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been incriminated as a local vector in the coastal villages of Pondicherry.^{4,5}

The tsunami-affected villages in the Nagapattinam district and Pondicherry have a history of imported malaria, primarily because of occupational movement of the fishermen,⁶ in addition to a low level of indigenous transmission in a few pockets. *An. culicifacies*, which is sensitive to salinity beyond 12 ppm, was the only known vector species recorded in the areas, but at a low density. The species breeds in coconut, casuarina, and vegetable garden pits.⁷ The tsunami has reduced the breeding potential of these habitats because of the increased salinity of the habitat waters. However, if these saline water habitats are diluted by rainwater in the future, they are likely to favour the breeding of the brackish water form of *An. subpictus*, which tolerates a salinity range from 967–5832 ppm.⁸

Screening of fever cases by the public-health department revealed that the fever rate has been low (5–8%), and among the people with fever in the relief camps or the affected villages, there were no people who tested positive for malaria. Furthermore, at present, there is no work-related movement of fishermen, and hence there is no question of importation of malaria. However, the arrival of people from other parts of the country, including malaria endemic areas, in connection with the relief and rehabilitation activities bring with it the risk of malaria importation.

There were a few suspected cases of JE recorded in the agricultural belt, which is far away from the coastal areas. In the present survey, a few larvae of *C. tritaeniorhynchus*—the major vector of JE—were collected from the puddles in one of the villages. The risk of JE occurrence is expected only when the vector density is enormous and other factors are conducive for transmission.⁹ This situation is unlikely to arise in the immediate future, as the paddy fields—the preferential breeding habitat of *C. tritaeniorhynchus*—are too saline.

There have been no reports of dengue cases in the Nagapattinam district. Although there are plenty of small containers and other receptacles (including broken boats) for water pools to form and support the breeding *Aedes aegypti*, there is little possibility of them supporting the breeding of the dengue vector, because the tsunami occurred after the northeast monsoon season (September–November) and

there is a low probability of rain until the next southwest monsoon (June–July). Moreover, the local people do not store drinking water at present, because protected water is being supplied. This situation is unlikely to change until the fishing community goes back to their villages.

Although analysis of the situation indicates that there is no risk for outbreaks of vector-borne diseases at present, surveillance must be continued and focused on the change in receptivity of these villages to vectors when the areas are reclaimed for rehabilitation by dredging and other activities. The movement of fishermen and others must be monitored to assess the possibility of bringing parasite infection in to the villages.

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Preparing for the first influenza pandemic of the 21st century

The tsunami tragedy in Asia cruelly exposed the citizens of this area to the mercy of mother nature through lack of planning and scientific investment.¹ In living memory, however, the even greater destructive power of the global outbreak of Spanish influenza overwhelmed a world totally unprepared. In the 7-month period from Oct 1918 to Mar 1919, as many people as died as a result of the tsunami died of virus-triggered pneumonia in every country of the world

each and every day, reaching a staggering total of 50 million.^{2,3} In 1918, and during the next pandemic in 1957, the scientific infrastructure was still minute and, although influenza vaccines were under serious development, there were no antiviral drugs licensed to combat pandemic influenza. Given the long lead time to reformulate vaccines, it is now acknowledged that antiviral drugs will be our first defence to reduce the mortality—and social and medical

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disruption—of the first wave of the next influenza pandemic. Influenza pandemics arise and spread as a succession of waves and then settle down to cause yearly epidemics. Given the lack of both antivirals and vaccines, our forebears struggled with the global outbreaks of the past with a mixture of masks, quarantine, and social distancing. There is no evidence that this entirely sensible defence had any effect whatsoever.

As we begin the new century, the WHO in particular has recognised, and broadcast very widely—often to deaf ears—that the key to not being overwhelmed in the first wave of a global infection is to plan very carefully and thoughtfully while there is still time.⁴ There is a window of opportunity open now that will gradually close over the coming months.

The WHO and the wider scientific community believe that we are as close to the next pandemic as we have been any time in the past 37 years. Two of the three widely recognised prerequisites for a human pandemic have been met in the avian influenza outbreak in east Asia: first, the emergence of a new influenza virus (avian influenza H5N1), to which the population has little or no immunity, and against which there is—to date—no effective vaccine;⁵ and second, its transfer to human beings with virulence. The virus is even battering its way through the final barrier—passage from person to person.⁶ The Director General of the WHO, Lee Jong-wook, discussed the danger of a pandemic of a new infection such as avian influenza with the WHO executive board in January, and highlighted the need to establish emergency systems for an immediate and effective response to an international health crisis. So where are we in terms of planning our response to the threat of an influenza pandemic?

A key part of a pandemic plan is clinical management options. Undoubtedly this is our Achilles' heel. The influenza science base is strong but practical application is frighteningly feeble. Essential stocks of antivirals and vaccines are notable by their absence. Research shows that the neuraminidase inhibitor (NI) antivirals are very effective against the human and avian H5N1 virus strains, while research into the composition of vaccines against H5N1 has led the USA to order 2 million doses, which will protect the population, at least in a small way, if the next pandemic stems from this strain.⁵ But what about the remaining 290 million or so citizens of the USA? How will they be protected? The outbreak of severe acute respiratory syndrome (SARS) in southeast Asia and the deliberate release of anthrax in the USA have shown that modern societies do not take kindly to outbreaks of infectious disease and they are prone to panic very quickly.

The UK, USA, Canada, France, Germany, Japan, and about a dozen other countries, have a pandemic plan in place. However, there is still a long, difficult, and frustrating road ahead to ensure nations are well prepared when the next in-

fluenza pandemic strikes. Reassuringly, Australia and France have moved a step forward in planning and will start to stockpile NI drugs for 20–25% of the population.

