

CHAPTER THREE: EVERYBODY'S BUSINESS

All of us have a responsibility to prevent the spread of communicable diseases. The behaviours we choose as individuals can affect transmission of many infections. For example, rejection of vaccination can threaten the life of infants exposed to serious diseases such as whooping cough. Sharing of syringes by intravenous drug users will spread blood-borne disease such as hepatitis C virus or HIV. A simple breakdown in hygiene can lead to a large outbreak of food borne disease.

Why do we continue to behave in ways that spread disease? The reasons are complex, often personal, and may involve a trade-off between an infection risk and a countervailing benefit. In our daily lives we are exposed to multiple risks. In deciding which risks to accept, we theoretically balance each risk against the inconvenience and the loss of enjoyment necessary to avoid it. As individuals we all need to be 'in the know', gathering information from experts, media and government about disease risks and control measures. As a community we need to view not only the impact of our choices on ourselves, but also the impact on the rest of the community.

IDENTIFYING RISK

Communicable disease risks depend on the ways that different microbes are transmitted. The risk of sexually transmitted disease following unprotected sex is obvious. Other risks may be less obvious.

Contaminated food or water leads to gastroenteritis. But how do we tell if food is contaminated? Raw meat and sea food are often contaminated during processing. Risky foods are those that have been poorly refrigerated, lack preservatives, are prepared in unhygienic conditions or kept warm, but not hot, for long periods of time. These conditions enable microbes to multiply³⁰, and would be present in many food stalls in developing countries. Most travellers would already avoid such stalls, just as they would recognise the need to sterilise their drinking water in areas where diarrhoeal diseases are endemic or the water is untreated. Similar risks also apply in developed countries like Australia, albeit less often. Each time we eat food we implicitly balance the risk of infection against our need to eat and enjoy food. Risks can be greater for some individuals than for others. For example, soft cheeses and pâté sometimes contain the organism *Listeria*. In most people this organism causes no harm, but in pregnant women and immuno-compromised people it can cause serious infection⁹.

Another risk comes from any break in the skin that allows infection to be introduced. For example, a puncture from a rose-thorn can lead to deadly tetanus in an un-immunised person, or to a serious bacterial infection requiring antibiotic treatment. Mosquito bites through the skin can introduce malaria or viruses; re-used needles and syringes or tattooing equipment can spread hepatitis B or C viruses or HIV. Intravenous lines in hospitals, improperly used, can allow dangerous bacteria to get into the blood stream. The skin provides excellent protection against infection but this protection is lost if the skin is pierced, abraded or burnt.



How else can organisms make their way into the body? The mucous membranes of the body are the moist areas: the lips, genital tract and conjunctivae that cover the eye. Such surfaces can allow many organisms to invade; they do not provide the same protection as intact skin. Unprotected sexual activity is well recognised as risky, but the conjunctiva of the eye is also vulnerable to organisms such as the common cold virus or more serious infections such as SARS.

Respiratory microbes enter the body through the mouth or eye, or by being inhaled. When someone with an infection coughs or sneezes, about two-thirds of the infective material will settle on surfaces or people nearby. Hands may become contaminated directly, or through contact of contaminated surfaces, and transfer infective material to the eye or mouth. Through evaporation from small droplets, about one-third of the infective particles from a cough or sneeze will become permanently airborne. Others in the room, or those breathing re-circulated air, are then at risk of infection if the particles are breathed into the lungs.

REDUCING RISK

SAFER FOOD AND WATER

Food-borne disease is prevented by avoiding contamination of food with faecal or other infected material and by preventing the multiplication of microbes³⁰. Food needs protection 'from paddock to plate' because contamination potentially starts on the farm and can occur at any step along the path to the mouth. Improvements in harvesting, slaughtering and handling procedures now enhance the cleanliness of farm products, while appropriate packaging and refrigeration reduce contamination during transport and storage. We need to pay constant attention to prevent contamination from fingers, flies, vermin, and other food and utensils. Cooking with complete penetration of heat for enough time will kill most microbes. However, there is still a possibility of food poisoning from foods contaminated after cooking or from preformed toxins that are not inactivated by cooking.

