Table S1. Changes in home blood pressure by change in indoor temperature (intervention group only)
(the model was adjusted for HBP levels at the baseline)

A: Morning

Blood pressure	Change in morning $Temp_{In}$ from the baseline survey									
	<−3°C (n=61)		−3°C to −1°C (n=208)		−1°C to +1°C (n=470)		+1°C to +3°C (n=471)		+3°C ≤ (n=368)	
	Difference	P value*	Difference	P value*	Difference	P value*	Difference	P value*	Difference	P value*
HSBP, mmHg	+4.0	Ref.	+2.1	0.967	+0.6	0.011	−1.3	<0.001	−3.6	<0.001
HDBP, mmHg	+2.4	Ref.	+1.7	1.000	+0.7	0.150	−0.2	0.002	−1.7	<0.001

B: Evening

Blood pressure	Change in evening $Temp_{In}$ from the baseline survey									
	<−3°C (n=61)		−3°C to −1°C (n=206)		−1°C to +1°C (n=571)		+1°C to +3°C (n=450)		+3°C ≤ (n=290)	
	Difference	P value*	Difference	P value*	Difference	P value*	Difference	P value*	Difference	P value*
HSBP, mmHg	+2.7	Ref.	+1.9	1.000	−0.2	0.064	−0.9	0.007	−4.2	<0.001
HDBP, mmHg	+1.1	Ref.	+1.1	1.000	+0.3	1.000	−0.2	0.880	−1.9	0.001

$Temp_{In}$ indicates indoor temperature; HSBP, home systolic blood pressure; HDBP, home diastolic blood pressure.

*P value was calculated after Bonferroni correction (reference group: <−3ºC).

Table S2. Cost information on home renovation

Type of cost	Currency*	Mean (SD)
Renovation costs**	[thousand-JPY]	2130 (1140)
	[$]	18800 (10000)
	[€]	16600 (8800)
Subsidies for participants	[thousand-JPY]	890 (300)
	[$]	7860 (2610)
	[€]	6910 (2300)
Out-of-pocket costs	[thousand-JPY]	1240 (930)
	[$]	11000 (8200)
	[€]	9640 (7230)

*We calculated the cost at the following rates (average rates during the survey period);
1 $ = 113.2 JPY, 1 € = 128.7 JPY.

**Renovation costs included the cost on barrier-free renovation in addition to insulation retrofitting because it was effective to conduct both at the same time.

Table S3. Effect of intervention and change in indoor temperature on home blood pressure in the morning and evening (the model was adjusted for indoor temperature at the baseline)

Predictor	Model-1*			Model-2**		
	β	95%CI	P Value	*β*	95%CI	P Value
Change in morning HSBP from the baseline survey, mmHg						
Intervention vs control	−2.9	−4.5, −1.3	<0.001	−2.8	−4.3, −1.2	<0.001
Change in $Temp_{In}$, ºC	—	—	—	−0.68	−0.84, −0.52	<0.001
Change in morning HDBP from the baseline survey, mmHg						
Intervention vs control	−2.1	−3.1, −1.0	<0.001	−2.0	−3.1, −1.0	<0.001
Change in $Temp_{In}$, ºC	—	—	—	−0.33	−0.44, −0.22	<0.001
Change in evening HSBP from the baseline survey, mmHg						
Intervention vs control	−1.7	−3.3, −0.1	0.037	−1.6	−3.1, −0.0	0.044
Change in $Temp_{In}$, ºC	—	—	—	−0.76	−0.93, −0.58	<0.001
Change in evening HDBP from the baseline survey, mmHg						
Intervention vs control	−1.5	−2.6, −0.4	0.007	−1.4	−2.5, −0.4	0.009
Change in $Temp_{In}$, ºC	—	—	—	−0.39	−0.51, −0.27	<0.001

CI indicates confidence interval; HSBP, home systolic blood pressure; HDBP, home diastolic blood pressure.

*Model-1 included the treatment condition (intervention vs control) as a predictor, and was adjusted for HSBP/HDBP and indoor temperature at the baseline survey, change in age, change in body mass index and change in outdoor temperature from baseline.

