmental conditions generally improved with enhanced ventilation
  - Asthma triggers
  - Mold
  - Volatile Organic Compounds
  - *Nitrogen dioxide increased*
- Installation of whole-house ventilation associated with lower dust mite levels

HRV/ERVs

- Installation of HRV/ERVs associated with fewer asthma respiratory symptoms



- 3 studies – all controlled trials with at-risk children or children with asthma
- Studies also observed improvements in CO_2, VOCs, and airborne mold

National Center for HEALTHY HOUSING

Exhaust Ventilation

- Installation of exhaust ventilation to meet 62.2-2010 associated with fewer headaches among children when compared to 62.2-1989
- Homes in both groups had lower CO_2 and formaldehyde levels after work
- Homes in a second study also observed reductions in radon after installation of exhaust ventilation

National Center for HEALTHY HOUSING

Additional Research Needs

- Studies of healthcare utilization
- Studies focused on residents who have a pre-existing respiratory health condition would enhance the research base
- Studies of work in market-rate housing
- Studies of environmental outcomes when health effects take time to be observed
  - Also, studies should better document the practices used by the energy efficiency contractors

National Center for
HEALTHY HOUSING

Take Home Message

- Consumers want improved comfort and better health; it is a key marketing opportunity
- Multiple studies find that residents feel better, have fewer respiratory symptoms, and experience fewer headaches after energy efficiency measures
- The health effects are supported by IAQ changes
- No one should use this research to guarantee health effects for any particular client, but the evidence is clear that population health benefits are real

Questions: Contact Jonathan Wilson – jwilson@nchh.org

Thanks to Ellen Tohn of Tohn Environmental Strategies.

www.nchh.org ♦ @NCHH ♦ facebook.com/HealthyHousing

National Center for
HEALTHY HOUSING

Questions/Comments?

Kevin Kennedy

Children’s Mercy Hospitals and Clinics

U.S. DEPARTMENT OF ENERGY

Better Buildings®
U.S. DEPARTMENT OF ENERGY

Healthy Home Performance- What Health Care Needs

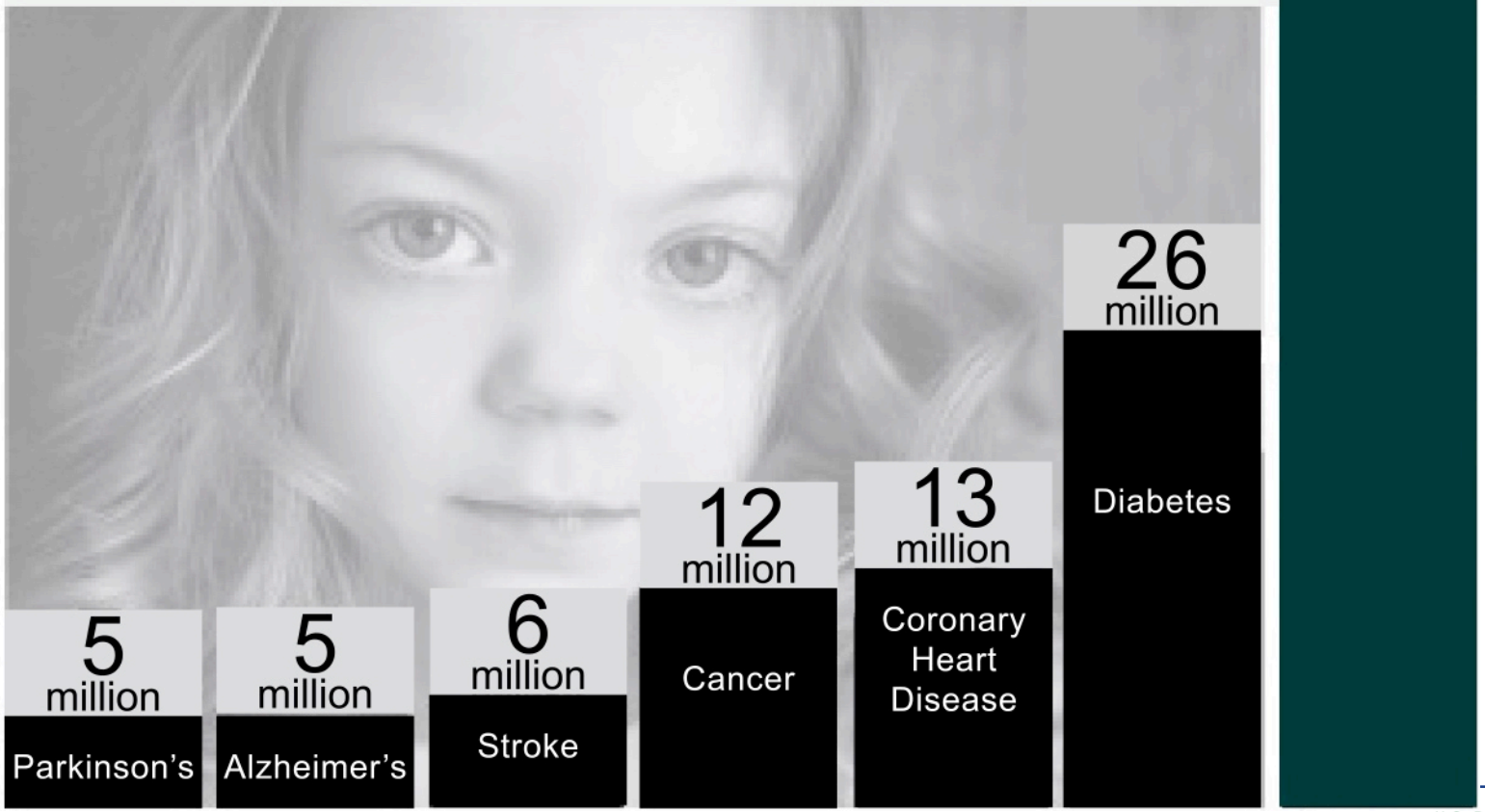
Kevin Kennedy,
Children's
Mercy
Hospital

U.S. DEPARTMENT OF ENERGY

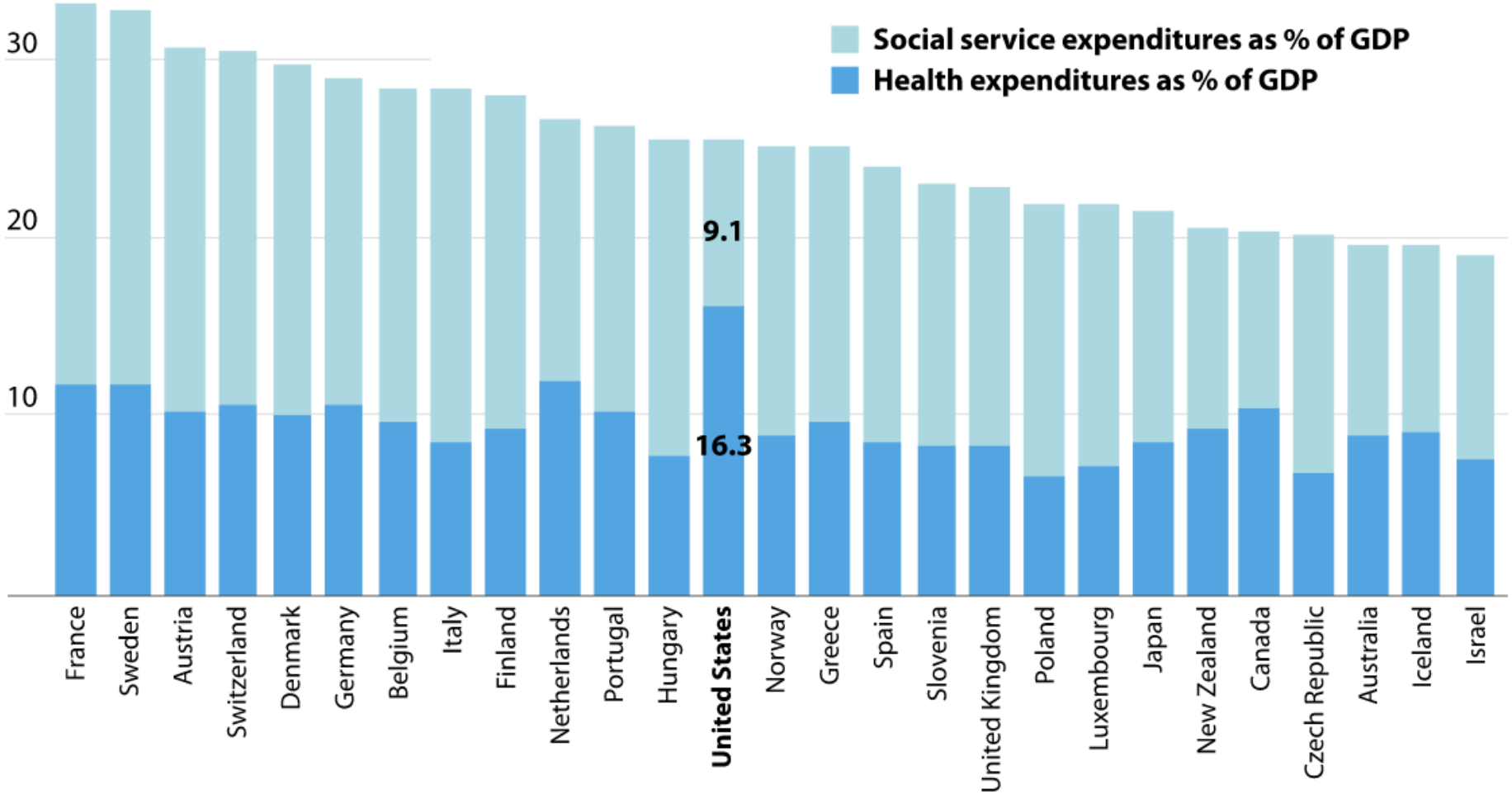
Everyone here will experience some kind of chronic health condition in their lifetime.

