

# 6

## Parental Choice and Expert Knowledge in the Debate about MMR and Autism

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In democracies, conflicts between public opinion and expert opinion can be morally and politically charged. It is one thing for the public to be alienated from expert aesthetic opinion, as when millions in public funds are spent on an 'artwork' that ordinary observers dislike; in that sort of case, although the 'artwork' can appear to be to a waste of money, it is widely accepted, even by the general public, that aesthetic taste varies, and that different works of art should get exposure, even if they are unpopular. It is widely accepted, too, that exposure to new works widens aesthetic taste, rather than contributing to its deterioration. It is quite another matter where expert opinion supports a coercive policy that the public, or sections of the public, resist. Especially where the policy is introduced for the good of the public, the resistance quickly invites the question of who is a better judge of the public good than the public itself. It is hard to confront this question without appearing either paternalistic or relativistic. I shall argue that where the coercive policy is backed by a clear medical consensus, appropriately reconsidered in the light of claims of doubters, there is sometimes a moral obligation on the part of the public to defer to the experts. The argument will be geared to the continuing controversy in the UK over the safety of the measles/mumps/rubella (MMR)

vaccine. The vaccine is administered to children twice, at the ages of one and four. It was introduced into the UK in 1988, before which there was a separate vaccination for each of the three diseases.

## 6.1. MMR Vaccination after the Wakefield Paper

In 1998, Andrew Wakefield, a consultant gastroenterologist at the Royal Free Hospital in London, published with colleagues a paper in the *Lancet* suggesting that there was a link between the MMR vaccine and both bowel disease and autism in young children (Wakefield et al. 1998). Widespread publicity for this suggestion had the effect of reducing uptake of the MMR vaccine in Britain, and of increasing demand on the part of parents for separate vaccinations for measles, mumps and rubella. A pressure group of parents of children who are believed to have been harmed by vaccinations in the UK—JABS—has also been active in making representations against the triple vaccine.<sup>1</sup> The NHS has resisted a change of vaccination policy, and the reduced uptake for the combined MMR vaccine has led to an increase in the incidence of measles. In Scotland, for example, cases of measles and mumps have risen markedly up to and including 2006.<sup>2</sup>

Recently, some of the co-authors with Wakefield of the 1998 paper have repudiated its results. So has the *Lancet*. Many scientific re-examinations of the evidence have taken place since 1998, and they, too have largely disagreed with Wakefield (Institute of Medicine 2004). Wakefield himself has stuck by his findings.<sup>3</sup>

The most obvious question that arises from the MMR controversy is, 'Who is right?' Does the vaccine increase the risk of bowel disease or autism, or doesn't it? Only those with relevant medical expertise are in a position to answer, and they do not all agree. Still, there is a clear consensus among them to the effect that Wakefield's claims are doubtful, and that the MMR vaccine should go on being administered. However, given that the UK government cannot *prove* that the MMR vaccine is safe, shouldn't the triple vaccine be withdrawn

<sup>1</sup> JABS: Justice Awareness and Basic Support. Available at: <http://www.jabs.org.uk>

<sup>2</sup> See <http://news.scotsman.com/scotland.cfm?id=2305852005> (accessed 28 March 2006).

<sup>3</sup> For the various statements of editors, Wakefield and co-authors see *Lancet* (2004) 363: 820–4.

for the time being, or replaced for the time being with single vaccinations, as Wakefield and the JABS pressure group urge? This issue is one of a range that arise when there is a conflict between popular opinion and expert opinion in a democracy. I shall argue that the burden of proof is on Wakefield and his supporters to show that there should be a departure from the established policy. Peer review of Wakefield's study has not produced general agreement to his findings on the part of those scientists who have tested them. On the contrary, scepticism has been the much more usual reaction. UK public health bodies have therefore been reasonable to resist a change of vaccination policy on the balance of the available evidence. Indeed, they have been more than reasonable, having gone to considerable trouble to follow up any UK cases which *prima facie* favour the Wakefield hypothesis. Many of these cases turn out to be explicable in ways that do not call in question the MMR vaccine.

