

Editorial: Epidemics and fear

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Humanity has but three great enemies: fever, famine and war; of these by far the greatest, by far the most terrible, is fever (Osler 1896).

The word 'epidemic' has ominous connotations – images of plague sweeping across continents, leaving death and despair in its wake (Koshland 1986). The prototype of an epidemic is what happens when an infectious agent is introduced on 'virgin' soil. When, for example, European and African pathogens were brought to the New World, this resulted in demographic disaster for the Amerindians: the population dropped to 4% or 5% of what it had been in pre-Columbian times.

'Behind such chill statistics lurks enormous and repeated human anguish, as whole societies fell apart, values crumbled, and old ways of life lost all shred of meaning. A few voices recorded what it was like: "Great was the stench of death. After our fathers and grandfathers succumbed, half the people fled to the fields. The dogs and vultures devoured the bodies. The mortality was terrible."' (McNeill 1976).

Europe's history, too, has been shaped by the demographic impact of epidemics: half of its population died during the Black Death of the 14th century (Ziegler 1969).

'... The ravages of armies ... probably did not damage Mediterranean populations as much as the recurrent outbreaks of disease, for, as usual, disease found fresh scope in the wake of marching armies and fleeing populations' (McNeill 1976).

Even in the 20th century military and civilians paid a heavier toll to disease than to bullets or swords (McNeill 1976). The death toll of the influenza epidemic in the wake of World War I matched that of the military operations; and if one can extrapolate from recent data from Iraq (CDC 1991; Ascherio *et al.* 1992; Anonymous 1995) and Sudan (Herwaldt *et al.* 1993; Krug *et al.* 1994; Veecken 1997; Seaman *et al.* 1998), germs are still deadlier than guns.

Epidemics have influenced history through both their demographic impact and their effect on the behaviour of societies. Reactions to epidemics or the threat thereof are a

combination of fear and flight (Curtin 1989), blame and explanation (Nelkin & Gilman 1991), and appeal to authorities (Ziegler 1969). Fear and flight have been noted throughout history: fear of the 'sweats' in 1529 caused Luther and Zwingli to break off their discussions in Marburg, and thus effectively split the Lutheran and Swiss Calvinist reforms (McNeill 1976). Fear of cholera in Tunis made the Bey of Tunis flee to Carthage in 1849 (Lacey 1994). Flight had developed into an effective strategy of the military to avoid yellow fever by the 1860s (Curtin 1989). Fear and flight were the first reactions to the recent outbreak of plague in India (Anonymous 1994) and Ebola in Zaire (John 1994; Muyembe & Kipasa 1995). Fear entails blaming (Nelkin & Gilman 1991): popular interpretations of epidemics include divine punishment or harm introduced by an 'other' who may be Jewish (Ziegler 1969), homosexual or Haitian (Nelkin & Gilman 1991). The medical paradigm, on the other hand, is shaped by John Snow's investigation of cholera in London in 1854 (Lacey 1994) and the germ theories of the late 19th century, which form part of health professionals' collective consciousness: epidemics may be frightening, but can be managed through sanitation, vaccination and case management. Epidemics are the diseases that best fit the military metaphors of medicine.

Populations faced with epidemics typically turn to religious or administrative authorities, expecting a response to what is considered a threat to society (Zinsser 1935; Ziegler 1969; Braudel 1973; McNeill 1976; Livi-Bacci 1992). In Renaissance Italy, the plague led to the first rational organized responses by civil authorities to public health problems (Ziegler 1969). From 1630 onwards all major cities regularly controlled access and took measures of hygiene and quarantine. In the beginning this was done without co-ordination, but gradually the state played a bigger role:

'The plague of 1667–1669 gave proof of the effectiveness of measures that were well co-ordinated at the highest levels, and severely implemented in the field, as ways to keep "the terrifying disease" in check.' (Delumeau & Lequin 1987).

Eventually, authorities' reactions to epidemics legitimized the role of the state in public health both in Europe and else-

where. In sub-Saharan Africa, from the 19th century onwards, colonial medicine tackled epidemic threats such as sleeping sickness, meningococcal meningitis, plague and smallpox (Suret-Canale 1964). In French West Africa this pre-occupation was so strong that it shaped the very organization of health services, with their focus on hygiene in the cities and military control of *les grandes endémies* (Van Lerberghe & Pangu 1988).

Bio-demographic burden and fear

Not every disease is labelled 'epidemic'. Dictionaries usually refer to large numbers and rapid spread (Collins Cobuild Essential Dictionary 1988; Cambridge International Dictionary of English 1995). Medical definitions contrast epidemic with endemic, where endemic means 'usual' or 'normal' and epidemic 'unusual' (Brès 1986); they mention 'numbers clearly in excess of normal expectancy' (Last 1983; Dorland's Illustrated Medical Dictionary 1994), *augmentation inhabituelle* (Manuila *et al.* 1971; Jammal *et al.* 1988), or 'not continuously present and introduced from outside' (Stedman's Medical Dictionary 1982). All these definitions are unsatisfactory. First, they fail to cover all situations where the term epidemic is currently used, both by the general public and by health authorities. Some epidemics affect only a small number of people, or spread slowly. Others – such as measles – are predictable, and are neither unexpected nor unusual (Brès 1986). The ongoing AIDS 'epidemic' is quite stable in many countries. Second, these definitions reduce the significance of epidemics to their bio-demographic burden; to what can be quantified in terms of case load and deaths, attack rates and case fatality rates (Walsh 1990). On top of these epidemiological and demographic considerations, however, and unlike most other diseases or health risks, epidemics trigger specific value-laden social perceptions (Rosenberg 1991). Panic and putting the blame on someone or something (Nelkin & Gilman 1991) are as much part of what is indicated by the word as the disease itself (Figure 1) (Rosenberg

1991). The collective memory of the suffering and threat to the survival of society partially explains the psychological impact of epidemics. This psychological dimension is difficult to quantify, different in each concrete situation, and often disproportionate to the bio-demographic burden (McNeill 1976). It is influenced by the understanding of the disease and its history and seems strongly linked to the perception of risk and control, which in turn is linked to control measures available and implemented, and the public's trust in its medical system and leadership (Foege 1991).