Over the centuries, food has been preserved through drying, or adding salt, sugar or acid to limit spoilage and multiplication of microbes. In more recent times, refrigeration has been effective in limiting bacterial multiplication during food storage. But even in commercial refrigerators, cold-tolerant pathogens such as *Listeria*, a hazard for pregnant women, can grow below 5°C.



The most widely accepted control system for food-borne disease is based on determining sites in the food chain that are a potential site for contamination. Experts identify all risks in the processing chain (Hazard Analysis- HA) and locate places (Critical Control Points - CCP) at which simple checks or tests (eg of temperature) can monitor any need for necessary corrections. The HACCP system⁷¹ focuses attention on preventive measures that are easy to audit rather than on a mass of regulations. It aims to assure



quality at all times even when the inspector is absent. Businesses are upgrading their food safety management systems, using 'tools' to implement food safety program with minimum cost and time. Developmental projects involve commercial food services, children's services, hospitals, nursing homes, school canteens, aboriginal community stores and seafood providers.

Australian drinking water guidelines set high standards⁷². The water treatment required depends on the quality of the source water. Uncontaminated ground water from an area free from human or agricultural waste needs less treatment than water from a source where contamination is possible (see Box 3.1⁷³).

Box 3.1 Will further water treatment lead to better health? - An innovative approach

Melbourne has a highly protected water source. Its drinking water is drawn from virgin forest catchments in the Yarra Ranges, free from agriculture or human habitation. Additional protection is afforded by long storage times in large reservoirs before the water is chlorinated and distributed in a secure and closed distribution system. Melbourne is one of only about six major cities worldwide to have an unfiltered surface water supply. There has been increasing pressure for the city to install filtration at a cost of about A\$500 million.

To resolve whether this expenditure was necessary, a large randomised clinical trial – The Water Quality Study – tested whether sterilisation of drinking water would provide any reduction in gastrointestinal disease. Six hundred families comprising 2,800 individuals had either a real or a fake drinking water treatment unit installed in their kitchen. Over an 18-month period, families recorded the number of episodes of gastrointestinal disease. There was no difference between the two groups, indicating that further treatment of Melbourne's drinking water to remove organisms would not provide any health benefit to its public. Accordingly, no filtration plant is planned for Melbourne. This study was one of the first of its type in the world.



Margaret Burgess - Director of the National Centre for Immunisation Research and Surveillance in Sydney - and a highly respected researcher and advisor on vaccination issues.

VACCINATION

Vaccination dates back to 1796 when Jenner first showed that cowpox vaccine could prevent smallpox^{14 15} (see Box 3.2). Vaccines for many other diseases were widely introduced in the 20th century. The first diphtheria vaccine and pertussis (whooping cough) and tetanus vaccines were introduced in the 1920s, poliomyelitis in the 1950s, and measles in the 1960s. Dramatic reductions of these serious diseases were seen in each decade following vaccination, as shown in Table 3.1.⁶⁷ Other childhood vaccines were introduced subsequently: hepatitis B in the 1980s and *Haemophilus influenzae b* (Hib) in the 1990s and meningococcal C vaccine from 2003.

Box 3.2 Cowpox protects against Smallpox¹⁵

In the 18th century it was known that dairymaids lacked facial scars from smallpox. Folklore attributed this to their prior exposure to cowpox, a much milder disease. Edward Jenner, a country doctor in Gloucestershire, wondered whether it might be possible to deliberately protect people against the deadlier smallpox by infecting them with cowpox at an earlier age. So on 14 May 1796, in a brave experiment that would be unethical by modern standards, Jenner inoculated eight-year-old James Phipps with cowpox pus from Sarah Nelves, a dairy-maid. Six weeks later, when inoculated with smallpox, James was found to be totally resistant. Edward Jenner's landmark discovery was that vaccination with material from cowpox sores (now known to contain vaccinia virus) would induce cross-immunity and protect against subsequent disease from smallpox, caused by a related but devastating virus. Later, Pasteur and others showed that prior exposure to weakened viruses such as rabies or to inactivated bacteria such as anthrax could also induce immunity to the disease itself.

