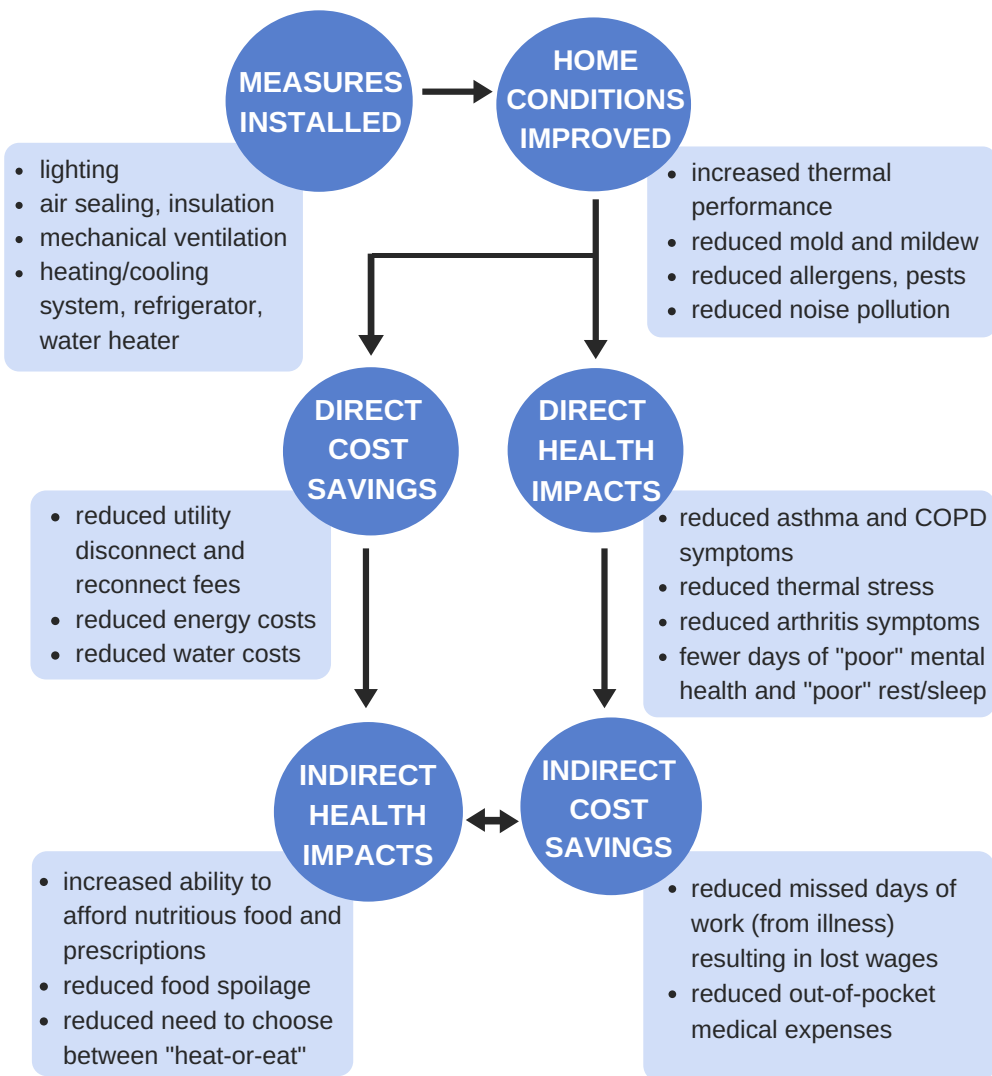


# LOW-INCOME MULTIFAMILY WEATHERIZATION HEALTH AND RESILIENCE IMPACTS

This project aims to assess the health and resilience benefits attributable to improving the energy efficiency of affordable multifamily buildings. This project is funded by:

The JPB Foundation and the Massachusetts Utility Program Administrators (PAs).

## How Weatherization Produces Health Benefits



## PROJECT ESSENTIALS

### GOALS

1. Estimate health & resilience non-energy impacts (NEIs) of weatherizing affordable multifamily (MF) buildings
2. Impact policy to increase funding for weatherization programs

### HYPOTHESIS

Single-family (SF) weatherization estimates do not apply to the MF sector. Initial findings support this hypothesis.

### SAMPLE

MF buildings with 5+ units in MA, NYC, IL, WI, RI, VT, NH, PA that fall into one of the following groups:

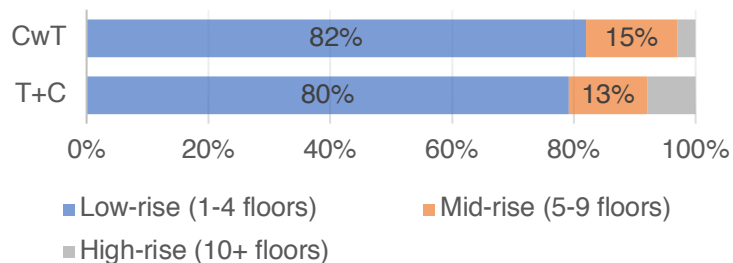
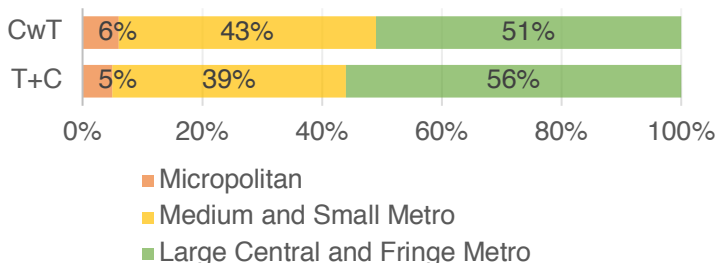
- **Comparison with Treatment (CwT)** - already been weatherized (post-)
- **Treatment (T)** - will soon be weatherized (pre-)
- **Control (C)** - will not be weatherized
- **Treatment + Control (T+C)** – pooled "pre-" data from both groups

### METHODS

Surveys were distributed to 7,745 tenants in 414 affordable multifamily buildings from Dec. 2017 – June 2019.