Although Wakefield and his supporters have turned up evidence that requires explanation, this evidence does not begin to indicate that the danger of MMR outweighs its benefits. Nor does it seem to be true that a reversion to separate vaccines would be more beneficial, all things considered, than continuing to offer the triple vaccine. The fact that many *parents* prefer the single vaccine has no particular weight unless the MMR vaccine just is, for independent medical reasons, inferior to the single vaccines. In the MMR case, I want to argue, parental opinion is no more relevant than public opinion in general, since what matters is the actual effects of the MMR vaccine, which is not a matter settled by public opinion or common sense, and that is all that most parents or most of the public can bring to bear. It is true that parents have a responsibility, both legal and moral, for their children's health, but that does not mean that they can always discharge the responsibility without deferring to expert opinion. In the MMR case, this deference is in order, especially when the experts have gone to so much trouble to investigate lay suspicions of a link between MMR and childhood disorders.

## 6.2. Respect for Parents and Patients

A good way of broaching the issues raised by MMR is against the background of a debate held at the annual conference of the British Medical Association in Bournemouth, in July 2001. There a motion proposing that single vaccines be

made available by the NHS was put to the vote. Opponents of the motion said that single vaccines were not as effective as the triple vaccine, and that allowing people to have their children separately vaccinated would reduce the rate of immunization even further, at a time when levels of immunization in the UK were below those recommended by the World Health Organization.<sup>4</sup>

The motion was overwhelmingly defeated. One of its supporters, Dr Ian Robbe, senior lecturer in public health at the University of Wales, Cardiff, was quoted as saying, ‘This is about the issue of respect that I offer as a doctor to a parent or patient. The evidence on MMR is very mixed. I think not to respect the parents’ position is not to give people the right to make a choice—it is taking choice away from them.’<sup>5</sup> Robbe’s position combines a number of views that are tempting to adopt, but I think wrong to adopt, in relation to MMR. The issue is precisely *not* one of respect. It is to do with the state of the evidence about the effects of MMR and the risks of having a different scheme of vaccination. Those who are able to, can speak to the relevant effects and risks. Presumably Robbe can. Presumably he is an expert who agrees that single vaccinations ought to be made available. But those who disagree with that policy on scientific grounds do not show disrespect for Robbe, and those who disagree on the same grounds with parents do not show them disrespect either. The experts *would* be showing disrespect if they disagreed with parents on non-scientific grounds—say on the basis that they detest the behaviour of the children brought up by these parents and have contempt for the parents. But they do not show disrespect simply by disagreeing. Nor is disrespect shown by distinguishing between lay opinion and expert opinion in the MMR debate. Nor, finally, is any disrespect shown by supposing that expert opinion carries more weight in this case than lay opinion. I enlarge on this point later.

Robbe seems to me wrongly to transfer to the MMR case a way of thinking about the doctor–patient relationship that leaves out the public health aspects of MMR and leaves out the fact that it affects people—children—other than those making decisions about vaccination. Let us begin with the standard doctor–patient relationship. If there is a disagreement between an adult patient and a doctor over the patient’s

<sup>4</sup> [http://news.bbc.co.uk/1/hi/in\\_depth/health/2001/bma\\_conference/1424527.stm](http://news.bbc.co.uk/1/hi/in_depth/health/2001/bma_conference/1424527.stm) (accessed 28 March 2006).

<sup>5</sup> *Ibidem*.

health, it is plausible to many people to say that it is for the patient to choose even if one of the patient's options is to ignore advice that objectively would benefit him. Not to leave the choice to the patient would be a way of denying his autonomy. And as soon as weight is given to autonomy, then so must weight be given to choices that treat health improvement as only one desirable thing among others, and one that can be outweighed by others in a patient's scheme of values. Again, if the patient autonomously makes a medically inadvisable decision, he takes the consequences. It's his health, his life and making a decision that is medically disadvantageous for him will not harm anyone else, at least on many occasions. Of course, in some cases involving adults who decide to ignore good medical advice, public health can also be affected. But Robbe is evidently not thinking of these cases when he says that refusing choice is a form of disrespect. If an autonomous adult is discovered to have a contagious disease and refuses treatment, or refuses to take steps to limit his contacts with others, it is not disrespecting the patient to argue with him on public health grounds, or to refuse him the choice of infecting others.<sup>6</sup> Choosing to infect others is not one of the choices protected by a duty of respect for patients. Nor is it a choice protected by a duty of respect for parents when parents are deciding on medical treatment for their children. In the MMR case, parents' decisions to forgo vaccination or to take single vaccinations can affect the level of immunization of everyone else. So it is never the parents alone who take the consequences of a bad decision.<sup>7</sup> Parents have a responsibility to have their children vaccinated against measles, mumps and rubella,<sup>8</sup> and they are understandably reluctant to do so in an atmosphere where the safety of vaccinations seems to be in doubt. One reason why parental reluctance might be weighty in cases other than MMR is that parents typically love