The herd protects the individual

Vaccination is successful not only because it protects the individuals who are vaccinated, but because disease transmission ceases when most in the 'herd' are immune⁶⁸. For example, following recovery from an infection such as rubella, or following immunisation, individuals acquire long - lasting protection against subsequent infection. A rubella epidemic will end when there are so few 'susceptibles' left in the population that each case infects, on average, less than one other person. Therefore in most populations, rubella cannot spread if more than about 87% of people are immune because of prior infection or immunisation⁶⁹. Even the 13% of non-immunised children will be protected because there is no virus circulating to expose them to disease. Furthermore, susceptible pregnant women will not then be exposed to the virus and their babies are thus protected from congenital rubella and the malformations it causes. However, if herd-immunity falls below about 87% because of a low uptake rate of immunisation, rubella will again be able to spread in the population, and non-immunised children will again be at risk. Consequently, rubella immunisation rates need to be sustained to maintain population immunity for as long as the virus survives anywhere in the world.

TABLE 3.1 DEATHS FROM DISEASES COMMONLY VACCINATED AGAINST, AUSTRALIA 1926–2000

Period	Diphtheria	Pertussis	Tetanus	Poliomyelitis	Measles	Australian Population
1926–1935	4073	2808	879	430	1102	6 600 000
1936–1945	2791	1693	655	618	822	7 200 000
1946–1955	624	429	625	1013	495	8 600 000
1956–1965	44	58	280	123	210	11 000 000
1966–1975	11	22	82	2	146	13 750 000
1976–1985	2	14	31	2	62	14 900 000
1986–1995	2	9	21	0	32	17 300 000
1996–2000	0	9	5	0	0	18 734 000

Indicates decade in which community vaccination started for the disease. Reprinted with permission⁶⁷



Gordon Ada - attracted Peter Doherty to ANU where Doherty and Zinkernagel did the work that later won a Nobel prize in immunology. Professor Ada is himself a world leader in research and an adviser to WHO on vaccines.

Reduced immunisation coverage and reduced population immunity can lead to the re-emergence of vaccine preventable disease (see Box 3.3). 'Old' diseases such as diphtheria re-emerged in states of the former Soviet Union following the breakdown of public health infrastructure. Outbreaks of whooping cough, and more recently measles, have occurred in the UK when the uptake of vaccines fell as a result of unjustified alarms^{68 70} linking neurological damage and childhood autism to vaccination.

Box 3.3 Case studies - spread of vaccine preventable diseases in poorly vaccinated groups

Measles in the Netherlands:

In 1999, a cluster of five cases of measles was reported among the 390 students attending a religious elementary school. Persons belonging to this denomination routinely refuse vaccination. Municipal health services investigated and found 160 suspected measles cases among children attending the school. Eight months later 2,961 measles cases, including three measles-related deaths, had been reported to the national registry, as a result of a national epidemic triggered by the school outbreak.

Diphtheria in the newly independent states of the former Soviet Union:

Between 1990 and 1997, local production of diphtheria vaccines ceased and children were not vaccinated. This resulted in a major epidemic with over 150,000 cases of diphtheria and more than 5000 deaths. The epidemic continued until alternative arrangements for vaccine supply were made.

There were also many cases among adults, whose immunity had faded following vaccination in infancy, raising the question of whether booster doses should be given every 10 years.

PREVENTING MOSQUITO BITES

The most effective measures to reduce diseases spread by mosquitoes are to reduce mosquito numbers and to change people's behaviour. Mosquito reduction programs can minimise threats in urban centres while surveillance can provide early warning of infectious agents or of a threatening build-up of mosquitoes. Education campaigns encourage people to destroy sites where water can pool and mosquitoes can breed, (eg in old tyres), to avoid risky outdoor activities (such as camping near swamps, fishing or hunting at dusk or dawn) and to protect themselves from bites by wearing long, loose fitting clothing and by using topical insect repellents. Australian surveillance programs provide early warnings of virus transmission and mosquito activity through blood tests on sentinel flocks of chickens, strategically placed, as 'sitting ducks' in rural areas.