**Additional Considerations:** 1 – Households in better financial condition may be able to forego predatory loans, which further decreases financial strains. 2 – Improvements in health and finance may improve mental health, which may lead to further health improvements.

## SITE CHARACTERISTICS OF PHASE I SAMPLE\*



\* n=186 sites/properties; representing 385 buildings

## ADDITIONAL RESEARCH COMPONENTS

### PROPERTY MANAGER SURVEY

Captures building systems resilience.

### WEATHERIZATION PROCESS INTERVIEW

Captures process, strengths and weaknesses of weatherization programs from interviews with property owners.

### DATA WITH A SOUL (DWaS)

Documents tenants' personal experiences.

### NON-ENERGY IMPACT (NEI) MONETIZATION

Assigns a dollar amount to NEIs based on inputs such as the cost of prevented medical care.

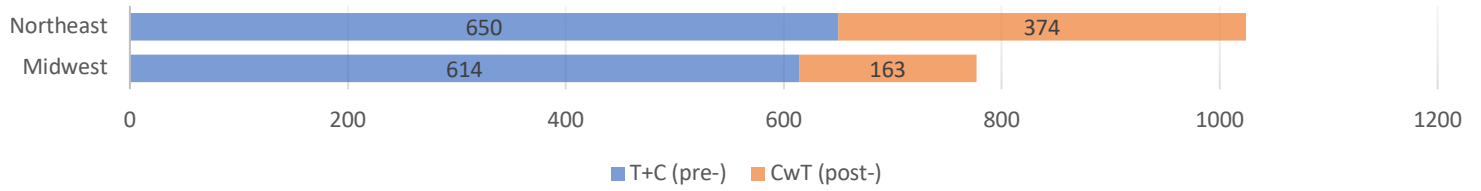
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# FINAL PHASE 1 SURVEY RESULTS (Baseline Conditions)

1,921 = NUMBER OF COMPLETED RESIDENT SURVEYS  
2,895 = INDIVIDUALS REPRESENTED



## HEALTH IMPROVEMENTS

Resident Survey Question <sup>†</sup>	Unweatherized (T+C)	Weatherized (CwT)	(+/-)
Asthma ED visits (mean) <sup>1</sup>	1.23 (n=190)	0.41 (n=80)	-0.82***
Doctor's office visits because apartment was too cold (mean)	0.04 (n=1966)	0.02 (n=921)	-0.02**
Days of mental health not good in past 30 days (mean)	5.64 (n=916)	4.79 (n=495)	-0.85*
ED visit or hospitalization because of COPD, chronic bronchitis, or emphysema (% yes) <sup>1</sup>	32.6% (n=172)	25.5% (n=102)	-7.1%

## DWELLING QUALITY AND SAFETY IMPROVEMENTS

Resident Survey Question	Unweatherized (T+C)	Weatherized (CwT)	(+/-)
Can hear a great deal of outdoor noise indoors when the windows are closed (% yes)	23.2% (n=1,221)	14.6% (n=625)	-8.6%***
Extremely or very infested with rodents (% yes)	7.6% (n=1,127)	2.8% (n=598)	-4.8%***
Apartment was at an unsafe or unhealthy temperature almost every month or some months in past year (% yes)	26.1% (n=1,230)	15.7% (n=630)	-10.4%***

## IMPROVEMENTS IN ENERGY AFFORDABILITY AND TRADE-OFFS

Resident Survey Question <sup>†</sup>	Unweatherized (T+C)	Weatherized (CwT)	(+/-)
How hard is it to pay energy bills? (Very hard or hard)	38.9% (n=552)	27.5% (n=389)	-11.4%***
Household did not purchase food in order to pay energy bill every month, every other month (% yes)	8.1% (n=606)	3.4% (n=412)	-4.7%**
Household members needed prescription medicines but didn't get them because they couldn't afford it? (% yes)	15.4% (n=1188)	10.4% (n=596)	-5.0**

## COMMUNITY RESILIENCE IMPROVEMENTS

Resident Survey Question	Unweatherized (T+C)	Weatherized (CwT)	(+/-)
How safe do you feel on the property? (Somewhat unsafe, very unsafe)	12.7% (n=1212)	7.2% (n=625)	-5.5%***
People in my building are committed to the well-being of the community (Strongly agree or agree)	49.6% (n=1092)	58.9% (n=581)	+9.3%***

## IMPROVEMENTS IN BUILDING SYSTEMS RESILIENCE (from the Property Manager Survey: n=164)

	Extreme hot	Extreme cold	Very high winds	Heavy Snow	Heavy Rain	Flooding	Drought	Wildfire	Earthquake	Power Outage
% Likely <sup>2</sup>	89%	94%	77%	96%	94%	28%	26%	3%	7%	49%
% Wx Improves <sup>3</sup>	77%	84%	45%	37%	36%	10%	4%	4%	4%	21%

<sup>†</sup> Unless otherwise stated, all results in this table report the number of incidents in the past 12 months

<sup>1</sup> Mean represents only those household members with the given illness

<sup>2</sup> How likely are the following types of events in the area where this property is located? (extremely likely, very likely or likely)

<sup>3</sup> How has Wx affected this property's ability to withstand extreme events? (greatly improved or improved)

\*p < .05 \*\*p < .01 \*\*\*p < .001