HOUSING-RELATED SURVEILLANCE AT MONTREAL PUBLIC HEALTH

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Centre intégré universitaire de santé et de services sociaux du Centre-Sud-de-l'Île-de-Montréal

Québec

Thanks

- Housing team at Montreal Public Health
  - Mélanie Tailhandier
  - Stéphane Perron
  - Louis Jacques
  - Karine Forgues
  - Véronique Duclos

- Data analysis, maps & tables
  - Sophie Goudreau
  - Céline Plante

The plan

- A little bit of background
- Knowledge development in Montreal
  - Housing conditions
  - Health impacts
  - Interventions
- Impacts, unfinished business, and thoughts for the future

Public health system

- In Quebec:
  - 18 regional public health units
  - Funding from the ministry of health
  - No intersectoral boards of health
  - Public health act (2001) provides legal framework
    - Limited capacity for direct intervention
- In Montreal:
  - 30+ municipalities
  - Inspection and bylaw enforcement is a municipal responsibility

Housing as a determinant of health

- Ten years ago, housing was not clearly situated as a public health issue in Quebec
- Montreal Public Health has been instrumental in putting housing issues on the agenda
- Knowledge development has been a key aspect of public health action

HOUSING CONDITIONS

Available data

- One indicator in the census on “physical conditions” (need for repairs)
- No provincial or municipal surveillance *per se*
- Very limited publicly available data on prevalence and distribution in urban settings elsewhere in North America

Telephone surveys (2010-2017)

- Pests
  - Bed bugs
  - Cockroaches
  - Rodents
- Moulds & water damage
- Safety & upkeep
- Affordability
- Food security

2014 Housing Survey (SALAM)

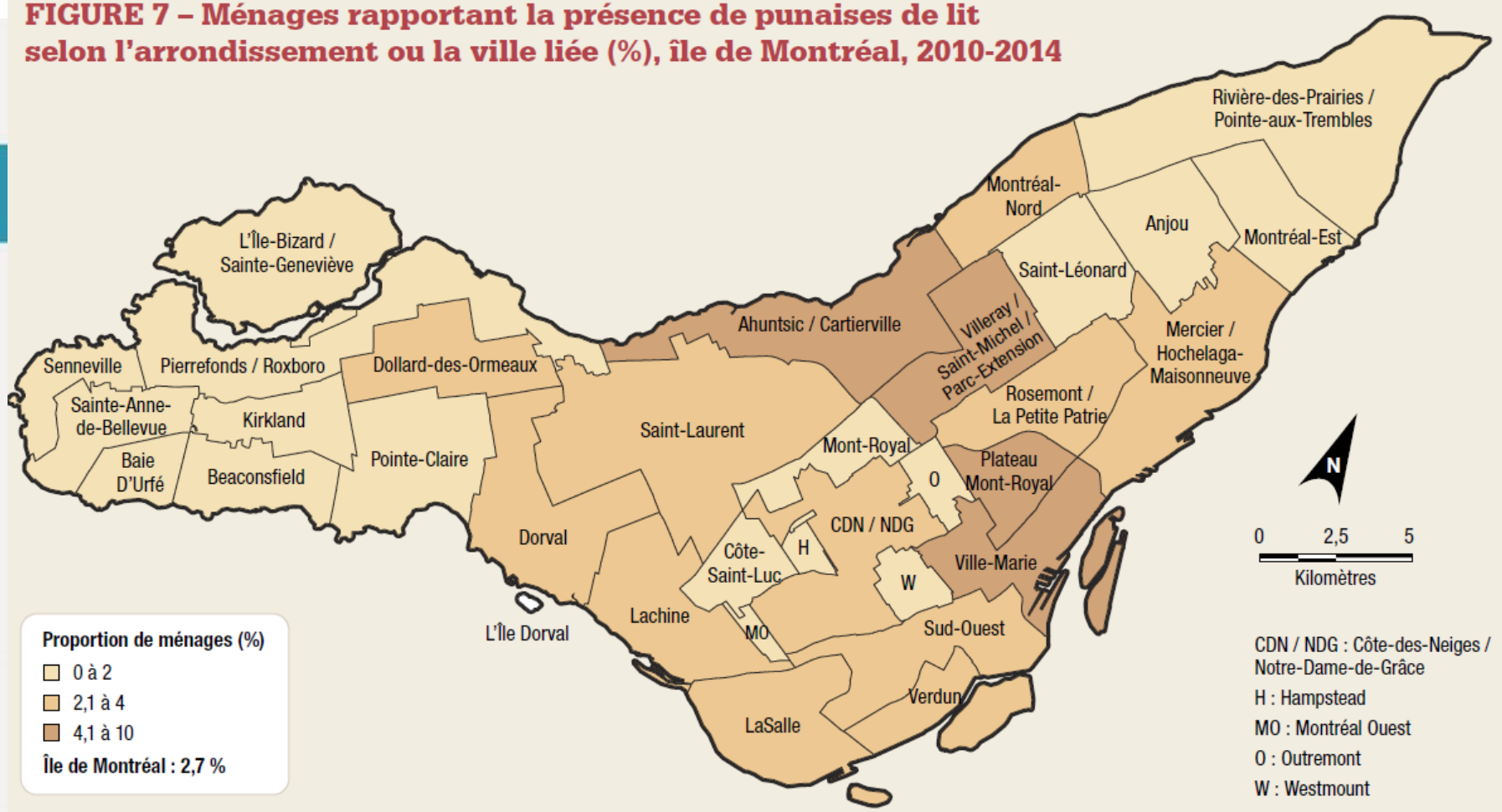
TABLE 2 – Households Reporting Certain Indicators of Substandard Housing or Inadequate Living Conditions (%), Island of Montréal, June 2014

