

Emerging Infectious Diseases: Assessing the Risk of Zoonotic Exposures

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While nearly 75% of viruses and 50% of bacteria associated with human disease are zoonotic, the emerging disease risk directly attributable to animal exposures remains unclear [1]. Animals and humans have coexisted throughout their existence and adaptive immunity against microbes appears to be the norm. However, a disproportionate burden of infectious diseases occurs in tropical and developing countries, where contact with animals occurs regularly. Furthermore, the transmission route and etiology for over 14% of human pathogens remains unknown, raising the question of species jumping as a potential new source of disease (i.e., evading innate immune surveillance conferred through evolution) [1].

Certainly, zoonotic infection plays a clear and defined role in many illnesses. Occupations such as farming and agricultural work that place individuals in direct contact with animals and their excretions/secretions increase the risk for infection [2]. However, the ease by which viruses and bacteria readily cross species as newly defined emerging infections among humans' likely remains low. Among chicken farm laborers regularly in contact with infected chickens and wildfowl, only 2 in a sample of 27 persons tested positive for antibodies to Rous Sarcoma Virus-Bryan (RSV-B) [3]. Similarly, wildlife workers who handle wild ducks when they are shedding high levels of virus consistently have negative viral and serologic assays [4]. Under experimental conditions,

participants inoculated with high doses of avian subtypes H4N8, H6N1, and H10N7 failed to produce a detectable antibody response, even though ~25% shed virus and displayed mild clinical signs and symptoms [4].

The attributable risk of most lethal microbial agents at the population level has been contained to small groups, who typically die before transmitting disease in large numbers.

Nonetheless, the possibility of a global pandemic cannot be ruled out and routine public health efforts represent the best prophylactic course of action.

References

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