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Purple Paper

Bed Bugs: A Public Health Problem?

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Introduction

The thought of being fed on in the night by tiny, blood-sucking creatures is enough to make anyone cringe. Bed bugs (*Cimex lectularius*) are making an international comeback—to the point where a global “bed bug pandemic” is predicted (1). The increase in international travel, modern heating and air conditioning systems that provide more stable environments for the bugs to flourish, the banning of chemicals such as DDT, and greater resistance to chemicals being used have meant that reports of bed bug infestations have been on the increase. The City of Toronto, for instance, received more than 1,300 bed bug complaints in the first nine months of 2010, compared with only 187 in 2005 (2).

In a recent announcement detailing the Manitoba government’s plan for responding to the bed bug problem, Healthy Living Minister Jim Rondeau made the point that bed bugs are “not exclusive to one area or group of people” (3). The Minister’s comment addresses one of the prevailing misconceptions regarding bed bugs: that the lack of cleanliness and personal hygiene is the cause of infestations. This misconception has led to social stigma of those unfortunate enough to experience

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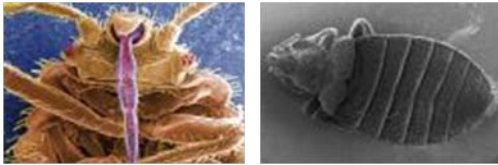
Key Points

- Bed bugs are making an international comeback—to the point where a global “bed bug pandemic” is predicted.
- From a social determinants of health perspective, with its focus on living condition standards, bed bugs constitute a threat to public health.
- While anyone can be at risk of experiencing a bed bug infestation, the social impacts of bed bugs can be especially devastating for people on low incomes. Reliance on second-hand furniture and clothing, lack of access to affordable, quality housing, and lack of control over the maintenance of rental units make low-income residents especially vulnerable to infestations. Once infested, the costs associated with treatment and management can be overwhelming for those with limited financial resources. When the social stigma that bed bug sufferers encounter is added into the mix, the result is stress, anxiety, sleeplessness, and social isolation—all of which compromise people’s health and well being.
- Almost all of the inner-city residents interviewed reported suffering from increased stress and sleep deprivation as a result of bed bugs. There is much well-supported research that documents the significant impacts of both stress and lack of sleep on people’s ability to undertake everyday activities, which can create further stress and health-related outcomes
- The SDH approach offers a holistic way of dealing with the problem of bed bugs. It acknowledges the negative health outcomes that can result from the experience of dealing with an infestation and directs our attention to the social determinants that need to be addressed in developing effective policies and practices for responding to the bed bug epidemic—and providing relief and resources to those most vulnerable.

bed bugs. Bed bugs, however, do not discriminate. They are attracted to a human host by a combination of body temperature and carbon dioxide, meaning that *anyone* can be at risk of a bed bug infestation. Minister Rondeau also suggested that “bed bugs are no different from the common

cold” (3), further reinforcing the normality of the experience.

Talk of a bed bug pandemic and comparisons to the common cold raise the issue of whether bed bugs constitute a public health problem. From a traditional approach to health, with its focus on biomedical and behavioural risk factors, bed bugs do not pose a health problem. Indeed, unlike other insects (such as mosquitoes), bed bugs have not yet been proven to transmit disease.^b As such, they are more likely to be classified as a ‘nuisance’ or a ‘pest.’



Adopting a social determinants of health (SDH) approach (5, 6, 7), however, leads to a different conclusion: bed bugs *do* constitute a public health problem. The SDH approach focuses on “the social and economic factors that shape the health and incidence of illness among individuals and groups of individuals” (8). While anyone can be at risk of experiencing a bed bug infestation, the social impacts of bed bugs can be especially devastating for people on low incomes. Reliance on second-hand furniture and clothing, lack of access to affordable, quality housing, and lack of control over the maintenance of rental units make low-income residents especially vulnerable to infestations. Once infested, the costs associated with treatment and management can be overwhelming for those with limited financial resources. When the prevailing social stigma that bed bug sufferers encounter is added into the mix, the result is stress, anxiety, sleeplessness, and social isolation—all of which compromise people’s health and well being.

To elaborate on this view that bed bugs constitute a public health problem, we draw upon interviews conducted in the winter of 2009 with 16 inner-city residents in Winnipeg, Manitoba. By learning from these residents we can better appreciate the

^b While bed bugs have been found to carry disease organisms such as antibiotic-resistant bacteria (4), whether they transmit associated diseases to humans has not been proven.

devastating impact that dealing with a bed bug infestation has had on their daily lives, their social relationships, their identity—and their physical and mental health.