Where do we manage our health?

Asthma and allergies strike 1 out of 5 Americans



The US spends more on health care and less on contributors to health problems than anywhere else

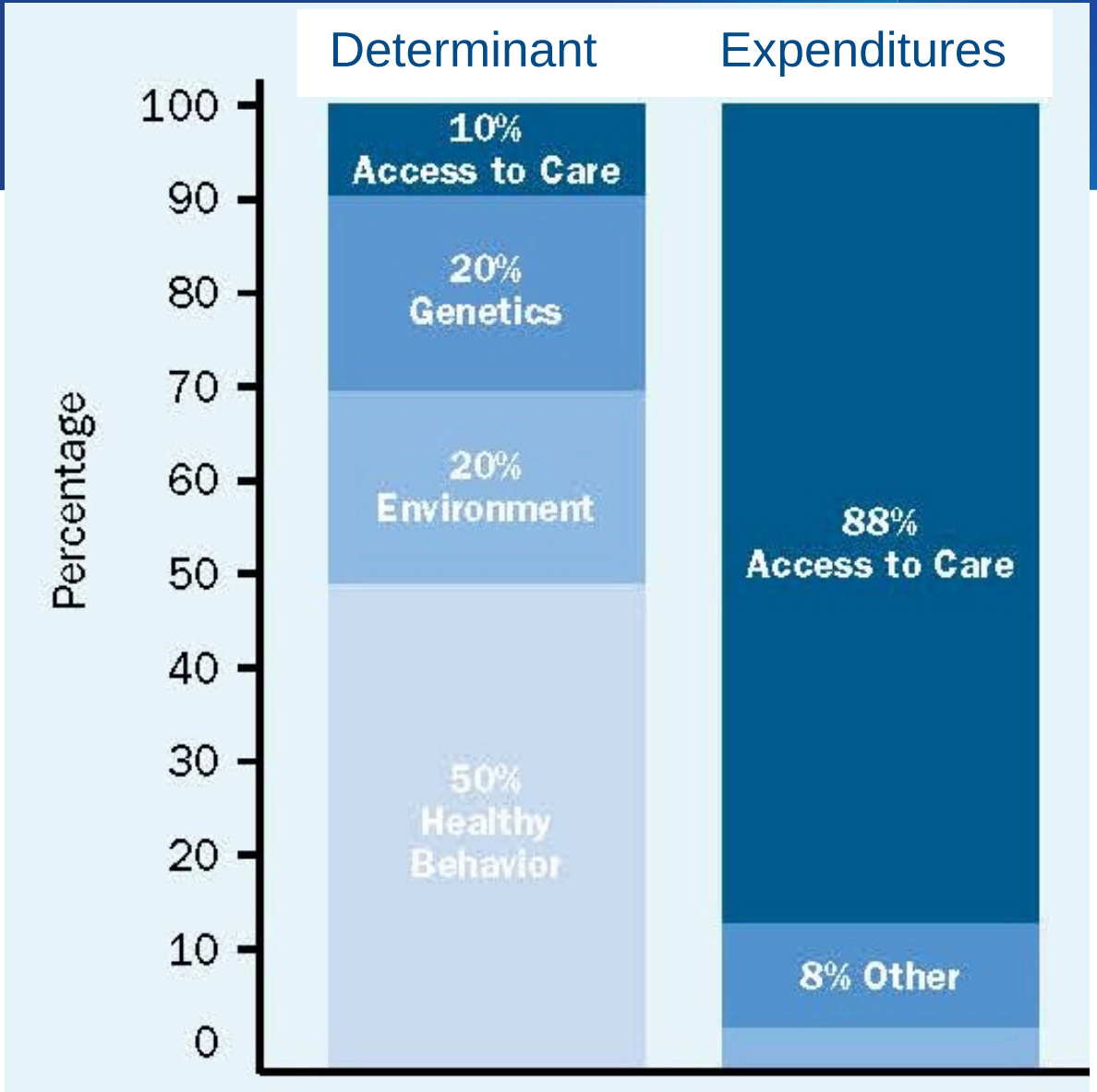


Health at a Glance 2009 – **OECD Publishing**

Mismatch:

