

Health Benefits of Energy Efficiency

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Allergies and asthma triggers are common

9% of the US Population has Asthma- 1 in 11
56% Atopic (Allergic)

~20% of the US Population have Environmental Allergies

25% Allergic to Dust Mites

25% Allergic To Pollen

25% Allergic To Mold

25% Allergic To Pets

25% of Asthmatics Have a smoker in the home

75% of Urban homes Have mouse Allergen in the dust

25 - 60% of asthmatics in urban areas allergic to roaches

From: www.aafa.org

24% households concerned about home risks

Share of Owner Households Expressing 'Healthy Home' Concerns (Percent)



**“Challenges and Opportunities in Creating Healthy Homes:
Helping Consumers Make Informed Decisions”**

http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/healthy_homes_wolfson_la_jeunesse.pdf

66%

are at least somewhat
concerned about indoor air quality.

Source: Eco Pulse 2015

Gain a sustainable advantage

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84%

think energy-efficient homes
are healthier homes.

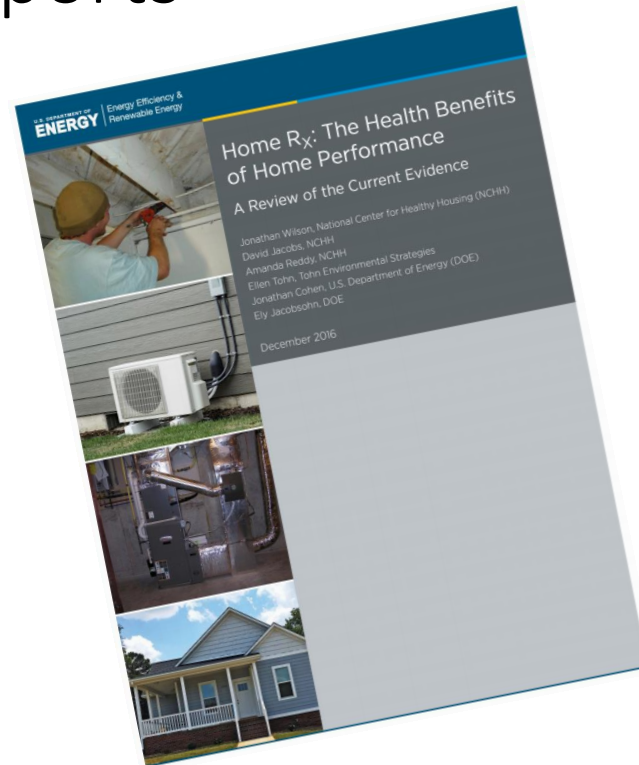
Source: Energy Pulse 2014

Gain a sustainable advantage

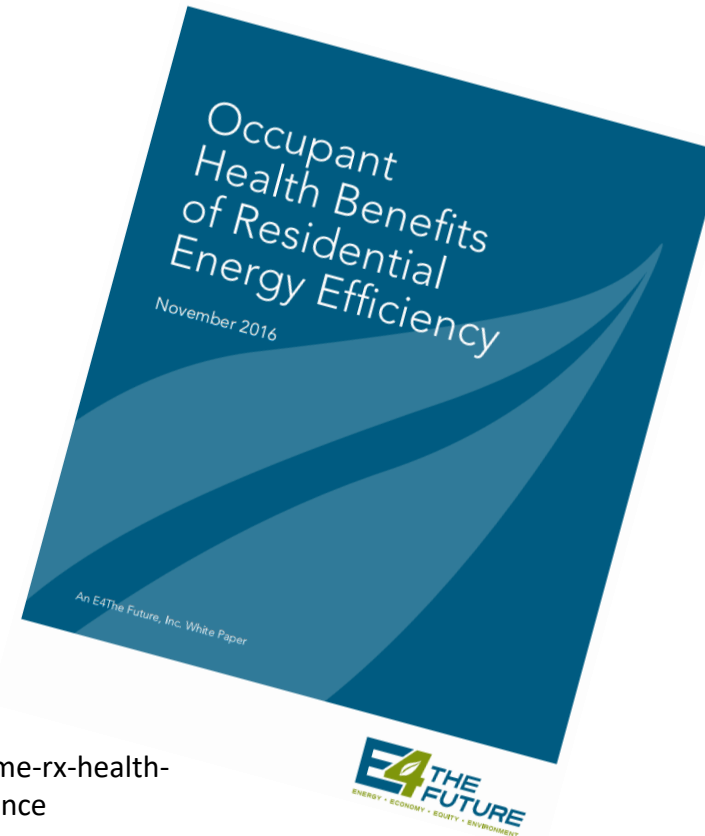
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New reports



