hands. Indeed, the single published study from the USA that examined hand hygiene as a single intervention (funded by the maker of the alcohol-based hand gel product) showed no effect on HAI.[2] One is tempted to infer that the absence of any data-based articles celebrating the wonders of hand hygiene in the publish-or-perish climate of the USA can be viewed as further evidence of non-efficacy. The few modern studies that do show efficacy of hand washing come from resource-strapped institutions; for example, in a report from a 1260-bed hospital in Vietnam, occupancy was 144% and sinks were few[8]—hints of 19th century Vienna.

To admit that the benefit in modern hospitals is minimal is not to say we should stop cleaning; hand hygiene obviously must continue. However, what should be stopped is our smug certainty that we are on the right track. Our focus on building better hand hygiene programmes has misled us into believing we are doing something about a problem that remains intractable. But we haven't done anything (except clean our hands really well).

The time has come for the infection control community to move on; please, no more cheerleading louder and harder to get thousands of people to improve their hygiene. We have to accept that our age-old dream of solving a complex problem cheaply and simply has failed. Instead, we must reacquaint ourselves with that lonely feeling familiar to clinicians when they realise a case is much more difficult than it appeared at first glance. In other words, we should embrace the intellectual audacity of our beloved Semmelweis but let go of his how-to manual. As he might tell us (loudly): an ineffective remedy is much worse than no remedy at all.

Kent A Sepkowitz
Infectious Diseases Service, Memorial Sloan-Kettering Cancer Center, New York, NY, USA
sepkowik@mskcc.org

I declare that I have no conflicts of interest.

1 Curtis V, Schmidt W, Luby S, Florez R, Toure O, Biran A. Hygiene: new hopes, new horizons. *Lancet Infect Dis* 2011; **11:** 312–21.
2 Rupp ME, Fitzgerald T, Puumala S, et al. Prospective, controlled, cross-over trial of alcohol-based hand gel in critical care units. *Infect Control Hosp Epidemiol* 2008; **29:** 8–15.
3 Centers for Disease Control and Prevention. Vital signs: central line-associated blood stream infections—United States, 2001, 2008, and 2009. *MMWR Morb Mortal Wkly Rep* 2011; **60:** 243–48.
4 Semmelweis I. The etiology, concept, and prophylaxis of childbed fever. Translated by K Codell Carter. Madison, USA: University of Wisconsin Press, 1983.
5 Kallen AJ, Mu Y, Bulens S, et al. Health care-associated invasive MRSA infections, 2005–2008. *JAMA* 2010; **304:** 641–48.
6 Steiner C, Houchens B, Barrett M. HCUP Projections: Clostridium difficile Infection 2010 to 2011. 2011. HCUP Projections Report #2011-01. http://www.hcup-us.ahrq.gov/reports/projections/CDI_Regional_projections_Final.pdf (accessed Jan 6, 2012).
7 Allegranzi B, Pittet D. Role of hand hygiene in healthcare-associated infection prevention. *J Hosp Infect* 2009; **73:** 305–15.
8 Le TA, Dibley MJ, Nho VV, Archilbald L, Jarvis WR, Sohn AH. Reduction in surgical site infections in neurosurgical patients associated with a bedside hand hygiene program in Vietnam. *Infect Control Hosp Epidemiol* 2007; **28:** 583–88.

Adherence to antiretroviral therapy: supervision or support?

We are entering a new phase in the strategic use of antiretroviral drugs. In addition to dramatically reducing HIV/AIDS-related morbidity and mortality, these drugs have recently shown an important effect in reducing HIV incidence and transmission.[1]

The broad benefits of antiretroviral therapy are adherence dependent. Yet, despite decades of research and millions of dollars in research grants (a PubMed search yields over 40 randomised trials assessing antiretroviral adherence interventions and the US National Institute of Mental Health have invested more than US$140 million on adherence research; M Stirrat, National Institutes of Mental Health, personal communication), there is still no consensus about what works. The challenge of maintaining adherence over the long term, including among a growing number of people who have never experienced symptoms, calls for rationalisation of adherence research with a renewed focus on simple, cost-effective interventions that are proven to work at scale.

A recent randomised trial from Kenya[2] assessed both reminders and supportive counselling on patient adherence and found that digital reminders offered no benefit, but supportive counselling did. Another recent trial,[3] also from Kenya, found that a simple weekly mobile phone text asking "how are you?" (in the local language) provided statistically superior viral suppression outcomes than routine care. During focus groups done parallel to the randomised trial, patients reported that the weekly texts made them feel that someone cared. Another trial found that short weekly one-way text messaging to patients via mobile phones improved medication

adherence compared with no text messages but daily text reminders did not.[4] The surprising finding from all these trials is that, although the trials were designed to assess a technological intervention, the supportive element of the interventions, not the technology, improved adherence.

Patient support can be given in many ways. The most intrusive reminder system tested so far is directly observed therapy—a method borrowed from tuberculosis treatment. Yet, as with tuberculosis treatment, all the randomised trials so far have failed to show any benefit.[5] Resource-intensive interventions such as direct observation have been justified on the basis that adherence rates of over 95% are necessary to prevent drug resistance.[6] There is evidence that, with new antiretroviral regimens, adequate viral suppression can be achieved with much lower rates of adherence and seems to improve with the duration of time a patient is on therapy.[7]

There is often so much emphasis on adherence monitoring and provider-controlled interventions that we miss the key reasons patients do or do not adhere well. In Africa, part of the explanation for the high reported rates of adherence thus far is the provision of adherence support in a manner that addresses patient needs, often through an adherence counsellor.[2] Patients with poor adherence or retention probably face major challenges in their lives that supersede adherence to drugs, such as fear of violence, transportation difficulties, mental health concerns, providing food and income for themselves and their families, and being responsible for care of children or elderly. In the face of such challenges, reminders probably play only a small part in a patient's overall health, whereas a broader supportive role might help patients to overcome these challenges. Future clinical and intervention research should give preference to interventions that promote a supportive environment of antiretroviral therapy care because this is probably the best way to improve patient satisfaction, adherence, and retention in care over the long term.