<sup>6</sup> Even in cases where the medical effects of ignoring undisputed medical advice fall mainly on the patient, there can be other bad effects on the doctor or the health service. It is not disrespecting a patient to ask him to take responsibility for some of these effects. On the contrary, it is paternalistic not to. For more in this vein, see Draper and Sorell (2002).

<sup>7</sup> Just how much is being risked depends on how many defect from the vaccination scheme. In a population where there were few defectors, the consequences of withdrawing one's children from the vaccination might be negligible, but this method of avoiding risk depends on free-riding on the decisions of other parents.

<sup>8</sup> The ground for this duty is complex. It derives from the duty to protect their children from the measles, mumps and rubella of others, *and* to limit the sources of infection of other people. Getting a vaccine in the context of an immunization programme satisfies both duties.

their children and can be assumed to give more weight to their children's interests than anyone else does, including the medical authorities. This is why their opinion about treatment is so important, and why getting it can be tantamount to giving the child's point of view the maximum influence in decisions where they cannot participate themselves. But the fact that parents are natural spokesmen for their children because they love their children is easily misinterpreted in the MMR case.

The fact that parents love their children makes it highly probable that they will not knowingly harm their children, and that they will actively help their children. But not knowingly harming one's children is compatible with harming them unwittingly, through lack of relevant knowledge. Similarly, actively helping one's children is only going to be successful within the limits of one's competence. If you are lousy at maths, then no matter how conscientiously you try to help your children with their maths homework, it is not going to do them any mathematical good. In short, it is not true that everything that their children need is, or can be, provided by parents, even if the parents put their children's interests first. There is a division of labour, geared in part to expert knowledge. Parents entrust the health of their children to doctors, and usually do not educate their children themselves. If their children travel, parents often put their children's lives in the hands of car drivers or bus drivers and airline pilots. Independent authorities certify these people as competent, and it would be jeopardising the welfare of children if everyone regularly decided to take over piloting, doctoring, or education of their offspring themselves. When a pressure group or individual parents decide that single vaccinations would do just as well as the triple vaccine, however, they are precisely taking over the doctoring role from the doctors. And they should no more take over the role of doctor when they are not medically trained than they should entrust their house to questionable DIY skills when they can call on the services of a good builder. The fact that they love their house more than anyone else does not mean that they are competent to maintain it, and the fact that they love their child more than anyone else does not mean that they are always the best judge of medical treatment either.

Admittedly, there is a difference between the case where there is no medical consensus about a particular treatment and the MMR case. A parent discharges his responsibility for the health of his child by making himself or herself as well informed as possible and acting on the information, but sometimes the best information will not be good enough for a clear choice,

because medical opinion itself is divided. In the MMR case, however, this does not appear to be so. The MMR vaccine is used worldwide, including in countries where the costs of medical negligence are very high and risks are not taken in the least casually; and there is wide agreement, even among the critics, that most people feel no ill effects from vaccinations, including MMR vaccinations. So we do not have an evenly balanced controversy tipping gradually in the direction of the conclusion that MMR is safe. Rather, it has always been the case that the evidence *against* the safety of MMR has been slight. Indeed, Wakefield's 1998 article turns out to have been much more tentative in its criticism of MMR than the tabloid newspapers that purported to report its conclusions.<sup>9</sup>

Parents can be forgiven for succumbing to the scare created by the tabloids, but because the issue is not *only* one of their child's health, and because the effectiveness of vaccinations in particular do depend on a very large take-up of injections, the consideration that not getting their children injected with the MMR vaccine was playing it safe for their children was not the only morally relevant consideration. Combined with the fact that the government went to some trouble to come out unequivocally in favour of MMR, that this message was overwhelmingly endorsed by GPs, and that actual doubts about MMR were raised fairly cautiously, it was probably not discharging one's responsibility to give more credence to JABS, Wakefield, or the newspapers.

