

8. Tebas P, Faisal S, Wallace RJ, Fraser V. Rapid development of resistance to clarithromycin following monotherapy for disseminated *Mycobacterium chelonae* infection in a heart transplant patient. *Clin Infect Dis*. 1995;20:443-4.
9. Vemulapalli RK, Cantey JR, Steed LL, Knapp TL, Thielmann NM. Emergence of resistance to clarithromycin during treatment of disseminated cutaneous *Mycobacterium chelonae* infection: case report and literature review. *J Infect Dis*. 2001;43:163-8.
10. Singh S, Rattan A, Kumar S. Severe cutaneous *Mycobacterium chelonae* infection following a yellow jacket sting. *Tuber Lung Dis*. 1992;73:305-6.
11. McKinsey DS, Dykstra M, Smith DL. The terrier and the tendonitis. *N Engl J Med*. 1995;332:338.

Address for correspondence: Ingrid Stelzmueller, Medical University Innsbruck, Department of General and Transplant Surgery, Anichstraße 35, 6020 Innsbruck, Austria; fax: +43-512-504-22605; email: ingrid.stelzmueller@uklibk.ac.at

## 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.

**Harry F. Hull\***

\*Minnesota Department of Health, Minneapolis, Minnesota, USA

### Reference

1. Hawryluck L, Gold WL, Robinson S, Pogorski S, Galea S, Styra R. SARS control and psychological effects of quarantine, Toronto, Canada. *Emerg Infect Dis*. 2004;10:1206-12.

Address for correspondence: Harry F. Hull, State Epidemiologist and Division Director, Infectious Disease Epidemiology, Prevention and Control Division, Minnesota Department of Health, 717 Delaware, SE, Minneapolis, MN 55414, USA; fax: 612-676-5666; email: harry.hull@health.state.mn.us

**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