	OWNERS		RENTERS		TOTAL	
	%	95% CI	%	95% CI	%	95% CI
Cockroaches	0.0	(0.0-0.3)	5.5	(3.9-7.7)	3.3	(2.3-4.6)
Bed bugs	0.8	(0.3-2.0)	5.2	(3.7-7.4)	3.4	(2.4-4.8)
Rodents	8.5	(6.2-11.5)	9.5	(7.4-12.2)	9.1	(7.5-11.1)
Visible moulds	3.9	(2.3-6.5)	15.2	(12.5-18.3)	10.6	(8.8-12.7)
Signs of water infiltration	7.8	(5.7-10.5)	20.2	(17.0-23.5)	15.2	(13.2-17.5)
Visible moulds or signs of water infiltration	10.9	(7.9-13.8)	28.2	(24.6-31.7)	21.2	(18.7-23.7)
Vermin or excess humidity	17.7	(14.1-21.3)	37.8	(34.0-41.7)	29.7	(26.8-32.5)
Too hot	9.1	(6.3-11.9)	28.3	(24.5-32.0)	20.5	(17.9-23.1)
Too cold	6.5	(3.2-9.7)	19.2	(16.2-22.2)	14.0	(11.8-16.2)

Source: Léa Roback Research Centre, SALAM 2014.

2014 Housing Survey (SALAM)

FIGURE 7 – Ménages rapportant la présence de punaises de lit selon l'arrondissement ou la ville liée (%), île de Montréal, 2010-2014



Source : DSP de Montréal, Sondages Omnibus 2010, 2011, 2012; Centre Léa-Roback, SALAM 2014.

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Residential pesticide use (2016)

Kaiser D et al. Rapport final – Enquête sur l'utilisation de pesticides en milieu résidentiel. Direction régionale de santé publique de Montréal. 2016.