The Social Determinants of Health (SDH) Approach

Social determinants of health are about the quantity and quality of a variety of resources that a society makes available to its members. SDH researchers have focused attention on the ways in which social determinants such as income, access to education, employment security, working conditions, early childhood development, food security, housing, and the experience of social exclusion produce health inequalities in a population (8, 9). In short, these researchers maintain that it is the standards of our living conditions—as opposed to simply unhealthy lifestyle choices or individual risk factors—that primarily determine the health of individuals, communities, and societies.

While higher levels of social inequality will produce poorer health outcomes for everyone in a society, those who are economically marginalized will be most at risk (6, 10). Access to affordable housing, for instance, is a risk condition that impacts on people’s ability to lead a healthy life. As Bryant (11) explains, “housing costs are critical because they are one of the largest monthly expenditures most people face. When housing costs eat up the majority of a person’s income, it affects other aspects of their lives.” As well, access to quality housing not only provides a basis for self-identity and self-expression (8), it also means that people can avoid exposure to unhealthy environmental factors such as mould, dampness, pest infestations, overcrowding, and neighbourhood crime and violence (12, 13).

Social exclusion is also an important determinant of health. As Galabuzi (9) notes, “social exclusion is used to broadly describe the structures and the dynamic processes of inequality among groups in society ... Groups in society experiencing some form of social exclusion tend to have poorer health status and sustain higher health risks.” Poverty is both a product and a cause of social exclusion. In Winnipeg, poverty is concentrated in the inner city, where the poverty rate in 2006 was 39.6% compared with 20.2% for the city as a whole (14).

SDH researchers have elaborated on the negative health outcomes that are produced by social exclusion and impoverished conditions. As Raphael (8) reports, “accumulating evidence shows that individuals who experience constantly difficult or stressful living circumstances come to have maladaptive responses to stress, a weakened immunity to infections and disease, and a greater likelihood of metabolic disorders.” Brunner and Marmot (15) argue that social inequalities create psychological consequences that can seriously damage health in the long term. “Chronic anxiety, insecurity, low self-esteem, social isolation, and lack of control over home and work weaken mental and physical health. The human body has evolved to react to emergencies. This reaction triggers a whole range of stress hormones that affect the cardiovascular and immune systems” (16). If this biological stress-reaction system is triggered too often and for too long, as it often is for people living in poverty, it can produce considerable health damage.

While SDH research has drawn attention to a host of factors that affect people’s quality of life and thereby compromise their health, little attention has been devoted to the social impacts of a bed bug infestation on people’s health and well being.

Bringing Bed Bugs into the Picture

Much like other health-related factors singled out in the SDH literature, the social impacts of a bed bug infestation can differ depending upon people’s social and economic circumstances. While anyone can encounter bed bugs in their travels, in a variety of public spaces, and in their homes, the impact of bed bugs does not affect all people equally.

The condition of living accommodations is one factor that puts some people at greater risk of an infestation. In Winnipeg’s inner-city communities, much of the housing stock is in need of repair (17). Cracks in walls, loose floorboards, and other flaws in older infrastructure provide harbourage for the bugs to flourish. Those who rent their accommodation—as is the case for 61% of inner-city residents (14)—are therefore reliant on landlords to ensure that buildings are properly maintained.

Bed bugs are extremely difficult to exterminate as they “shelter in a variety of dark locations, mostly close to where people sleep. These include under

mattresses, floorboards, paintings, and carpets, behind skirting, in various cracks and crevices of walls, within bed frames and other furniture, and behind loose wallpaper” (18). As such, the treatment required when bed bugs are detected in a dwelling is a laborious—and stress-producing—process. During the treatment process, all furniture and belongings where the bugs can hide must be inspected for signs of an infestation, and then either steam-cleaned or wrapped in plastic and then discarded. All bedding, clothing, and any other washable fabrics must be transported in plastic bags and then placed in a dryer for at least twenty minutes on high temperature. All areas of the dwelling must be vacuumed thoroughly, and the vacuum bag double wrapped and discarded after use. The economic costs that stem from infestations include cleaning supplies, replaced items, mattress covers and other bed bug prevention supplies, and staying at alternate locations while extermination is underway (19, 20). While these costs can be a financial burden for most people, they can be overwhelming for individuals and families on a restricted budget. As well, the social stigma associated with having bed bugs can cause “intense feelings of shame (often leading victims to isolate themselves from others), anxiety, stress, and insomnia” (21).