### 6.3. Parental Choice, Realism and Deference to Experts

Even if there is a medical consensus about the safety of MMR and other vaccines, there are some who will say that it is only a consensus among practitioners of establishment medicine. It is possible to have unorthodox

<sup>9</sup> The Science Museum in London has put together for public consumption a very good and accessible summary of the scientific disagreements over MMR and the course of the controversy. See: <http://www.sciencemuseum.org.uk/antenna/mmr/cip2/index.asp> (accessed 28 March 2006). One important aspect of the controversy left out by both the Science Museum and by the present article is the role of the popular press in stirring up the MMR scare.

views about wellness as a patient; perhaps these deserve to be given weight in decisions about vaccination for one's children. This is the line of thought developed by Healthy Child Online, an American internet site promoting holistic medicine. On a web page devoted to vaccines, Healthy Child Online says the following:

### **Universal Vaccines for Everyone?**

Does it make sense to mandate vaccines for every child given the risks involved? The public health strategy for eliminating diseases includes universal vaccines for everyone, regardless of risks to the individual. Some children must be sacrificed in order to achieve the goal of eradicating disease in a population. They tell us that more lives will be lost to the disease if we don't vaccinate against it. But is this statement really true in the current reality of high-tech medicine in a population with effective sanitation and knowledge about the immunology of breastfeeding?

We cannot wipe out every disease on the planet. It may be more sensible to focus on *strengthening* our children's immune systems to deal with the increasing number of different 'superbugs' created by the inappropriate and massive use of antibiotics than to inject numerous toxins into their delicate, developing bodies. If we use breastmilk, good nutrition, herbs, naturopathy, homoeopathy, or other immune-enhancing methods to keep our children's immune systems strong, then why would we want to inject foreign material and toxins into their bodies, especially since there have been no long term studies done to prove their safety? An increasing number of parents are not willing to take the risk of sacrificing their child to a point of view that goes against their core beliefs about health and wellness.

### **Parents Do Have A Choice**

At the doctor's office, parents are given a two-page 'Vaccine Information Statement' which highlights the importance of vaccines and downplays the harmful effects. Many parents are coerced into vaccinating their children with the threat of losing their doctor, having their children denied school attendance, and charges of medical neglect. Children have actually been taken away from their parents, forcibly vaccinated, and placed in the care of the 'state' when their parents chose to protect them from vaccines. Informed consent means that an informed patient (or parent) should always have absolute freedom to accept or reject any specific medical treatment or procedure. The patient (or parent) has the right to be treated sensitively and compassionately while learning about his or her options. The doctor is both ethically obligated and legally required to participate in a communication process that helps the patient to understand risks and benefits as well as alternatives. There are informed consent statutes and case laws in all 50 states in the U.S. Why don't these revered informed consent laws apply when it comes to vaccines? Parents



are almost never told about exemptions to state vaccine laws. They are usually told they do not have a choice.<sup>10</sup>

This statement puts forward its own (as far as I can tell) unsupported theory about how to strengthen the immune systems of children, and claims that its methods are superior to conventional ones in that they do not aim at universality and do not put foreign materials and toxins into children's bodies. The fact that what are normally toxins can sometimes help patients, and the fact that naturopathy and homeopathy are badly understood, are not acknowledged. Again, the fact that conventional medicine challenges some parents' core beliefs is taken to count against conventional medicine when what is ostensibly under discussion is what methods of immunization are safest and most effective—*whatever* parents' core beliefs are.

Healthy Child Online begs the question of whether vaccines are in fact safe when they assert that some parents choose to 'protect' their children from vaccines. Talk of protection implies, without establishing, that vaccines are harmful. Like Robbe, Healthy Child Online treats as interchangeable the question of a patient's right to choose for himself—disputable in any case where a patient's choice poses a public health risk—and a parent's right to choose for a child. And Healthy Child Online confuses the issue of what harms or benefits children by talking about the coercion of parents. Coercion is of course best avoided; but sometimes it is moral obligatory. It is not always against the medical and other interests of the child, as when parents addicted to drugs are forced to go onto a rehabilitation programme or else lose the children they are neglecting.

