

New Zealand's Burden of Disease from Housing

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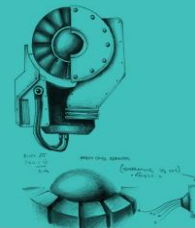
Disclaimer

The results in this presentation are not official statistics, they have been created for research purposes from the Integrated Data Infrastructure (IDI) managed by Statistics New Zealand.

The opinions, findings, recommendations and conclusions expressed in this presentation are those of the authors not Statistics NZ nor the Ministry of Health.

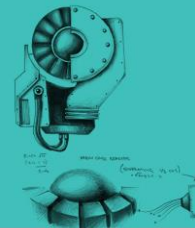
Access to the anonymised data used in this study was provided by Statistics NZ in accordance with security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person, household, business or organisation and the results in this paper have been confidentialised to protect these groups from identification.

Careful consideration has been given to the privacy, security and confidentiality issues associated with using administrative and survey data in the IDI. Further detail can be found in the Privacy impact assessment for the Integrated Data Infrastructure available from www.stats.govt.nz.



State of New Zealand Housing

- New Zealand households, on average, spent 26% of their gross adjusted disposable income on housing in 2017 (the highest in the OECD)
- Increasing percentage of households are renting – rentals generally more problematic than owner-occupied
 - More often cold, damp, and mouldy
 - More often in need of repair