The great advantage of antivirals is that they can be stockpiled for future use, providing a critical management option in the first months of a pandemic and during the first great wave while a vaccine is in development. There are a number of antiviral attributes that may lend some drugs to being more appropriate than others for stockpiling. For example, the M2 ion channel inhibitors (amantadine and rimantadine) and one of the NIs (oseltamivir) can be taken orally; however, the M2 inhibitors are more likely to be associated with the emergence and spread of drug-resistant influenza than oseltamivir. Thus, the WHO have highlighted the importance of selecting appropriate agent(s) for stockpiling as part of national pandemic plans.⁷

In the two pandemics in 1957 and 1968, the casualties were in excess of 6 million worldwide and the virological community did very little except to observe and record. But the SARS outbreak of 2003 awakened a new aggressive spirit, underpinned with molecular science and rapid diagnostics. We would no longer wish to be the passive audience at a macabre theatre of infection; rather, infectious disease experts, mathematicians, virologists, vaccine specialists, and chemotherapists would be thrown into the fray. The confrontation with SARS was very much like a battle. Indeed, the troops on the ground—epidemiologists, nurses, and doctors—died. The WHO uncovered its new power and used it to the full—nations who failed to act were exposed and had travel restrictions applied. This measure rocked even countries with a firm economy.

The world was lucky with SARS. It turned out to be a slow dachshund of a virus akin to smallpox, and not a speedy greyhound like measles or influenza. These plodder viruses are characterised by a low basic reproductive rate (R_0)—in the case of SARS, the R_0 was 2, meaning that from a single case only two new cases would be expected. Together with a long incubation period of 10–12 days, the epidemic could be—and was—broken by quarantine. Surprisingly, a retrospective study of the 1918 influenza pandemic has suggested a low R_0 of 3–4. But influenza has another vital attribute: a very short incubation period. Thus, we will not be able to rely on quarantine as a defensive measure, except as a second-line strategy. Our first defence must exploit the scientific advances of the past decades: new drugs and vaccines.

The UK has a proud history of intervention and innovation against infectious diseases, from the individual heroism of the people of Eyam during the Black Death, to huge investment in the sewage systems of Victorian Britain, and, in the past century, the scientific discovery of influenza itself as a virus. The UK has more pandemic plans than any country, and a strong, supportive scientific and infectious disease community. But very serious decisions must be made

now. The Department of Health has spearheaded discussions about the pandemic plan and supported the purchase of smallpox vaccine stocks in the unlikely event of a bioterrorism attack. But mother nature is more capricious and powerful than any bioterrorist. The coming influenza pandemic will cut huge swathes in the world community, and history would look with a jaundiced eye should governments hesitate and not join in this war, and place monetary priorities elsewhere.

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Infection control in *ER*: how hand-washing is avoided even in fiction

The television series *ER* is a well-written fictional drama that shows procedures to diagnose, treat, and deal with patients and family members with diseases frequently seen in an emergency room. The medical level shown is state-of-the-art. We understand that the series does not pretend to explain all the circumstances involved in medical practice, but the lack of attention given to very well known and important measures to prevent infections in the medical setting is noteworthy. The educational effect of such a popular television series cannot be disregarded and, up to now, its contents have not seriously considered the importance of hand-washing as a means of protection for the health team and the patients. The dangerous message could be that prevention is useless.

Almost two centuries ago, Ignaz Semmelweis presented the practice of hand-washing as a life-saving manoeuvre.^{1,2} Even though practical and effective means to increase adherence to hand-washing exist, health-care workers worldwide neglect this practice, despite educational efforts.^{3,4} Adherence to recommended hand-hygiene procedures has been poor, with an average of 40% of health-care workers complying.² Why do supposedly well-educated health professionals not perform such a simple but essential ritual?

Factors for poor adherence to hand hygiene have been determined in several observational studies, and are mainly due to a lack of knowledge, understanding, and agreement with the guidelines.^{2–10} Furthermore, there is a deficit of infection-control professionals and adequate surveillance systems, since they are considered unappealing or unnecessary.⁴

Since *ER* could be considered the standard of medical care in USA, and because it is a highly popular television programme for medical and non-medical audiences, we decided to measure the frequency of mistakes in hand hygiene in this fictional scenario.

To measure the lack of compliance to infection-control recommendations, one of us (MVH) reviewed 100 episodes of *ER*. A list of circumstances and practices was created, based on the standard precautions established by the Centers for Disease Control and Prevention (CDC) in 1996,¹¹ and during the review of each episode we recorded every time a preventive measure was missed.

Of 1446 opportunities for hand-washing, only 0.20% were actually taken, representing 62.1% of the mistakes detected, followed by the incorrect usage of protective barriers (24.7%). It was not possible to record the total number of opportunities for the use of gloves, since they were used for most medical actions, even if they were not required; nevertheless, 54 opportunities to use them correctly were missed. There is a tendency to substitute hand-hygiene measures with the use of gloves, and hand-washing never occurred when removing gloves after being in contact with secretions. Of 207 opportunities for the correct disposal of sharp-end objects in adequate containers, only 0.9% was done properly.

The results confirmed our hypothesis—preventive measures are extremely neglected in the television series. Appropriate hand-washing is never done, and this is also true for most other preventive recommendations. These factitious practices are even worse than reality, since most studies done in the clinical setting have shown low or very low compliances with regard to hand hygiene, but less than 1% is highly unrealistic and is dangerous to show to an audience—medical and non-medical—keen to follow practices from the charismatic nurses and doctors on the television show. We should be able to take advantage of the power of the media to inform and not merely entertain the population; they—and we—deserve much more than that.

Christina Pedrazzi/SPL