Let us leave aside cases in which there is significant disagreement among the experts over the correct medical treatment of a child. Let us concentrate on cases in which the experts agree amongst themselves, but the parents don't agree with the experts. Why, in that sort of case, is there *any* room morally for parents to choose or to affect the decision about treatment? One general reason for parents always having a say, even if it is not a decisive say, is that it is they who have the responsibility, outside episodes of medical treatment, for the care of the child. Parents are obliged to see to all of the needs of the child that they are aware of, including minor illnesses. They also have a role when doctors are involved, being expected to see that medication is administered,

<sup>10</sup> See: [http://www.healthychild.com/database/vaccinations\\_a\\_parent\\_s\\_right\\_to\\_choose.htm](http://www.healthychild.com/database/vaccinations_a_parent_s_right_to_choose.htm) (accessed 28 March 2006).

and they are relied upon to supply early warning of the need for medical interventions, including public health interventions. The control of head-lice is routinely privatized in this way, albeit with mixed results. Again, parents have responsibilities for, as it were, the whole child. The child's needs for food, water, shelter, education, protection from assault, transportation, entertainment, affection—all of these fall on parents, who are assumed, usually correctly, to be willing and able to meet those needs or to be able to identify others who can. Differently, parents are relied upon by the state to be local forces against offending behaviour. In relation to many of these duties, parents are in a sort of tacit partnership with professionals and officials: teachers, doctors, the police and so on. The presumption that the efforts of parents and public officials are directed to the same goals over a wide range of the needs of the very young justifies co-operation, and also consultation with parents when public officials and professionals see a need of the child that the parents do not.

The presumption that professionals, officials and parents are all on the same side in seeing to the needs of children does not mean that there can never be disagreements. After all, parents disagree amongst themselves, not only across families, but within families, about how the needs of the children should be met. In many cases these disagreements about needs stand alongside disagreements about the fine detail of upbringing and behaviour. And in many of these disagreements there may be no telling who is right, and no need to decide who is right in any case. There are many different variations on family life, and many of them are harmless and able to co-exist.

Some styles of family life can rub off on other families. Reflective parents observe how others raise children and sometimes wonder whether they do it well themselves. People from different generations in an extended family volunteer their opinions as well, often with a sense of its being important to do things one way rather than another. But it is mostly left to families themselves to develop their preferred practices for seeing to the needs of children. If they copy the practices of other families or listen to advice from relations, that is their choice. If they read parenting magazines and books and follow the advice they give, that is their decision, too. This is the large background against which it can seem presumptuous for people outside a family, or people other than parents, even to *comment* on how parents organize their children, unless that comment is asked for. It is against the same background that it can seem outrageous for an outsider to *insist* that parents do something for or to their children that those parents disagree with.

It takes something like the philosophical position called Realism to make sense of the possible appropriateness of outside interventions, especially those verging on or amounting to coercion. The key to Realism can be found in the common saying that believing doesn't make it so. We can believe things very firmly and sincerely—about many different topics—and be wrong despite the fact that we firmly and sincerely believe them. In particular, we are fallible—able to be wrong—about our states of health. It is possible to think that one has a disease and not have it, and possible to have a disease while believing one doesn't. It is also possible to be wrong about the effects on us of food we ingest, of things in the atmosphere, of failing to take exercise, and so on. These facts about our fallibility are not in the least affected by how *many* people believe a thing firmly or sincerely. Believing doesn't make it so, whether it's one person believing or millions. Instead there has to be something that makes a thing true, *independently* of its being believed—at least for many things we hold beliefs about.

It is not only possible but *easy* to be wrong about medical matters, just as it is not only possible but easy to be wrong about any subject matter in which understanding depends on principles about microstructures in organic or inorganic bodies. These are the principles taught in a medical education but not in what is called the university of life. And it is the existence of such principles that creates a big gap between expert knowledge in medicine or physics, say, and common sense or common opinion. There are other kinds of supposed expert knowledge—the knowledge of management consultants, say, or of lawyers—that does not depend on anything like these principles, and though people are able to make mistakes in law or in management, it is not because they are ignorant of the behaviour of organic or inorganic microstructures. In other words, there are kinds of expert knowledge that do not amount to *science*, where what counts as science is determined in part by comparability with physics or molecular biology.

One reason that medical expertise trumps other kinds of expertise, including homeopathic expertise—is that medicine *is* a science, or, probably better, a set of sciences. It explains and predicts a lot of effects with a reasonable small set of conceptually uniform principles supported by exact measurements. It is again on account of this scientific status that medicine trumps ordinary public or parental opinion, even where there exists a convention that parents are responsible for giving some of the medical care their children receive. It takes a very sophisticated (and in my view quite unfounded) philosophy of

science to argue that medicine is no more authoritative than homeopathy. And it takes a false philosophy of science again to show that medicine is not a science in any sense of 'science' that deserves to have authority, so that homeopathy is just as authoritative or common sense is just as authoritative.