- 3000 respondents
- Province of Quebec
- In collaboration with the ministry of health, INSPQ, CNESST, PMRA

Tableau 2 : Proportion des ménages ayant utilisé des pesticides à l'intérieur du domicile au cours des 12 derniers mois, selon certaines caractéristiques des ménages. Province de Québec, 2015

	%	IC95 %	
Type d'immeuble			
10+ logements	14,2	10,2	18,3
4-9 logements	18,9	14,5	23,3
1-3 logements	14,0	12,6	15,4
Revenu familial			
< 20 000 $	14,3	10,2	18,4
20 000 $ - 50 000 $	12,8	10,9	14,7
> 50 000 $	16,7	14,4	19,0
Statut de propriété			
Locataire	13,8	11,8	15,7
Propriétaire	13,6	12,4	14,7
Région			
RMR Montréal	16,7	14,9	18,4
RMR Québec	5,1	3,4	6,9
Reste de la province	12,3	10,6	13,9
Province de Québec	**13,7**	**12,6**	**14,7**

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Tableau 1 : Proportion des ménages ayant rapporté la présence d'insectes nuisibles au cours des 12 derniers mois, selon certaines caractéristiques des ménages. Province de Québec, 2015

	Punaises			Blattes			Fourmis			Autres[5]		
	%	IC95 %		%	IC95 %		%	IC95 %		%	IC95 %	
Type d'immeuble												
10+ logements	1,4	0,4	2,3	1,7	0,5	2,8	14,3	8,2	20,4	30,7	23,2	38,3
4-9 logements	3,6	1,1	6,1	5,3	2,1	8,6	19,0	12,7	25,3	28,2	23,2	33,3
1-3 logements	0,7	0,1	1,3	1,7	0,9	2,6	25,4	23,0	27,9	34,3	31,5	37,2
Revenu familial												
< 20 000 $	1,9	0,4	3,3	4,6	1,5	7,8	19,4	13,5	25,2	26,3	19,5	33,1
20 000 $ - 50 000 $	1,5	0,5	2,4	2,2	1,0	3,5	19,8	16,6	23,1	30,6	26,6	34,5
> 50 000 $	0,6	0,1	1,0	1,6	0,2	2,9	27,8	24,3	31,3	37,9	33,9	41,9
Statut de propriété												
Locataire	2,0	1,1	2,9	4,1	2,5	5,8	20,1	16,8	23,3	32,9	28,8	36,9
Propriétaire	0,5	0,2	0,8	1,1	0,6	1,7	25,4	23,2	27,5	34,6	32,0	37,1
Région												
RMR Montréal[6]	1,4	0,8	2,0	2,7	1,7	3,7	29,7	26,7	32,7	33,9	30,5	37,2
RMR Québec[7]	0,5	0,0	1,3	1,1	0,0	2,6	7,4	4,5	10,2	31,4	24,4	38,5
Reste de la province	0,7	0,0	1,5	1,4	0,4	2,3	20,2	17,3	23,0	34,5	30,7	38,3
Province de Québec	**1,1**	**0,7**	**1,5**	**2,3**	**1,6**	**3,0**	**23,3**	**21,5**	**25,1**	**33,9**	**31,7**	**36,1**

2017 Housing Survey

- 5500 respondents
  - 5000 tenants
- Montreal health administrative region
- In collaboration with the City of Montreal
- Data collection May-July 2017

Tenant households – perception of housing

PRELIMINARY DATA

	Proportion of households	95% CI	Estimated number of households
Dwelling is not big enough	**8.2%**	7.2% - 9.1%	**44 600**
Dwelling not adapted to physical needs and age of occupants	**7.7%**	6.7% - 8.7%	**42 000**
Dwelling does not feel secure	**4.2%**	3.4% - 5.0%	**23 000**
Doors don't lock	**7.6%**	6.5% - 8.6%	**41 400**
Discomfort due to cold >24 hrs	**12.2%**	10.9% - 13.5%	**66 800**
Discomfort due to heat >24 hrs	**24.0%**	22.4% - 25.6%	**130 900**

Tenant households – water damage & mould

PRELIMINARY DATA

	Proportion of households	95% CI	Estimated number of households
History of water damage	**18.4%**	16.9% - 19.9%	**100 500**
Signs of water damage	**17.7%**	16.3% -19.2%	**96 800**
Water damage (history or signs)	**27.6%**	25.9% - 29.3%	**151 000**
Mould odour	**8.4%**	7.3% - 9.5%	**45 900**
Visible mould	**9.0%**	8.0% - 10.1%	**49 300**
Mould (visible or odour)	**13.1%**	11.8% - 14.4%	**71 600**

