

of the spectrum is a non-immune, pregnant health-care worker for whom a poor outcome with influenza is well known.<sup>13</sup> Thus, the efficacy of equipment worn by pregnant women should be assured.

What is missing in some of the debate about the respiratory protection of health-care workers is the importance of source control. Placing a surgical mask on a coughing patient infected with influenza stops the detection of the virus 20 cm away.<sup>14</sup> As with tuberculosis, masking the infected patient, when tolerated, should be the foundation of infection control. Finally, health-care workers can wear powered air purifying respirators, eye protection, gowns, and gloves when exposed to patients with influenza, but even if they properly remove their protective equipment, they can become infected from colleagues who work with influenza-like symptoms.

Science will guide us as we care for patients infected with A H1N1 2009 but a lack of attention to our understanding of the transmission of human influenza has left us debating which procedures create influenza superspreading events, what is appropriate personal protective equipment, use of suboptimum engineered respirators that need fit-testing and are poorly tolerated for prolonged use, and limited industrial capacity to meet our needs. For now, infection-control experts at each institution must weigh the variables noted in the figure to establish not only what is best, but what is realistic in reducing risk to their staff, their visitors, and their patients.

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I declare that I have no conflicts of interest.

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## Relative risk of death in the SMART study

In the May issue of *The Lancet Infectious Diseases*, Justin Stebbing and Angus Dalgleish<sup>1</sup> noted that 79 of the 85 deaths (93%) in the SMART study<sup>2</sup> happened in the USA, whereas 45% of the participants were enrolled outside the USA.<sup>3</sup> They concluded that it was "apparently safer to be off highly active antiretroviral therapy (HAART) outside the USA rather than on HAART within the USA", and contemplated possible reasons for this difference.

In fact, the hazard ratio (HR) for deaths in participants randomised to intermittent HAART (drug conservation [DC] group) compared with continuous HAART (viral suppression [VS] group) was very similar for participants

of SMART in the USA compared with other countries (estimated HR [DC/VS] of 1.8 and 2.0, respectively; table). Thus, there is no suggestion that the treatment interruption strategy evaluated in SMART is safer when used outside the USA compared with within the USA.

Stebbing and Dalgleish correctly noted that the overall rate of death was higher in the USA, in both treatment arms.<sup>3</sup> Most of the increased risk can be explained by differences in baseline characteristics of participants enrolled within and outside the USA. The proportions of participants with HIV RNA copy number greater than 400 copies per mL at study entry (40% vs 14%), who were

smokers (43% vs 38%), had a history of cardiovascular disease (5% vs 2%), diabetes (10% vs 4%), hepatitis B or C (22% vs 11%), or intravenous drug use (13% vs 6%), or used antihypertensive (26% vs 10%) or lipid-lowering drugs (19% vs 12%) were larger among participants enrolled in the USA compared with those enrolled outside the USA. Each of these factors was associated with an increased risk of death (estimated HRs of 1.1 or greater in Cox regression). After adjustment for demographics (age, sex, race), baseline CD4-cell count, lowest CD4-cell count, and the factors listed above, the HR for death in the USA versus other countries dropped from 3.1 (95% CI 1.3–7.3,  $p=0.009$ ) to 2.0 (95% CI 0.8–4.9,  $p=0.13$ ). Since follow-up at non-USA sites before Jan 11, 2006 (when the drug conservation arm was stopped), was too short to reliably estimate rates of death, we assessed the effect of including the additional 18 months of follow-up until closing of the SMART study in July, 2007, on the difference in mortality risk between USA and non-USA participants. Through the end of follow-up, there were 134 deaths among participants at sites in the USA (1.3 per 100 person years) and 33 deaths among sites outside of the USA (0.64 per 100 person years). The unadjusted HR for death in the USA versus other countries for both treatment groups combined was 1.8 (95% CI 1.2–2.7,  $p=0.003$ ) and after adjustment for the above baseline covariates, the HR dropped to 1.2 (95% CI 0.8–1.9,  $p=0.37$ ).

Therefore, there is no evidence that participants in the USA had an increased risk of death compared with those outside the USA, when differences in their baseline characteristics are taken into account. In the SMART study, the relative risk of AIDS or death was consistently

	USA	Other countries
Number of participants	2989	2483
Drug conservation (intermittent HAART) group		
Deaths per person-years of follow-up	51/2899	4/755
Rate of death per 100 person-years	1.76	0.53
Viral suppression (continuous HAART) group		
Deaths per person-years of follow-up	28/2942	2/751
Rate of death per 100 person-years	0.95	0.27
HR (95% CI)	1.84 (1.16–2.92)	2.01 (0.37–11.0)

Table: Deaths in the SMART study before Jan 11, 2006

higher, across many subgroups, in the intermittent antiretroviral therapy group compared with continuous antiretroviral therapy.<sup>2</sup> As these and other data from SMART show,<sup>2,3</sup> there might be subgroups with greater or lower absolute risk. Whatever the risk, it is increased when interrupting antiretroviral therapy with the strategy used in SMART.

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AP has received payment from Roche, Bristol-Myers Squibb, GlaxoSmithKline, Abbott, Boehringer-Ingelheim, Gilead, Tibotec, and Oxxon Therapeutics for attending symposia, speaking, research funding, and consultancy work. The other authors declare no conflicts of interest.

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## *Clostridium sordellii* toxic shock syndrome

In their recent Review, Emma Lappin and Andrew J Ferguson provide a thorough and interesting update on the pathophysiology and management of two major toxic shock syndromes caused by the Gram-positive pathogens *Staphylococcus aureus* and *Streptococcus pyogenes*.<sup>1</sup> As the most common cause of Gram-positive toxic shock syndromes, it is important for health-care providers to familiarise themselves with these pathogens. However, by contrast with the broad scope implied by the title of their paper, the authors did not mention toxic shock syndrome caused by the

Gram-positive bacterium *Clostridium sordellii*. This oversight is surprising given the marked increase in the number of reported cases of toxic shock syndrome caused by *C sordellii*.

*C sordellii* is a soil-dwelling, anaerobic, spore-forming bacillus that infects human beings and other animals.<sup>2</sup> Clinical infections caused by this emerging pathogen happen in distinct populations. Diseases include bloodstream and necrotising soft-tissue infections associated with black tar heroin use,<sup>3–5</sup> soft tissue infections associated either with trauma<sup>6</sup> or

See Review *Lancet Infect Dis* 2009; **9**: 281–90