Public Health and Bioethics

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ABSTRACT

Conduct that satisfies certain bioethical doctrines may come into conflict with the needs and ethics of public health. The growth of antibiotic resistance in bacteria and the spread of HIV both contribute to the difficulty of controlling infectious disease. These two sets of priorities need to be reconcile and this is likely to require a reassessment of prevailing ethical doctrines in the face of the needs of public health.

Key words: autonomy, bioethics, confidentiality, public health, informed consent, genetic typing, stigmatization, resistance gene.

Conflict between the priorities of public health and the emphasis of medical ethics on the duty of the doctor to the individual patient is of long standing and has never been satisfactorily resolved. The principal focus of public health has generally been on the need to control infectious disease. The forcible isolation of those suffering from particular infectious diseases goes back at least to the Middle Ages in the case of leprosy. However, the real rise of public health followed the discovery of the microbial causes of infection and the recognition of the causative organisms of many infectious diseases from the middle of the nineteenth century onwards. Infections were shown to be transmitted not only from those with overt disease but from those incubating disease and sometimes from chronic carriers of micro-organisms — as well as from contaminated food and water (and blood products). Medical officers of health and the public health service were given considerable quasi-judicial powers to control the spread of infections. Quarantine, a term originally used for ships and then subsequently extended to people, could be legally enforced and there were wide powers to control the spread of epidemics through infected food or water.

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Since the 1930s with the introduction of effective vaccines against many of the more common infectious diseases, and with the introduction of effective antibiotic therapy for many bacterial infections, infectious disease has become much less feared in industrialized countries. The priority given to public health control of infectious disease gradually lessened. Indeed, the 1970s saw in the United Kingdom the substitution of "community medicine" for "public health" as a medical specialty, a change which epitomizes the change in perception of what public health is about and epitomizes also an unjustified optimism about mankind's relation to the infectious agents to which they are subject. During this same period medical ethics began to concentrate less on the duties of doctors towards their patients individually and en masse, but increasingly — and not improperly — on the "rights" of potential and actual patients. In regard to this discussion the strong interpretations given to both informed consent and to patient autonomy are of great importance.

PATIENTS' RIGHTS VERSUS PUBLIC HEALTH

The thesis of this paper is that the combination of the reduced fear of infectious disease with the increased emphasis on patients' rights has given rise to a situation that is dangerously complacent and which may do great damage to public health. The problem arises because the battle against infectious disease is at the present time faltering. A number of factors contribute to this faltering.

The first is the increasing antibiotic resistance encountered among bacteria (Bartlett et al., 1993). The genes responsible for antibiotic resistance in bacteria are frequently carried in plasmids, small DNA-containing organelles which can pass directly from bacterium to bacterium (Datta, 1984). Antibiotic resistance in bacteria is thus contagious from one bacterium to another. These plasmids also tend to carry resistant genes for a number of antibiotics. It is, therefore, not the case that discontinuing the use of an antibiotic is likely to restore antibiotic sensitivity. In practical terms the process is largely irreversible.

At least two other features have also contributed to increased rates of antibiotic resistance among bacteria. The first is antibiotic abuse. This itself may seem to be justified by some "ethical" doctrines. In some parts of the world the freedom of patients to have whatever drugs they wish to buy, and in others the right of a doctor to prescribe any drug which he thinks to be in the best interests of an individual patient, have taken precedence over any public health considerations. This has led to the use of
new antibiotics in ways that are clearly inimical to preserving efficacy against resistant micro-organisms. Antibiotic abuse is wide-spread, and few countries have yet seriously come to grips with it. It is almost inescapable that in the future when new powerful antibiotics are developed they will need to be restricted for use only against specified micro-organisms with specified resistance patterns.

The second cause is the increased speed and extent of travel around the world. Infectious diseases are spread largely by infected people. Two or three generations ago the number of people who moved was small, and the time it took them to travel was sufficiently long that, if they were incubating diseases, they were likely to fall sick before they arrived. With the coming of large scale air travel, diseases can travel all around the world in days. This has brought exotic infections from remote parts of the world into large centers of population. It is likely that HIV and AIDS originated in this way in Africa by transmission from monkeys to humans and then spread quite rapidly round the world. HIV is spread largely by sexual intercourse or by contact with infected blood (as seen in intravenous drug abusers) and there is no doubt that a trend to a more permissive sexual morality has had a facilitating effect on the spread of this infection. Speculations on the origin and selective advantage of the behavioral constraints preached by most religions have proposed that these constraints may have survived because they had selective advantage within populations (Lachmann, 1983). These selective advantages may more often have had to do with infectious disease than is often realized.

PATIENTS’ AUTONOMY AND COMPULSORY VACCINATION

Vaccination is probably the medical intervention that has most affected disease mortality in the world. Vaccination has been effective in eradicating smallpox (Henderson, 1987) and in preventing many diseases produced by bacterial toxins and viruses. Vaccines are in general given to healthy children, and for this reason the safety requirements put on vaccines are necessarily extremely high. The pre-release testing of vaccine safety, however, is probably incapable of detecting adverse events that have a frequency much below one in a thousand. On the other hand, an adverse reaction rate of 1:10,000, while tolerated in the smallpox vaccine (since smallpox was a greatly feared disease), has been regarded as intolerable for most other vaccines. Even an adverse reaction rate of 1:100,000, which is the highest figure quoted for whooping cough vaccine, had a very bad effect on the use of the vaccine (Cowan et al., 1993). Even where the
prevalence of the disease and its severity may result in the saving of lives of between 1:100 and 1:1000 of those vaccinated, this risk benefit ratio does not necessarily impress the general public. Those who do not develop the disease and do not die from it are statistics and not identifiable human beings. On the other hand, an individual child who falls sick or dies as a consequence of vaccination is very much an identifiable individual whose picture can appear in the papers and whose parents can sue the vaccine company or health authorities. There is an important ethical dimension to achieving realistic and accurate perceptions of risk.