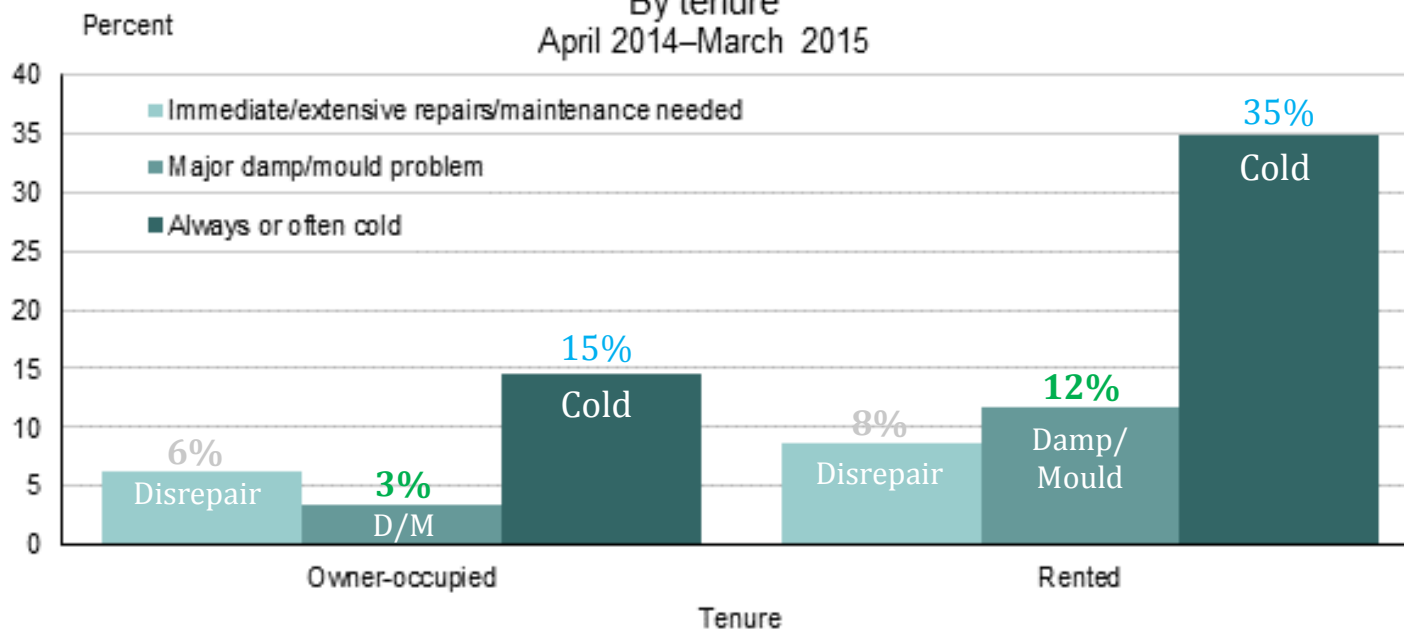


Rental Properties More Problematic

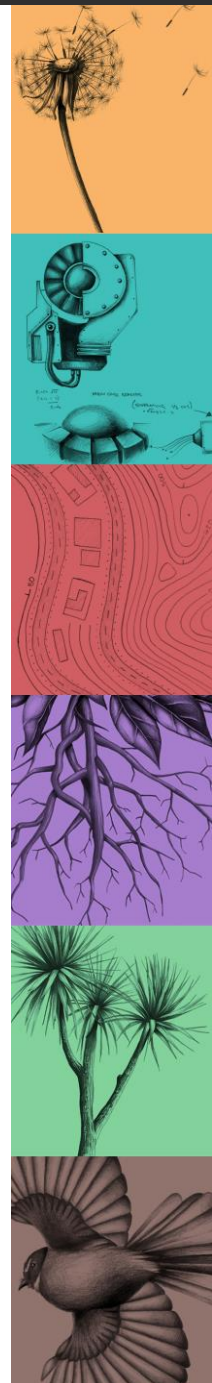
Self-reported housing problems

By tenure

April 2014–March 2015

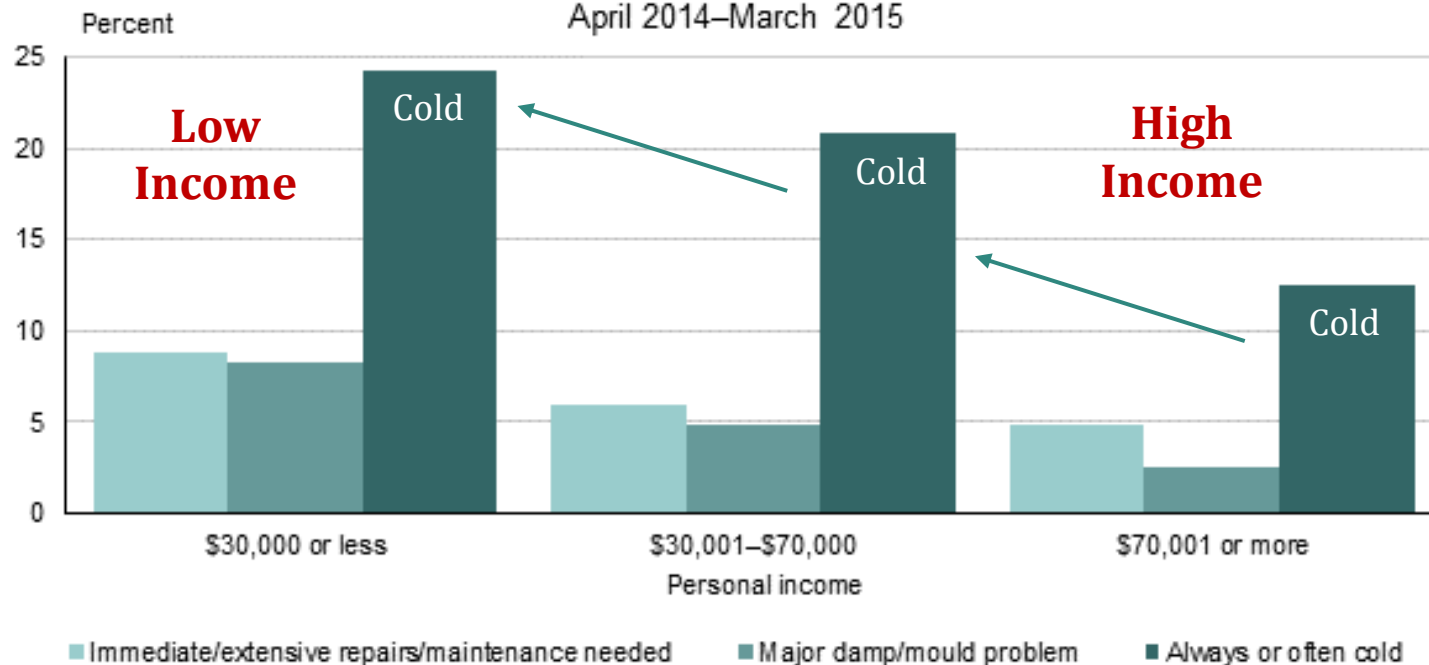


Source: Statistics New Zealand

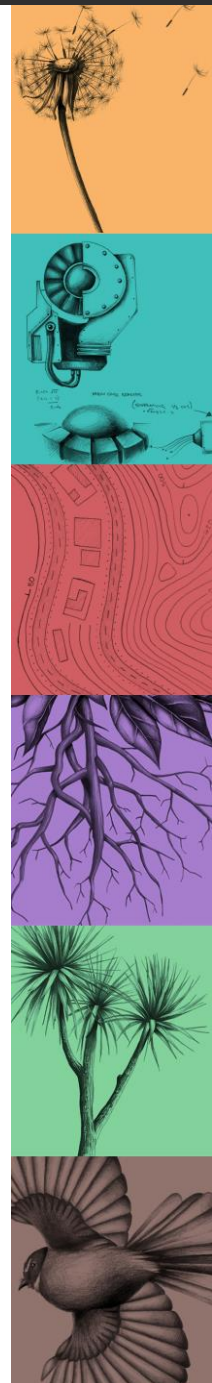


More Housing Problems Lower Income Households

Self-reported housing problems
By personal income
April 2014–March 2015

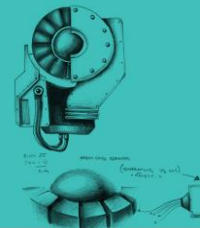


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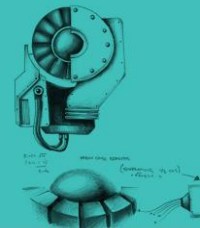
Burden of Disease in NZ – How big is the problem?

- WHO methodology designed to estimate preventable burden
 - Data required for burden of disease estimates
 - Population Attributable Fraction (PAF)
 - Risk factor exposure within the study population
 - Exposure-response relationship for the risk factor
 - Disease estimates (e.g., morbidity, mortality)
 - Add cost component to usual methodology
 - Injury claims and hospitalisation costs
 - *Lost wages/productivity – tbd*
 - Useful for policy
 - Size of problem
 - Develop cost per case averted
- Calculate** →
- **Lit. Review**



