

The impending influenza pandemic: lessons from SARS for hospital practice

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Routine infection control strategies are likely to have the most benefit

There is increasing concern regarding the possibility of another influenza pandemic arising from genetic mutation or reassortment of the avian influenza strain H5N1.¹⁻³ Governments have stockpiled billions of dollars worth of antiviral agents, even though efficacy may be limited.⁴ Vaccines are being developed for a disease that does not yet exist.⁵ Many birds have been destroyed in the hope of preventing a possible future mutation and spread of disease to humans.⁶ Meanwhile, since the 1918 influenza pandemic, the seasonal winter flu has killed more people than the number who died in the pandemic.⁷

The recent SARS epidemic was a wake-up call regarding the risk of major epidemics. While important differences exist between SARS and pandemic influenza, the experience of controlling SARS provides some lessons on how to prepare for major outbreaks. It is possible that the next global infectious disease threat will not be influenza. Improving general infection control procedures and preparedness has the potential to improve routine health care on a daily basis as well as improve our ability to manage the next pandemic (Box).

The SARS epidemic was not predicted. It took time to recognise that there was an epidemic and then to identify the virus.⁸ Cooperation among affected countries led to a coordinated effort to improve infection control procedures and limit spread of the disease. The epidemic was controlled largely with basic epidemiological principles of outbreak management and basic infection-control strategies.

Hospital infection control

Infection control in hospitals is likely to have the most benefit in controlling a pandemic. The following points need to be considered.

Overcrowding: Several of the hospitals affected in the SARS outbreak were suffering from chronic overcrowding (common to all Western countries). Patients were accommodated in beds less than one metre apart and routine infection-control procedures such as hand washing and changing gowns between patients were not possible. Overcrowding in emergency departments, and hospitals generally, inevitably increases the risk of infectious disease outbreaks.⁹ A separation of at least one metre should be maintained between patients and staff wherever possible.

Separation of patients should be routine for all patients with undifferentiated, potentially infectious, illnesses. The easiest way to enforce separation of patients and encourage hand washing and other basic infection-control behaviour is to physically separate the patients in single rooms.

Hand washing: Many studies have shown that hand washing protocols are not followed. This is partly related to ward layout, but also involves training and use of innovative solutions, such as staff having small antiseptic lotion bottles around their neck. It does need concerted effort and a culture change.

Masks should be used routinely when dealing with patients who have undifferentiated, potentially infectious, respiratory illnesses or any infection that can be spread by droplets or aerosolisation (eg, measles, SARS). It is unclear whether high-performance masks (eg, N95) are needed or whether fit-testing is required, but it is probably more important to wear some type of mask routinely rather than a high-performance mask intermittently. Experience suggests that known high-risk patients represent a lesser threat than an unrecognised patient presenting with what is thought to be a common condition.

Both patients and staff should wear masks.

Personal protective equipment should be simple, such as disposable gowns, gloves, masks and eye protection.¹⁰ Expensive and complicated equipment, if used at all, should be limited to high-risk procedures (eg, airway procedures), as it is difficult to use properly.

Design flaws are present in many hospitals. Examples include turbulent ventilation across patient areas and flow of aerosolised gases between treatment areas. Negative pressure rooms are frequently in short supply, if they exist at all, and would be insufficient in a pandemic. Therefore, other strategies are needed, such as physically separating patients, using curtains as separators, and cohorting infected patients as required.

The benefits of good infection control were demonstrated during the SARS epidemic, with reduced staff sickness rates and fewer common infections such as gastroenteritis.¹¹ A recent study has shown that in-hospital infection rates with multiresistant

Strategies to limit an infectious disease outbreak from any likely cause

- Strictly follow routine precautions in hospitals:
 - Hand washing (alcohol/non-alcohol based lotions preferable to soap and water)
 - Wearing of masks, gowns, gloves, goggles
 - Maintaining one metre distance between patients and staff where possible
 - Placing patients with undifferentiated infectious disease in single rooms.
- Avoid overuse of complicated or expensive approaches, as they cannot be used routinely (eg, negative pressure rooms, isolation suits).
- Limit exposure to procedures that produce aerosolisation (eg, intubation, nebulisation).
- Avoid hospital overcrowding, especially in emergency departments.
- Have a planned approach for isolation and cohorting of large groups of potentially affected people.
- Develop epidemiological and disease surveillance skills.
- Ensure staff are up to date in regular staff vaccination schedule.
- Ensure health system has a sustained surge capacity. ◆

organisms are also reduced by good basic infection control.¹² Improving day-to-day infection control will also ensure staff familiarity with basic infectious disease principles and allow rapid implementation in a pandemic.

It is prudent to ensure that all first-line staff are fully vaccinated for common diseases, and risk assessment should be undertaken regarding other vaccination for staff.

Other lessons from SARS

Epidemiological skills: Many of the hospitals and communities affected by the SARS epidemic did not have the ability to rapidly deploy skilled staff for epidemiological study of the epidemic as it unfolded. This led to delays in contact tracing and control of the outbreak.

Epidemiological skills need to be readily available, either directly through the hospital, or through a regional or national facility.

Agreed isolation procedures: During the SARS outbreak, there was little consensus on how to quarantine and cohort potentially affected people — both in hospitals and in the community. Planning and capability to perform these functions should be researched now. Additionally, planning for surge capacity should be part of routine health care planning.¹³

Coordination and oversight: A poorly integrated public health system meant policies and protocols could vary even in neighbouring communities. Governments scrambled to set up expert committees composed of individuals with varied backgrounds and no history of working together. The absence of legislation empowering governments to compel health authorities and hospitals to comply with directives led to confusion and often incomplete compliance.

An agreed regional approach for an infectious disease outbreak is essential; there are many authoritative guidelines.^{14,15} Equally, the dangers of a profusion of lengthy guidelines must be avoided. Materials must be made available to front-line staff, and should be concise, applicable and accessible.

If a major infectious disease outbreak occurs, antivirals and vaccines are unlikely to be effective initially, as it will be a new disease or mutation (whether avian flu or not). Improving routine infection control procedures within hospitals is likely to have a much greater effect on limiting a new outbreak within hospitals, as well as providing benefits on a daily basis to patients and staff.

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