

*Earlier this year, the National Pest Management Association (NPMA) and the University of Kentucky surveyed U.S. and international pest management companies about the state of the bed bug resurgence. The findings presented here suggest a growing global pandemic that necessitates urgent action by stakeholders.*

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## **BUGS WITHOUT BORDERS – EXECUTIVE SUMMARY**

### **Defining the Global Bed Bug Resurgence**

*By Michael F. Potter, Bob Rosenberg and Missy Henriksen*

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Bed bugs are a hot topic these days throughout the news media and the industry alike. While most industry observers agree that infestations are increasing, the magnitude of the problem and its international implications lack definition. With its enormous customer base, the global pest management community is uniquely equipped to provide such insights. In a sobering report from almost 1,000 companies, this study shows that bed bugs are escalating worldwide, and that society is ill-prepared to deal with the consequences.

**SURVEY PARAMETERS.** Two online surveys were developed: the first consisting of 43 questions aimed at pest control companies in the United States; the second containing 34 questions for companies operating internationally. Both questionnaires covered topics ranging from frequency of bed bug infestation, to management methods, to business practices. Questions were formatted either as open-ended or closed-ended (fixed) responses. The survey was conducted from January to April, 2010. Letters requesting participation were emailed to approximately 6,000 U.S. and 900 international pest management companies, resulting in 521 and 429 completed surveys, respectively (950 total responses).

Respondents from 43 countries represented firms ranging in size from fewer than 10 to thousands of employees. After the U.S. which had 521 respondents, the greatest number of completed surveys came from Latin America (208 respondents), Europe (113) and Canada (64), followed by Asia (26) and Africa/Middle East (10). Additional regions included Australia (4) and various smaller markets with fewer responses. Respondents from all regions of the world characterized their principal service sector as “urban,” followed usually by “suburban,” then “rural.” Among U.S. firms, the average ratio of work performed was 60% “residential” and 40% “commercial;” elsewhere in the world, however, commercial work exceeded residential.

**QUANTIFYING THE RESURGENCE.** The first series of questions examined the extent to which bed bugs are increasing throughout the world. An overwhelming 95% of U.S. respondents indicated their company or organization encountered a bed bug infestation in the past year, with similarly high frequencies reported for Canada (98%), Europe (92%) and Africa/Middle East (90%). The majority of respondents also encountered bed bugs during the past year in Mexico/Central America (80%), Asia (73%), and South America (59%). A higher percentage of respondents across regions reported encountering bed bugs at least once in the past year vs. “over five years ago” or “over 10 years ago” When asked if the incidence of bed bugs in their country/region was

increasing, decreasing or staying about the same, a higher percentage of respondents from Latin America (including Mexico/ Central America and South America) felt infestation levels were staying “about the same,” relative to those dealing with bed bugs elsewhere in the world.

Many respondents had opinions as to why bed bugs are increasing — most often mentioned were increased travel, more immigration, changing pest control products and methods, and resistance to available insecticides. Another factor noted by many respondents throughout the world was a lack of societal awareness and precautions (e.g. inspecting one’s bed or shunning discarded furniture). As expected, many respondents also blamed the global resurgence of bed bugs on the loss of once-available more effective insecticides.

**Other factors mentioned as contributing to the resurgence included:**

- Overcrowding of cities, leading to poor hygiene and sanitation
- Unregulated sale, donation, importation and smuggling of second-hand clothing and mattresses
- More clutter and belongings in which the bugs can hide; conducive building and decorating practices, and transience and turnover of occupants
- Denial/lack of incident reporting by tenants, workers, landlords, hotel or business management, universities, etc.
- Economic expansion in developing countries, enabling more people (living with bed bugs) to travel
- Soldiers returning home from conflicts in Africa, Iraq and Afghanistan
- Global health officials focusing their efforts on disease vectors rather than bed bugs
- Changes in indoor treatment for disease-carrying mosquitoes, including reliance on pyrethroids and short-lived ULV applications that are less effective against bed bugs
- A worldwide decline in preventive inspections/treatments of hotels, apartments, etc. for pests including bed bugs
- Changing lifestyles, resulting in greater reliance on communal laundries rather than washing items at home
- A global increase in secondary hosts, including rodents, poultry, dogs and cats.

Whatever the reason(s), the statistics clearly show that bed bugs are increasing throughout most of the world, which comes as no surprise to professionals in the pest management industry. In a previous survey of U.S. pest control firms (Potter 2008a), 6% of respondents said their companies performed more than 100 services for bed bugs during the previous year. In the more recent survey, conducted two years later, 20% of U.S. respondents reported their company doing more than 100 bed bug jobs last year and 7% reported doing *more than 500*. Other areas of the world where many respondents reported doing hundreds of bed bug jobs last year included Africa/Middle East (60% of respondents), Canada (37%), Asia (20%), and Europe (13%).

**SHOWING UP EVERYWHERE.** Bed bugs are appearing almost everywhere, from homes to hospitals to high-end clothing stores. In the U.S., the greatest percentage of respondents said they've encountered infestations in apartments and condominiums (mentioned by 89%), single family homes (by 88%), and hotels/motels (67%). Several also said they found bed bugs in college dormitories (mentioned by 35%), homeless shelters (31%), nursing homes (24%), office buildings (17%), hospitals (12%), and primary/secondary schools (10%). When U.S. firms were surveyed a few years ago, half as many respondents found them in hospitals and schools, and less than 1% mentioned finding them in office buildings.