Tenant households – pests

PRELIMINARY DATA

	Proportion of households	95% CI	Estimated number of households
Bed bugs	**4.0%**	3.2% - 4.8%	**21 900**
Cockroaches	**4.7%**	3.9% - 5.4%	**25 400**
Rodent (rats or mice)	**9.4%**	8.3% - 10.6%	**51 600**

Tenant households – pests

PRELIMINARY DATA

	Proportion of hous	timated number f households
Bed bugs		21 900
Cockroaches		400
Rodent (rats or m		600

22,000 Montreal households have bed bugs over the course of any given year!

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HEALTH OUTCOMES

Available data

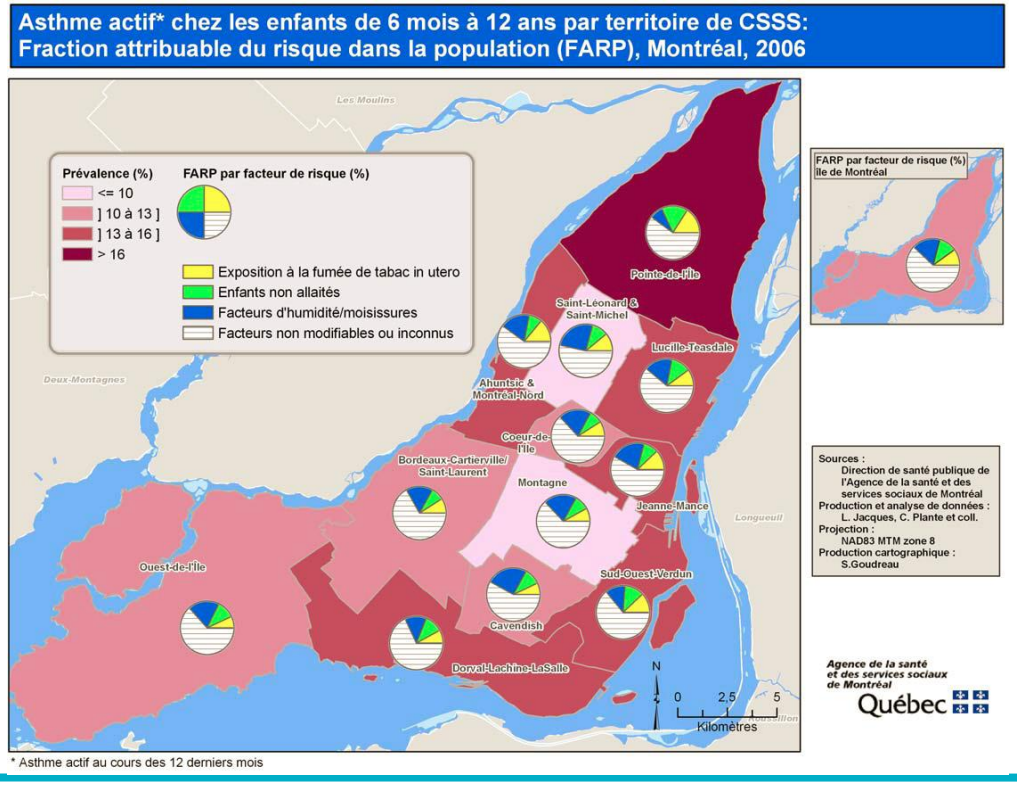
- Nothing in provincial/federal databases on housing-related health outcomes
- No surveillance *per se* at the provincial level (absence of specific indicators)
- Abundant literature for humidity/moulds and respiratory health
  - But, limited scientific literature for most exposure-outcome relationships and burden of disease

Respiratory health in children (2011)

Jacques L, et al. Étude sur la santé respiratoire des enfants montréalais de 6 mois à 12 ans – Rapport synthèse regional. Direction de santé publique de Montréal. 2011.