Lots of Health Care,

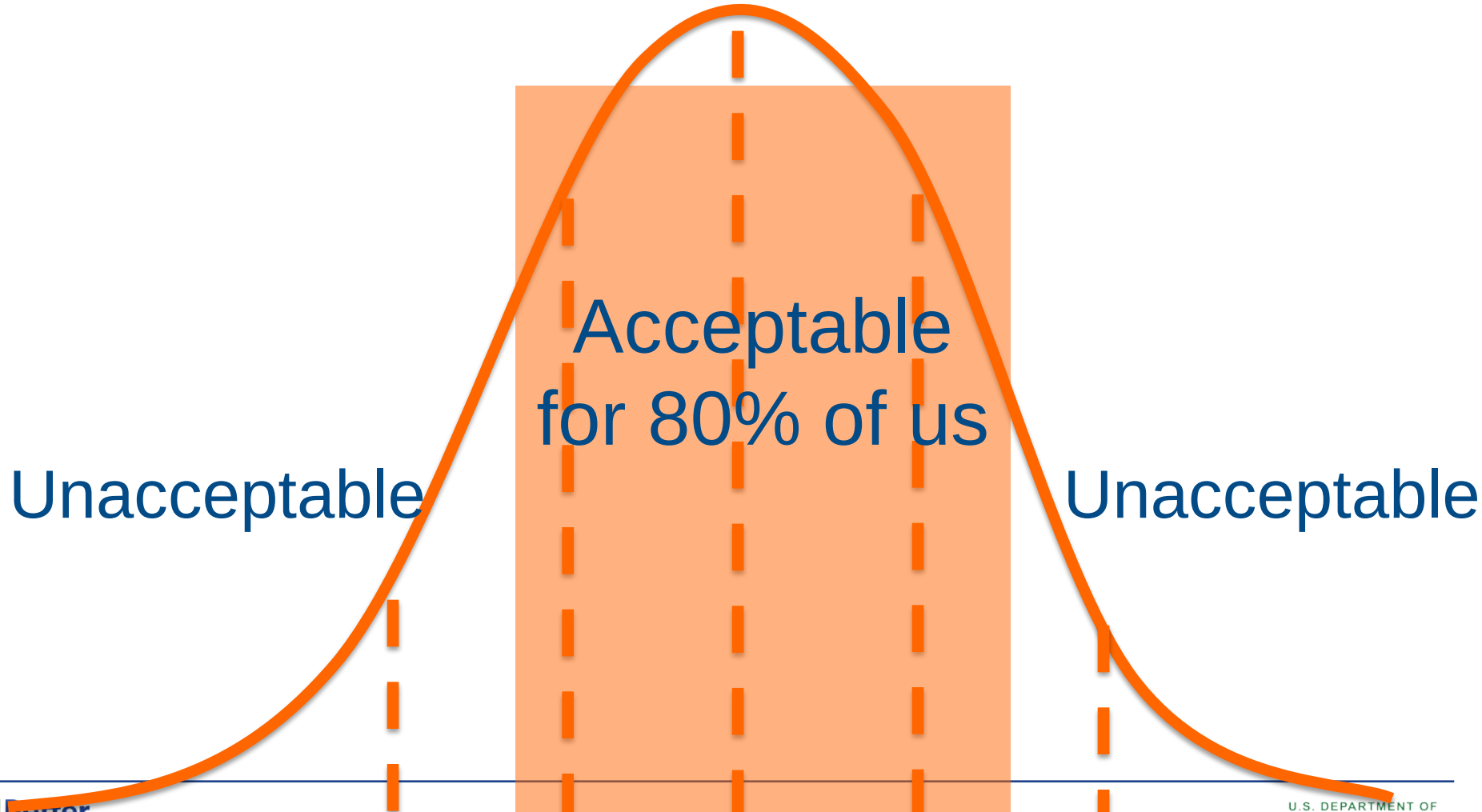
Not Enough Health



Boston Paradox, Lots of Health Care,

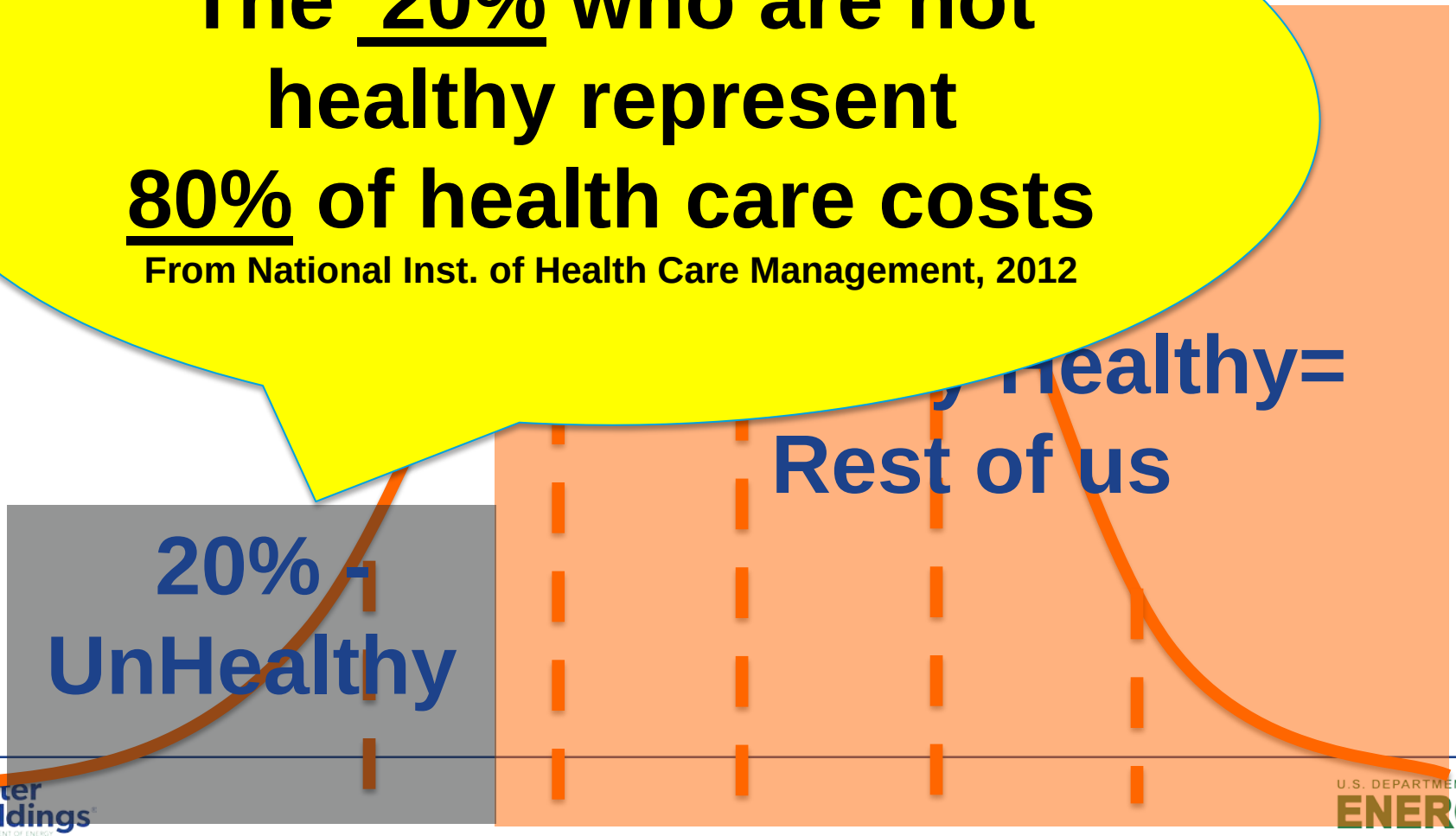
Not Enough Health– **NGHI, 2007**

Most of us are healthy and find indoor air acceptable

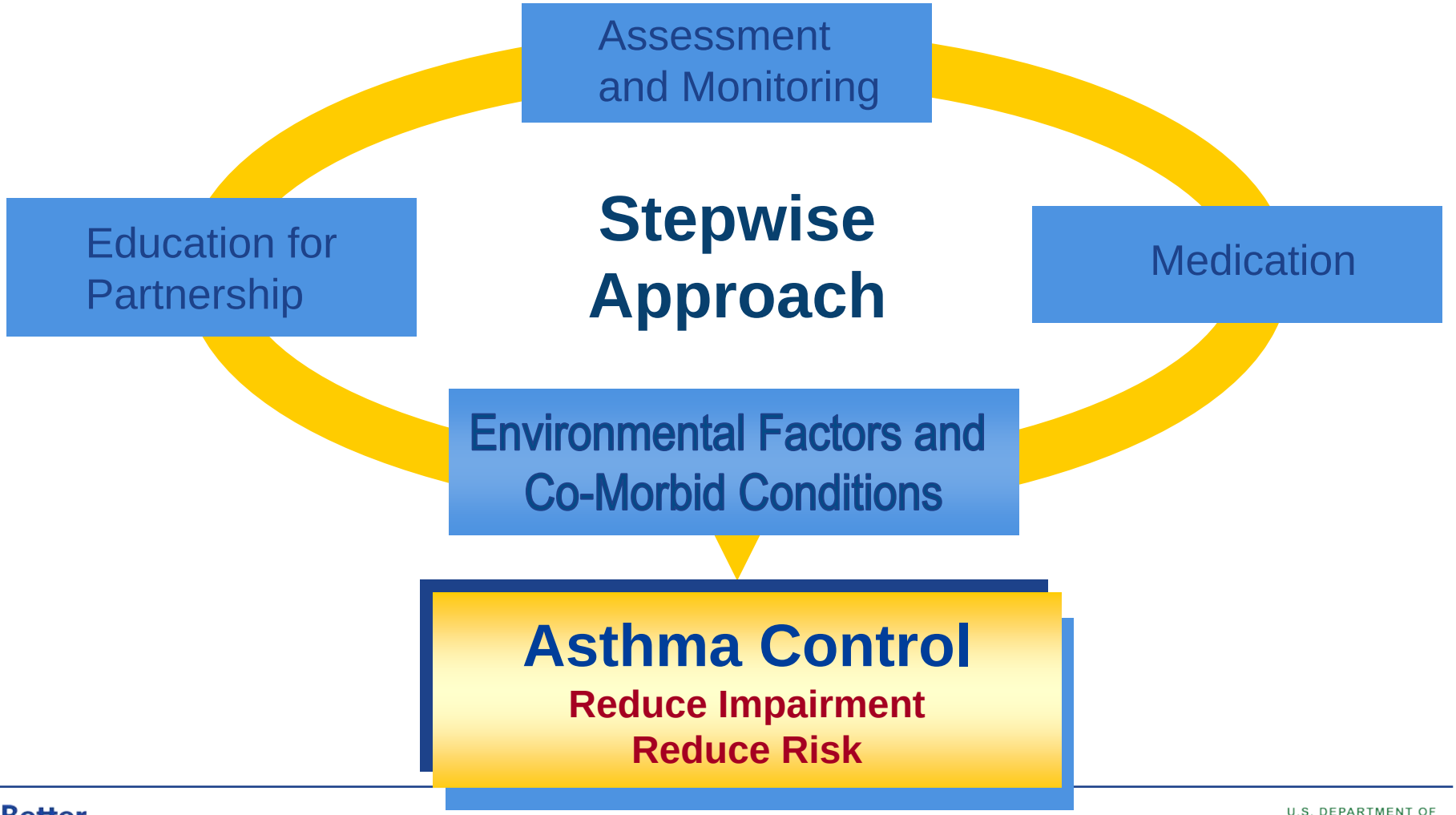


The 20% who are not healthy represent 80% of health care costs

From National Inst. of Health Care Management, 2012



The Asthma Management Guidelines say environmental factors are key



One Managed Care Example

One Plan in KC area:

- 8000 Pediatric Asthma Patients in Plan
- 5000 Diagnosed
  (3000 not seeing Physician)
- 80% or 4000 Intermittent
- 20% or 1000 Persistent
- 1 - 2% Severe or ~200 Patients

Many health conditions are known to get better from environmental improvement:

- Diagnosis
  - Asthma
  - Rhinitis
  - Hypersensitivity Pneumonitis
  - Aspergillosis
  - Sinusitis
  - Other Respiratory Conditions
- Other Criteria
  - Symptoms are perennial & flare on exposure
  - Environment exposures has (or may have) been suspected of triggering symptoms
  - Continued exposure is likely
  - Patient has some control over environment

