

Psychosocial consequences of infectious diseases

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Abstract

Historically, there has been an exaggerated fear related to infection compared to other conditions. Infection possesses unique characteristics that account for this disproportionate degree of fear: it is transmitted rapidly and invisibly; historically, it has accounted for major morbidity and mortality; old forms re-emerge and new forms emerge; and both the media and society are often in awe. Because, in an outbreak, the patient is both a victim and a vector, and because there exists the potential for infringement of personal rights in order to control an outbreak, infection may be viewed (and has been depicted in popular culture) as a foreign invasion. During recent outbreaks, fear, denial, stigmatization and loss have been recorded in the implicated individuals. Stigmatization and discrimination may further involve ethical correlations, and attempts to address these issues through activism may also have unwarranted effects. Public health initiatives can address the public's fears by increasing health literacy, which can contribute to reducing stigmatization.

Keywords: Emerging infections, epidemic, mortality, pandemic, re-emerging diseases, social fear

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Parallel Stories

A man watches the news and starts feeling anxious. His hands feel sweaty and his heartbeat increases. He experiences a sense of agitation as he hears of a possible bird flu pandemic. The media puts before him scattered images of people rushing to buy flu vaccines, discussions on the utility and potential shortage of antiviral agents, journalists reporting the death toll of the previous influenza pandemics, the hundreds of millions of birds slaughtered in Southeast Asia, the hundreds of millions of human victims expected worldwide, the extraordinary expense of the control of past outbreaks and the anticipated expense apparently needed to enhance preparedness. The man feels overwhelmed by the amount of information.

In a nearby hospital, a nurse in the emergency department thinks of asking for a long-term leave because she wants to be absent when an outbreak emerges; she is thinking of her family and feels she is unqualified to deal with, and not secured against, morbid infection.

An infectious diseases specialist is on a plane, returning from an international congress on infectious diseases; several hours earlier, he attended a lecture about the then evolving severe acute respiratory syndrome (SARS) outbreak. Now, a Chinese passenger sits in a nearby seat; the specialist is transiently overwhelmed by fears: what if this person is a carrier; what should one do if this fellow passenger coughs? Later, he manages to reassure himself.

These three individuals, among many others, experience levels of fear associated with infectious diseases in their everyday lives. They share the anxiety, the uncertainty, and the potential for irrational behavior due to fear of an unknown disease. They suffer from 'germ panic' [1].

Inducing Health-Related Fear: Why Infectious Diseases Predominate

Infectious diseases have had a significant role in shaping human history, and are responsible for, through the great plagues of the past, more deaths than any other human pathology [2]; these outbreaks have engraved an automatic response in our subconscious of a fear of infection. In an era of major scientific progress in battling, and even eliminating, certain infections, this fear may seem unwarranted. Yet 'germ panic' consistently re-emerges, in contrast to the fear

related to more burdensome entities, in terms of mortality, such as cardiovascular disease.

Why is it that infectious diseases cause the most significant psychological unrest, both in the public and in health professionals alike?

Infection is: (i) transmissible, (ii) imminent and (iii) invisible. Moreover, the field of infectious diseases is ever-expanding. The risk of cardiovascular disease is a recognized entity with predisposing factors that have changed little over the years. On the other hand, numerous new major threats have emerged during the last three decades; the pandemic of AIDS, the SARS outbreak, the ominous scenarios of an avian influenza pandemic, and the threat of biological weapons are just some examples explaining the concern among health authorities, the media, and the public. The evolution of the 'global village' further enhances the fear of contracting exotic diseases that can be imported into metropolitan areas (e.g. the Chikungunya virus) [3], diseases that can be transmitted in the context of air travel [4,5], or simply diseases that emerge in new areas as a result of nature's peculiar ways (e.g. the West Nile Virus New World epidemic) [6].

Stages and Faces of Fear of Infectious Diseases

Fear, in strict neuropsychological terms, is a normal reaction to an evolving threat, preparing the individual, both physically and mentally, for an acute response to possible harm. This reaction, however, is triggered both in the cerebral cortex, the outcome of a rational mental approach to the present situation, and by the amygdala, a process generated earlier than the cortical one, which is subconscious and potentially irrational, often crossing the barrier to panic. There are numerous exogenous factors that shape the nature of this subconscious response.

The psychological response of both patients and the public to the threat of infection has been evaluated with respect to numerous circumstances in recent years, not only acute outbreaks such as SARS, but also gradually evolving pandemics such as AIDS, threats with marginal risk for humans such as bovine spongiform encephalopathy (BSE; mad cow disease), and even threats that are only theoretical such as avian influenza. Moreover, inordinate psychological responses to infection have been recorded in the context of epidemics.

