

THE SOCIAL IMPACT OF BED BUGS ON COMMUNITIES

An ESG Framework for Prevention, Early Detection and Community Resilience

Prepared by the Free From Bedbugs Programme

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 DETECTION KITS. |  TREATMENT KITS. |  PEACE OF MIND.

Table of contents

1. Executive summary
2. Key findings
3. Evidence base and method
4. The social impact of bed bugs
5. The prevention gap
6. Bed bugs as a poverty multiplier
7. The Free From Bedbugs model
8. Economic and SROI framework
9. ESG outcomes framework
10. Deployment scenarios
11. Recommendations
12. Research integrity statement
13. Appendices and references

Executive summary

Bed bugs are often described as a pest-management problem. This framing is incomplete. Infestations can disrupt sleep, contribute to anxiety, generate household costs, increase stigma, place pressure on housing providers and hospitality operators, and create avoidable environmental impacts through repeated intervention and discarded furnishings.

The strongest published evidence concerns resurgence, insecticide resistance, clinical relevance, sleep disturbance, anxiety, psychological distress, and quality-of-life impacts. Wider claims concerning housing inequality, education, environmental outcomes, and poverty effects are evidence-informed and require further direct measurement. This report therefore treats these areas as social-impact frameworks for programme evaluation rather than settled scientific consensus.

The central proposal is that prevention and early detection should be treated as social infrastructure. In the same way that smoke alarms, carbon monoxide alarms, and water-leak sensors reduce harm by identifying risk early, bed bug monitoring can reduce the time between introduction and action. When detection occurs earlier, social, financial, operational and environmental burdens are likely to be lower.

The Free From Bedbugs programme is designed around a simple intervention logic: make low-cost monitoring accessible, educate residents and site managers, create clear reporting pathways, and measure outcomes transparently. The model uses a £15 monitor cost as the baseline deployment assumption for illustrative economic modelling.

Key findings

Finding	Implication	Evidence confidence
Bed bugs have resurged internationally and are difficult to control.	Prevention and early detection deserve more attention alongside treatment.	High
Infestations are associated with sleep disturbance and psychological distress.	The burden is not limited to bites or property damage.	High
Households with fewer resources may experience greater disruption.	Prevention has an equity dimension.	Moderate
Delayed detection increases direct and indirect costs.	Monitoring can be evaluated as cost avoidance.	Moderate to high
Environmental and ESG benefits are plausible but need programme data.	Impact reporting should be built into deployment.	Emerging

1. Evidence base and method

This report uses a multidisciplinary evidence base: entomology, public health, housing policy, social determinants of health, sustainability reporting, and social value measurement. Published studies document the modern resurgence and insecticide resistance of bed bugs, their clinical relevance, and evidence of mental-health and sleep impacts. Public-health and social determinants literature is used to interpret how household-level disruptions may interact with vulnerability, housing instability and poverty.

Social impact measurement is guided by Social Value International's SROI approach, which provides a framework for measuring, managing and accounting for social value. ESG alignment is framed against recognised reporting concepts such as the Global Reporting Initiative, which is designed to help organisations report impacts on the economy, environment and people.

Evidence level	Use in this paper	Example
Established evidence	Directly supported by published literature.	Resurgence, resistance, clinical relevance, sleep disturbance, anxiety.
Evidence-informed interpretation	Supported by related literature and reasoned inference.	Housing burden, productivity effects, education consequences.
Proposed framework	A model for evaluation and programme design.	Poverty Multiplier, Prevention Gap, ESG Outcomes Model.

2. The social impact of bed bugs

Mental health and wellbeing

The psychological burden of bed bugs has been documented in public-health and clinical literature. A Montreal cross-sectional study found that exposure to bed bugs was associated with sleep disturbance and symptoms of anxiety and depression. Clinical commentary and reviews also describe anxiety, insomnia, hypervigilance, avoidance behaviours and psychological distress in affected people.

This matters because sleep and wellbeing are not peripheral outcomes. They influence concentration, family functioning, productivity, and capacity to manage other pressures. In practical terms, even when an infestation is biologically small, the perceived risk can dominate household life.

Housing and vulnerability

Bed bugs are not caused by poverty, and they can affect any household. The consequences, however, are not evenly distributed. Households with savings, control over their accommodation, access to reliable advice and rapid professional help are better positioned to respond. Households in insecure, temporary, supported, or low-income housing may face barriers to reporting and resolution.

This is where bed bugs intersect with social determinants of health. The WHO defines social determinants as the conditions in which people are born, grow, live, work and age, and people's access to power, money and resources. Bed bugs should not be described as a primary social determinant, but infestations can interact with these determinants by adding stress, cost and disruption.

