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SARS Control and Psychological Effects of Quarantine, Toronto, Canada

To the Editor: Hawryluck et al. (1) have published an interesting study that found that some persons subject to quarantine for severe acute respiratory distress syndrome (SARS) displayed symptoms of posttraumatic stress disorder and depression. They conclude that the psychological symptoms result from quarantine. I believe the study has serious flaws and that their conclusion is premature.

First, their study sampled 129 volunteers among the >15,000 persons subjected to quarantine. As acknowledged by the authors, persons with the most severe symptoms may be more likely to volunteer for the study, resulting in an overestimation of the frequency and severity of the symptoms. Second, more than two thirds of the participants were healthcare workers. Healthcare workers in Toronto who cared for SARS patients but were not subject to quarantine were experiencing extreme stress because they were working with a poorly understood infectious disease, wearing protective equipment for extended periods, and watching colleagues become ill and die while wondering if they themselves were the next victims. Most healthcare workers subject to quarantine in Toronto (including 34% of persons on work quarantine) likely cared for SARS patients and would have experienced stresses similar to those not quarantined. Third, 85% of the study participants wore masks at home, indicating that they were likely to have been symptomatic and subject to isolation rather than quarantine. Certainly symptomatic persons would be undergoing stress because of their concerns about SARS developing, the possibility of dying, and the potential for exposing others. Increasing levels of stress with increasing length of isolation found in the study may be due to more severe or prolonged symptoms rather than to isolation or quarantine per se.

Measuring the psychological effects of isolation and quarantine will require studies comparing psychological symptoms of healthcare workers subjected to quarantine with those who continued working, as well as studies comparing randomly selected persons subject to isolation with the general population living in the city during the outbreak.

In the final analysis, although isolation and quarantine are stressful, that is an insufficient reason to hesitate when these measures are indicated. One might wonder how stressed the participants would have been if SARS had developed and they infected their family members or friends. Regardless of whether isolation and quarantine induce posttraumatic stress disorder, public health officials must be cognizant of and prepared to supply appropriate emotional and social support to persons subject to isolation or quarantine.

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In Response: Dr. Hull raises concerns regarding our study design and the conclusions that were drawn, believing the conclusions to be premature (1). To reiterate, we concluded that quarantine might result in considerable psychological distress in the forms of posttraumatic stress disorder (PTSD) and depressive symptoms, but we clearly qualify this conclusion by stating that the results of the study are hypothesis-generating and require further exploration.

Dr. Hull correctly writes that more than two thirds of the respondents to our survey were healthcare workers and assumes that healthcare workers in Toronto who cared for patients with severe acute respiratory syndrome (SARS) were extremely stressed. We agree with this statement not on the basis of data presented in this study, but rather on additional

work that we have conducted on nonquarantined, uninfected healthcare workers treating patients with SARS in a hospital in Toronto (2). The implication of Dr. Hull's statement, however, is that being a healthcare worker in Toronto at the time of SARS, rather than being placed into quarantine, was responsible for the psychological distress that we measured. To dispute this, we found that healthcare worker status was not correlated with PTSD or depression symptoms, which indicates that respondents who were nonhealthcare workers experienced similar levels of distress as healthcare workers who responded. Furthermore, we found that longer durations of quarantine were associated with increased symptoms of PTSD, which indicates that the physical state of being in quarantine was at least in part responsible for the psychological distress.

Finally, Dr. Hull states that 85% of the study participants wore masks at home, which indicates that they were likely to have been symptomatic and subject to isolation rather than quarantine. This statement is incorrect. The respondents to this survey were asymptomatic, exposed persons who were placed into quarantine. Instructions to all quarantined persons, per public health guidelines (3), were to wear masks while in the presence of other household members, not because they were symptomatic, but rather because they may have been incubating SARS and had the potential to transmit infection to household contacts in the 24 hours before symptom onset.

Although the terms isolation and quarantine have often been used interchangeably, they actually represent distinct concepts (4). The strategies differ in that isolation applies to persons who are known to have an illness, and quarantine applies to those who have been exposed to a transmissible pathogen but who may or may not become ill. Quarantine directives for SARS included the adherence to home infection control measures, including wearing masks in the presence of other household members, not sharing utensils, and sleeping in separate quarters (3).

We agree with Dr. Hull's final statement that the psychological distress experienced by persons in quarantine is not a sufficient reason to refrain from invoking these measures when they are needed to control an outbreak. We did not arrive at this conclusion in our article. The goal of the study was to develop a benchmark for the possible distress associated with quarantine. While we felt that documenting the possible distress that may result from quarantine was important, it was not intended to negate the need to impose quarantine should it be required, but rather to determine the support measures that may be needed by quarantined persons. Public health officials must be cognizant of these needs and prepared to supply appropriate emotional and social support to persons in quarantine for such measures to succeed in halting the spread of disease.

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Correction, Vol. 9, No. 12

In "Severe Acute Respiratory Syndrome Epidemic in Asia," by G. Zhou and G. Yan, an error occurred in the Table. Under the table heading "Parameter estimation," the third subheading should be "1/α." The corrected table appears online at http://www.cdc.gov/ncidod/EID/vol9no12/03-0382.htm#table

We regret any confusion this error may have caused.