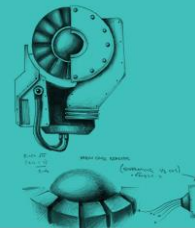
Poor Housing Conditions

- **Household Crowding**
- **Indoor Environment**
 - Cold
 - Damp, mouldy
 - *Second-hand smoke*
- **Interior/Exterior Injury Hazards**
 - **Slip/Trip/Fall Hazards**
 - Missing/faulty handrails for steps/decks
 - Missing grab rails bathrooms/toilets
 - Poor outdoor lighting
 - *Burn Hazards -- tbd*
 - *Unsafe heaters/ovens*
 - *Lack of working smoke detectors*
 - *Hot water temperatures at over 60 degrees*
 - *Other Hazards -- tbd*
 - *Poisons/medicines not locked or stored out of reach*
 - *Electrical outlets not covered*



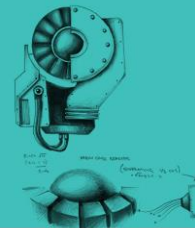
Data

- Estimating burden of household crowding and the interior environment
 - Publicly funded hospitalisations
 - 2010-2017 for hospitalisations
 - Ministry of Health using Statistics NZ IDI
 - Mortality data -- *in process*
 - 2010-2015 for deaths
 - Ministry of Health using Statistics NZ IDI
- Estimating burden of home injuries
 - Claims data from the Accident Compensation Corporation
 - All claims for injuries between 2010 and 2017
 - Scene is listed as “Home”
 - Classification implies slips/trips/falls



