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Don't Let Them Bug You! Bed Bug Awareness in Durham Region

In recent years, bed bug infestations have been on the rise globally, leading to public concern. The increase has been attributed to growth in international travel, increased resistance of bed bugs to pesticides, increased urban population density, and the move away from the use of broad spectrum pesticides to chemicals that are safer for use in residential settings.¹

Although bed bugs are not known to transmit disease, they can still be a significant public nuisance. Bed bugs cause a variety of negative physical and mental health consequences. Many people have allergic reactions to the bites and bites can also lead to secondary infections. Mental health effects from bed bug infestations include anxiety and loss of sleep. Having bed bugs may leave a person feeling socially isolated and service providers may be reluctant to provide services where bed bugs are present.

In response to growing public concern and media coverage about the potential health impacts of bed bug infestations, in January 2011, the Ontario government announced one-time funding that was used to establish a Bed Bug Support Fund to support bed bug related activities in Ontario Public Health Units for the period of April 2011 to March 2012.¹ It also launched a website bedbugsinfo.ca to provide information about how to identify and eliminate bed bugs.

Durham Region Public Awareness Campaign

Durham Region Health Department applied for and received funding from the Ontario Bed Bug Support Fund and the funds were used in part to undertake a public awareness campaign. The focus of the campaign was how to control the spread of bed bugs: prevention, detection and elimination, and promotion of the bedbugsinfo.ca website. The campaign was implemented in February 2012 and included pamphlets, posters and displays that were used in public venues such as malls and libraries, and advertisements for movie theatres, transit shelters, tourism guides, billboards, buses and radio (see Figure 1).

RRFSS Data Collection

In 2011, 2012, and 2013, the Rapid Risk Factor Surveillance System (RRFSS) was used to measure awareness of bed bugs among Durham Region residents. They were asked about bed bugs in their home, their awareness of how to prevent and control bed bugs, and their use of bed bug related information and resources, including bedbugsinfo.ca. Between May 2011 and August 2013 RRFSS surveyed a total of 3,040 Durham Region residents aged 18 and older regarding bed bugs. Data collected in January 2012 (102 responses) were excluded from the 2012 data when comparing years of data, to better measure the impact of the information campaign launched in February 2012. Results were compared for three time periods related to the implementation of the Durham Region public awareness campaign:

- Pre-campaign (May to December 2011), 1,203 respondents
- During campaign (February to August 2012), 1,235 respondents
- Post-campaign (May to August 2013), 602 respondents

Summary of Results

Prevalence and Treatment of Bed Bugs

The results indicate a very low level of prevalence of bed bugs in Durham Region households. For the years 2011 to 2013 combined, less than 1% of respondents reported having bed bugs in their home in the past 12 months, and about 1% said that a pest control company had come to inspect or treat their home for bed bugs.

Awareness of Bed Bugs (Table 1)

About 90% of Durham Region adults had heard about bed bugs and half were very or somewhat concerned about bed bugs getting into their home. There was no change over the three time periods in these findings.

Table 1 - Awareness of bed bugs, Adults 18+, Durham Region

Indicators	Pre-campaign 2011		During campaign 2012		Post-campaign 2013	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Awareness and Concern about Bed Bugs						
Have read/seen/heard anything about bed bugs	92%	90-93	92%	91-94	91%	88-93
Very/somewhat concerned about bed bugs getting into their home.	51%	48-54	51%	48-54	52%	48-56

Health Effects of Bed Bugs (Table 2)

The majority, about 80%, thought that bed bugs had an effect on human health. When asked to identify the health effects of bed bugs the most common responses were bites or skin problems and the spread of disease. This indicates that there continues to be a misperception about the ability of bed bugs to transmit disease. There was a significant increase, from 17% pre-campaign to 29% post-campaign, in the percent of residents who identified mental health issues as a health effect of bed bugs.

Table 2 - Health Effects of bed bugs, Adults 18+, Durham Region

Indicators	Pre-campaign 2011		During campaign 2012		Post-campaign 2013	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Health Effects of Bed Bugs						
Think that bed bugs have an effect on human health	82%	79-84	83%	80-85	83%	80-86
Bites or skin problems	36%	33-39	39%	36-42	33%	29-37
Spread disease	26%	23-29	28%	25-31	28%	24-32
Mental Health Issues	17%	15-19	16%	13-18	29%	25-33
Allergic Reactions	8%	7-10	7%	6-9	5%*	4-8

* Interpret with caution, high variability, Coefficient of Variation from 16.6% to 33.3%.

Access to information about Bed Bugs (Table 3)

Between 15% and 17% of residents had looked for information on bed bugs in the past year with the internet being the most common source of information. Only 7% to 10% had heard about the bedbugsinfo.ca website and 3% had visited the site, with no significant increase over time.

Table 3 - Access to information, Adults 18+, Durham Region

Indicators	Pre-campaign 2011		During campaign 2012		Post-campaign 2013	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
Bed Bug Information and Resources+						
Looked for information about bed bugs in the past 12 months	17%	13-20	17%	15-20	15%	12-18
Looked online/internet	14%	11-17	14%	12-16	13%	10-16
Seen or heard about the website bedbugsinfo.ca	8%	6-11	10%	8-12	7%	5-10
Visited the website bedbugsinfo.ca	Not Releasable	Not Releasable	3%*	2-4	3%*	2-5

* Interpret with caution, high variability, Coefficient of Variation from 16.6% to 33.3%.

+ Number of respondents for data collected during pre-campaign from May-Aug 2011 was 603.

