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The social benefits of private infectious disease-risk mitigation.

Does society benefit from private measures to mitigate infectious disease risks? Since mitigation reduces peak prevalence and the number of people who fall ill, the answer might appear to be yes. But mitigation prolongs epidemics and the time susceptible people avoid infection. These avoidance activities come at a cost. Whether private mitigation yields net social benefits depends on the social weight given to the costs of illness and illness avoidance, now and into the future. We show that, for a large class of infectious diseases, private risk mitigation is socially beneficial. However, in cases where society discounts the future at either very low or very high rates relative to private individuals, or where it places a low weight on the private cost of illness, the social cost of illness under proportionate mixing (doing nothing) may be lower than the social cost of illness under preferential mixing (avoiding infectious individuals). That is, under some circumstances, society would prefer shorter, more intense epidemics without avoidance costs over longer, less intense epidemics with avoidance costs. A sobering (although not surprising) implication of this is that poorer societies should be expected to promote less private disease-risk mitigation than richer societies. (Received August 11, 2015)