**Model-2 included the treatment condition (intervention vs control) and change in indoor temperature as predictors, and was adjusted for HSBP/HDBP and indoor temperature at the baseline survey, change in age, change in body mass index and change in outdoor temperature from baseline.

Table S4. Members of Smart Wellness Housing survey group

A: Members of the Research Committee for the Promotion of the Smart Wellness Housing survey

Chairperson

Shuzo MURAKAMI*

Vice-chairperson

Takesumi YOSHIMURA*

Kazuomi KARIO*

Hiroshi YOSHINO*

Organizer

Toshiharu IKAGA*

Committee member in medicine

Suminori AKIBA, Mikio ARITA, Michiya IGASE, Masayoshi ICHIBA, Nami IMAI, Masaki UEMURA, Hiroyuki UEHARA, Haruo UGUISU, Kensuke ESATO, Akira EBOSHIDA, Kuniaki OTSUKA*, Yuko OGUMA, Toshiyuki OJIMA, Shimato ONO, Yoshio OMATA, Sadanobu KAGAMIMORI, Takahiko KATOH, Masahiko KATO, Yukinori KUSAKA, Shinya KUNO, Kiyokage KUBO, Yoshiki KURODA, Yasuaki SAIJO, Eiji SHIBATA, Kuninori SHIWAKU, Narufumi SUGANUMA, Tomotaka SOBUE, Toshiro TAKEZAKI, Toru TAKEBAYASHI*, Atsuhiro TATEOKA, Masatoshi TANAKA, Tsuyoshi TANABE, Masakazu NAKAGUN, Susumu TSUKAMOTO, Hiroyuki DOI, Kunio DOBASHI, Chisato NAGATA, Hiroyuki NAKAMURA, Kunio NAKAYAMA, Norihiro NOGATA, Takashi HANATO, Daisuke FUKUDOME, Yoshihisa FUJINO*, Tanji HOSHI*, Satoshi HOSHIDE, Takahiro MAEDA, Toru MATSUDA, Muneo MINOSHIMA, Takashi MURAWAKA, Naoki YASUDA, Genichiro YATAKE, Hidekazu YAMADA, Shoji YOSHIDA, Misako YOSHINAGA, Masahito YONEOKA, Ken YONEDA

Committee member in architecture

Akihiko IWASA, Atsushi IWAMAE*, Akihito OZAKI, Satoru KUNO, Minoru KUMANO, Shoichi KOJIMA, Yuzo SAKAMOTO, Yasuyuki SHIRAISHI, Hirotaka SUZUKI, Tsuyoshi SEIKE*, Naoki TAKAGI, Masaki TAJIMA, Yoshito TANAKA, Takayuki TAMAI, Mitsutaka TSUJI, Reiji TOMIKU, Hisaya NAGAI, Daisaku NISHINA, Hideyo NIMIYA, Kenichi HASEGAWA, Hirofumi HAYAMA *, Akira FUKUSHIMA, Yuji HORI, Kiyotada MAGATA, Takeo MATSUOKA, Teruaki MITAMURA, Shinji YOSHIDA

*: members of the Research Planning Committee for the Promotion of Smart Wellness Housing

B: Members of the Subcommittee for Analysis of the Smart Wellness Housing survey

Chairperson

Toshiharu IKAGA*

Vice-chairperson

Yoshihisa FUJINO*

Organizer

Shintaro ANDO*, Tatsuhiko KUBO

Committee member

Yuko OGUMA, Hiroshi KANEGAE, Shun KAWAKUBO, Yoshinobu SAITO, Masaru SUZUKI, Tsuyoshi SEIKE*

Experts committee member

Maki ITO, Wataru UMISHIO, Hiroshi KOJIMA, Takayuki TAJIMA, Yukie NAKAJIMA

Adviser

Kazuomi KARIO*, Toru TAKEBAYASHI*, Tanji HOSHI*, Takesumi YOSHIMURA*

*: members of the Research Planning Committee for the Promotion of Smart Wellness Housing