Managing epidemics: balancing response to burden and fear

Public health managers should acknowledge these two dimensions of epidemics: their bio-demographic burden and their psychological impact. Decisions on interventions to control epidemics are usually motivated both by an assessment of the probability of excess morbidity and mortality and by fear. Fear causes pressure to act, but also facilitates the mobilization of resources. The resulting time pressure usually does not allow for putting the expected burden of the epidemic in perspective with other health problems. The expected additional burden is usually overestimated (worst-case scenarios carry the greatest weight). The knowledge base used for the decisions is often incomplete, and time constraints may leave it so (Figure 2).

Several factors thus converge to lower the quality of decision-making; these same factors, however, help to increase the resources made available for controlling the epidemic threat (Figure 2), often above and beyond the necessary. Inefficiency is then not surprising. Limiting excess morbidity and mortality and reducing fear should be balanced objectives of decision-making. Explicitly acknowledging the role of fear in epidemics is a prerequisite for their sound management. This is not as straightforward as it seems: little appears to be known about how best to handle the fear generated by epidemics. The perception of risk is not always in tune with the actual risk (British Medical Association 1987). Studies on the appreciation of risk show three key features relevant to epidemic control: First, people intuitively overestimate the risk of rare events and underestimate the risk of common events. Second, the notions of uncertainty and risk are systematically confused. Third, perception of risk is linked to the subjective feeling of control: although driving your own car may be more dangerous than taking a plane, the risk of driving is more readily accepted than the risk of flying. Consequently, measures that increase the feeling of control may decrease the perception of risk, fear and the psychological impact of epidemics (Foege 1991), even in the absence of biological or demographic effects.

Consequently, expert opinion on the probability of ill con-

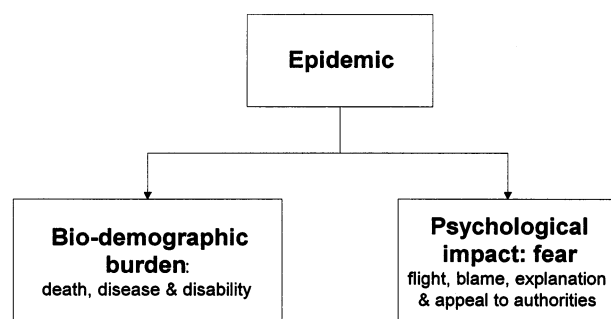


Figure 1 Two dimensions of epidemic.

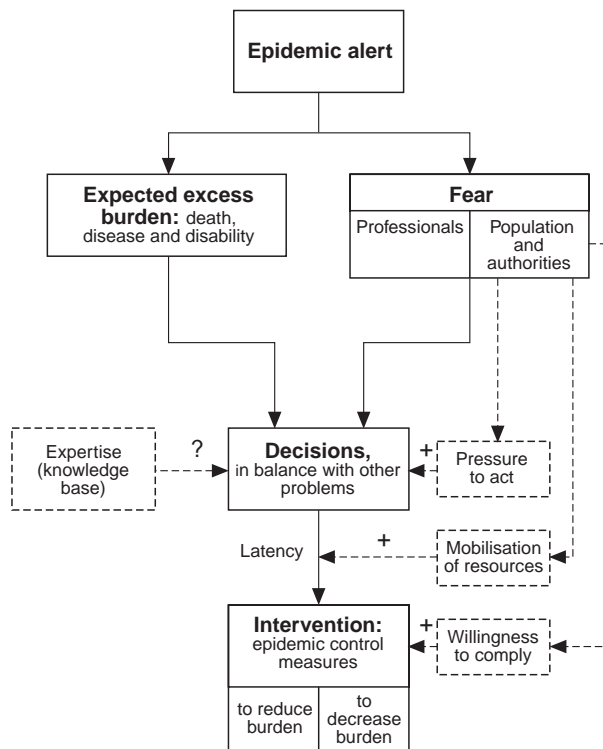


Figure 2 Decision-making in epidemics.

sequences as such hardly reduces perceived risk. On the contrary, experts trying to convince the population that risk is low may contribute to overestimation of risk, especially if attention is drawn to the uncertainty of the risk estimate in situations that are potentially catastrophic, large-scale, and beyond personal control. Recent history abounds with examples of irrational response to epidemic threats: over-reaction, such as with the swine-flu non-epidemic (Dutton 1988), or underestimation, as in case of AIDS. Epidemics are characterized by time-pressure and fear. In such circumstances it is difficult to distinguish uncertainty and risk, put probabilities of individual harm in perspective with other risks and allocate resources accordingly. Dealing with time pressure and fear – among professionals as well as the public – is an essential aspect of epidemic control. Failure to do so is what renders much of decision-making in epidemics so irrational and inefficient. Facing our fears is as important as knowing biology.

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