<https://energy.gov/eere/buildings/downloads/home-rx-health-benefits-home-performance-review-current-evidence>



<https://e4thefuture.org/wp-content/uploads/2016/11/Occupant-Health-Benefits-Residential-EE.pdf>

DOE & E4TheFuture reports investigated health benefits

Goal: Investigate impact of home performance measures on resident health. To build the case for contractors and advocates so they can:

- Educate clients
- Educate current funders (utilities, DOE)
- Educate medical community

300 studies reviewed, 40 studies included

More studies of lower income single family homes

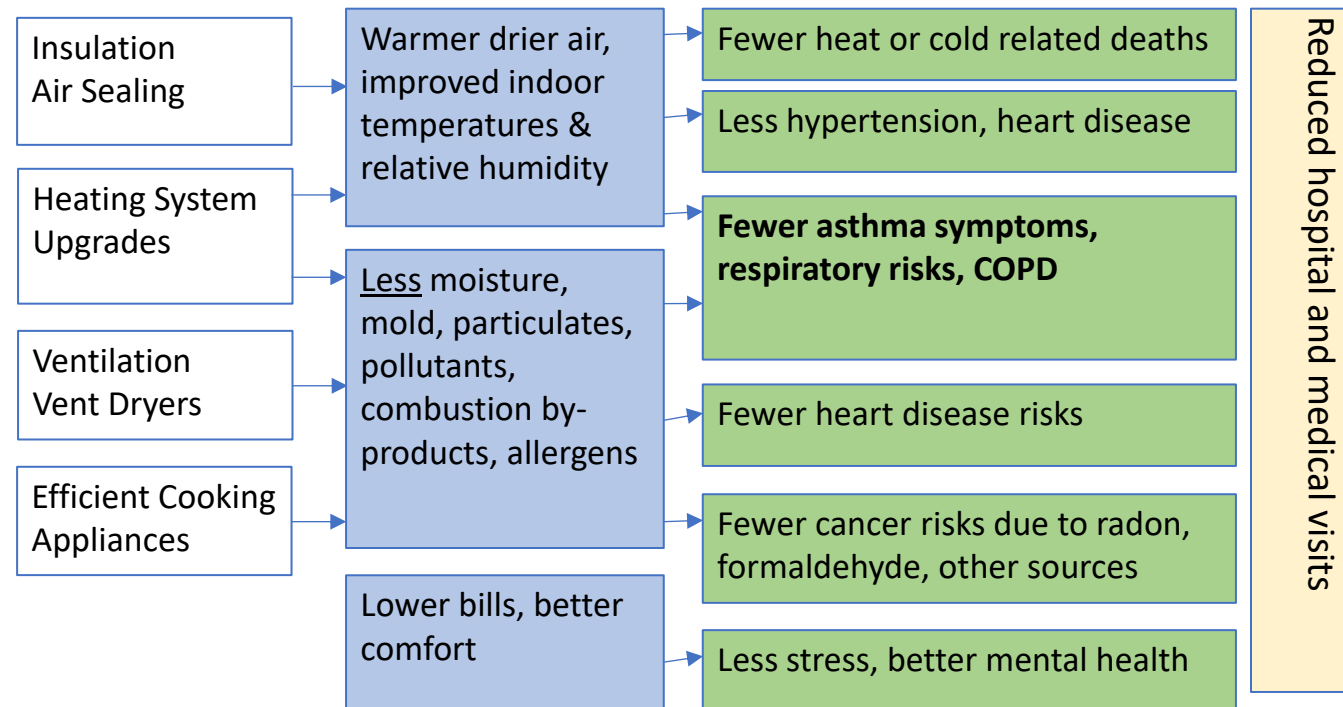
Rx for Child Health: Lower Fuel Bills



Young children receiving fuel assistance are healthier than their peers who do not get fuel assistance

- Healthier babies - 20% less likely to be underweight for age or length
- Reduced hospital stays in colder months - 30% less likely to require admission after visiting emergency room.

