

## Confronting an Influenza Pandemic: Ethical and Scientific Issues

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Keywords: resource allocation, liberty, governance, global cooperation, health policy, planning

The prolonged concern over the potential for a global influenza pandemic, to sweep across the world causing perhaps many millions of fatalities is a chilling one. After the severe acute respiratory syndrome (SARS) scares [1], attention has turned towards the possibility of an avian influenza virus hybridising with a human influenza virus to create a highly virulent, as yet unknown killer, on a scale unseen since the Spanish flu outbreak of 1918, producing more fatalities than the Great War. In deciding how countries should react to this potential pandemic, individually and collectively, a reasonable and practical balance must be struck between the rights and obligations of individual citizens and protection of the wider community and indeed society as a whole. In this communication, ethical issues are discussed in the context of some of the scientific questions relating to a potential influenza pandemic. Amongst these issues are the rights and obligations of healthcare professionals, difficulties surrounding resource allocation, policies impacting upon liberty and trade, when and how to introduce any vaccine or other form of mass treatment, global governance questions and the role of health policies in contemporary society. By considering these issues and questions in advance of an influenza, or indeed other form of pandemic commencing, countries can be better prepared to deal with the inevitably difficult decisions required during such events, rather than dusting down out-dated previous plans, or making and implementing policy in an *ad hoc* manner with a resultant higher risk of adverse consequences.

## Health Care Professionals' Obligations

Pandemic planning must include consideration of the risks that health care professionals, including medical practitioners, nurses, dentists, optometrists and ancillary workers in health facilities can reasonably and justifiably be expected to expose themselves to [2]. An acceptance of serious risks of infection or bodily harm was historically integral to being a health professional since time immemorial. Acceptance of this is less obvious in the era of readily available antibiotic treatment, vaccination against blood borne infectious agents such as Hepatitis B and drug cocktails to control the consequences of human immunodeficiency virus (HIV) infection [3]. Modern medical students no longer consider their profession as particularly hazardous. Instead, health professionals' responses relate to the potential transmissibility and consequences of exposure. This is exemplified by the duty to treat felt by healthcare workers dealing with HIV infected patients, where the infection risk is considered negligible if universal precautions are being followed, in contrast to those dealing with SARS patients [4]. Little or no debate took place regarding the obligations expected of SARS care professionals even though some staff became infected and died as a result of such exposure [5]. In some cases, however, at the height of the SARS scare, some Canadian healthcare staff refused to treat SARS victims [6]. The altruistic behaviour expected of professionally autonomous care workers previously may no longer hold in contemporary society with greater knowledge of risks and hazards. Altruistic behaviour is no longer expected to the same degree as has been the case historically [7], although some element of risk could be considered a contractual obligation since, for example, National Health Service workers do not routinely choose which patients they attend to [8]. Whilst healthcare professionals have a special obligation of beneficence to

patients, this is not an infinite obligation, since doctors are not routinely asked to, for instance benefit their patients by donating their kidneys to those of their patients who would clinically benefit from such a donation. There does not seem to be a clear boundary to assist in determining what is a moral obligation and what would constitute a supererogatory action. The role of contractual obligations in determining acceptable levels of risk are also pertinent here, as risks tend to be determined as either usual or extraordinary for a particular occupation. At times of pandemic, what is accepted as usual may however change, requiring infectious disease specialists for example, to accept higher risks than other healthcare workers [9]. These risks would include potential transmission to family and friends. Toronto doctors and nurses refusing to treat SARS patients suffered no disciplinary sanction as a result of their withdrawal of treatment, in an eerie reflection of Roman plague doctors remaining in their homes and refusing to attend the sick to protect themselves and their families [1]. Thankfully however, such instances are rare. Managers of healthcare systems have a duty of care towards their staff to minimise such risks and hazards, but also have a responsibility to determine, justify and make clear in advance of a pandemic their understanding of health professionals roles and the reasonable limits of their exposure. In developing such an understanding, consensus should be encouraged, including the involvement of professional associations such as the British Medical Association (or equivalent) and statutory bodies should be fully engaged and encouraged to issue their own guidelines.