Değer L, et al. Home environmental factors associated with poor asthma control in Montreal children: a population-based study. Journal of Asthma 2010; 47 :513-520

- 8000 children (6 months – 12 years)
- Attributable fractions of mould/water damage for respiratory disease (asthma, rhinitis, infections)



* Asthme actif au cours des 12 derniers mois

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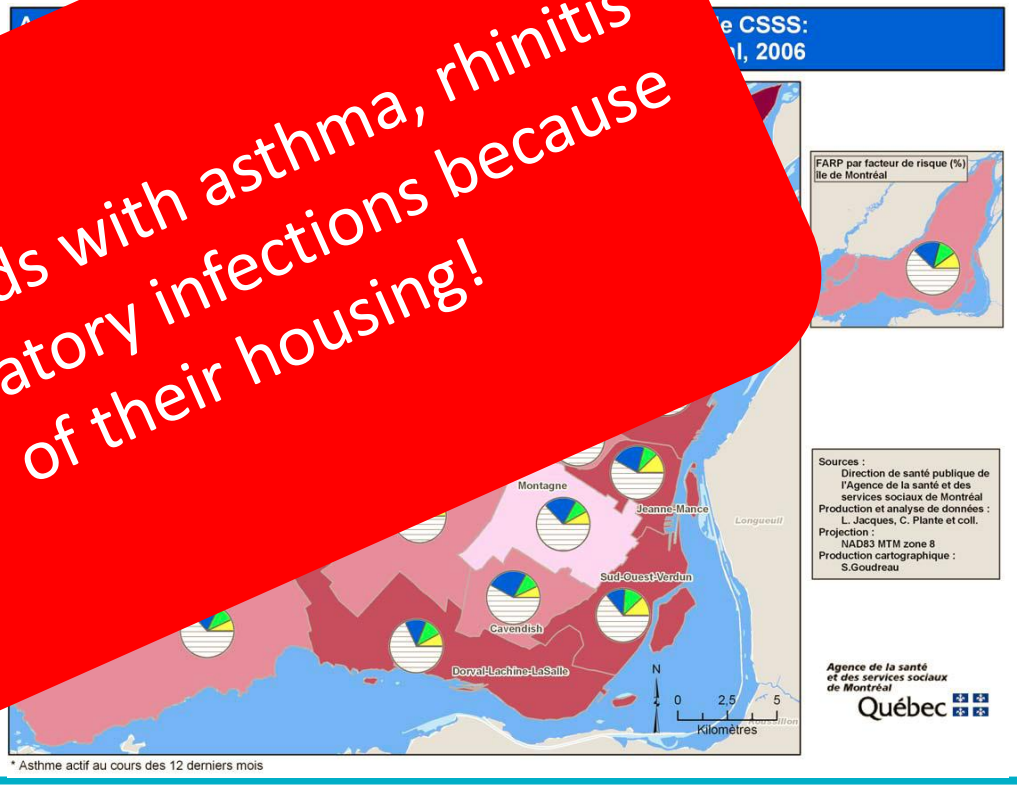
Değer L, et al. Home environmental factors ass… ma control in Montreal children: a population-based stu… 47 :513-520

- 8000 children (6 months – 12 …
- Attribut… of mould, damage fo… respiratory (asthma, rhi… infections)

10,000 kids with asthma, rhinitis or respiratory infections because of their housing!



Bed bugs and mental health (2012)

Susser SR, et al. Mental health effects from urban bed bug infestation (Cimex lectularius L.): a cross-sectional study. BMJ Open 2012;2:e000838. doi:10.1136/bmjopen-2012-000838.

- Anxiety symptoms and sleep disturbances were significantly more likely to occur among individuals exposed to bed bug infestation.