Learning from Inner-City Residents

For the inner-city residents we interviewed, bed bugs were one more trouble that they had to deal with while already facing difficult life situations. In combination, experiences of poverty and social exclusion—including inadequate housing and limited financial resources—and the social stigma attached to bed bug sufferers set the stage for increased stress, anxiety, and sleeplessness for those dealing with an infestation. The net effect of a bed bug infestation was to compromise people’s (already precarious) physical and mental health.

George's story was typical of the residents we interviewed.^c Married with two teenaged children, George is a tradesperson by profession, but had been unable to work for the previous year as he had been the victim of a serious assault. One of his legs was badly burned, and he required several skin grafts to repair the injury. A few months after the assault George and his family moved into a rental accommodation.

The place was really gross and disgusting. Like, if you would have seen it you would have told the guy basically to 'take it and stick it where the sun don't shine' and walked away. But we had no choice, basically. That was because of my burn and everything.

George was also unaware that the house was infested with bed bugs—until he woke up one night covered in them. George contacted the rental agency three times, and found them to be “completely frustrating”:

Each time he sloughed us off. 'Well, we'll do it next week' or 'We'll do it next month.' And when I couldn't deal with it anymore—I couldn't sleep, I was basically sleeping on just a white sheet in the middle of the floor just so I can see if there's any bugs climbing on me or coming near me—when I got to that point that's when I contacted Landlords and Tenants and told them the situation.

It took three written notices before the landlord finally fumigated the house. The chemicals made George's family ill:

We weren't allowed in the house for three days. And upon entering the house we got sick from the fumes. Like, there was nausea, vomiting.

The family also lost all of their furniture:

If it had upholstery it was thrown out. Anything that they could hide in or lay their eggs in we had to get rid of.

George estimated that the infestation cost him \$5,000—a steep figure for someone who is not able to work.

The impact on the family was severe in other ways. Sleeplessness was a problem:

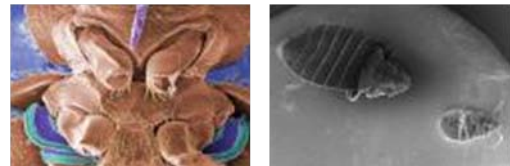
^c Pseudonyms have been used to respect the confidentiality of the participants.

All of us, we couldn't sleep. We were lucky to get two hours of sleep a night, just worrying about getting sick or being bitten constantly.

George also encountered difficulties because of his injuries from the assault:

Because of the operations and everything I was going through, most of my leg was still all unhealed. The skin grafts would still be constantly bleeding. And a couple of times I looked when I changed my dressings. I'd find them in my dressings. Like, I actually found bed bugs inside the dressing! And I'm like, 'Eeuw. They're going straight after the blood that was dripping out of my leg!'

Being at risk of a nervous breakdown, George's doctor prescribed a sedative so that he could sleep at night. His wife was also prescribed a muscle relaxant so that she could sleep.



Because of the social stigma attached to people who encounter a bed bug infestation, relations with friends and family often suffer. George said that the experience affected his friendships to the point where he even got into a physical altercation with one friend over the bed bugs. George's teenaged children were also being singled out at school, as the other kids “were calling them down [and] belittling them.”

For George the bed bug infestation was the last straw:

I was basically ready to give up. I was going to honestly even commit myself. Like, I was at the end of the rope.

While George was intent on getting back to work, he estimated that the experience with the bed bug infestation set back his healing process by at least six months. He summed up the experience:

This has been one heck of a learning experience, how to deal with this. And even though you get help through Landlord and Tenants or the Health Board, it's still just affected, you know, you're being eaten alive by

these bugs and your family is being destroyed. Your kids can't sleep. Your wife can't sleep. You have to get rid of all your furniture and start everything over again. And you get hard times from your landlord. It's just so stressing. I think I've grown at least a hundred white hairs this year alone.

The personal toll that comes along with an infestation was evident in the other interviews we conducted with inner-city residents. Residents spoke about the impact of losing all of their belongings:

It's just like a house fire, you know, where you have to start all over.

I had to throw everything out. And it was, like, really hard—and really stressful.