Energy efficiency can reduce health risks



Energy efficiency can improve health

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

Italics: some negative outcomes VOCs: Volatile Organic Compounds

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

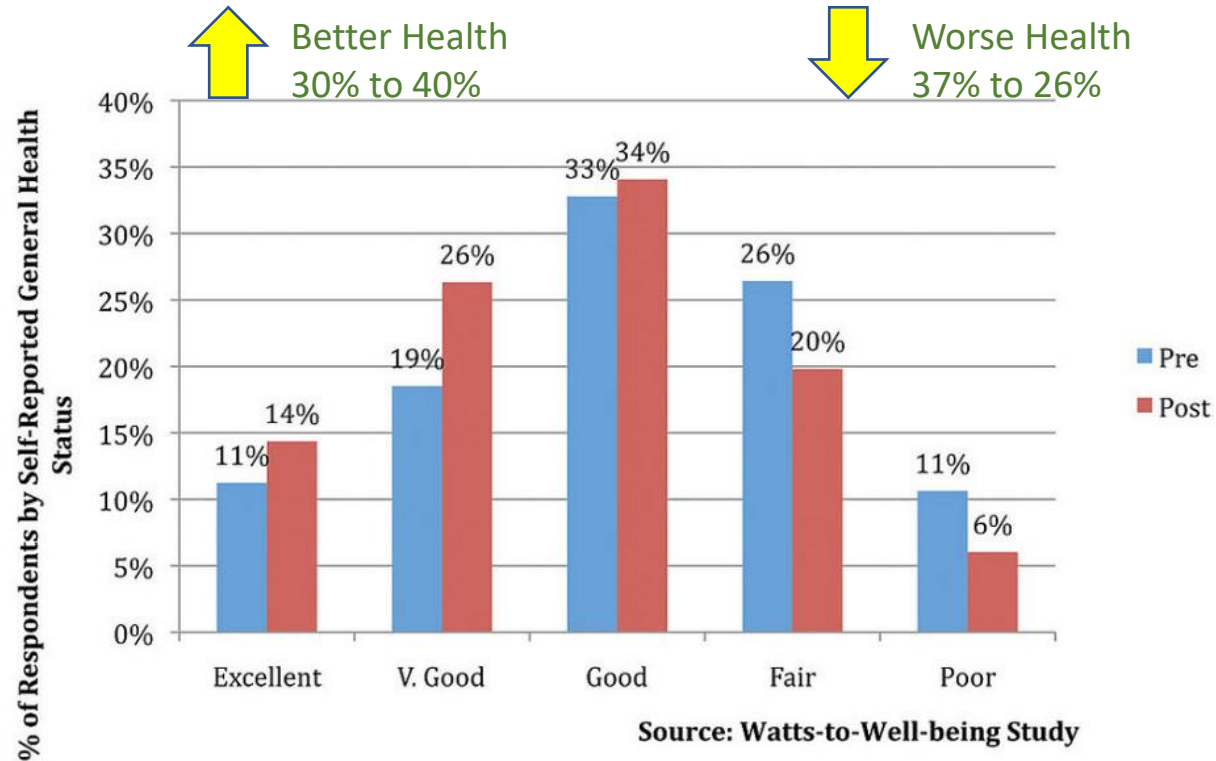


National weatherization evaluation shows healthier outcomes

Survey Question	Pre-WX	Post-Wx (1)	Change
Asthma emergency department visits past year	15.8%	4.3%*	-11.5%
Persistent cold symptoms lasting more than 14 days last year (% yes)	21%	12%***	-9%