### Resource Allocation

As recently noted by Sir Liam Donaldson, England's Chief Medical Officer healthcare facilities and staff will be placed under enormous pressure during an influenza pandemic and access to facilities will need to be targeted at those most in need [10]. Primary care staff themselves will also fall ill until any vaccination campaign becomes effective, and local hospital trusts and strategic health authorities must consider, plan

and regularly test how they would respond to the difficult ethical issues likely to arise. Who will be given priority access to primary care facilities? Will healthcare staff, local planners, politicians, police or armed forces personnel receive priority, to the disadvantage of more severely ill others, including family members? The importance of a home-based care strategy and communicating the benefits of frequent hand-washing are considered crucial, as is the establishment of a national group to consider ethical questions such as whether it is appropriate to prioritise younger over older patients and family carers over single citizens in any primary care rationing strategy [2, 10]. Identifying the likely total resource demands during a pandemic, considering different clinical attack and mortality rates is essential if reasonable attempts at allocation justice are to be made [2, 11]. Clinical attack rates of 5-25% and mortality rates of 0.5-5% appear possible. Better still to have sufficient resources in place before a pandemic strikes, as is being contemplated for anti-virals such as Tamiflu, in the absence of an effective vaccine. Balancing the need to maximise quality additional life years (QUALYS), or disability adjusted life years (DALYS) with the economic value of particular occupations and skills to society is likely to be a difficult task, resting on a utilitarian problem solving strategy [12]. In practice, however, implementing such an approach may be highly demanding on arbitrage staff and health decision-makers. Consideration must be given not just to which types of people should receive care or vaccine access but also to prioritising the types of other illnesses receiving primary care treatment. Many Torontonians cancer and heart disease patients for example, endured surgery postponements during the 2003 SARS outbreak. The level of collateral and consequential damage extended to several patients dying before receiving what would in other circumstances have been priority hospital treatment [1].

Policy Impacts on Liberty

Historical experience suggests that restrictions on individual liberty are likely to be invoked during a pandemic. In deciding upon the nature and extent of such restrictions, there is a need to weigh individual liberty versus public health related concerns. The proportionality of any restrictive response and the desirability of avoiding undue stigmatisation must also be considered. Two types of autonomy restriction are likely, with different aims. Quarantine is intended to separate exposed or potentially exposed individuals who are not yet symptomatic for long enough to determine whether they will develop symptoms, from the general population. This allows for surveillance and the identification of appropriate care strategies prior to the development of symptoms. Isolation, on the other hand, is intended to confine and physically separate symptomatic individuals from distributing infectious agents to the populace [13]. Ethical questions relating to the limiting of autonomy include whether the restrictions are justifiable and likely to be effective [14]. In determining whether restrictions are justifiable, the need for transparent communication with the public cannot be underestimated if goodwill and solidarity are to be maintained [1]. The scale of restrictions must be shown to be the minimum to be effective and applied equitably to all sections of the community. The nature, scale, enforcability and effectiveness of autonomy restrictions are likely to vary during a pandemic between different societies. Both Toronto and Beijing, for example, quarantined or isolated around 30,000 citizens during SARS outbreaks. Ontario authorities needed to issue only 22 compulsory quarantine orders within this, in contrast to the sealing of buildings, electronic surveillance and potential use of execution orders as enforcement devices in Beijing [6]. Potential UK measures restricting liberty may include the closure of sports stadiaums?, theatres, universities, schools and shopping centres. Serious consideration must be given to severe limitations of national and international air travel. The sensitive use of restriction orders in justifiable circumstances can also include 'work quarantine' orders preventing health workers from breaking journeys, donning masks and limiting contact with family or

visitors [6, 15]. Public forbearance in accepting autonomy limitations should be matched by government acceptance of the need to promulgate the benefits of these measures and endeavour to care and compensate affected individuals. The majority of Toronto paramedics voluntarily accepted 10-day home quarantine measures in the knowledge of Ontario legislation preventing loss of employment and providing generous compensation measures [6, 16]. Where justifiable and likely to be effective, autonomy restricting measures can reinforce the individual's moral obligation of not infecting others [17].