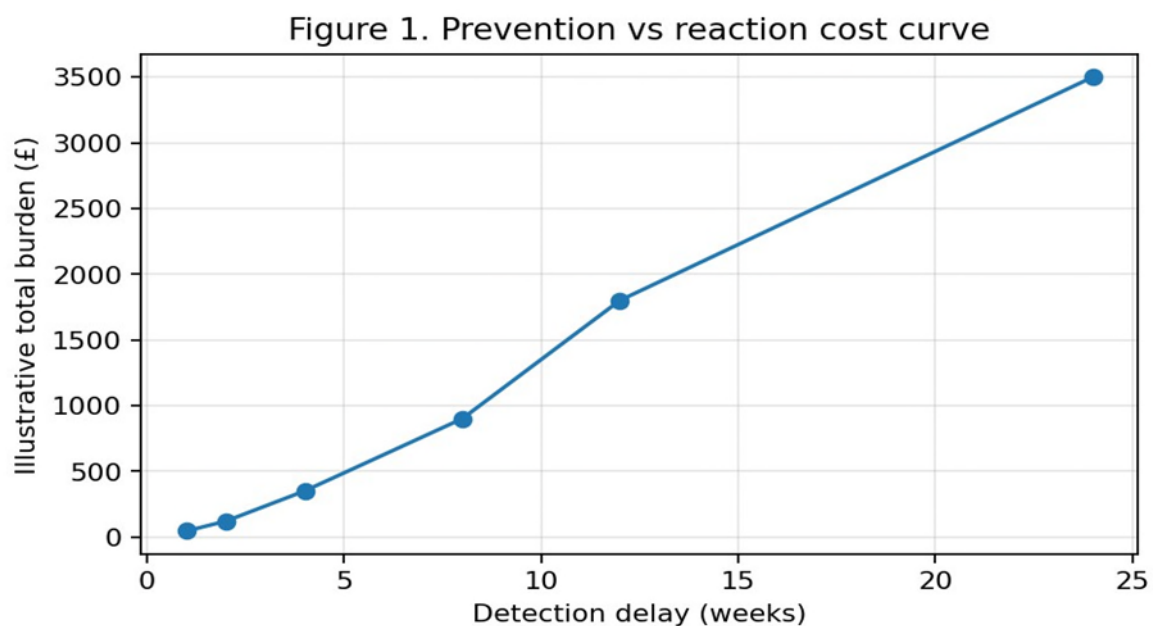
Education, productivity and community effects

Direct bed bug-specific evidence on education and productivity remains limited. However, the pathway is plausible and should be measured: infestation anxiety and nocturnal disturbance can affect sleep; sleep affects concentration and daytime performance; family stress can affect attendance and routines. Community effects may include stigma, neighbour disputes, delayed reporting and increased organisational workload.

3. The prevention gap

Most bed bug expenditure is reactive. Money is spent once a case has escalated: inspection, treatment, replacement items, complaint management, room closure, rehousing, and reputational repair. By contrast, routine prevention and early detection are often treated as optional.

This report defines the Prevention Gap as the imbalance between the scale of avoidable harm caused by delayed detection and the comparatively low level of investment in early warning systems.

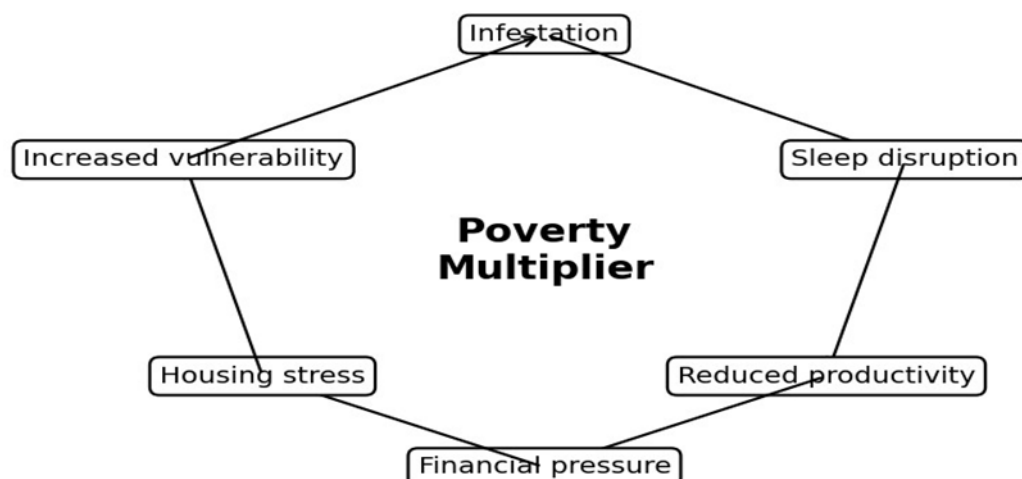


The chart above is illustrative rather than a claim of fixed costs. It shows the principle that total burden can rise sharply as detection is delayed. The same logic applies in fire safety, water damage, public health screening, and many other fields: early warning reduces harm.