Important Survey of State-by-State Reimbursement Policies

http://www.nchh.org/Resources/HealthcareFinancing/Snapshot.aspx

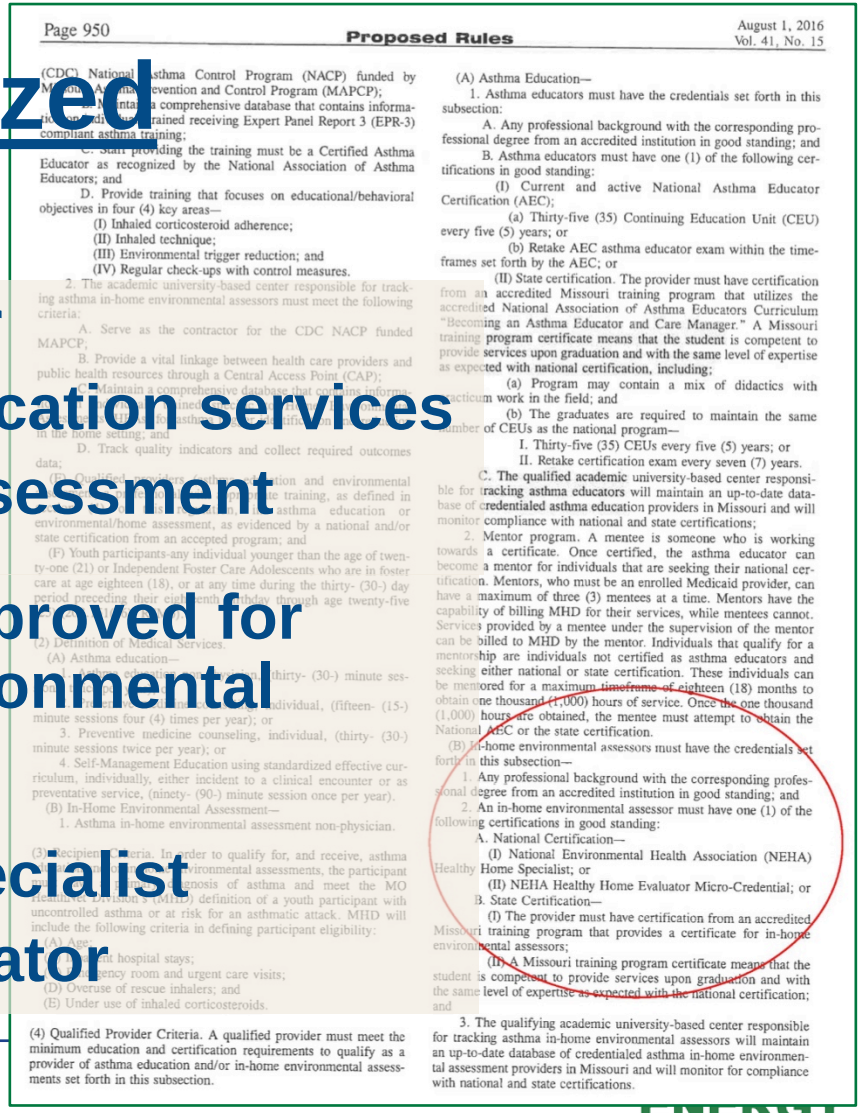
Key Findings: States are moving slowly

- 27 states (54%) reported having some Medicaid reimbursement policy in place for
  - home-based asthma services
  - follow-up services for children with lead exposure.
- 7 states (14%) reported that one or more private payers in the state provide or reimburse for home-based asthma services
- An additional 7 states (14%) report that one or more private payers are actively exploring putting these services into place.
- Only 3 states (6%) reported knowledge of private payers who reimburse for or provide lead follow-up services

We need to advocate for state policies that reimburse for home visits

Missouri Policy Finalized

- Medicaid reimbursement for
  - home-based asthma education services
  - Home Environmental Assessment
- Two national credentials approved for individuals to provide Environmental Assessments:
  - NEHA Healthy Home Specialist
  - BPI Healthy Home Evaluator



Page 950 **Proposed Rules** August 1, 2016 Vol. 41, No. 15

(CDC) National Asthma Control Program (NACP) funded by MO[illegible] Prevention and Control Program (MAPCP);

[illegible] Maintain a comprehensive database that contains information [illegible] trained receiving Expert Panel Report 3 (EPR-3) compliant asthma training;

C. Staff providing the training must be a Certified Asthma Educator as recognized by the National Association of Asthma Educators; and

D. Provide training that focuses on educational/behavioral objectives in four (4) key areas—

(I) Inhaled corticosteroid adherence;

(II) Inhaled technique;

(III) Environmental trigger reduction; and

(IV) Regular check-ups with control measures.

2. The academic university-based center responsible for tracking asthma in-home environmental assessors must meet the following criteria:

A. Serve as the contractor for the CDC NACP funded MAPCP;

B. Provide a vital linkage between health care providers and public health resources through a Central Access Point (CAP);

[illegible] in the home setting; and

D. Track quality indicators and collect required outcomes data;

[illegible] tion and environmental [illegible] training, as defined in [illegible] asthma education or environmental/home assessment, as evidenced by a national and/or state certification from an accepted program; and

(F) Youth participants-any individual younger than the age of twenty-one (21) or Independent Foster Care Adolescents who are in foster care at age eighteen (18), or at any time during the thirty- (30-) day period preceding their eighteenth (18th) through age twenty-five

(2) Definition of Medical Services.

(A) Asthma education—

[illegible] thirty- (30-) minute ses-

[illegible] individual, (fifteen- (15-) minute sessions four (4) times per year); or

3. Preventive medicine counseling, individual, (thirty- (30-) minute sessions twice per year); or

4. Self-Management Education using standardized effective curriculum, individually, either incident to a clinical encounter or as preventative service, (ninety- (90-) minute session once per year).

(B) In-Home Environmental Assessment—

1. Asthma in-home environmental assessment non-physician.

(3) Recipient Criteria. In order to qualify for, and receive, asthma [illegible] environmental assessments, the participant [illegible] diagnosis of asthma and meet the MO HealthNet Division (MHD) definition of a youth participant with uncontrolled asthma or at risk for an asthmatic attack. MHD will include the following criteria in defining participant eligibility:

(A) Age;

[illegible] hospital stays;

[illegible] ency room and urgent care visits;

(D) Overuse of rescue inhalers; and

(E) Under use of inhaled corticosteroids.

(4) Qualified Provider Criteria. A qualified provider must meet the minimum education and certification requirements to qualify as a provider of asthma education and/or in-home environmental assessments set forth in this subsection.

(A) Asthma Education—

1. Asthma educators must have the credentials set forth in this subsection:

A. Any professional background with the corresponding professional degree from an accredited institution in good standing; and

B. Asthma educators must have one (1) of the following certifications in good standing:

(I) Current and active National Asthma Educator Certification (AEC);

(a) Thirty-five (35) Continuing Education Unit (CEU) every five (5) years; or

(b) Retake AEC asthma educator exam within the timeframes set forth by the AEC; or

(II) State certification. The provider must have certification from an accredited Missouri training program that utilizes the accredited National Association of Asthma Educators Curriculum "Becoming an Asthma Educator and Care Manager." A Missouri training program certificate means that the student is competent to provide services upon graduation and with the same level of expertise as expected with national certification, including:

(a) Program may contain a mix of didactics with practicum work in the field; and

(b) The graduates are required to maintain the same number of CEUs as the national program—

I. Thirty-five (35) CEUs every five (5) years; or

II. Retake certification exam every seven (7) years.

C. The qualified academic university-based center responsible for tracking asthma educators will maintain an up-to-date database of credentialed asthma education providers in Missouri and will monitor compliance with national and state certifications;

2. Mentor program. A mentee is someone who is working towards a certificate. Once certified, the asthma educator can become a mentor for individuals that are seeking their national certification. Mentors, who must be an enrolled Medicaid provider, can have a maximum of three (3) mentees at a time. Mentors have the capability of billing MHD for their services, while mentees cannot. Services provided by a mentee under the supervision of the mentor can be billed to MHD by the mentor. Individuals that qualify for a mentorship are individuals not certified as asthma educators and seeking either national or state certification. These individuals can be mentored for a maximum timeframe of eighteen (18) months to obtain one thousand (1,000) hours of service. Once the one thousand (1,000) hours are obtained, the mentee must attempt to obtain the National AEC or the state certification.

(B) In-home environmental assessors must have the credentials set forth in this subsection—

1. Any professional background with the corresponding professional degree from an accredited institution in good standing; and

2. An in-home environmental assessor must have one (1) of the following certifications in good standing:

A. National Certification—

(I) National Environmental Health Association (NEHA) Healthy Home Specialist; or

(II) NEHA Healthy Home Evaluator Micro-Credential; or

B. State Certification—

(I) The provider must have certification from an accredited Missouri training program that provides a certificate for in-home environmental assessors;

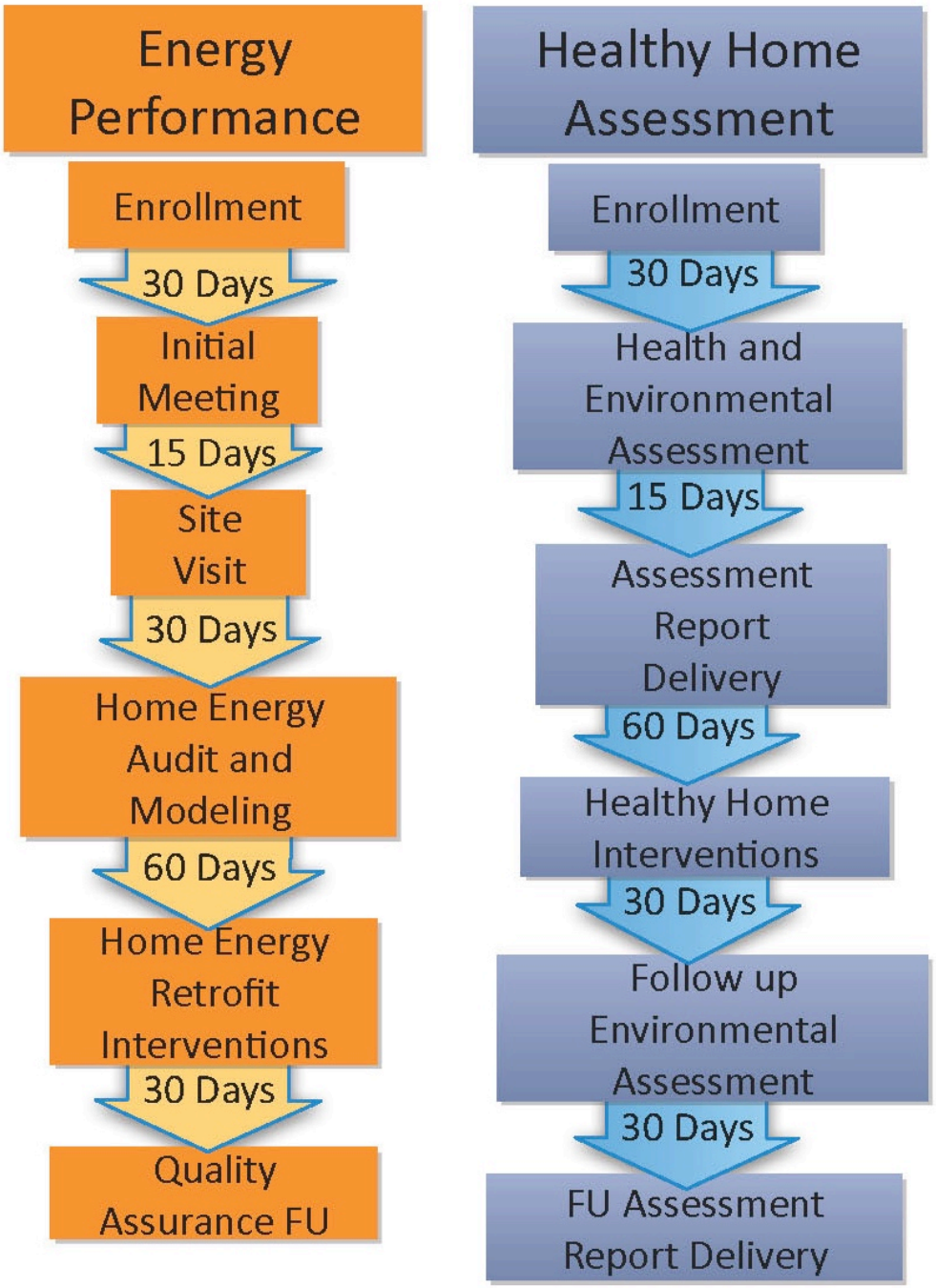
(II) A Missouri training program certificate means that the student is competent to provide services upon graduation and with the same level of expertise as expected with the national certification; and

