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Undertaking #26

Please provide the source of Health Canada Guidelines relative to rodent infestation in vehicles and subsequent treatment. Please indicate when that publication became available.

RESPONSE:

MPI's Training and Research relied upon several sources to determine the human health risks associated with rodent infestation, with a specific focus on Hantavirus as it is the most serious health risk. This information was used to document the appropriate treatment recommendations for rodent infested vehicles.

The research confirms that people can contract the virus by inhaling an aerosol containing live virus particles. Research, as provided in Attachment A to this Undertaking, also confirms that the risk of exposure to this virus is very low¹, as the duration of survival in the environment of this virus is usually less than 24 hours and typically only exists in approximately 11% of the deer mice population.

Public Health Agency of Canada recommends applying the following solutions:

- 1% solution of sodium hypochlorite (bleach)
- 1-5% Clidox® (chlorine dioxide)
- 1-5% Dettol® (parachlorometaxyleneol)
- 1-5% Halamid-d® (sodium-p-toluene-sulfonchloramide)
- 1-5% peracetic acid
- Virkon®
- Absolute methanol

¹ Canada Communicable Disease Report (CCDR) by National Microbiology Laboratory, Public Health Agency of Canada (June 4, 2015) (<https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2015-41/ccdr-volume-41-06-june-4-2015/ccdr-volume-41-06-june-4-2015-1.html>)

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Based on discussions with Public Health Agency of Canada, MPI simplified the recommended cleaning product to Commercial Disinfectant. Our response to ensure the health and safety of customers is to eradicate and disinfect vehicles in accordance with these treatment guidelines². Based on the research, treatment has changed to focus on occupancy areas including ventilation systems where an aerosol from particles can be generated. Any further repair and or disassembly is considered based on actual damages or severity of infestation. This process aligns with other jurisdictions across Canada.

² Pathogen Safety Data Sheet for Hantavirus by Public Health Agency of Canada (Updated October 2010) <https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/hantavirus.html>



August 18, 2014

Loren Braul, Hill Sokalski Walsh Trippier

Winnipeg, MB Canada

Dear Loren,

Thanks for providing the written summary of the questions you have regarding hantaviruses and potential human exposure. I have embedded the background and the questions into this report and provide a response for each below. As background you provided the following: "A vehicle was infested by mice and a claim was made to MPI. The passenger and engine compartments were cleaned. However, following the cleaning there were still visible signs of what appeared to be mouse urine in the engine compartment and our client had concerns that the cleaning was insufficient. In particular, MPI did not specify which cleaning agent had been used or the effectiveness if the cleaning agent."

You had specific questions and wanted my input on the following questions:

- the nature/structure of the hantavirus and the ability of the hantavirus to survive in the natural environment (life span, tolerance of heat/cold),

In Canada, Sin Nombre virus (SNV) is the only hantavirus that is known to cause human disease (specifically hantavirus pulmonary Syndrome or HPS). People are typically infected when they inadvertently create an aerosol containing virus particles and this happens most often when people sweep or vacuum areas contaminated by deer mouse droppings (e.g., urine and feces). Although this route of transmission is the most common way humans become infected, SNV is not particularly resistant in the environment. Although the precise duration of survival for SNV has not been determined, for other related hantaviruses, the duration of survival in the environment is usually less than 24 hours. Hantaviruses are susceptible to drying but can remain viable for longer periods if they are protected by organic material. For example, at room temperature, both Puumala and Tula viruses (two hantaviruses from Europe) lose viability within 24 h when they are dried, but can remain infectious for more than 5 days if their environment remains moist. Hantaviruses are also rendered non-infectious when heated (for example, we routinely inactivate blood samples by heating them to 56 C for 15 minutes in order to ensure hantavirus particles in the blood are destroyed). The structure of hantaviruses also makes them susceptible to a variety of disinfectants such as bleach, and this susceptibility forms the rationale for the public health recommendations to disinfect areas contaminated with rodent droppings to eliminate the risk of HPS.

- the recommended cleaning solutions and methods for eliminating the hantavirus,

Commercial disinfectants or cleaners that are rated to kill viruses are acceptable products to use to ensure that areas contaminated by rodent droppings are free of live virus. The most commonly recommended disinfectant is sodium hypochlorite or household bleach and it is usually diluted to a 1:10 ratio in water. Contaminated surfaces are typically saturated with the bleach solution and then left for up to 10 minutes (i.e., contact time) and then the area is "wet mopped" to remove any solid waste (feces) and wet mopping prevents any further creation of aerosols.

Chlorine residues may persist on some surfaces and stainless steel can pit as a result of treatment, so bleach is often followed by an alcohol rinse to minimize the potential damage to this type of surface.

- any recommended tests that can be used to confirm the presence or absence of the hantavirus,

Although hantaviruses can be detected in rodent hosts (in their blood or lung tissues) using serological or molecular testing procedures, at present time, there isn't a test that can reliably applied to environmental samples (droppings) to detect hantaviruses. When areas are contaminated by droppings, our recommendation is to assume that they might contain hantaviruses and to clean using disinfectants and then it will not matter if they are infected because the proper steps to disinfect them were taken and there should be no residual risk of exposure.

- whether heat will activate the hantavirus,

As mentioned in the first question, heating can effectively kill hantaviruses and the heating does not have to be excessive (56 C for 15 minutes). In the scenario you described, if droppings were present on the engine block, the heating of the motor during its normal operation would have been much higher than is required to kill virus particles so the risk from exposure to contaminated surfaces in the engine compartment would be effectively nil.

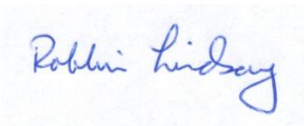
- whether hantavirus may reappear following a cleaning with a recommended cleaning agent,

The only way viruses could reappear on a surface following appropriate cleaning would be for the structure to be "re-infested" by rodents and freshly contaminated.

- any other relevant information when considering mitigating the risks associated with hantavirus.

In my opinion, the risk to your client from the infestation of their vehicle poses only a very slight chance of exposure to hantaviruses. Most deer mice are not infected with SNV and many that are do not actively shed virus into the environment, and once in the environment, especially a hot and dry environment like a vehicle, the virus particles would rapidly breakdown. Given that the vehicle has been professionally cleaned following an established protocol (I assume MPI has such a protocol as they often deal with claims associated with deer mouse infestations), the odds are even more remote that hantaviruses in the vehicle would be an on-going concern. The presence of mouse urine or residue of urine in the engine compartment likely represents dried urine (which would not be infectious) or the residue from the cleaning products themselves. I would be happy to discuss this issue further with you if you have any more questions.

Sincerely



Robbin Lindsay

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