Table 2 ORs and 95% CIs for the associations between bed bug infestation exposure and mental health symptoms

	Unadjusted OR (95% CI)	Fully adjusted OR (95% CI)*
PSQI(5)	3.80 (1.10 to 13.35)	5.00 (1.30 to 18.80)
GAD-7	2.56 (1.04 to 6.32)	4.75 (1.54 to 14.70)
PHQ-9	1.86 (0.74 to 4.67)	2.48 (0.84 to 7.30)

Affordability & food security (2015)

TABLE 3 – Problems Reported by Households, by Condition of the Property and Affordability Ratio, Montréal, June 2014

	OWNERS	RENTERS			TOTAL
		Income spent on housing <30%	Income spent on housing >30%	Total renters	
Overcrowding	2.3*	7.0	10.7	7.7	5.3
Difficulty making ends meet every month	11.3	19.2	44.6	26.7	20.5
Food insecurity					
Afraid of running out of food	2.8	9.6	27.7	14.4	9.6
Not enough food	1.8*	7.0	24.6	11.1	7.7
Inadequate quality of food	4.1	13.5	32.5	18.1	12.4
Use of food bank	0.1*	1.6*	19.8*	7.5	4.2

* 95% confidence interval

Source: Léa Roback Research Centre, SALAM 2014.

INTERVENTIONS

Literature

- Some literature on benefits of insulation and repairs targeting water damage
- American studies on impacts of housing upgrades
- Abundant literature on integrated pest management (esp. for bed bugs)

Apartment preparation - bed bugs (2017)

Perron S. & Hamelin G. Rapport d'évaluation - Soutien à la préparation des logements de personnes vulnérables aux prises avec une infestation de punaises de lit. Direction régionale de santé publique de Montréal. 2017.

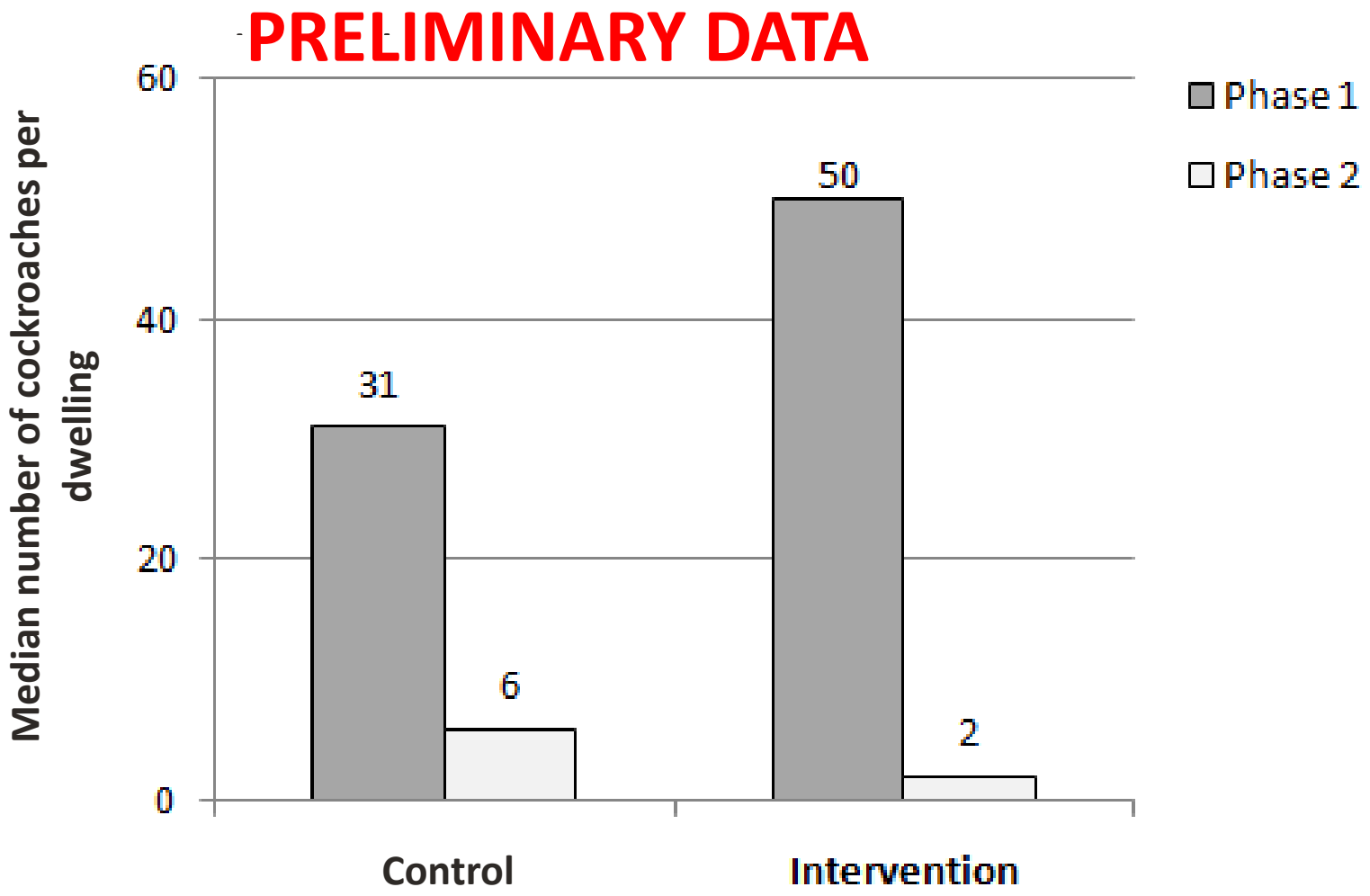
- Evaluation of an intervention to accompany households in social housing in preparing for pest control treatments
- The intervention appears to be associated with lower number of treatments needed for success, particularly in vulnerable households
- Eradication of bed bugs was associated with reduction in symptoms