Edward J Mills, Richard Lester, Nathan Ford
Faculty of Health Sciences, University of Ottawa, Ottawa, Canada (EJM); Department of Medicine, Division of Infectious Diseases, University of British Columbia, Vancouver, Canada (RL); Médecins Sans Frontiers, Geneva, Switzerland (NF); and Centre for Infectious Disease Epidemiology and Research, University of Cape Town, South Africa (NF)
edward.mills@uottawa.ca

We declare that we have no conflicts of interest.

1 Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med* 2011; **365:** 493–505.
2 Chung M, Richardson B, Tapia K, et al. Counseling and alarm on adherence: a randomized controlled factorial trial. *PLoS Medicine* 2011; **8:** e1000422.
3 Lester RT, Ritvo P, Mills EJ, et al. Effects of a mobile phone short message service on antiretroviral treatment adherence in Kenya (WelTel Kenya1): a randomised trial. *Lancet* 2010; **376:** 1838–45.
4 Pop-Eleches C, Thirumurthy H, Habyarimana JP, et al. Mobile phone technologies improve adherence to antiretroviral treatment in a resource-limited setting: a randomized controlled trial of text message reminders. *AIDS* 2011; **25:** 825–34.
5 Ford N, Nachega JB, Engel ME, Mills EJ. Directly observed antiretroviral therapy: a systematic review and meta-analysis of randomised clinical trials. *Lancet* 2009; **374:** 2064–71.
6 Lucas GM, Flexner CW, Moore RD. Directly administered antiretroviral therapy in the treatment of HIV infection: benefit or burden? *AIDS Patient Care STDS* 2002; **16:** 527–35.
7 Lima VD, Bangsberg DR, Harrigan PR, et al. Risk of viral failure declines with duration of suppression on highly active antiretroviral therapy irrespective of adherence level. *J Acquir Immune Defic Syndr* 2010; **55:** 460–65.

Errata

Jentes ES, Poumerol G, Gershman MD, et al. The revised global yellow fever risk map and recommendations for vaccination, 2010: consensus of the Informal WHO Working Group on Geographic Risk for Yellow Fever. Lancet Infect Dis *2011;* ***11:*** 622–32—On page 625 of this Review, the margin link to the yellow fever risk maps should have been "http://www.who.int/ith" and the margin link to the CDC's vaccination map should have been "http://wwwnc.cdc.gov/travel/yellowbook/2012/chapter-3-infectious-diseases-related-to-travel/yellow-fever.htm". On page 626, the second sentence of the first full paragraph in the right-hand column should have read: "Regions in the south, including Santa Catarina and Rio Grande do Sol, have intermittent yellow fever virus activity when there is southward expansion of the virus". On page 626, the first sentence of the second full paragraph in the right-hand column should have read "Areas of Colombia…except for the arid Uribia municipality in the Guajira Peninsula, which is probably unsuitable for *Haemagogus* spp mosquitoes". In table 2, the entries for the 2010 consultation on yellow fever and international travel revised classifications for Argentina, Brazil, Colombia, Ecuador, and Peru have been updated. The areas in Argentina with transitional risk for yellow fever are "all departments of Misiones (including Iguassu Falls); and Departments of Berón de Astrada,…and Santo Tomé in Corrientes Province". The areas in Brazil with endemic risk for yellow fever are "entire states of Acre…and designated areas of Bahia, Paraná, Piauí, and São Paulo states". The areas in Colombia with low potential for exposure are "areas below 2300 m in the departments of Narino, Cauca, and Valle de Cauca; the Alto Baudó,…Tadó, and Unión Panamericana municipalities of the Choco Department; and the cities of Barranquilla, Cartegena, Cali, and Medellin". The areas in Ecuador with endemic risk for yellow fever are "areas below 2300 m in the provinces of Morona-Santiago, Orellana, Pastaza…and Zamora-Chinchipe". The areas in Peru with transitional risk for yellow fever are "designated areas of Piura region". The areas in Peru in which yellow fever is endemic are "areas below 2300 m in the regions of Amazonas,…and Ucayali and designated areas of the following regions: Ancash Apurimac,…and Puno". The areas in Peru with no risk are "areas above 2300 m; the cities of Cuzco and Lima, Machu Picchu, and the Inca Trail; and all areas not listed above". These corrections have been made to the online version as of Jan 23, 2012.

Heffron R, Donnell D, Rees H, et al. Use of hormonal contraceptives and risk of HIV-1 transmission: a prospective cohort study. Lancet Infect Dis *2012;* ***12:*** 19–26—In table 5, the odds ratio (95% CI) and p value for detection of any genital HIV-1 RNA in HIV-1 positive women taking injectable contraceptives should have been 1·38 (1·05 to 1·81) and 0·05 and for those taking oral contraceptives 0·98 (0·63 to 1·52) and 0·43. This correction has been made to the online version as of Jan 23, 2012.