4. Bed bugs as a poverty multiplier

The Poverty Multiplier framework is one of this report's central contributions. It does not claim that bed bugs cause poverty. Rather, it proposes that infestations can amplify existing vulnerability through a chain of stress, cost and disruption.

Figure 4. Bed bugs as a poverty multiplier



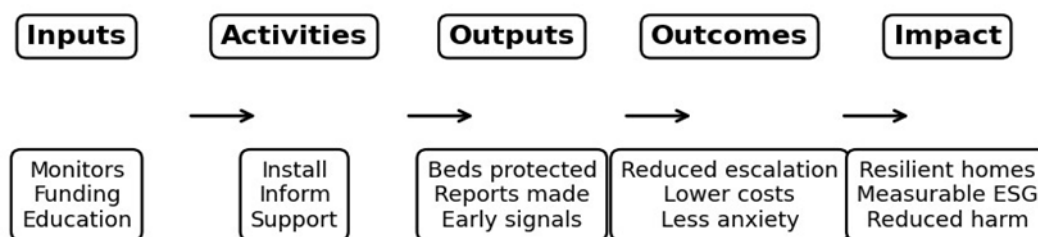
A household already close to financial pressure may be pushed into debt by treatment costs or discarded furniture. Sleep disruption may affect work. Housing stress may worsen relationships with landlords or neighbours. Stigma may delay reporting. These effects can combine and reinforce disadvantage.

5. The Free From Bedbugs model

The Free From Bedbugs model is a prevention-led framework built on four components: accessible monitoring, education, early reporting and transparent impact measurement. The model uses passive monitoring and routine checking as the first line of community protection.

A key operational assumption used for modelling is one £15 monitor per protected sleeping area. This allows funders to understand deployment costs in simple terms and compare them against avoided treatment, replacement, operational and social costs.

Figure 3. Free From Bedbugs theory of change

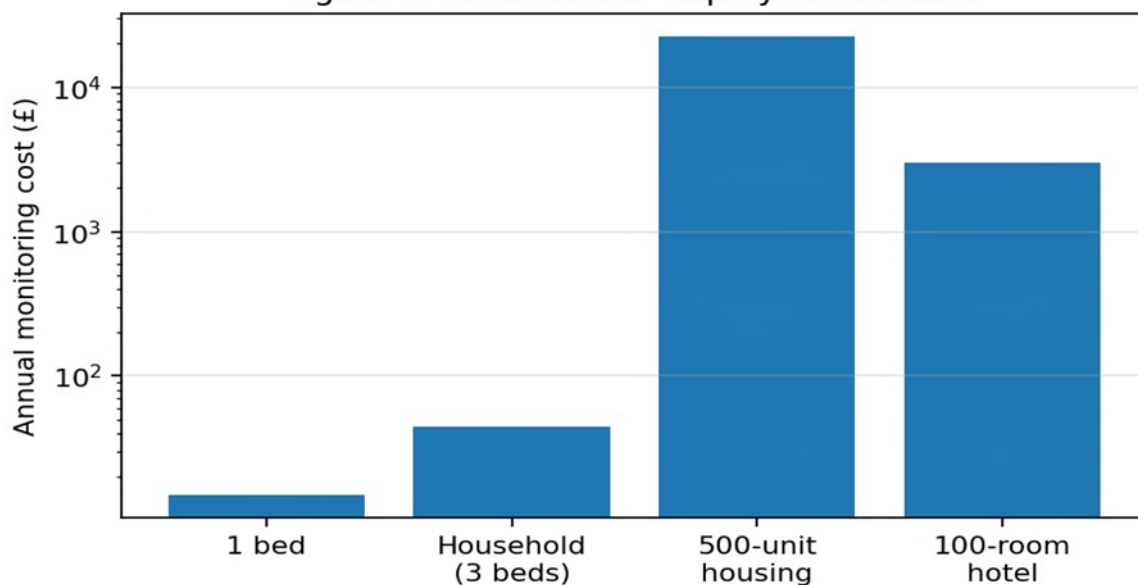


6. Economic and SROI framework

The economic case for prevention should not rely only on treatment savings. A broader social value model should include direct, indirect and intangible outcomes. Social Value International's SROI guidance is useful because it encourages organisations to account for social, environmental and economic value, while avoiding over-claiming.