Survey Question	Pre-WX	Post-Wx	Change
How often home too drafty (1= all the time, 4 = never)	2.86	3.60***	26%
How infested is home with cockroaches, other insects, spiders (1=extremely infested, 5=not infested at all)	4.19	4.37***	4%
How infested is home with mice (1=extremely infested, 5=not infested at all)	4.61	4.73*	3%
Frequent mildew odor or musty smell (1=yes, 0=no)	.30	.21***	-9%
How often have observed standing water in home (1= never, 5=always)	1.60	1.44**	-10%
Have seen mold in home (1=yes, 0=no)	.28	.19**	-9%

Energy efficiency improves reported health outcomes

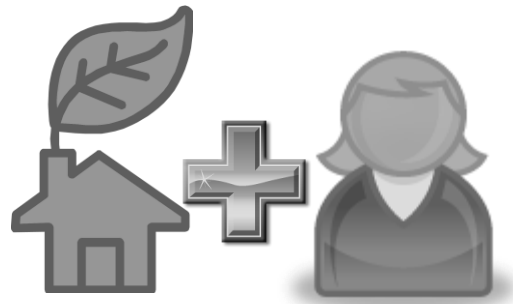


Source: Wilson J, Dixon SL, Jacobs DE, Breyse J, Akoto J, Tohn E, Isaacson M, Evens A, Hernandez J (2014). Watts-to-Wellbeing: does residential energy conservation improve health? *Energy Efficiency*, 7(1), 151.

Weatherization “Plus”