1 *Psychosocial reactions in acute outbreaks: the case of SARS:*

When dealing with an acknowledged threat, awareness may contribute to minimizing the psychological consequences. This was not the case in the SARS outbreak,

for which an unidentified, readily transmissible agent with high mortality was responsible. Fear, denial and frustration, which comprise three sequential stages of the rational response to fear, have been reported as predominant among patients or quarantined individuals during the SARS outbreak in Canada and Amoy Gardens in Hong-Kong [7–9]. Loss and a conflict between duty to the patient and the will to be with one's family have been recorded in health care workers quarantined during the SARS outbreak in Canada [10]. Anxiety extends (in the case of patients and exposed persons) beyond the physical consequences of infection, to social consequences such as stigmatization, with the latter even extending to Asian populations of non-endemic regions such as New York's Chinatown [11]. A similar case of stigmatization during an acute outbreak was also racially orientated: in the US 1993 Hantavirus outbreak, the Native American Indians were stigmatized by the term 'Navajo disease', a term which ignored the fact that non-Navajos were also becoming ill; as a result, 'anti-Indian racism mixed with fears of disease' emerged [12]. The potential effect of psychological reactions was also exemplified in the 1994 plague outbreak in Surat, India, which led to an extended official and unofficial quarantine, with stigmatization being disproportionate to the extent of the outbreak [13]. In the case of an unknown agent, a lack of preparedness on the part of medical authorities and misleading information reproduced by the media may further aggravate these pathological psychological responses. In the SARS epidemic, both these factors have been recognized, and media miscommunications and inconsistent health policies have been highlighted as factors amplifying stigmatization in Hong Kong [7]. Medical authorities can also inadvertently augment a problem by initiating and recycling fear. Apart from the awe-inducing isolation procedures, devices and uniforms (with the latter being reminiscent of astronauts and the concept of alien invasion), the medical disputes over preventive and therapeutic strategies may perpetuate fear when made public.

2 *Psychosocial reactions in gradually evolving epidemics: the case of AIDS:*

The AIDS pandemic was also attributed to a hitherto unknown agent, but significant differences contributed, in part, to shaping the psychological response of both patients and the public. The AIDS pandemic developed over a period of years, instead of days, and it was related to sexual practices, further influencing public response. The initial stages of the disease, however, were reminiscent of the 'Navajo disease', in that a marginalized

population was targeted and stigmatized. However, the history of AIDS highlights the fact that such discrimination continues to exist, and targeted populations are marginalized through germ panic. Activism here acts like a double-edged sword; it fights discrimination and augments public health literacy, but may also enhance fear [1]. Attempts to raise awareness of an issue may be subject to media misinterpretation; continuous discussion of an issue may raise awareness, but also may raise the sense of threat in individuals who are inadequately informed. Although the psychological responses to some extent reflect the epidemic, the AIDS story exemplifies that responses also reflect the content of public education campaigns and public health efforts, as well as media and news coverage [14]. The Surgeon General's AIDS-related campaign in the USA took place in 1988, comprising the first official nationwide effort to promote risk reduction or even explain the mechanics of HIV transmission. It is worth noting here that a pamphlet by Callen and Berkowitz entitled 'How to Have Sex in an Epidemic', produced by several gay activists, was distributed in 1983, 5 years ahead of the Surgeon General's campaign, to help sort through the confusing information concerning the new epidemic and the divergent theories regarding the cause of the syndrome [15]. As a result, the epidemic was better understood among the gay community, regardless of the officials' silence, which left the rest of the population uninformed for a protracted period. A similar observation was made in Israel in a region that was affected by poultry avian influenza; the residents of this area had a significantly greater understanding compared to residents of the rest of the country [16]. Awareness is a key issue, particularly when there is ample time for it to be enhanced.

- 3 *Fear of forthcoming epidemics: the case of avian influenza, mad-cow disease, and more to come:* Fear may be a physical response leading to individual protection, but, sometimes, protective measures undertaken according to public initiative can lead to increased morbidity because of the protective measures themselves rather than the threat against which they were supposed to be protective [17]. In the case of both BSE and the, only now gradually subsiding, avian influenza pandemic scenarios, a common denominator was the climax of the threat, with the mass media capturing the public's attention, classically highlighting the subconscious, and memories of the great epidemics of the past (e.g. the 1918 Spanish influenza pandemic). In the case of BSE, fear rapidly extended to other countries [18,19] and continents [20–22], aided by coverage of the subject in well respected journals of medical and