Residents also spoke about the social stigma that accompanies an infestation. There is a definite silencing around the issue of bed bugs. People are afraid to admit they have bed bugs:

I think if a person is to talk to somebody else they'd say, 'Oh, don't let that guy in the house. He's got bed bugs. Don't let him in.' That's why I don't think people are talking. That's what I fear.

I hate being marked, like, blacklisted. Like, people think we're going to infect you or something.

This stigma results in increased social isolation, and hinders the ability to deal with the problem:

I don't want people to come to my house, because I'm scared to get them.

I didn't realize how much it has an impact on you. It isolates you. It damages relationships.

The experience of a bed bug infestation also has an impact on people's sense of self. Several residents talked about how "dirty" they felt in having to deal with bed bugs. Reflecting an awareness of the negative stereotype associated with those who are unfortunate enough to encounter bed bugs in their homes, the statement "I'm a clean person" was heard many times throughout the interviews. Residents also commented:

I felt degraded. I felt sick. I felt just, like, burn everything. Just burn it and get rid of it.

People ask me, 'Do you got AIDS or something? Do you got bugs? You got bites and you got marks all over you.' Think about that. All the stigma that comes with that. I'll tell you the truth. It really bothers me.

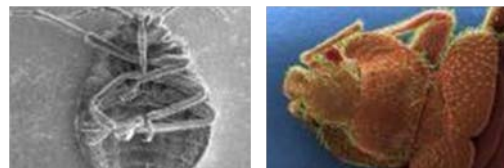
Residents also spoke about the health problems that come with the lack of sleep and the stress associated with an infestation, and with bites that become infected:

I couldn't sleep, eat, or nothing. ... And I lost weight. My girlfriend is really worried about my weight now.

I developed an infection. I had to get antibiotics. They were all over me and they were just, like, really infected. Now I've got scars all over.

Bed Bugs are a Public Health Problem

Almost all of the inner-city residents reported suffering from increased stress as well as an alarming amount of sleep deprivation as a result of bed bugs. There is much well-supported research that documents the significant impacts of both stress and lack of sleep on people's ability to undertake everyday activities such as work, school, and raising families, which can create further stress and health-related outcomes. These two factors are also interrelated: stress can have a significant impact on sleep duration and sleep duration can have a significant impact on stress.



Sleep deprivation has been linked to a host of health issues, including heart and circulatory conditions, hypertension, weight gain, diabetes, psychological problems, and a weakened immune system (22, 23). Strine and Chapman (24) found that their results "corroborate previous research indicating that insufficient sleep is a major public health problem." Therefore, if sleep deprivation is considered a major public health problem, and bed bugs drastically affect the amount of sleep people receive, then experiencing a bed bug infestation should be considered a major public health problem as well.

Stress has many of the same implications for health as sleep deprivation, especially in influencing heart and circulatory problems. As SDH researchers have emphasized, people who are economically marginalized already suffer from higher levels of chronic stress, which impacts their health (15, 25, 26). Adding the experience of bed bugs into the mix makes life tougher for people who already have it tough as it is.

Using the SDH approach to frame the problem of bed bugs as a threat to public health—as opposed to simply a ‘nuisance’ or ‘pest’—offers a holistic way of dealing with this issue. Not only are the negative health outcomes that can result from the experience of dealing with an infestation acknowledged, our attention is directed to the social determinants that need to be addressed in developing effective policies and practices for responding to the bed bug epidemic and providing relief and resources to those who are most vulnerable.