### Vaccination Timing

Vaccination and the use of anti-viral drugs prior to symptom onset are currently seen as the most effective precautions against an influenza pandemic. Demand for anti-virals currently outstrips supply and can only increase with the arrival of such a pandemic. Scientific issues surrounding a vaccination strategy include the precise nature of the viral agent against which protection is to be gained, the scale, timing and cost of vaccination needed. At this time, whilst the H5N1 avian flu strain has caused fatalities, and has recently shown human-human transmission in Indonesia [18], the real concern comes from a hybrid between H5N1 and a highly virulent human influenza strain, of the type which routinely infects 10-20% of the population annually [10]. Ethical questions include whether it is appropriate to immunize with potentially sub-optimal, early versions of vaccines, and how best to deal with an anticipated surge of risk behaviour once vaccinated. Communicating the need to limit movements for up to two weeks after vaccination is also necessary, before any protection takes effect. A difficult trade-off must be made between protection from early vaccine release and losses due to therapeutic misconception [19]. Recent improvements in adjuvants for influenza vaccines developed by Glaxo Smith Kline may enhance our response. Resource allocation issues will remain, however, no matter how effective novel vaccines may be, whilst Ferguson *et al.* [20] have recently

suggested that as little as a three-week window will exist to quarantine, identify carriers, and treat symptomatic citizens with anti-virals in an affected country before infection spreads out of control.

### Global Governance

As shown by the ease with which SARS spread across Asia and on to Canada, epidemics do not respect national boundaries. Should a pandemic arise, global governance issues will become as important as local arrangements. The role of the World Health Organisation (WHO) in communicating information on disease status, travel advisory warnings and regional information will be very important. In this regard, recent events in Indonesia including the deaths of seven members of the same family from avian flu in Sumatra, are concerning. Speed of response, sharing of viral sequence information and data sharing have all been shown to be key matters where improvements are desirable. WHO and the governments involved face several dilemmas, including the ownership of and when to share viral sequence information with others, and the economic and social implications of issuing travel advisories for international air travel, tourism and other forms of commerce. Differences of opinion between WHO and affected governments appear inevitable and the ethical dimension of these differences should not be ignored. As yet, no clearly communicated decision support tool to decide whether the national economic interests, or global concerns should take priority exists. In the recent Indonesian avian flu clusters, the first acknowledgement of likely extended human-human transmission caused stock market panic. The understandable protectiveness of national governments towards their own economy must however be weighed against delaying release of scientific data. A mutation found in Turkish and apparently at least one Indonesian sample substituting glutamic acid with lysine at position 627 in the PB2 domain of the polymerase gene may be associated with an increased viral

ability to survive and be distributed from the cooler regions of the upper respiratory tract, including the throat and nose compared with previous H5N1 strains [18]. Other governments, including China have also been slow to release avian flu viral sequence information and this reticence to share biological data internationally must be overcome if effective and ethical preparations are to be made [21].

### Policy Responses, Society and Preparedness

Considering important ethical issues prior to setting pandemic policy will help to ensure that appropriate responses are developed [10]. Levels of preparedness will be lower if questions of healthcare workers' obligations [22], resource allocation prioritisation, restricting autonomy, treatment timing and global governance have not been addressed. Ethical policy responses in a just society should be the product of transparent decision making processes, involving, as far as is reasonable, public participation. Measures for dealing with an influenza pandemic should be published and easily accessible in advance and related to the analytical framework guiding the decision making [23]. It is only by incorporating consideration of ethical issues such as these, alongside scientific, sociological and economic issues, that society can be fully prepared for the pandemic.

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