PRACTISE SAFE SEX

All sexually transmitted infections (STIs) are potentially controllable through 'safe sex' practices, case-finding, treatment, or vaccination⁵³. The most effective control strategy is to encourage individuals to protect themselves and others (see Box 3.4).

STIs are transmitted by people who have, or have had, multiple partners. If an individual ignores safe sex messages, there is a risk of sexually transmitted infection (STI), not only for that person, but also for future partners and future partners of partners. Over the past few years there is evidence for a decline in the impact of safe sex messages in Australia^{54 56}. It is timely to explore how messages about sexually transmitted infections, sexual risk and responsibility, and safe sexual practice can be delivered more effectively, particularly to younger

persons who may be ill-informed, or more likely to take risks. Messages about safe sex and social responsibility need to be complemented by research to evaluate the effectiveness of such messages in modifying behaviour.

Box 3.4 Sex is safer if

- *blood, semen or vaginal fluids from a sexual partner do not enter another's body,*
- *condoms are always used correctly or sex is with partners known not to have a sexually transmitted infection,*
- *a partner has not had lots of other partners.*



USE STERILE EQUIPMENT IF INJECTING

In Australia today, over 90 percent of hepatitis C infections are associated with injecting drug use. Hepatitis C transmission would virtually cease if injecting equipment is never shared between drug users⁵⁸.

An important and effective public health measure has been Australia's Needle and Syringe Program^{74 75}.

Providing free and sterile needles and syringes reduces the risk that people will re-use injecting equipment and spread of the viruses that may be contained within.

Box 3.5 Prevention

Needle and syringe programs provide new sterile syringes and needles to prevent spread of infections through reuse of contaminated equipment and:

- *encourage clients to dispose of used equipment safely,*
- *collect used needles and syringes,*
- *refer drug users to treatment.*



QUESTION THE NEED FOR AN ANTIBIOTIC

Health professionals and the public now recognise the risks we face from antibiotic resistant bacteria. The central message is that if antibiotics are 'demanded' by patients or prescribed by doctors when not really needed, the risks of generating and spreading antibiotic resistant bacteria are greatly increased.

Australia is one of the highest users of antibiotics per person in the Western world: about 24 million prescriptions annually. There are more antibiotic prescriptions written per person in Australia than in the USA. Perhaps half of Australian prescriptions are unnecessary²¹. Recommendations for doctors about antibiotics have tended to focus on 'which antibiotic' rather than on whether to use an antibiotic at all. Use of antibiotics in animals poses additional risks.

Box 3.6 Antivirals

In recent years new medications, called antivirals, have been developed which can treat serious virus infections such as influenza or HIV. These also need to be used responsibly to avoid emergence of resistance in the relevant viruses.

However, all is not lost with effective antibiotics. Animal uses of antibiotics are now subject to regulation. Prescribers and consumers are becoming more circumspect about antibiotic use. New 'rapid tests' to discriminate bacterial infections from viral infections, which do not need antibiotics, will support more rational prescribing. As antibiotic use is restricted to the more serious bacterial infections, there will be less selective advantage for resistant bacteria. Indeed, in an antibiotic free environment, bacteria with out resistance genes have a slight competitive advantage, and the frequency of resistant strains will fall, as has already been described in Denmark⁷⁶. This will prolong the useful life of existing antibiotics. Furthermore, new antibiotics will be discovered, and novel antimicrobial substances will be developed, using new genetic information, to block resistance mechanisms in the bacterial cell. Some older, discarded antibiotics have even been shown to be effective against new infections.⁷⁷

Patients, the media, doctors, nurses and pharmacists can all help to ensure that antibiotics are used less frequently and only when really needed. The 'Common colds need common sense' campaign, conducted by the National Prescribing Service and the Australian Consumers' Association, is one successful initiative. In the longer term such initiatives will help



to reduce the frequency of bacterial strains resistant to antimicrobials. Antibiotics don't cure viral infections such as colds or flu. New drugs for viral infections need to be used carefully (see Box 3.6).

