

INFESTATIONS OF GERMAN COCKROACH *BLATTELLA GERMANICA* IN MULTI-OCCUPANCY DWELLINGS IN A LONDON BOROUGH – A PRELIMINARY STUDY INTO THE RELATIONSHIP BETWEEN ENVIRONMENT, INFESTATION AND CONTROL SUCCESS

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Abstract—Records from a two year period from over 24,000 dwellings in the London Borough of Southwark were examined and infestations of German cockroaches, recorded by inspection and trapping, were analysed. Factors identified as possibly influencing infestation levels were block size and type of heating system, standard of hygiene in dwellings and human density in dwellings. The results indicate that the type of heating system does not have a major influence on cockroach infestation levels in small and medium blocks. However, with large blocks district heating was associated with higher levels of infestation. A relationship between cockroach infestation levels and the standards of hygiene in individual dwellings was established. Heavier levels of infestations were found in dwellings with poor standards of hygiene. Size of multi-occupancy block appeared to have no effect on levels of infestation, although there are implications for the persistence of infestation and difficulties for the implementation of control in very large blocks.

INTRODUCTION

The German cockroach, *Blattella germanica*, requires high temperature and humidity, harbourage and adequate food supply in order to survive and breed in the UK. For this reason it is a pest associated with human beings and their dwellings, which provide the ideal environment for the cockroaches' survival (Cornwell, 1968; Bennett and Owens, 1986). In recent years many local authorities have experienced great problems controlling infestations of German cockroaches, the majority of which were found in multi-occupancy housing blocks (Lea, 1995; Rutter and Tullis, 1992). This type of environment seems particularly well suited to support cockroach infestations. A large turnover of tenants provides ample opportunity for import of cockroaches into the buildings. Poor proofing and ducted services provide ample harbourage for the cockroaches and allow spread of infestations between dwellings (Lea, 1995). Once an infestation is established, many factors may then contribute to the subsequent severity of the problem and the level of success achieved in controlling the infestation. However, it is difficult to find hard evidence to identify key factors relating to cockroach infestation within such complex environments. It was therefore decided to examine the monitoring records of a large number of dwellings in a London borough and to attempt to correlate cockroach infestation levels with specific factors. The factors identified as possibly influencing infestation levels were block size and type of heating system, standard of hygiene in dwellings and absence or presence of children.

The results of this study are discussed in the light of future needs for monitoring infestation, improving the proofing and design of buildings and strategies for control.

MATERIALS AND METHODS

Data was collected from 487 multi-occupancy housing blocks in South East London by companies contracted to carry out pest control by Southwark Council Housing Department. All blocks monitored had reported German cockroach infestations before this survey.

Block size and heating type

Housing blocks were categorised according to their size. Blocks were classified as small when they contained 6–30 dwellings, medium containing 31–80 dwellings and large if they contained 81 or more dwellings

Blocks were then categorised depending on whether or not they had Individual or district heating systems. The tenants in dwellings with local or district heating paid for their heating at a standard rate regardless of how much heat is used. Occupants of such dwellings tend to have their heating at higher levels and for longer periods than those in flats without district heating.

Infestation levels

Levels of infestations were monitored using sticky traps. Visual observations of the dwellings visited were made to detect any signs of cockroaches or cockroach frass. Occupants were also questioned as to whether cockroaches had been sighted between visits. Traps were placed in the kitchen, the bathroom and in the airing cupboard. Where visual observations by occupants and pest controllers showed no evidence of cockroach presence, only 1 trap was placed in each position. Where cockroaches had been sighted, more traps were placed. Traps were collected 3–6 months later. Infestation levels were then categorised based on the following criteria.

1. Were cockroaches present on any of the sticky traps collected?
2. Did visual inspections show any signs of cockroach activity?
3. Did occupants report any sightings of cockroaches?

Dwellings were classed as clear of infestation if the answer to *all* these questions was “no”. They were classed as infested if the answer to *any* of these questions was “yes”. Infested dwellings were then further classified as:

- Light: When no more than 5 cockroaches were caught on all the sticky traps collected.
Medium: When 6–25 cockroaches were caught on all the sticky traps collected.
Heavy: When more than 25 cockroaches were caught on all the sticky traps collected.

Hygiene levels

Hygiene levels in each dwelling were also recorded and classified, based on the following criteria:

- Good: When floors and surfaces were clear of food and uncluttered.
Fair: Where there were minor food spillages and pet food and unwashed dishes were left out overnight.
Bad: Where there were heavy deposits of grease and grime in kitchens and ample spilled and open food. Surfaces and floors were cluttered hampering access for inspection and treatment.

An example of the Pro forma report form on which data was recorded is shown in appendix “A”.

Infestations and human density

Data indicating family or single/couple occupancy was collected for the 6 month period commencing April 1995.

Treatment

Blocks were monitored over 6 month periods commencing October 93, April and October 94 and April 95. The mean of data from both periods commencing in 1994 was used, where appropriate. Treatments were carried out by contractors during these periods with Maxforce gel (hydramethylnon) and Protrol (hydroprene) in the main. The change in infestation levels with time were examined to determine the success of these treatments.

RESULTS

Blocks with all dwellings classified as clear of infestation, but with any dwellings not accessed during visits, were not used in the analysis of block results. The non-accessed dwellings may have