Other 'atypical' places where U.S. respondents reported finding bed bugs included public transportation (by 9%), laundries (5%) and movie theaters (4%) — as well as in churches, day cares, libraries, summer camps, hostels, furniture and retail stores, restaurants, locker rooms, dressing rooms, prisons, fire and police stations, moving vans, ambulances, funeral homes, and doctor's offices.

The resurgence of bed bugs in such varied places should not be too surprising. In the 1930s and '40s, infestations were common in hospitals. Entire sections of seating were infested in movie houses. Bed bugs also were common years ago on trains, buses and taxicabs. In Sweden in the 1930s, almost half of all moving vans inspected had bed bugs, and a subsequent survey in Iceland showed that bed bugs were often found inside televisions and radios being serviced by appliance repair shops (Potter 2008b). The remarkable ability of this pest to "hitchhike" from one place to another means they can materialize almost anywhere...from a restaurant booth to a blood pressure cuff.

When asked if they felt there was a correlation in their country between bed bugs and poverty, respondents to our survey were split, with differing opinions by region. In the United States, for example, 55% of respondents said that "problems tend to be worse among the poor" while 45% said "all citizens are equally affected." A wider discrepancy occurred amongst respondents from Europe, with 77% insisting that bed bugs affected all citizens equally regardless of socio-economic standing. Nowadays, even five star hotels and high-end clothing stores are susceptible to infestation, but historically the poor have suffered the most from bed bugs. This pattern, unfortunately, shows signs of repeating with the resurgence of the pest. Individuals from lower socio-economic groups often cannot afford to hire a professional to handle an infestation, nor are they as willing to discard infected items.

**PUBLIC ATTITUDES.** When U.S. firms were asked to describe the feelings of clients who have had bed bugs, 99% of respondents felt their customers were "upset and concerned," with 77% saying such customers were "very upset and concerned." Similar distress over bed bugs was echoed around in the world.

The emotional strain of living with bed bugs should not be taken lightly, especially by those who have not experienced infestation personally. Some suggest that being bitten by bed bugs is no worse than being bitten by ticks or mosquitoes. This rationale overlooks the fact that in the developed world, ticks and mosquitoes bite and breed mostly outdoors.

Bed bugs, however, dwell in one of the most intimate spaces of the home environment; the bed. Dismissing the gravity of bed bug resurgence on the basis that these pests are unproven disease vectors ignores the pain, suffering and emotional toll inflicted on their victims.

Bed bugs are so reviled that people seem willing to do anything necessary to eradicate the pests. More than half (51%) of U.S. respondents estimated that 50% or more of their customers tried to treat their problem themselves before calling a professional. Pest control firms reported seeing many ineffective and potentially dangerous measures used by do-it-yourselfers, including ammonia, bleach, fire, smoke, kerosene, wasp spray, and bug bombs, as well as concentrated pesticides bought on the internet. As bed bug victims become more desperate, serious injury may result from such applications, especially among those who choose not to hire a professional. These types of behaviors suggest an increasing need for public education on the subject.

**CONTROLLING INFESTATIONS.** The majority of respondents from the U.S., Canada, Europe, Africa and Australia felt that bed bugs are difficult to control — more so than cockroaches, ants and termites. In the U.S., 76% found bed bugs more difficult to control than ants (considered “most difficult” by 13% of respondents), cockroaches (by 9%), and termites (by only 2%).

**DOES THE SEASON MATTER?** Respondents were also split when asked if they received more bed bug calls at certain times of the year. Outside the U.S., 55% saw no seasonal pattern to their bed bug calls while 45% said that they did; among those who did, three fourths (75%) said their company received more calls about bed bugs during the summer. In the U.S., 72% of respondents felt there was no busier time of the year for bed bugs; of those who felt there was a seasonal pattern, however, summer was again mentioned as the busiest season (48%). Several respondents also mentioned they received more bed bug calls after holidays, vacations, and completion of the school year when children return home.

**CLOSING THOUGHTS.** As the most detailed portrait of bed bug resurgence to date, this study confirms that infestations are increasing worldwide, although in some areas (e.g., Latin America), the upsurge is less evident. Many factors are fueling the growing global pandemic of bed bugs—but it remains a mystery why we’re seeing such an abrupt increase after years of scarce encounters.

Infestations are showing up in all the same places they did years ago — from poor house to penthouse, schools to surgical suites, cubicles to clothing stores. Perhaps most unsettling about 21<sup>st</sup> century bed bugs from a societal standpoint is that we are in uncharted waters. There will be new challenges this time around including unprecedented movement of people from across town and around the globe; more clutter and belongings in which bugs can hide; less potent insecticides for both householder and professional use; and a mindset today that when someone is harmed they should sue.

Bed bugs are increasing across the globe and without bias for highly developed or currently developing nations. The crux of bed bug management, however, remains hard work, public education, and constant vigilance to prevent or detect infestations in the early stages.

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## **References**

Potter, M.F. 2008a. "The business of bed bugs," *Pest Management Professional*. 76(1): 24-40.

Potter, M.F. 2008b. "The history of bed bug management: lessons from the past," *Pest Control Technology*. 36(8)