general interest; in the latter case, with eye-catching titles such as 'can it happen here?'. In one French study [19], the perceived risk of BSE (which is significantly different to the actual risk) modified the public's approach towards meat consumption, although this modification of the peoples' cognitive and affective responses to hazard peaked rapidly and subsided in approximately 1 year. In the case of avian influenza, a similar 'vaccination panic' that rapidly subsided was recorded in Greece [23], underlining the distorted ways in which the public reacts when overwhelmed by information. The psychosocial effect of misconceptions about the disease was also demonstrated in Israel, where the public had a distorted perception of the dynamics of human-to-human transmission [16]. The way that the media and scientists present relevant information can also account for this effect [24]. 'Scare statistics' and imaginary titles in the news all contribute to arouse the subconscious perception of threat; although some have proposed the use of fear as an educational tool, behavioral effects in this case have not been demonstrated [25]. Regarding avian influenza, fear extends to hospital personnel and the public alike [26,27], and cannot be underestimated. A study conducted in Hong Kong showed that the majority of the public would expect panic or other forms of stress-related responses to emerge [28], as well as a potential for stigmatization [13].

- 4 *Fear of infection in non-epidemic situations:* People continue to use antibiotics, even when advised against doing so, for numerous respiratory tract infections of obvious viral origin. Patients fear that they may develop pneumonia and overestimate the morbidity, even the mortality, related to their symptoms. Infection is often considered as a social issue that indirectly leads to stigmatization, as in the case of brucellosis, where patients may express denial, because of a correlation of the infection with a lower socio-economic status (i.e. an indirect form of stigmatization) [29]. This has been the case also for outbreak-causing diseases in the aftermath of the outbreak, as with BSE, where protective measures have been dismissed by many UK farmers as potentially stigmatizing individual farmers in terms of 'bad practicing' [30].

How is Fear Shaped and Aggravated?

Fear develops in public and refers to the society. Its evolution is not a strict medical process of the nervous system, but the result of a complex interplay of medical and social factors

and forces. Fear of infection is not only engraved in our subconscious as a result of memories of former epidemics, but also because of fictional dramatizations of such potential threats. The way that infectious diseases are presented in the cinema is a typical example and can influence society's perceptions [31]. The concept of an unseen foreign invasion, the numerous apocalyptic views of the end of the world as a result of an unknown virus, and the scenes of panic, are all derived from public fears and they concomitantly, via feedback, shape these fears. Mass media is another major factor that shapes the physical and psychological response of the public to an infectious disease threat, as depicted in numerous attack scenarios in the literature [32–34]. A simulation of a Q fever outbreak in Spain after deliberate release highlighted such potential: one journalist retrieved a medical report of person-to-person transmission of the disease; the public was already informed that such transmission is not possible; some journalists accused the scientists of hiding the truth; the public felt misinformed by the scientific community. And this was a scenario focusing on an agent of limited mortality [34].

It would be unfair to judge the public as a homogenous group; the public is a coalition of numerous subgroups of individuals, with vastly different social, educational and economical backgrounds. One would expect these subgroups to face threats of infection in different manners. For example, a higher educational background should theoretically be related to lower levels of fear; on the other hand, it may be related to increased access to information in general and to medical advice, and thus to increased individual participation in the development of the perception of 'threat'. These differences in the perception of disease in general, and infection in particular, among individuals of different social, economical and educational status have not been adequately evaluated.

A series of ethical dilemmas applies to the control of infectious diseases, and these dilemmas further serve to enhance the fear of infection. The typical ethical dilemma is the conflict between feelings and decisions [35]; in an outbreak, the patient is a victim, but also a vector, and isolation and quarantine practices may make stigmatization unavoidable. A recent statistical model has focused on the effect of individual psychological responses during the outbreak itself; fear induces a 'fight or flight' response, flight in this case predisposing to outbreak spread [36]. Control of a large-scale infectious disease outbreak may often demand the infringement of individual liberties and civil rights [37]. These ethical dilemmas extend beyond the actual nature of the disease and its psychological consequences, and may implicate the means and content of public communications [38], from authorities and the media, during an outbreak (i.e. how much actual

information can the public handle without going into panic, and where does the thin line between the right to know and panic lie in this case).

Approaching Germ Panic

These recently observed psychosocial responses are not unique. We not only have re-emerging diseases, but also re-emerging responses to disease. The equivalent of the famous Plague Doctor mask of the 1600s in Venice is the white surgical mask worn during recent epidemics.

Public health initiatives can address the public's fears by increasing education about a disease. Enhanced health literacy, along with wide-ranging access to health information, can contribute to early case detection and may be useful in reducing stigma and decreasing levels of fear of an illness.

Transparency Declaration

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