3. The qualifying academic university-based center responsible for tracking asthma in-home environmental assessors will maintain an up-to-date database of credentialed asthma in-home environmental assessment providers in Missouri and will monitor for compliance with national and state certifications.

Building Analysts are perfect Healthy Home Assessors

- Building Diagnostics
  - Training in building science
  - Trained in measurement
  - Understand combustion safety
  - Have knowledge of basic health and safety

Energy audits and healthy home assessments are very similar processes



Healthy Home Performance is Here!

We can Measure Healthy!!

Healthier Home

Very Healthy

Unhealthy &
Inefficient

Very Efficient

Energy Performance

**Thanks to Eric Werling for conceiving of this illustration

Why Hasn't This Happened Already?

Some possible reasons:

- Health care providers don't know how to find healthy home professionals
- Healthy home professionals don't know how to communicate with health care providers
- Health Insurers and managed care comp. are still nervous about who pays for what
- Health providers and insurers may prefer to contract for a package of healthy home services

Kevin Kennedy,
kkennedy@cmh.edu

Questions/Comments?

Steve Cowell, President

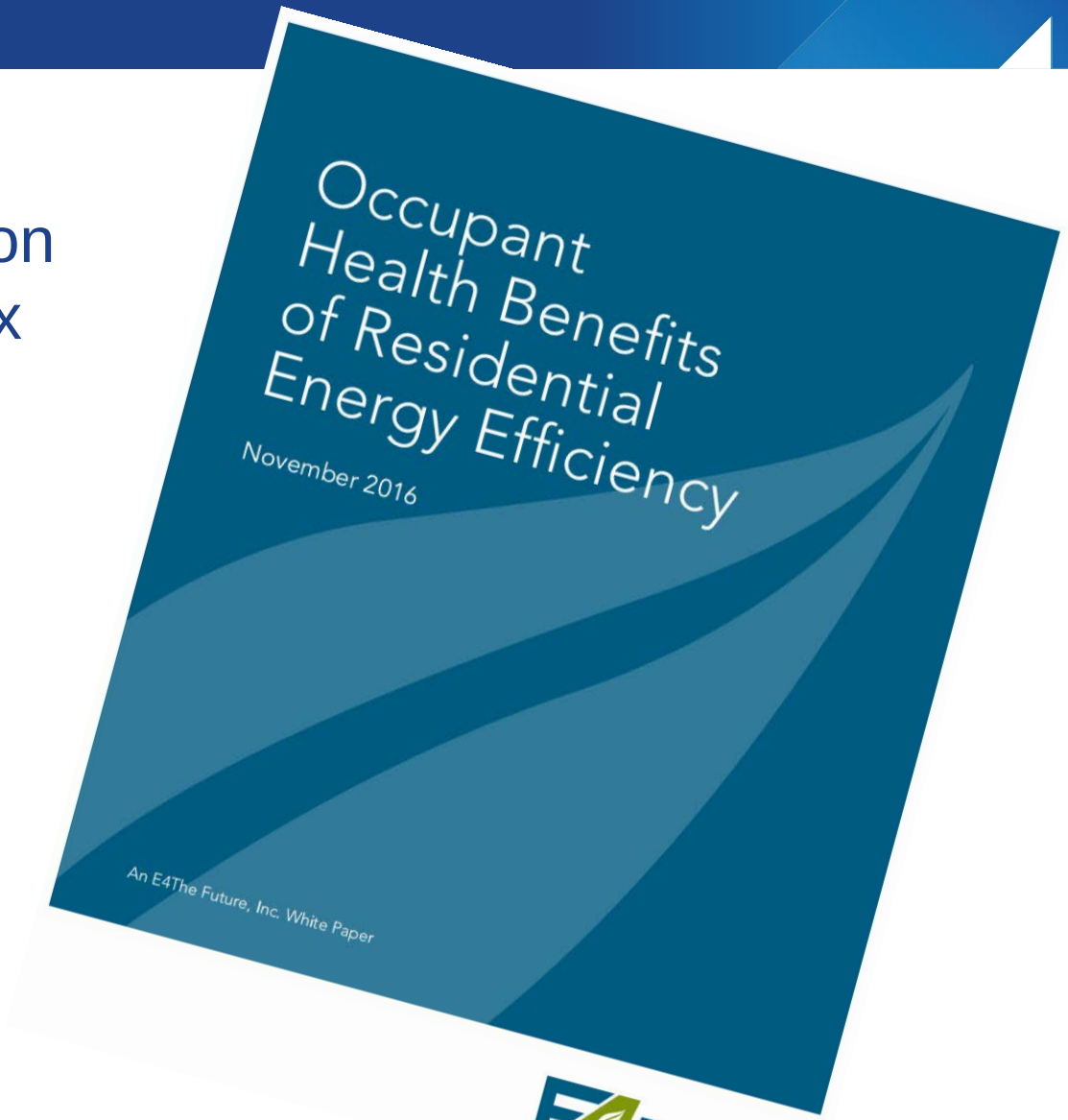
E4TheFuture

U.S. DEPARTMENT OF ENERGY

E4TheFuture - Health Impacts Report

Developed in coordination with US DOE's Home Rx Health Impact Study

Fall 2016



Better Buildings
U.S. DEPARTMENT OF ENERGY

E4 THE FUTURE
ENERGY • ECONOMY • EQUITY • ENVIRONMENT

U.S. DEPARTMENT OF ENERGY

How EE Can Reduce Health Risks

- Insulation
  Air Sealing
- Heating System
  Upgrades
- Ventilation
  Vent Dryers
- Efficient Cooking
  Appliances

→ Warmer drier air, improved indoor temperatures & relative humidity

→ Less moisture, mold, particulates, pollutants, combustion by-products, allergens

→ Lower bills, better comfort

→ Fewer heat or cold related deaths

→ Less hypertension, heart disease

→ **Fewer asthma symptoms, respiratory risks, COPD**

→ Fewer heart disease risks

→ Fewer cancer risks due to radon, formaldehyde, other sources

→ Less stress, better mental health

→ Reduced hospital and medical visits

Example: Monetized Values for Health Impacts (MA 2016)

NEI Value	Annual Per Unit Benefit*				
	Household W/ Avoided Death Benefit	Household W/O Avoided Death Benefit	Societal	Total w/ Avoided Death Benefit	Total W/O Avoided Death Benefit
Tier 1	**A**	**B**	**C**	**A+C**	**B+C**
Reduced asthma symptoms	**$9.99**	$9.99	$322.01	**$332.00**	$332.00
Reduced cold-related thermal stress	**$463.21**	$4.67	$33.73	**$496.94**	$38.40
Reduced heat-related thermal stress	**$145.93**	$8.28	$27.00	**$172.93**	$35.28
Fewer missed work days	**$149.45**	$149.45	$37.36	**$186.81**	$186.81
Tier 2					
Reduced use of short-term, high-interest loans	**$4.72**	$4.72	$0	**$4.72**	$4.72
Reduced CO poisoning (5-year life)	**$36.98**	$0.25	$1.87	**$38.85**	$2.12
Tier 3					
Increased home productivity	**$37.75**	$37.75	$0	**$37.75**	$37.75
Reduced home fires	**$93.84**	$9.77	$17.87**	**$111.71**	$27.37***
Annual Total—per weatherized home	**$941.87**	**$224.88**	**$439.84**	**$1,381.71**	**$664.45**

EE Program Cost-Effectiveness and Health Impacts

Challenges:

- Health benefits typically not included in CE analyses
  - For neither indoor or outdoor air quality benefits
  - For neither Participant Impacts and Societal Impacts
- Costs and benefits are not symmetrically treated
- Robust data needed to monetize health impacts ($$)

Opportunities:

- Integrated health/EE programs can help utility programs in various ways, not only with CE
- New cost-effectiveness guidance can help support inclusion of health impacts

EE Program Cost-Effectiveness (CE) Defined

Cost-effectiveness testing used to determine if the benefits of an energy efficiency program outweigh the costs (where B/C > 1.0)

Integrated EE/Health Programs

For EE program CE analyses – integrated EE/health programs can either increase benefits and/or decrease program costs by leveraging costs with health industry

$$\frac{\text{BENEFITS} \uparrow}{\text{COSTS}} \qquad \frac{\text{BENEFITS}}{\text{COSTS} \downarrow}$$

Integrated EE/Health Programs Value Proposition for Utilities (1)

- Opportunity to coordinate home visit (health assessment & energy audit) could streamline program costs and leverage funds across health and EE industries
- Existing integrated program implementation has been coordinated successfully between low income public programs (state or Federal) and a local hospital.
  - Integrating non-low income utility programs is more challenging, as is multi-family

Integrated EE/Health Programs Value Proposition for Utilities (2)

Customers care about IAQ in their homes/buildings.