ENGAGE INFECTION CONTROL

Infection control is not a new concept (see Box 3.7 and 3.8). Hygienic behaviours have long been recognised and have been taught through generations. The notion of 'public hygiene' seeks to prevent the spread of organisms from an infected person or source to someone who is uninfected. As described in Chapter One, when people are closer together or in crowded living conditions, infection can spread readily from person to person through inadvertent contamination and transmission of faecal material or respiratory secretions. Infection control guidelines aim to break the chains of microbial transmission through hand-washing and safe disposal of waste and secretions. Gloves, masks and gowns and isolation may be required in high-risk situations.

Special guidelines are available for people who work in child care²⁶ and aged care to help them reduce the transmission of disease. Prevention not only reduces immediate illness,



it can also reduce the need for antibiotics in situations where they have come to be frequently used. This in turn can be expected to reduce the prevalence of antibiotic resistant organisms. Thus the prevention of cross-infection in group care can help to ensure that antibiotics will still be effective in treating serious infections.

Box 3.7 Underlying Principle of Infection Control

Break the chain of transmission from one infected person to the next.

Box 3.8 Echoes from the past

'There is nothing to prevent as perfect a condition of sanitation in the Australian colonies as obtains in England. We have not overcrowding and poverty to contend with, our climate is one of the most healthful in the world, and we have ample means at our disposal. What we require is (1) special legislation; (2) organization and co-ordination of authority; (3) the sympathy and assistance of the public, who, at the present time, display an apathy in all matters of public hygiene.'

*Intercolonial Medical Congress of Australasia
Melbourne 1888*

Most recently, the global outbreak of SARS (Chapter 2) has reawakened our attention to the importance of infection control measures and guidelines (see Box 3.9)⁷⁸.

Box 3.9 Infection Control for SARS – A Case Study

SARS spread quickly from country to country in the early days of the epidemic when sick people were still allowed to travel by air. Subsequently, airlines and SARS-affected countries have restricted travel for people with symptoms of SARS, and for those who might be incubating the disease. This has helped to protect countries such as Australia.

At the Australian border, travellers have been alerted to SARS, and to the importance of seeking early attention should symptoms develop after arrival. Incoming passengers with symptoms are assessed and referred for expert management as required.

Persons under investigation for SARS have been managed in isolation, with barrier nursing (gloves, gowns, masks and goggles, no touch techniques and safe waste disposal) until the diagnosis is excluded or the patient recovers. The overseas experience has been that without stringent infection control precautions, SARS-affected patients are very infectious for those in close contact with them, and particularly for health care workers in emergency departments or wards who have not taken adequate precautions.

SARS only appears to be spread from people who are ill with the disease. However, as an extra precaution, contacts of known SARS cases, even if free of symptoms, have been excluded from hospitals and health care facilities for 10 days. Persons returning from SARS-affected countries need to be excluded from work or school only if they develop symptoms during the notional incubation period.



PREVENT 'HOSPITAL ACQUIRED INFECTION'

The risks of acquiring an infection in hospital should not cause undue fear, as they do not outweigh the benefit of hospital treatment³⁵. Nevertheless, patients can be more pro-active about their management in the health system, and be aware of what should be done to protect them from infection in hospital. For example, they should feel able to ask the doctor or nurse to wash their hands before contact and health care professionals should expect to be asked to do so. Unfortunately, infections acquired in hospital are more likely to be due to an organism that is resistant to antibiotics than an infection acquired in the community²¹ (see Box 3.10). Hospital-acquired infections are thus more difficult to treat.

Health-care associated infections are of major concern because of the impact of deaths and disability on individual patients, families, and health staff, and the financial burden to the community resulting from longer patients stays and increased treatment costs. It is estimated that surgical site infections could cost as much as \$286 million per year, and bloodstream infections as much as \$686 million per year. The Australian Council for Safety and Quality in Health Care has made recommendations to strengthen surveillance and reporting of health-care associated infections, to strengthen infection control guidelines and incentives for compliance, and to monitor improvements over time^{35 79}.

The complexity and time pressures in the modern health care system can make it difficult to prevent hospital-acquired infections, and delay detection and response. New infection control procedures, if implemented piece-meal, run the risk of overloading a system that is already highly stressed. Accordingly, there is a new emphasis on a system-based approach to infection control, using information technology to support training, communication, surveillance and follow-up⁸⁰. Standardised guidelines for surveillance are being introduced⁸¹.