Highline Communities, King County, WA

STUDY GROUP:
WEATHERIZATION PLUS
COMMUNITY HEALTH
WORKER

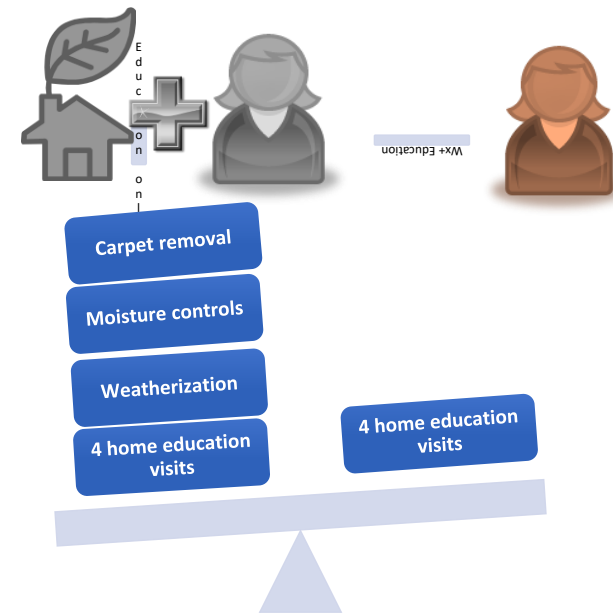


COMPARISON GROUP:
COMMUNITY HEALTH
WORKER ONLY



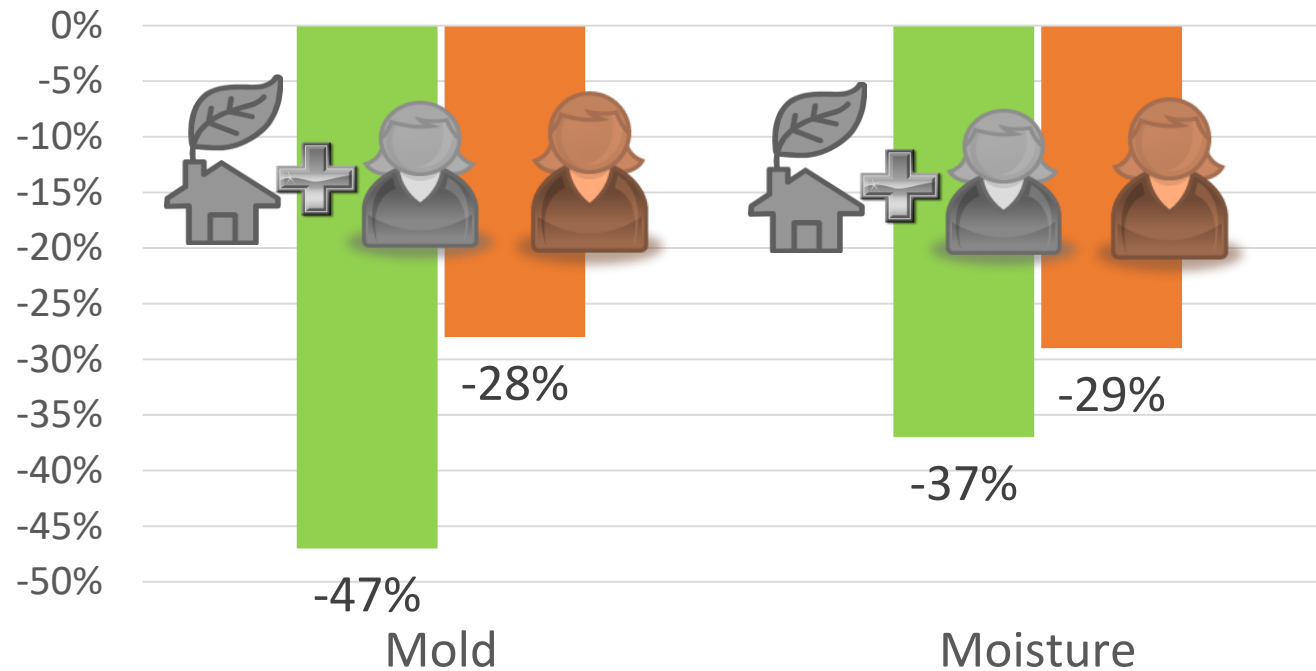
Weatherization Plus Health work

- 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)