Value category	Possible measure	Notes
Direct cost avoidance	Treatment, inspection, replacement items.	Most easily monetised.
Operational savings	Staff time, room closure, complaint management.	Important for housing and hotels.
Productivity protection	Lost days avoided, sleep-related performance effects.	Should be conservatively modelled.
Wellbeing benefits	Anxiety and sleep self-report scores.	Measure first; monetise cautiously.
Environmental value	Furniture retained, treatments avoided, travel reduced.	Useful for ESG reporting.

Figure 2. £15 monitor deployment model



Illustrative deployment examples: one bed = £15 per year; a three-bed household = £45 per year; a 500-unit housing portfolio with three protected sleeping areas per unit = £22,500 per year; a 100-room hotel with two protected beds per room = £3,000 per year. These figures exclude programme administration, training, fulfilment and evaluation costs, which should be modelled separately for grant applications.

7. ESG outcomes framework

The ESG case is strongest when framed as measurable impact rather than marketing language. Environmental outcomes may include reduced waste and reduced treatment intensity. Social outcomes may include improved sleep, reduced anxiety, earlier reporting and protected housing stability. Governance outcomes may include transparent data capture, verification, audit trails and annual reporting.

ESG pillar	Relevant outcomes	Suggested KPI
Environmental	Less waste, fewer unnecessary interventions, fewer discarded furnishings.	Items retained; treatments avoided; estimated kg waste avoided.

Social	Wellbeing, sleep, reduced stigma, household resilience.	Households protected; early detections; self-reported anxiety reduction.
Governance	Transparency, measurement, verification, learning.	QR verification rate; completed checks; published impact report.

8. Deployment scenarios

Scenario	Deployment	Primary value proposition
Low-income household	One monitor per bed; education; reporting pathway.	Reduce escalation, anxiety and replacement costs.
Social housing portfolio	Routine monitor installation across high-risk units.	Reduce complaints, spread, treatment intensity and tenant disruption.
Supported accommodation	Monitoring with staff training and simple checks.	Protect vulnerable residents and improve confidence.
Hotel	QA monitoring in rooms with incident protocol.	Protect reputation, minimise room downtime, reduce guest complaints.
Local authority pilot	Targeted deployment in priority housing groups.	Generate public-health and housing evidence for scale-up.

9. Recommendations

For foundations and ESG funders

Fund a structured pilot rather than a general awareness campaign. Require baseline data, deployment records, early detection outcomes, resident feedback and an annual impact report. Fund independent review where possible.

For housing providers

Integrate monitoring into routine property risk management. Reduce stigma through resident education. Measure complaints, detection stage, treatment intensity and furniture loss before and after deployment.

For local authorities

Consider bed bug prevention within housing resilience and public-health prevention strategies. Target pilots at temporary accommodation, supported housing and households facing financial vulnerability.

For hospitality organisations

Treat monitoring as quality assurance. The business value lies not only in detection but in documented due diligence, reduced room downtime and more confident incident management.

10. Research integrity statement

This report is not a claim that bed bugs are the sole or principal cause of poverty, poor mental health, educational disadvantage, housing insecurity or community stress. It argues that infestations can contribute to these outcomes and can amplify existing pressures. Strong claims should be supported by direct evidence; emerging claims should be treated as hypotheses for programme evaluation.

The report's strongest evidence-supported claims concern resurgence, clinical relevance, resistance, sleep disturbance and psychological distress. Its most original frameworks - the Prevention Gap and Poverty Multiplier should be tested through pilots, outcome tracking and external evaluation.

11. Appendices

Appendix A: Minimum impact dashboard

Domain	Metric
Reach	Households enrolled; beds protected; monitors installed.
Detection	Suspected activity reported; confirmed early detections; escalation rate.
Social	Sleep confidence; anxiety rating; resident satisfaction.
Economic	Treatment costs avoided; furniture replacement avoided; room downtime avoided.
Environmental	Items retained; interventions avoided; estimated waste avoided.
Governance	QR verification; check compliance; annual reporting.

Appendix B: Suggested pilot design

A practical first pilot could protect 1,000 households for 12 months. Using a three-sleeping-area household assumption, monitor cost would be £45,000 before fulfilment, training, administration and evaluation. Baseline and follow-up data should be collected on reports, confirmed detections, treatment intensity, furniture loss, resident anxiety and satisfaction.

Appendix C: Limitations

Evidence on mental health is stronger than evidence on community-level economic and environmental impacts. Environmental savings should not be overstated until measured. Productivity and education outcomes should be treated as plausible pathways, not quantified claims, unless direct data are collected. The £15 monitor model is a deployment-cost assumption, not a complete programme cost.

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