Box 3.10 People in hospitals are at risk of infection

Patients are more likely to acquire infection if:

- intact skin is broken by intravenous lines wounds or burns,
- bowel surgery releases bacteria into usually sterile sites,
- urinary catheters are placed into the bladder,
- nearby patients have serious infections or are on antibiotics.

Patients are more susceptible to infection if they are:

- debilitated through illness,
- in an older age group,
- immuno-suppressed because of HIV or drugs that suppress the immune system.

An infection is more likely to be due to an antibiotic resistant bacterium if the patient himself, or any nearby patient, has already been treated with antibiotics.

Health staff are also at risk of infection. Stabs with used needles can transmit HIV or HCV. Close contact can spread other infections, including SARS.

INVOLVED COMMUNITIES

CONSUMER PARTICIPATION IN DECISION MAKING

Communicable disease controls have previously relied heavily on public health legislation to ensure safe food and water, waste disposal and human and animal quarantine. Nowadays, the community is better informed and able to be more directly involved in decision-making about health, with strong support from health promotion and consumer movements, governments and public health professionals. An informed public will be better able to protect itself from infection, and to participate in public discussion and decision-making. Wider participation will help to broker prevention and control programs that are technically sound, cost-effective, and most acceptable to the public and affected groups.

Box 3.11 By and With

'Health promotion is carried out by and with people, not on or to people. It improves both the ability of individuals to take action, and the capacity of groups, organisations or communities to influence the determinants of health.'

The Jakarta Declaration on Health Promotion in the 21st Century (WHO, 1997)

Australia's rapid and effective response to the AIDS epidemic was built on outstanding political and scientific leadership, strong community support, and professional strengths in epidemiology, virology, immunology, clinical medicine, and public health. Australia's partnership approach to controlling HIV depended on community education, community action and relevant social research. Early in the epidemic, gay groups recognised the risk, and how to prevent it, and helped to drive the education and harm minimisation programs that were supported by government.



Box 3.12

HIV/AIDS Control in Australia-Determinants of Success

Awareness and leadership from the most affected community (including gay men and people living with HIV/AIDS).

Political commitment from governments:

- *to provide resources for prevention, treatment and care,*
- *to deliver education programs through peer educators,*
- *to educate the wider community,*
- *to protect privacy and avoid stigmatisation.*

Expert scientific, social, medical and public health input into:

- *strategies for prevention and treatment,*
- *monitoring of the epidemic,*
- *research and development.*

Acceptance of alternative lifestyles in the media and the wider community and avoidance of stigmatisation.

Needle and syringe exchange programs

We have also learnt valuable lessons about community participation to improve health for Indigenous Australians. Where the local community is fully involved, immunisation has had excellent take-up rates, and interventions for treatment and prevention of diseases such as scabies, impetigo and rheumatic fever have been sustained⁸². Indigenous communities thus benefit from multi-disciplinary teams to deliver health care and health promotion messages that are sensible, locally relevant and medically appropriate. With improved nutrition, safe water, sanitation and hygiene facilities, a healthy lifestyle, and good medical care, rates of communicable and chronic diseases amongst Indigenous Australians will fall towards those of other Australians.

MAINTAINING TRUST IN THE WIDER COMMUNITY

Without trust and openness, it is difficult to maintain confidence in public health measures. Interventions to control the spread of disease are inevitably based on imperfect knowledge, even though it is the best information available at the time. The public recognises that

health decisions are difficult, but people may not respect the chosen path if they are not given all of the information. Open decision making is crucial and experts and government agencies at times must be prepared to acknowledge uncertainty. This is perhaps the major lesson to come out of the UK epidemics of BSE and v-CJD.

Effective media communication is fundamental to control of communicable diseases. If the media know the background to public health issues and decisions, the community will be better informed and more able to understand interventions and policies. However, as the media also need to 'sell' a story, some will report with unjustifiable sensationalism. Sensation can have unintended consequences which harm the community interest, as exemplified by the 'copy-cat' hoaxes that followed media reports of anthrax attacks in the USA. Furthermore, fear can spread rapidly if the risks and control measures for communicable disease are presented in the media without adequate explanation. A balanced and informed media can ameliorate fear and support the effectiveness of disease control measures through enhanced community understanding.