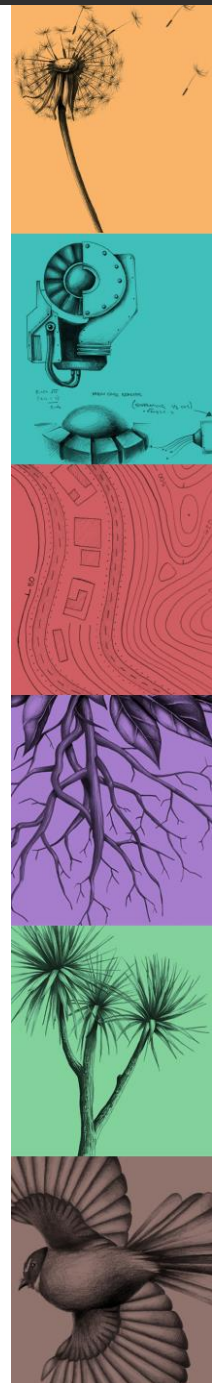
Main Assumptions

- **10.1%** of population live in **crowded** housing (Census 2013)
 - (CI: 10.1-10.2)
 - Children generally live in more crowded households, ranging from 12.5% to 15.4%
- **21.2%** report house is always or often **cold**
 - (CI: 20.0-22.3)
 - NZ GSS 2014/2015
 - 46% do not heat bedrooms in winter (BRANZ 5th HCS)
 - 53% of houses could benefit from retrofitted insulation (BRANZ 5th HCS)
- **31.8%** report problem with **dampness or mould**
 - (CI: 29.7-33.8)
 - NZ GSS 2014/2015
 - Exposure-response measures generally based on dampness, water damage, visible mould, mould odor or flooding
- **26%** of **home injuries** from slips, trips, or falls are **preventable** (Keall *et al.* 2015)



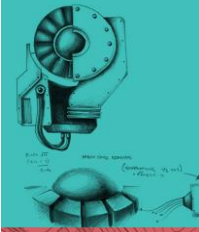
Estimated Annual Hospitalisations attributed to Household Crowding

Primary Diagnosis	Age Group	PAF	Patients			Hospitalisations			Hospitalisation Costs			LOS (# nights)		
			#	Low	High	#	Low	High	#	Low	High	#	Low	High
Gastroenteritis	0-5	1.9%	63	5	124	66	5	129	148,041	11,591	290,561	90	7	177
<i>H. pylori</i> (gastric cancer)	0+	7.6%	21	15	29	31	22	43	423,465	291,369	576,727	297	205	405
<i>H. pylori</i> (gastritis)	0+	7.6%	42	29	57	42	29	58	144,761	99,604	197,153	80	55	109
<i>H. Pylori</i> (peptic ulcer)	0+	7.6%	97	67	132	103	71	141	1,055,481	726,234	1,437,486	944	649	1,285
<i>Haemophilus influenza</i>	0-6	9.7%	1	0	1	1	0	1	6,452	2,508	11,034	5	2	8
Hepatitis A	0+	5.1%	1	0	2	1	0	2	4,460	1,993	7,381	3	1	4
Meningococcal disease	0-16	12.4%	5	2	9	5	2	9	57,758	21,161	103,854	36	13	65
Pneumonia/ LRTI	0-5	9.3%	266	137	410	286	148	442	1,010,319	522,549	1,561,738	631	326	976
Rheumatic Fever (acute)	0+	0.7%	1	1	1	1	1	1	15,223	10,895	17,551	17	12	20
Rheumatic Fever (chronic heart disease)	0+	0.7%	3	2	4	4	3	4	95,465	68,327	110,064	38	27	44
RSV	0-3	16.0%	142	19	302	144	19	308	898,961	118,326	1,919,292	619	82	1,322
Tuberculosis	15+	21.9%	29	9	55	34	11	65	482,802	155,077	927,277	578	186	1,109
URTI	0-18	4.6%	274	-	1,076	286	-	1,123	542,207	-	2,132,716	274	-	1,076
Totals		6.5%	943	286	2,203	1,005	311	2,327	4,885,395	2,029,635	9,292,833	3,612	1,565	6,601



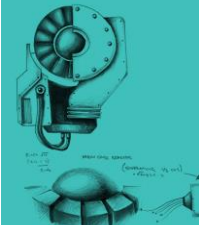
Estimated Annual Hospitalisations attributed to Damp/Mouldy Homes

