Decontamination through a One Health Lens

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In an increasingly connected world, integrating a One Health approach is needed to better assess risks posed by biothreat agents and for developing effective, environmentally-sustainable response strategies. One Health recognizes the interaction and interconnectedness of human, animal, and environmental health, allowing for a systemic approach to decontamination activities with multiple points of intervention. The potential impact of such methods is amplified when applied to decontamination of urban environments. Urban populations are at greater risk during bioincidents due to their significantly higher density relative to rural counterparts. However, this is not the only risk factor for increased virulence. In the built environment, pathogens have greater opportunity for fomite mobility via mass transit, building ventilation, and water and wastewater systems. Animals tend to exacerbate these issues. In a bioterrorism event, contaminated buildings may be off-limits to humans, but animals (such as rodents, dogs, cats, birds, bats, etc.) and insects still have access to the building and could transmit disease to surrounding human and animal populations. For example, the AMI building in Boca Raton, Florida was contaminated when an anthrax-laden letter was opened. The building was quarantined for months awaiting decontamination. In the meantime, city wildlife could have moved in and out of the contaminated area. Without addressing the movement of city wildlife, bioincidents cannot be fully addressed, and in turn decontamination of the urban environment cannot be achieved, thus human health remains at risk. Medical countermeasures are insufficient to combat environmental persistence of harmful microbes in potential epidemic or pandemic scenarios. Additional understanding is needed of the complex relationships at the human-animal-environment interface, to develop environmental countermeasures to effectively stop the chain of infection is vital to effective decontamination