Prevention of Bed Bugs in the Home (Table 4)

The most common way that residents said they would prevent bed bugs from getting into their home was to keep it clean and tidy, including cleaning bedding, and checking and cleaning their luggage and belongings after trips. Other methods mentioned less frequently were not bringing used items such as mattresses, beds and furniture into the house, being careful when staying in hotels and motels and checking and cleaning second hand clothing.

Table 4 - Prevention of bed bugs in the home, Adults 18+, Durham Region

Indicators	Pre-campaign 2011		During campaign 2012		Post-campaign 2013	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
How would you stop bed bugs from entering home?						
Clean-up/wash/tidy bedding	29%	27-32	25%	22-27	25%	21-29
Check and clean luggage and belongings after trips	16%	14-19	18%	16-20	11%	9-15
Don't bring in used mattresses, beds, furniture	8%	7-10	6%	4-7	6%	4-8
Vacuum mattress, carpet, furniture	6%	4-7	5%	4-7	4%*	2-6
Avoid or use care when in hotels or motels	5%	4-7	5%	4-7	4%*	3-7
Check and wash second hand clothing	3%	2-4	5%	4-6	4%*	3-6

* Interpret with caution, high variability, Coefficient of Variation from 16.6% to 33.3%.

Identification of Bed Bugs in the Home (Table 5)

When asked how they would check for bed bugs in their home, the most common methods reported were checking mattresses, bedding and beds, looking for signs of bug bites, and looking in cracks and crevices.

Table 5 - Identification of bed bugs in the home, Adults 18+, Durham Region

Indicators	Pre-campaign 2011		During campaign 2012		Post-campaign 2013	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
How to check for bed bugs in your home?						
Check mattresses, bedding, box springs, bed frames	49%	46-52	48%	45-51	50%	45-54
Look for bites on skin or blood on sheets	29%	26-31	29%	26-32	27%	23-31
Search cracks/crevices around bed/ furniture/ baseboards	18%	16-20	15%	13-17	14%	12-18
Use a flashlight	2%*	2-3	3%*	2-4	4%*	2-6

* Interpret with caution, high variability, Coefficient of Variation from 16.6% to 33.3%.

Removal of Bed Bugs in the Home (Table 6)

To get rid of bed bugs in their home, the actions reported most often were using a pest control company, cleaning and tidying, getting rid of mattresses, carpets etc. and using a chemical treatment.

Table 6 - Removal of bed bugs from the home, Adults 18+, Durham Region

Indicators	Pre-campaign 2011		During campaign 2012		Post-campaign 2013	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
How would you get rid of bed bugs in your home?						
Hire a pest control company or exterminator	41%	38-44	38%	35-41	39%	35-43
Clean up, wash, tidy, clean bedding	22%	19-24	21%	18-23	24%	20-25
Get rid of mattress, carpet, furniture etc.	16%	14-18	16%	14-19	12%	9-15
Use bug or insect spray or other chemical treatment	14%	12-16	13%	11-15	11%	8-14
Vacuum mattress, carpet, furniture	7%	6-9	7%	5-9	6%*	4-8

* Interpret with caution, high variability, Coefficient of Variation from 16.6% to 33.3%.

Discussion

The Rapid Risk Factor Surveillance System included questions about prevalence and public awareness of bed bugs, health effects, and the most effective methods to prevent, identify, and get rid of bed bugs in the home. The most common methods reported by Durham Region residents were consistent with the information provided during the public education campaign launched in Durham Region in February 2012, however, comparing pre- and post-campaign, there was no significant change in awareness among Durham Region residents. Contributing factors may be that there was considerable media coverage during the fall of 2010 and the Ontario government launched their promotion campaign and website in January 2011. These events, along with the many internet resources available, may have increased public awareness prior to the Durham Region campaign, diminishing the impact.

Health Department Initiatives

- Public displays of the bed bug banner bug and pamphlets to municipalities and libraries to increase public knowledge about bed bug prevention and control
- Presentations, displays, pamphlets and promotional material provided to community stakeholders
- Distribution of bed bug DVDs, scroll pens, and magnifying ruler, bookmark and card



Figure 1 - Bed bug poster released by the Durham Region Health Department.

Data Notes

The Rapid Risk Factor Surveillance System (RRFSS) is a random-digit-dialed telephone survey of adults aged 18 years and older, conducted by the Institute for Social Research at York University, on behalf of the Durham Region Health Department. Since 2001, a sample of at least 100 Durham Region residents has been surveyed on a monthly basis regarding health risk behaviours such as smoking, alcohol use, immunization, etc. For further information see www.rfss.ca and durham.ca (public health/health statistics). The information is essential to the DRHD for planning and evaluating programs and services, as well as for monitoring emerging health issues.

95% Confidence Interval (CI) refers to the variability around the estimate. Percentages are expressed in the form of the point estimate and the 95% CI around the estimate. The true or actual percentage falls within the range of values 95 out of 100 times. A wide confidence interval reflects a large amount of variability or imprecision. Usually, the larger the sample size the narrower the confidence intervals. In bar charts, the 95% confidence interval is represented by an error bar at the top of each bar.

Coefficient of Variation (CV) refers to the precision of the estimate. When a CV is between 16.6% and 33.3%, the estimate should be interpreted with caution because of high variability. An estimate with a CV over 33.3% is not releasable.

Significant Difference refers to a difference between two estimated percentages that is not likely due to chance. If the 95% Confidence intervals of two estimates do not overlap there is considered to be a significant difference between the estimates.

Household Weights are applied when calculating the estimates to compensate for the unequal probability of respondent selection based on the number of adults in the household.

References

1. Ministry of Health and Long Term Care (MOHLTC), *Bed Bugs Support Fund 2011-2012: Summary Report*. June 2014. Copies available from: MOHLTC INFOline: 1-866-532-3161.