Unfortunately, even comments from health experts can have unintended consequences. Some experts, in a competition to be heard, can overstate risks, or exaggerate new research findings as a strategy to promote funding. Sometimes, their highly specialised views can promote an unbalanced perspective of health priorities, and unnecessarily fuel public alarm. It is the proper role of an informed media to explore the claims of experts, and to report on them with an eye on the overall community interest.



BALANCING COMMUNITY AND INDIVIDUAL INTERESTS

Traditional measures for communicable disease control, such as quarantine and isolation, show how individual freedom has sometimes been constrained in the interests of others in the wider community (Table 3.2). How far should health authorities be able to go to prevent transmission of infection? For, example, should

health authorities be able to require that a person potentially incubating SARS be placed under surveillance for the duration of the incubation period? Once someone develops symptoms of a disease such as SARS, should they be compelled to accept care as determined by health authorities? What is the responsibility of those who know they are infected to not infect others?

In modern democratic societies, we accept the libertarian principle that competent people, who are sufficiently informed, should be

free to take risks or lead lifestyles that might increase the probability of them becoming ill or even dying early. The sentiment of 19th century British philosopher John Stuart Mill⁸³ is echoed in contemporary thinking about public health policy: 'The only purpose for which power can be rightfully exercised over any member of a civilised community, against his will, is to prevent harm to others.'

TABLE 3.2 INDIVIDUAL AND COMMUNITY INTERESTS IN COMMUNICABLE DISEASE CONTROL

Individual Choice	Community Interest
To be free to refuse childhood immunisation.	Unless the large majority of children are immunised, vaccine preventable diseases will continue to spread.
To be able to travel freely.	If people carrying exotic diseases are not quarantined or treated the diseases could be introduced.
To refuse isolation if infected with an exotic disease such as drug resistant TB or SARS.	If infected patients are not isolated, many more people will be secondarily infected.
To behave in a way that might lead to infection, or to the infection of others.	Infected individuals may place others at risk of infection.
To maintain privacy about infection status.	If a person not known to be infected behaves irresponsibly, the infection will be more widely spread.
To maintain privacy about past contacts.	If not traced, contacts may miss out on diagnosis and treatment, and themselves inadvertently infect others.
To refuse diagnosis or treatment.	Untreated infections are more likely to spread to others.
To accept responsibility for personal decisions and behaviours.	The community will be called upon to share the risk, and bear costs of prevention and treatment.

Individuals sometimes make personal choices that increase their risk of infection; they may fail to take precautions or refuse vaccination. However, if such a choice also places other persons at involuntary risk, society needs to consider whether the freedom of the risk-taker should be constrained. For example for a person who knows he or she has HIV, should there be sanctions against unprotected sex with new partners? Even in the absence of risk to another person, if the financial costs of voluntary risk-taking are to be borne by society, then society could also make a claim to constrain the freedom to take risks.

In previous generations, the choice between individual and community interests, such as in Table 3.2, were resolved through legislation or regulation. In our modern democracy, we prefer persuasion to coercion. Essentially, we explain the risks, and we ask risk-takers to act responsibly and take better care of others as well as themselves. However, if individuals cannot be persuaded, there are public health legal powers, in most jurisdictions, that can be used as a last resort.

CONCLUSION

Communicable diseases affect us all. The choices we make day-to-day influence our risk of acquiring an infection and the chance of spreading this infection to others. As individuals we are responsible for our loved ones and ourselves, but we are also responsible to our wider community. If we understand how diseases spread and act responsibly, with measures as simple as hand-washing, safe sex and home hygiene, we will be playing our part to minimise communicable diseases in the uncertain world of the future.

To keep Australia healthy, our best strategy is to ensure that the community and media are well informed, with opportunity for public discussion, that our scientists and health professionals continue to be well trained, and that governments continue to provide leadership and accept overall responsibility. Such plans really are everybody's business.