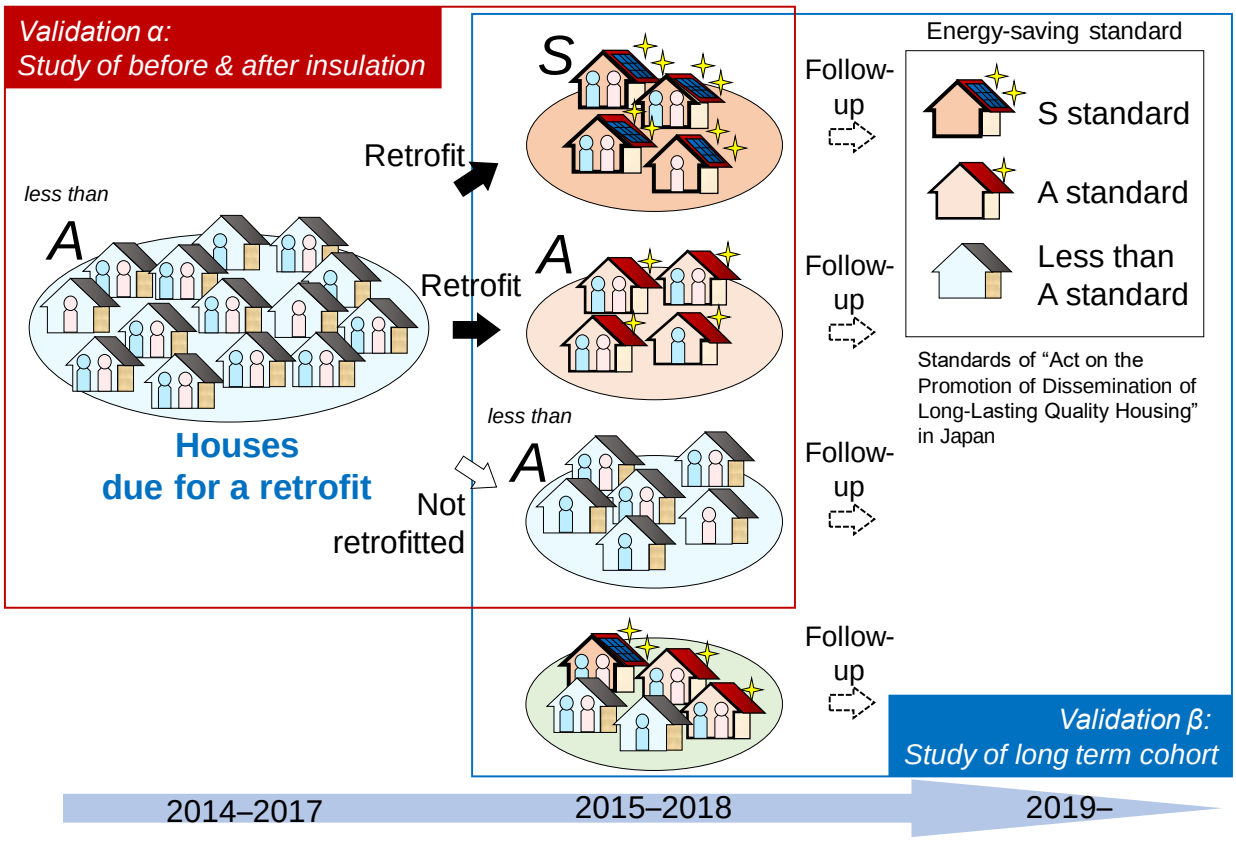

Figure S1. Overview of a nationwide Smart Wellness Housing survey in Japan

(1) Study before and after insulation (validation α)

This is a before and after study to investigate short-term changes in indoor environment and health condition before and after insulation retrofitting.

(2) Study of long-term cohort (validation β)

This is a cohort study to verify the difference in long-term health effects due to differences in the adiabatic level by conducting a follow-up survey on health data of households after completion of insulation retrofitting. For households that do not carry out insulation retrofitting, these are also randomly selected and investigated as a control group.