For vaccination to be able to eradicate an infectious agent, the use of the vaccine has to be high — probably well over 90% — and this gives rise to problems of consent. There is the temptation for parents to wish to include their children in the few percent who do not need to be vaccinated, and who, therefore face no possible vaccine-related risk, while the disease is being eradicated by virtue of everybody else being vaccinated. However, this course, if at all widespread, will lead to the failure of the eradication campaign. Compulsory vaccination against smallpox was attempted in the nineteenth and early part of the twentieth century in the United Kingdom before it was abandoned as a result of widespread public resistance at the time of the introduction of the National Health Service in 1948. If further campaigns to eradicate diseases in this way are to be undertaken, it is almost certain that the vaccination would have to be mandatory. This would conflict with strong views of patient autonomy and probably also with current interpretations of informed consent since many of those vaccinated will be children. But the potential gain would be so large to public health that to reject such a course on ethical grounds would seem perverse.

INDIVIDUAL GENES AND GENETIC TYPING

As novel vaccines are developed it is likely that they will need to be separately formulated for populations and individuals of different genetic composition. This will require widespread genetic typing, particularly of the major histocompatibility complex (MHC), which is the genetic locus controlling what antigens are seen by T-lymphocytes. Many people carry this type of genetic information on their donor cards and have done so for thirty years or more. It is interesting that the genetic information at this locus has never given rise to any concerns with regard to health insurance, life insurance or employment, although it is the most informative with regard to disease susceptibility (Thomson, 1995). In contrast, there is major concern about other loci that give information about disease suscepti-
bility. One reason for such concern may be that the MHC provides information about susceptibility to infectious and autoimmune diseases and the public are more concerned about predisposition to cancer, heart disease and dementia. Another reason may be that MHC typing used to be done with antibodies using white blood cells and this is somehow less threatening than tests done directly on DNA. It is this area which has drawn the most media concern. However, it may also merely reflect that MHC typing has been available for much longer than the DNA-based tests and familiarity has bred acquiescence.

There may well be a period in the next decade or two when drug resistant infections — tuberculosis, staphylococci, malaria, HIV — become significant problems even in the developed world. There will then be a need to return to policies of reducing the transmission of these infections (isolation, quarantine, closing of some public facilities), that have not been employed in the Western world since the polio epidemics of the 1950s, which involve quite substantial infringements on individual freedom. Restriction of international travel on health grounds with a return to the practices of requiring medical evidence of freedom from various diseases, which has been condemned as discriminatory in the past, may well need to be re-introduced. Such practices lead to problems on some interpretations of medical confidentiality and have already generated controversy over HIV. However, the high political profile of HIV has led to the adoption of some policies whose ethical basis seems more than slightly dubious. For example, the requirement of informed consent to perform a laboratory test for HIV infection has no parallel in the rest of medicine. No such consent is needed for testing for cancer or syphilis. Concern about stigmatization has led to such severe restrictions on information about carriers of the infection as to pose a serious hazard to the uninfected population. It is, however, the spread of tuberculosis by those with HIV that is likely to be the spur to some change of view. There is for most people some choice about exposing oneself to HIV; there is no such choice with tuberculosis.

DIFFICULT ETHICAL QUESTIONS

In many medical decisions a balance has to be reached between the interests of the individual and the interests of others. The caveat not to harm others is included in most statement of rights. These conflicts, however, are seen very starkly in relation to infectious disease. There the conflict is usually between the interests of a known individual with those of an unidentifiable individual.
The issues have so far been discussed from a utilitarian point of view concentrating on risk/cost-benefit ratios. Some *mantras of bioethics* — beneficence, absence of maleficence, autonomy, justice, human dignity and the "partimonie humaine," however, are not necessarily congruent with the greatest benefit to the greatest number. Having an unfavorable risk/benefit ratio is neither necessary nor sufficient to make a course of action ethically wicked. Indeed, the difficulties arise precisely when courses of action are held to be wicked in spite of favorable risk/benefit ratios. The capacity for utilitarian ethics to be perverted by totalitarian regimes is a compelling argument for buttressing such an ethic with one that is philosophically prescriptive.

These *prescriptive ethical systems*, however, have their own drawbacks. (1) They may give rise to harms to others by standing in the way of effective public health measures as discussed above. (2) They may make some procedures so expensive as to make them effectively inaccessible to certain populations. The insistence on counselling everyone to be tested for HIV is an example. (3) They may occasionally give rise to consequences that are plainly irrational. The requirement to obtain consent before any genetic testing would forbid determining the blood group of an unconscious accident victim. There is an urgent and constant need to reconcile these two approaches.

ACKNOWLEDGEMENT

The author is grateful to David Shapiro for much helpful discussion in preparing the manuscript.

REFERENCES