Waste management and cockroaches (2018)

- Pre-post study with control group

- Evaluating the impact on cockroach density and distribution of a change in waste management practices

Waste management and cockroaches (2018)



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IMPACTS AND OPPORTUNITIES

Data availability – today

	Literature	Local
Exposure (prevalence, intensity, etc.)	+	++
Health and social impacts (burden of disease)	+	+
Interventions	+	+

Data availability – today

	Literature	Local
Exposure (	+	++
Health and social	+	+
Interventions	+	+

Very little publicly available information

Limited breadth in terms of exposures and outcomes

Limited breadth and poor quality for everything but IPM

Putting data to work – a few examples

- 2015 housing report
  - Extensively used in lobbying and positioning vis-à-vis municipal, provincial and federal governments
  - Data integrated into recent planning exercises at public health and in local health units

- 2017 housing survey
  - Already being used by community partners, e.g. public consultation re. housing for the elderly

Putting data to work – a few examples

- Bed bug prevalence data
  - Extensively used by the media (and by partners) as an indicator of housing success (or failure?)

- Bed bugs & mental health
  - Local studies feature prominently in a chapter we wrote for *Advances in the biology and management of bed bugs* (just published!)

Positive impacts

- Need for data increasingly recognized
  - Public health data seen as reliable and useful by local health units, community groups, etc.
- Some uptake at the ministerial level
  - Bed bugs (clinical guidelines)
- Evolution in municipal interventions
  - Increase in number and improvement in training of municipal inspectors
  - Program for accompanying vulnerable households for bed bug treatment

Unfinished business

- Still no federal or provincial surveillance of housing indicators
- No unified vision of housing as a determinant of health amongst intersectoral partners
  - Intersectoral action often remains *ad hoc*
- Very limited information on the burden of disease
- Public health capacity is still extremely limited
  - Essentially no academic partnerships
  - No specific financial measures for housing-related interventions within the health system

Future directions – knowledge development

- Appropriate scale – finer-grained data
  - Modelling approaches
- Political and economic determinants
  - Link with transport & urban development
- Link with health and wellbeing outcomes
  - Etiological research & comparative risk estimation
- Evaluation of interventions
  - Impacts on exposure and health outcomes

Opportunities for collaboration

- Lobbying for inclusion of core housing indicators in pan-Canadian surveillance systems
- Pooling resources for etiologic and evaluative research and estimating burden of disease
- Sharing experiences with regards to using surveillance data to influence intersectoral action and public policy development

MERCI!

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