Integrated EE/Health Programs can help to:

- Engage customers
- Increase program participation
- Market program e.g., hospitals referrals to patients
- Increase program cost-effectiveness
- Inform regulators about health impact value to customers

Integrated EE/Health Programs Challenges for Utilities

- How to incorporate potential resource or benefit sharing between multiple sources that are each highly regulated
- How to best operationalize shared funding between EE and health industry
- Liability concerns for utilities / HP contractors
- Privacy and security concerns (e.g., info regarding repeat emergency room visits)

Forthcoming New Guidance - and relevance to inclusion of health impacts in CE analysis

National Standard Practice Manual
For Energy Efficiency Cost-Effectiveness

Prepared by
The National Efficiency Screening Project

NATIONAL EFFICIENCY SCREENING PROJECT

Forthcoming May 18, 2017

EE Program Cost-Effectiveness Accounting for Health-Related Impacts

Non-Utility Impact	Description
Participant impacts	Impacts on program participants, includes participant portion of measure cost, other fuel savings, water savings, and participant non-energy costs and benefits
Impacts on low-income customers	Impacts on low-income program participants that are different from or incremental to non-low-income participant impacts. Includes reduced foreclosures, reduced mobility, and poverty alleviation
Other fuel impacts	Impacts on fuels that are not provided by the funding utility, for example, electricity (for a gas utility), gas (for an electric utility), oil, propane, and wood
Water impacts	Impacts on water consumption and related wastewater treatment
Environmental impacts	Impacts associated with CO_2 emissions, criteria pollutant emissions, land use, etc. Includes only those impacts that are not included in the utility cost of compliance with environmental regulations
Public health impacts	Impacts on public health; includes health impacts that are not included in participant impacts or environmental impacts, and includes benefits in terms of reduced healthcare costs
Economic development and jobs	Impacts on economic development and jobs
Energy security	Reduced reliance on fuel imports from outside the state, region, or country

NSPM – Universal Principles

Efficiency as a Resource	**EE is one of many resources that can be deployed to meet customers' needs, and therefore should be compared with other energy resources (both supply-side and demand-side) in a consistent and comprehensive manner.**
Policy Goals	A jurisdiction's primary cost-effectiveness test should account for its energy and other applicable policy goals and objectives. These goals and objectives may be articulated in legislation, commission orders, regulations, advisory board decisions, guidelines, etc., and are often dynamic and evolving.
Symmetry	Cost-effectiveness practices should be symmetrical, where both costs and benefits are included for each relevant type of impact.
Hard-to-Quantify Impacts	Cost-effectiveness practices should account for all relevant, substantive impacts (as identified based on policy goals,) even those that are difficult to quantify and monetize. Using best-available information, proxies, alternative thresholds, or qualitative considerations to approximate hard-to-monetize impacts is preferable to assuming those costs and benefits do not exist or have no value.
Forward-Looking Analysis	Analysis of the impacts of resource investments should be forward-looking, capturing the difference between costs and benefits that would occur over the life of the subject resources as compared to the costs and benefits that would occur absent the resource investments.
Transparency	Cost-effectiveness practices should be completely transparent, and should fully document all relevant inputs, assumptions, methodologies, and results.

NSPM – Resource Value Framework

Step 1 Identify and articulate the jurisdiction's applicable policy goals.

Step 2 Include all the utility system costs and benefits.

Step 3 Decide which non-utility impacts to include in the test, based on applicable policy goals.

Step 4 Ensure that the test is symmetrical in considering both costs and benefits.

Step 5 Ensure the analysis is forward looking and incremental.

Step 6 Develop methodologies to account for all relevant impacts, including hard to quantify impacts.

Step 7 Ensure transparency in presenting the inputs and results of the cost-effectiveness test.

← Includes health? If yes, then go to Step 4 to identify benefits, and then use Step 5 guide you on options for quantifying impacts

NPSM – Different Approaches to Account for All Relevant Impacts

Approach	Description
Jurisdiction-specific studies	Jurisdiction-specific studies on EE costs and avoided cost offer the best approach for estimating and monetizing relevant impacts.
Studies from other jurisdictions	If jurisdiction-specific studies are not available; studies from other jurisdictions or regions, as well as national studies, can be used for estimating and monetizing relevant impacts.
Proxies	If monetized impacts are not available; well-informed and well-designed proxies can be used as a simple substitute.
Quantitative and qualitative information	Relevant quantitative and qualitative information can be used to consider impacts that cannot or should not be monetized.
Alternative thresholds	Pre-determined thresholds that are different from one (1.0) can be used as a simplistic way to account for relevant impacts that are not otherwise accounted for.

Questions/Comments?

Larry Zarker

Building Performance Institute

U.S. DEPARTMENT OF ENERGY

Developing the Workforce to Deliver Comfort, Health and Safety in E.E. Retrofits

Raising the Bar in Home Performance Contracting

Larry Zarker
BPI
LZarker@bpi.org

Building Performance Institute, Inc.

Disconnected
return duct
Dead possum

A Growing Asthma Epidemic in the U.S.

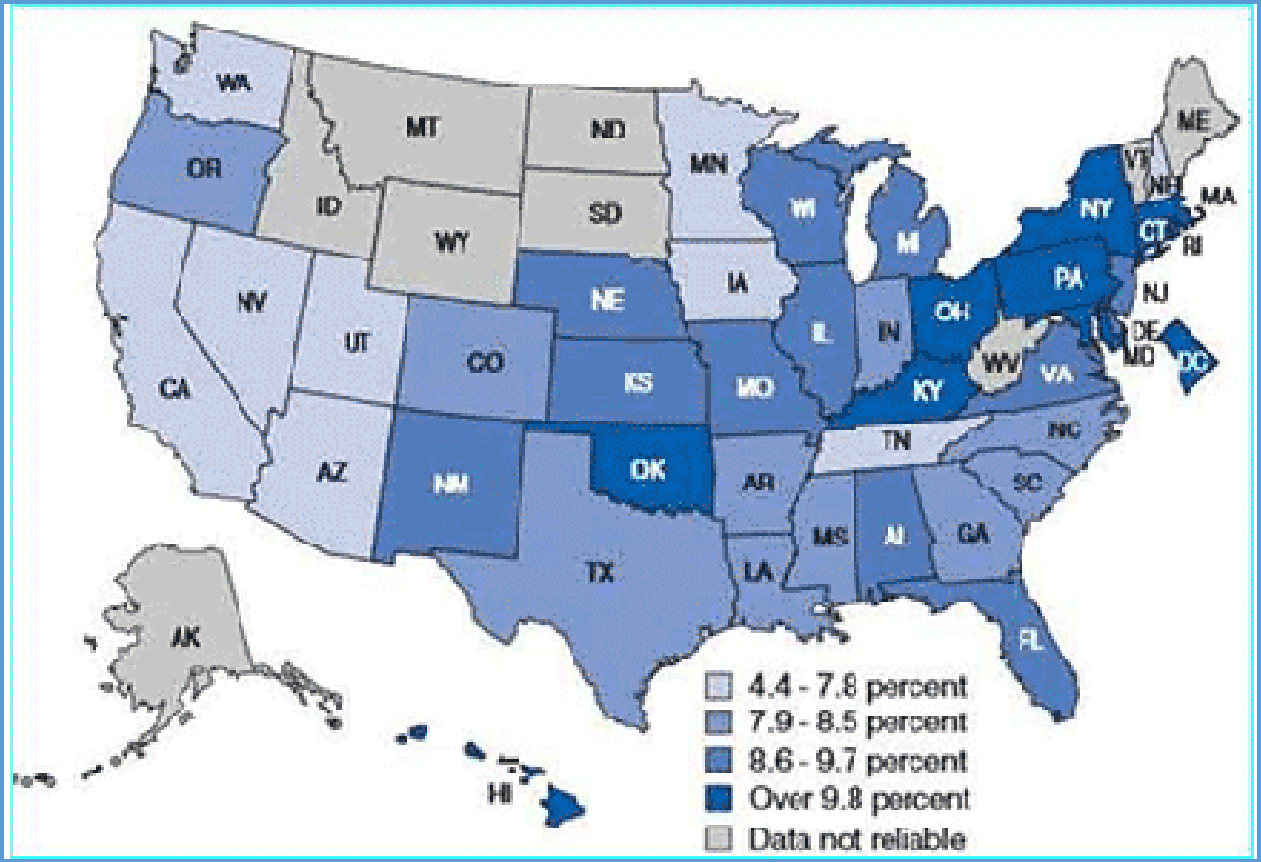
Of the **21.8 million** people reported to have asthma in the U.S., approximately **4.6 million** cases are estimated to be attributable to dampness and mold exposure in the home.