Primary Diagnosis	PAF	Patients			Hospitalisations			Hospitalisation Costs (\$)			LOS (# nights)		
		#	Low	High	#	Low	High	#	Low	High	#	Low	High
Asthma	15.1%	900	487	1,340	1,095	593	1,632	2,726,778	1,475,772	4,062,618	1,967	1,064	2,930
Bronchiectasis	12.3%	97	67	131	138	95	187	836,869	574,804	1,133,573	957	658	1,297
Bronchiolitis	12.3%	424	292	575	541	372	733	2,149,708	1,476,528	2,911,866	1,166	801	1,579
Bronchitis	12.5%	141	98	188	143	99	190	653,636	453,165	868,116	653	453	867
Cough	17.6%	93	68	120	96	69	123	268,726	194,373	344,577	137	99	176
Other respiratory	12.3%	174	120	236	177	122	240	1,746,705	1,199,725	2,365,983	1,582	1,087	2,143
Pneumonia/ LRTI	12.3%	2,316	1,591	3,138	2,486	1,707	3,367	23,736,929	16,303,723	32,152,633	28,253	19,406	38,270
URTI	12.3%	1,261	866	1,709	1,308	898	1,771	3,216,949	2,209,563	4,357,488	1,692	1,162	2,292
Wheeze	13.7%	259	191	335	293	217	380	502,503	371,471	651,439	242	179	313
Totals	12.5%	5,666	3,779	7,771	6,276	4,171	8,622	35,838,804	24,259,125	48,848,294	36,649	24,908	49,868



Estimated Annual Hospitalisations attributed to Cold Homes

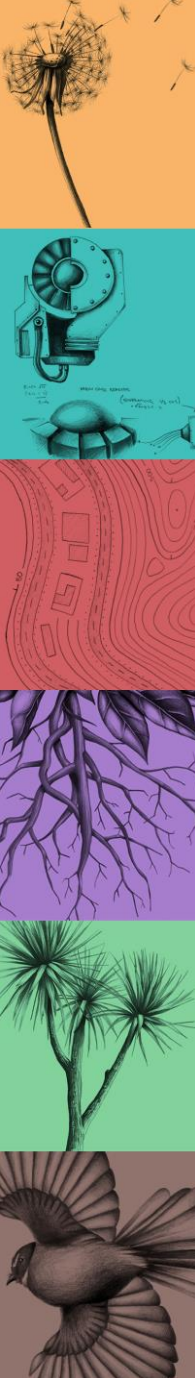
Primary Diagnosis	PAF	Patients			Hospitalisations			Hospitalisation Costs			LOS (# nights)		
		#	Low	High	#	Low	High	#	Low	High	#	Low	High
Cold or flu	15.3%	260	158	387	261	159	389	1,262,283	770,787	1,882,763	997	609	1488
COPD	0.7%	48	0	132	69	0	190	546,058	-	1,500,901	594	0	1632
Wheeze	13.8%	260	149	473	295	169	536	505,037	289,176	918,127	243	139	441
Totals	2.8%	568	307	992	625	328	1,115	2,313,378	1,059,964	4,301,792	1,834	748	3,561



Estimated Annual Claims for Home Injuries (Slips/Trips/Falls)

Claim Type	Annual Average for All Injury Claims (Slips/Trips/Falls)		Estimated Annual Burden of Disease from Poor Housing Conditions	
	# of Claims	Cost in NZD	# of Claims	Cost in NZD
Fatal	280	5,225,388	68	1,277,085
Serious injury	49	17,218,369	12	4,208,169
Hospitalised	6,345	122,677,291	1,551	29,982,330
Entitlement claims	22,611	146,400,741	5,526	35,780,341
Medical fee only	442,977	125,979,878	108,264	30,789,482
Other	552	1,074,288	135	262,556
Total	472,813	\$418,575,955	115,555	\$102,299,963

PAF=26%



Conclusions

- Preventable injuries and hospitalisations due to poor housing conditions in NZ could be costing more than **\$145 million annually** (\$129-164 million) for ACC claims and hospitalisations – CONSERVATIVE
- Housing conditions impact health on a number of dimensions
 - Can place substantial burden on society as a whole
 - Can increase income inequality due to more housing problems for lower income households
- Future research
 - Examine demographic factors (ethnicity, age, housing tenure)
 - Estimate costs beyond claim and hospitalisation costs
 - Keall *et al.* 2016 include **social costs** and estimate annual costs of slips, trips, and falls at **~\$5 billion annually**
 - Sensitivity analysis