References

- [1] Lederman, M., & Morrow, A. (2010). Bedbug 'Pandemic' Predicted. *The Globe and Mail*, July 30, A3.
- [2] Allen, K. "At the Bedbug Summit." *Toronto Star*, September 30, GT4.
- [3] Borkowsky, K. (2011). Little Biters 'No Different' from Cold. *Winnipeg Free Press*, March 11, A1.
- [4] Stobbe, M. (2011). Bedbugs Carrying 'Superbugs' Found on Canadian Hospital Patients. healthzone.ca. Retrieved May 11, 2011 at: <http://www.healthzone.ca/health/newsfeatures/article/989496--bedbugs-carrying-superbugs-found-on-canadian-hospital-patients?bn=1>
- [5] Marmot, M., & Wilkinson, R. G. (Eds.). (2006). *Social Determinants of Health* (2 ed.). New York: Oxford University Press.
- [6] Raphael, D. (2001). From Increasing Poverty to Societal Disintegration: How Economic Inequality Affects the Health of Individuals and Communities. In P. Armstrong, H. Armstrong & D. Coburn (Eds.), *Unhealthy Times: Political Economy Perspectives on Health and Health Care in Canada*. Toronto: Oxford University Press.
- [7] Raphael, D. (Ed.). (2009). *Social Determinants of Health: Canadian Perspectives*. Toronto: Canadian Scholars' Press Inc.
- [8] Raphael, D. (2010). *About Canada: Health and Illness*. Halifax and Winnipeg: Fernwood Publishing.
- [9] Galabuzi, G. E. (2009). Social Exclusion. In D. Raphael (Ed.), *Social Determinants of Health: Canadian Perspectives* (2 ed.). Toronto: Canadian Scholars' Press.
- [10] Marmot, M. (2006). Introduction. In M. Marmot & R. G. Wilkinson (Eds.), *Social Determinants of Health* (2 ed.). New York: Oxford University Press.
- [11] Bryant, T. (2003). The Current State of Housing in Canada as a Social Determinant of Health. *Policy Options*, 52-56.
- [12] Dunn, J. R. (2000). Housing and Health Inequalities: Review and Prospects for Research. *Housing Studies*, 15 (3): 341-366.
- [13] Shaw, M. (2004). Housing and Public Health. *Annual Review of Public Health*, 25, 397-418.
- [14] MacKinnon, S. (2009). Tracking Poverty in Winnipeg's Inner City: 1996–2006. *State of the Inner City Report 2009*. Winnipeg: Canadian Centre for Policy Alternatives–Manitoba (CCPA–MB).
- [15] Brunner, E., & Marmot, M. (2006). Social Organization, Stress, and Health. In M. Marmot & R. G. Wilkinson (Eds.), *Social Determinants of Health*. New York: Oxford University Press.
- [16] Bryant, T. (2009). Housing and Health: More than Bricks and Mortar. In D. Raphael (Ed.), *Social Determinants of Health: Canadian Perspectives* (2 ed.). Toronto: Canadian Scholars' Press.
- [17] Skelton, I., Selig, C., & Deane, L. (2007). CED and Social Housing Initiatives in Inner-City Winnipeg. In J. Loxley, J. Silver & K. Sexsmith (Eds.), *Doing Community Economic Development*. Halifax and Winnipeg: Fernwood Publishing.
- [18] Doggett, S. L., Geary, M. J., & Russell, R. C. (2004). The Resurgence of Bed Bugs in Australia: With Notes on Their Ecology and Control. *Environmental Health*, 4 (2): 30-38.
- [19] Bonnefoy, X., Kampen, H., & Sweeney, K. (2008). *Public Health Significance of Urban Pests*. Copenhagen: The Regional Office for Europe of the World Health Organization.
- [20] Woodgreen. (2008). *The Bed Bug Resource Manual: A Guide to Preventing, Treating and Coping with Bed Bugs*. Toronto: The Community Bed Bug Committee and Woodgreen Community Services. Retrieved May 6, 2011 from <http://www.woodgreen.org/LinkClick.aspx?fileticket=x983T664n8A%3d&tabid=11>

- [21] Brody, J. (2008). The Scandalous Truth about Bed Bugs. *Fast Facts*. Winnipeg: Canadian Centre for Policy Alternatives—Manitoba (CCPA—MB).
- [22] Gottlieb, D. J., Redline, S., Nieto, F. J., Baldwin, C. M., Newman, A. B., Helaine E. Resnick, et al. (2006). Association of Usual Sleep Duration with Hypertension: The Sleep Heart Health Study. *Sleep* 29 (8): 1009-1014.
- [23] Zee, P. C., & Turek, F. W. (2006). Sleep and Health: Everywhere and in Both Directions. *Archives of Internal Medicine*, 166: 1686-1688.
- [24] Strine, T. W., & Chapman, D. P. (2005). Associations of Frequent Sleep Insufficiency with Health-Related Quality of Life and Health Behaviors. *Sleep Medicine*, 6: 23–27.
- [25] Kelly, S., Hertzman, C., & Daniels, M. (1997). Searching for the Biological Pathways between Stress and Health. *Annual Review of Public Health*, 18: 437-462.
- [26] Siegrist, J., & Marmot, M. (2004). Health Inequalities and the Psychosocial Environment—Two Scientific Challenges. *Social Science & Medicine*, 58: 1463–1473.