Dust Mites: Serious Allergens in Your Home

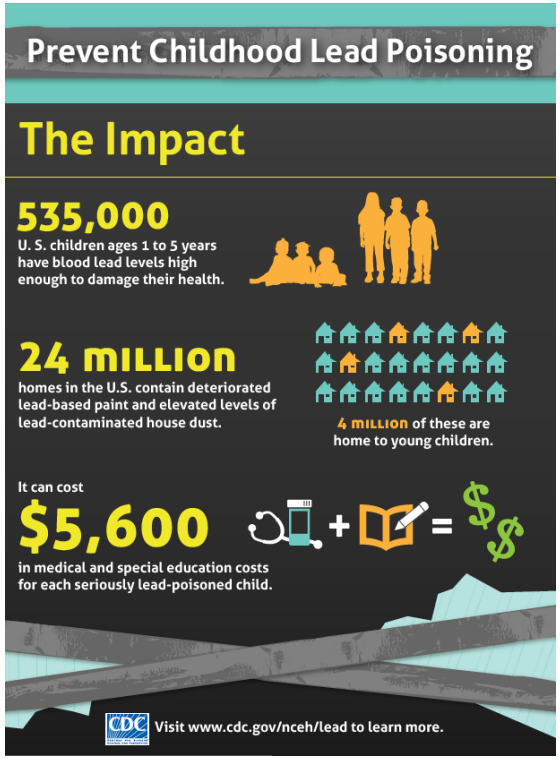
FEBRUARY 22, 2010 | AQASERVICES, TIPS & TROUBLESHOOTING | AIR QUALITY PROBLEMS, DUST MITES, HEALTH HAZARD, INDOOR AIR POLLUTANTS, RESPIRATORY PROBLEMS

Dust mites scavenging a bed sheet for dead skin (magnified 500 x) TIME

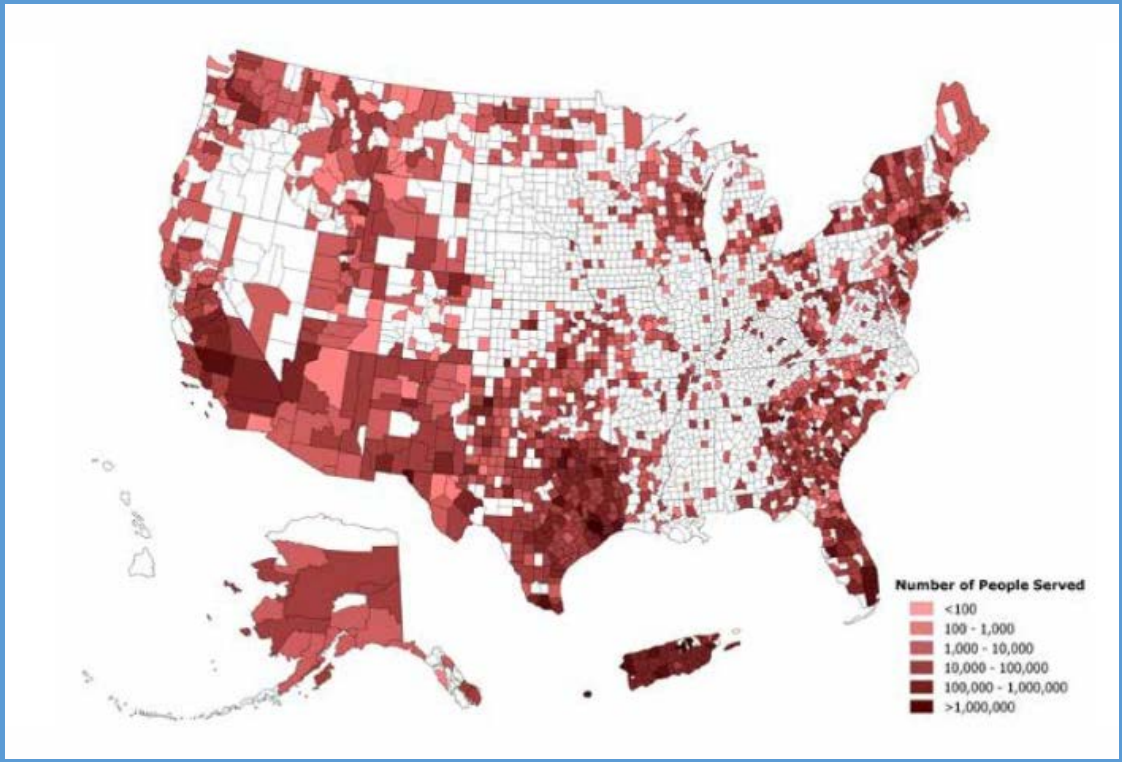
Asthma Prevalence Intensity in Children (0-17)



Tragedy of Lead



5,300 Water Systems Violate EPA Lead Rules



Affecting Nearly 18 Million People

Gas Leak Explosion Levels Home

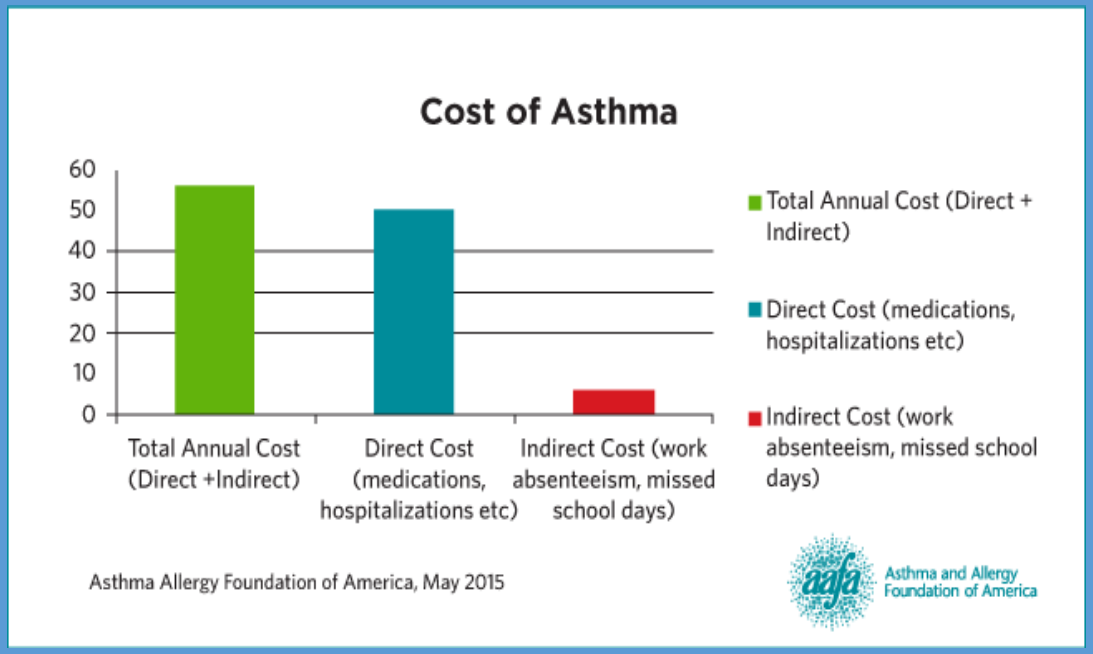
RESEARCHANDMARKETS
THE WORLD'S LARGEST MARKET RESEARCH STORE

The Indoor Air Quality Market Should Total $8.3 Billion in 2016 and $10.8 Billion by 2021

The indoor air quality market in the U.S. totaled $7.8 billion in 2015. The market should total $8.3 billion in 2016 and $10.8 billion by 2021, increasing at a compound annual growth rate (CAGR) of 5.3% from 2016 to 2021.

For more information please click on:
http://www.researchandmarkets.com/publication/mg23nzp/3877143

What Does Asthma Cost in the U.S.?



- Researchers think the yearly cost of asthma in the United States is around **$56 billion.**
- The direct costs make up almost **$50.1 billion**. Hospital stays are the largest part of that cost.
- Indirect costs make up **$5.9 billion**. This includes lost pay from sickness or death and lost work output from missed school or work days.
- In 2009, researchers found that the direct cost of asthma is about **$3,259** per person each year.

Where are the HHE Business Opportunities?

Post Surgery Recovery in the Home:
A Greater Likelihood of Infection

Hospitals are penalized financially for repeat admissions, so they have an interest in keeping their customers well at home.

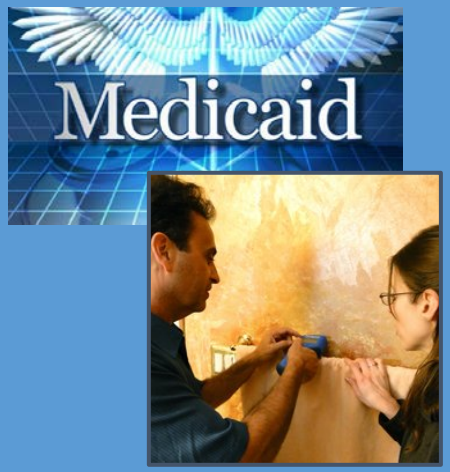
Asthma and Respiratory Infection Trigger Assessments in Homes

Aetna estimates a cost of $800 for emergency room visits and $8,800 for hospital stays.