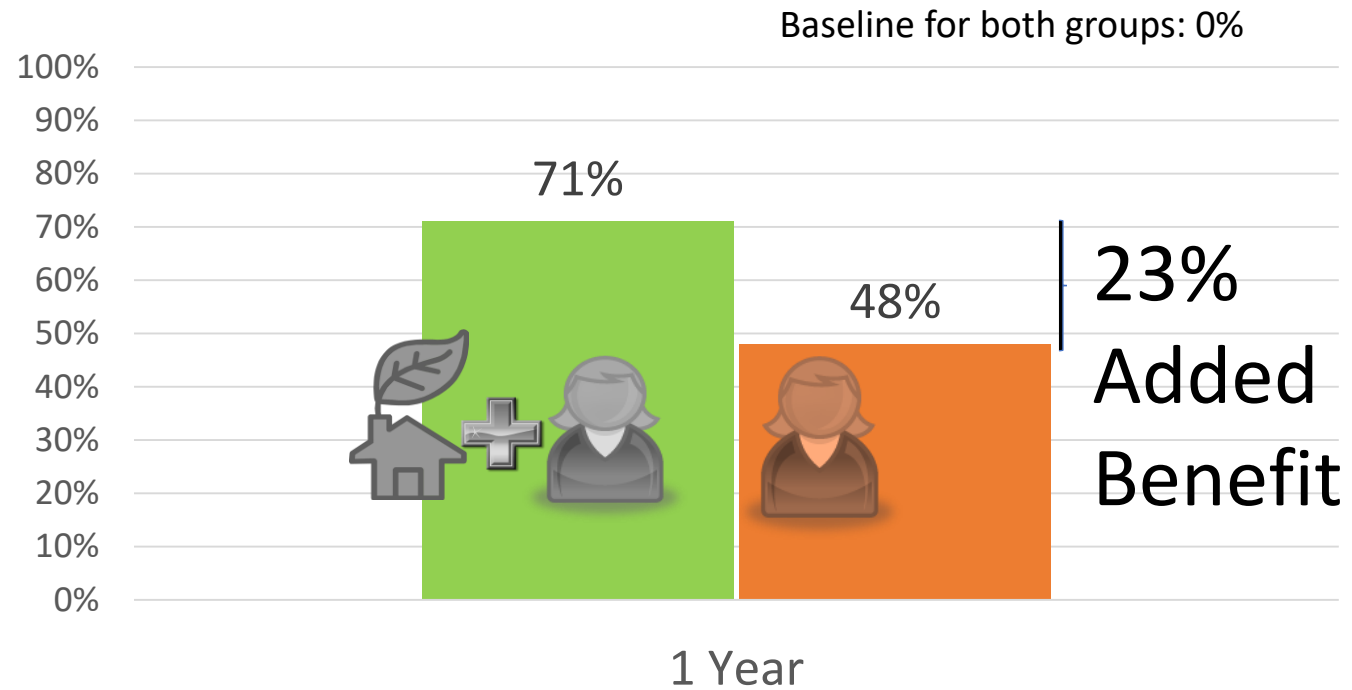


Source: Breyse J, Dixon S, Gregory J, Philby M, Jacobs DE, Krieger J. (2014). Effect of weatherization combined with community health worker in-home education on asthma control. *American Journal of Public Health*, 104(1), 57.

Weatherization Plus Health: Reduced moisture/mold

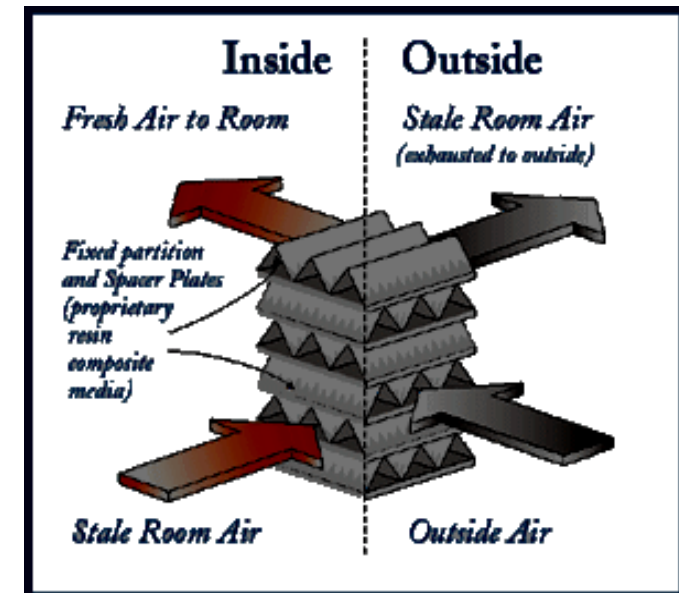


Asthma better controlled for children



HRVs/ERVs can improve asthma symptoms

- 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 CO₂, VOCs, and airborne mold



ASHRAE 62.2 exhaust ventilation can improve environmental conditions

- Fewer headaches among children in 62.2 2010 vs. 1989 homes
- Homes in both groups had lower CO₂ and formaldehyde
- 62.2 2010 homes had some declines in radon in first floor





Typical One Touch Partners



Health

Lead
Asthma
Visiting Nurses
Smoking Cessation



Housing

Government Rehab
Habitat for Humanity
Rebuilding Together
Community Programs



Energy




Weatherization
Utility Programs
Home Performance



VT WAP families have health risks



Families want health insurance information




Response	Chart	Percentage	Count
Yes		44.0%	435
No		55.8%	552
Yes and older than 60 years, refer to Area Agency on Aging		0.2%	2
Total Responses			989