Aging in Place Elderly Assessments to Prevent Trips and Falls

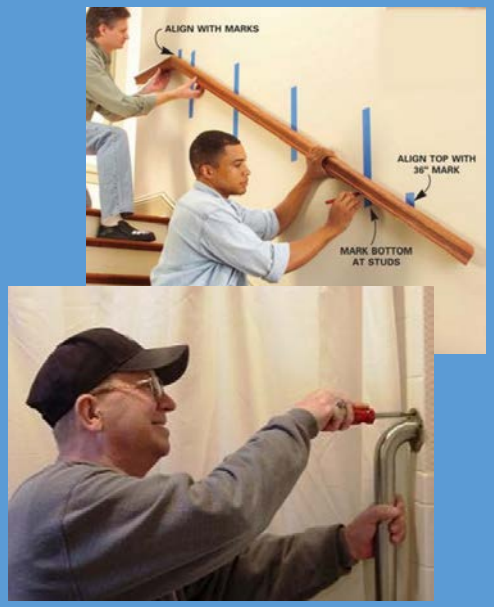
CDC: Costs for falls to Medicare in 2015 totaled over $31 billion with a $30,000 cost for hospital stay.

Where are the HHE Business Opportunities?



Medicaid Starting to Reimburse for the Healthy Home Assessment

Utility Programs Focusing on Comfort, Health and Safety + E.E.



Eliminating Major Trip and Fall Hazards in Homes

Define Your Capabilities. Educate Your Audiences.

Health Specialists
- Local Allergy and Asthma Treatment Centers
- Immunologists
- Ear, Nose and Throat Specialists
- Pulmonologists
- Pediatric Physicians
- General Practitioners
- Local Hospitals (Community Investment)

Local Government
- Public Health Agencies
- Certified Lead Paint Abatement Contractor
- Licensed Mold Remediation Service Provider
- Become a Certified Radon Tester
- Federal/State Certification for Asbestos Remediation

Educators
- Provide Information to Parent/Teacher Associations

Care Givers
- In-home Nurses and Care Givers

Real Estate Professionals
- Realtors, Appraisers, and Inspectors
- Lenders

Shows
- Bridal Shows
- Pet Shows (differentiate from the home & garden crowd)

Media
- Provide Case Studies to Local TV, Radio and Newspapers
- Participate in Social Media Sites Relating to Health Issues
- Build a Strong Web Site with Credible Information
- Engage SEO/SEM and Lead Generation Consultants

Powerful Case Studies Build Credibility

Breathing Better

Tweet Like 2

Vilandre Case Study: Our home is making us sick

2000 Built, 2 Story, 1600 sq ft, Family of 4

Assessment

A homeowner requested a full home assessment of air quality and energy efficiency after feeling that her home was contributing to chronic illness in her family of four. The family wanted to open their windows for fresh air, but couldn't because heavy smoke from a neighbor with wood burning stoves. The whole family was suffering from respiratory issues.

Assess

- **Asthma:** Two people were on medications, including a form of steroids. The other two family members were showing the beginning signs of asthma.
- **Allergies:** Family members would frequently wake with sneezing attacks in the middle of the night .
- **Dry throats & itchy eyes:** The family would wake in the morning with dry sore throats and scratchy eyes.

Wearing a Coat in the House

Tweet Like 9

Tiedt Case Study: Wearing a Coat in the House

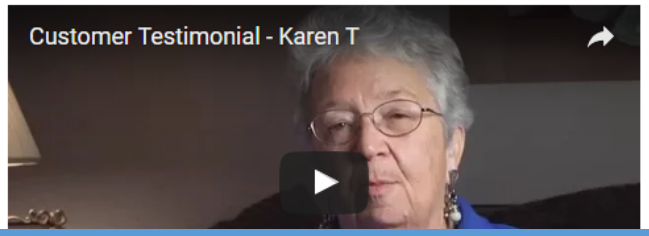
Assessment

Karen Tiedt was cold in her own home and her energy bills were very high. When Karen invited friends over to eat or play cards, they would often be forced to keep their coats on inside the house. Karen's home relied on baseboard heaters, which are a very inefficient way to heat a home, and her utility bill was high.

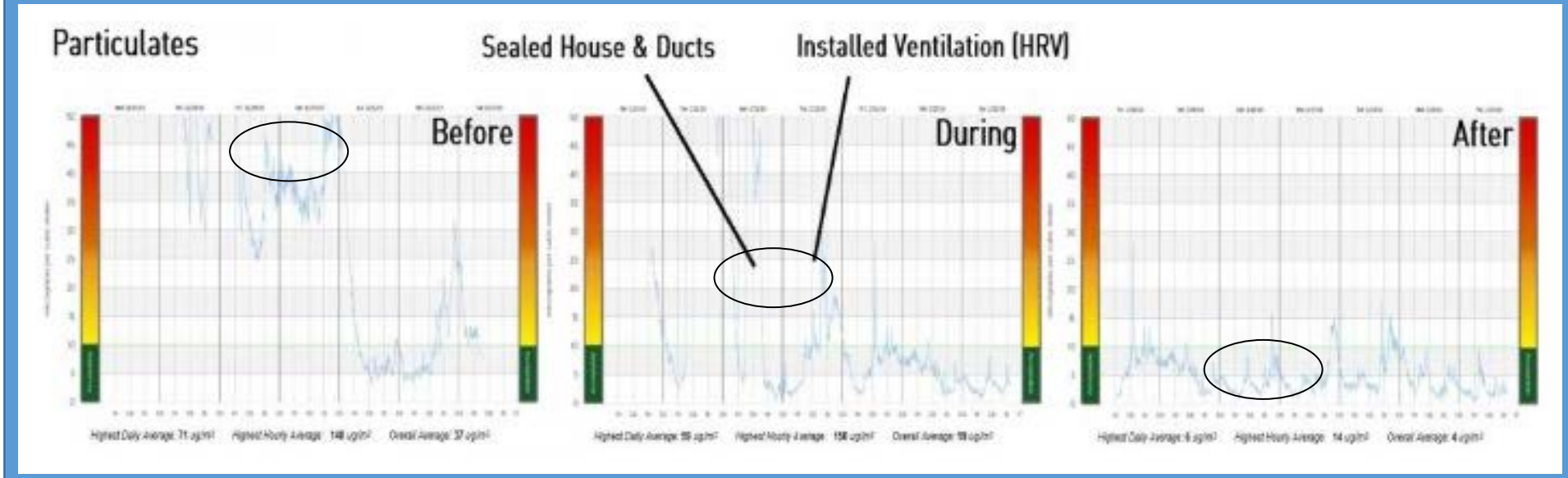
Despite raising the baseboard heaters to the maximum settings, her home was drafty and cold. Then, one winter,the units stopped working altogether.

Karen called the team at Revival Energy.

Assess



A “Two Inhaler” Family Case Study



Source: Revival Energy Group

Healthy Home Evaluator Certification

- The *Healthy Home Evaluator* micro-credential builds upon the knowledge of the certified BPI Building Analyst, the BPI Energy Auditor, the BPI QC Inspector, or the Multi-family Building Analyst by establishing the competencies required to conduct an in-depth healthy home environmental risk assessment.

- The *Healthy Home Evaluator* assesses and characterizes home-based environmental health and safety hazards by integrating qualitative observations with quantitative diagnostics to determine and prioritize recommendations that address existing and potential hazards.

- The *Healthy Home Evaluator* communicates the identified risks and hazards to the occupant with the goal of improving health and quality of life.

Created in partnership with the Green & Healthy Homes Initiative (GHHI)

HHE Certification Scheme Handbook

Help Break the Link Between Unhealthy Housing and Unhealthy Families: Earn the Healthy Home Evaluator (HHE) Credential

www.bpi.org/hhe

Follow BPI

SEARCH BPI GO

Find a BPI Test Center Near You

- Help me find training
- Equipment
- I am certified
- Download the HHE Certification Scheme Handbook
- Click Here For HHE References

Curriculum Development and Train-the-Trainer

- Development of a model curriculum for trainers to use in preparation for the Healthy Home Evaluator exam
- Piloted in Kansas City through Children's Mercy Hospital
- A Master Trainer session with 4-6 individuals completed in December
- A Train-the-Trainer initiative is underway to bring the curriculum to the BPI Test Center network of over 135 training organizations
- First TtT session held with 17 Test Centers in Toledo, OH in January
- **The HHS curriculum is now available for use by BPI Test Centers and the HHS Training Network**
- **A live online Train-the-Trainer session was held on April 20 and 21**

Led by Healthy Housing Solutions with funding support from the U.S. Department of Housing and Urban Development

Announcing….

HHEA

Healthy Home Environment Association

www.healthyhomeenvironment.org/

Rx
PATIENT NAME
ADRESS
Get a Healthy
Home
Evaluation
ASAP!

Discussion? Questions? Ideas?

Please contact:
Larry Zarker, CEO
Building Performance Institute
lzarker@bpi.org
(202) 256-3893 (direct)

Coming Soon: Part 2 Breakouts

- Break out audience by topic:
  - Value of Healthcare-EE Integration to Stakeholders
  - Workforce Development
  - Policy & Regulatory Environment
  - Developing Access to Funding
- Topics explored based on:
  - Stakeholder views
  - Implementation strategies

Part 2 Breakouts

- Break out audience by topic:
  - Value of Healthcare-EE Integration to Stakeholders
  - Workforce Development
  - Policy & Regulatory Environment
  - Developing Access to Funding
- Topics explored based on:
  - Stakeholder views
  - Implementation strategies