Wx replaced smoke & CO alarms in 40% homes

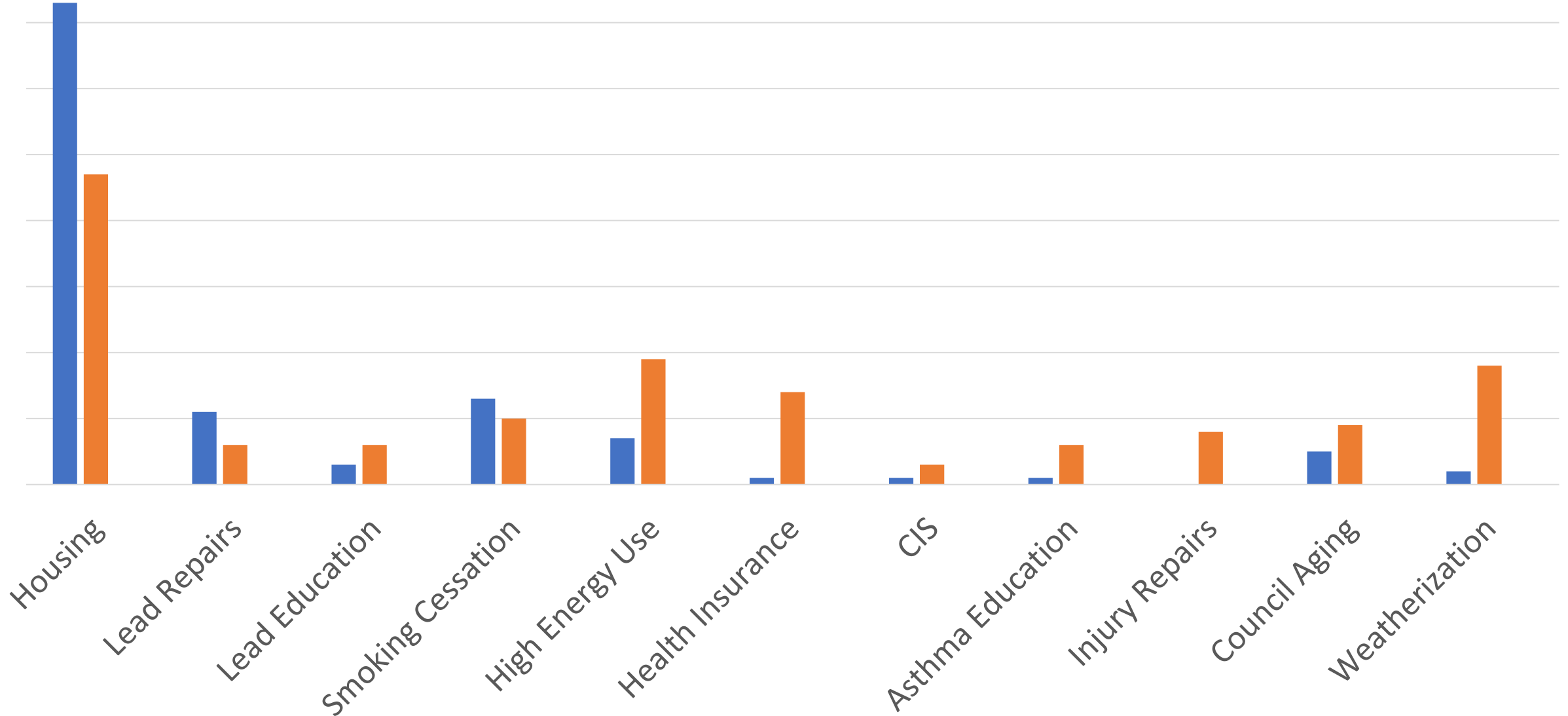
Response	Chart	Percentage	Count
no working smoke detector or detector > 10 years old		8.2%	102
no working carbon monoxide alarm or > 5 years old		10.1%	126
non working smoke detector will be replaced by Weatherization		39.6%	494
non working carbon monoxide alarm will be replaced by Weatherization		42.0%	524
exposed electrical wiring		3.8%	47
stairs or porch without adequate railings		4.1%	51
windows or doors don't open for exit		3.8%	47
Other, please specify...		6.2%	77
no safety risks mentioned or observed by home visitor		44.3%	553
Total Responses			1247

VT One Touch

1 in 4 homes/families (300) needed a referral

Response	Chart	Percentage	Count
Yes, will specify		24.0%	301
Yes, but family declined referral		1.3%	16
No referral needed		74.7%	937
Total Responses			1254

Most Common One Touch Referrals



One Touch is up and running in 6 – 12 months