Though the philosophy of science I favour supports deference to 'science' where it deserves the name, and where it is reflected in public policy, it does not support deference to every kind of professional regarded as an expert. It supports deference to public health officials who say that the MMR vaccine is safe; but it does not support deference to those who say that e.g. there should be an internal market in public medical provision, supply-side economics not being on a par as a science with molecular biology.

Are the grounds for deference in the MMR case also grounds for compelling parents who, on account of false or ill-founded 'core-beliefs', refuse to vaccinate their children? I think the answer is 'Yes', so long as every effort has been made first to explain the scientific basis for the need to vaccinate, this effort being directed at obtaining consent from the parents. But the policy described by Healthy Child Online of prohibiting school attendance and even of withdrawing the medical advice that the parents are ignoring at a risk to the public seem defensible if all else fails. On the other hand, removing the children altogether from the care of the parents, other things being equal, seems wildly disproportionate.

## 6.4. Expert Knowledge and Democracy

In the UK, the MMR scare inevitably has a political dimension. The Health Service is government-run and funded, and its policy is to administer the triple vaccine. Were there to be a scare over vaccines in general on the part of a large number of voters, vaccination policy would start to enter general political debate and party political campaigning. Suppose that there were a majority for withdrawing the MMR vaccine or some other vaccine or vaccinations in general. Would *that* be an argument for withdrawing the MMR vaccine or altering vaccination policy in some other way? Although it may sound anti-democratic to say so, my answer is that that would *not* by itself be an argument. The fact that a lot of medically inexpert people want a medical policy changed is only a reason for changing the medical policy if there are good reasons for changing the policy independently of how many people want it changed.

Once again what is at issue is the authority of expert knowledge where expert knowledge is relevant to a matter of public policy. The problem would not arise if expert medical knowledge in general, or knowledge of vaccines in particular, were widely distributed among the public. But public understanding of science in the West is notoriously low.<sup>11</sup> Western government ministers and officials sometimes suffer from the same ignorance as the general public, but feel obliged to maintain independent bodies of experts, precisely to make up for these shortcomings. One way of summarising the main claim of this chapter is that in this respect parents should imitate governments, and feel obliged to consult people who know more than they do, where such knowledge is relevant to practical deliberation and discussion.

Unfortunately, the policy decisions of governments sometimes seem to foster a false sense of expertise in parents specifically, and the public at large in general. For example, when parents are told that the choice of schools for their children should be up to them, or that they have the right to overrule and challenge teachers in school though their own education is abysmal, that may foster an illusion of being able to make the relevant judgements just in virtue of being a parent. This is just as much of an illusion as it is to think that one is expert in relation to one's child's health because one is the parent of that child. Of course, it is easier to acquire the knowledge relevant to school choice and dealing with teachers than it is to acquire the knowledge required for decisions about MMR, but the knowledge is not innate, and it does not suddenly come into being when one becomes a parent. Some parents may never acquire, and a few may be *unable* to acquire, *either* sort of knowledge.

In the MMR case expert knowledge seems highly relevant in ways that other things—strongly felt parental feelings—may not. But in other cases expert knowledge may be out of its element altogether, or may matter less because things that are not matters of expert knowledge are also relevant and weighty.

Consider the case of genetically modified (hereafter 'GM') food. There may be a majority in the UK against growing GM crops, and also against buying GM produce in the shops. Even if this consensus is based, as it seems

<sup>11</sup> It is easy to overdraw the divide between the experts and the public. Intermediaries, in the press, and in NGOs, who have the relevant expertise but are also interested in making experts accountable, can mediate between the public and experts and can equip members of the public with expert representation in the scientific community. What is more, they can aid the process of disseminating or making accessible, expertise.

to be, on very little evidence that GM crops or GM food are harmful, the fact that there would be little or no market for them if they were produced may be an argument for not developing a capacity for producing GM food products, at any rate for the time being. People could eventually be convinced that GM food was harmless, but that would not guarantee that GM food would ever be bought in sufficient quantities to make trials in the present worthwhile. Matters would stand differently if alternatives to GM food became very scarce, and GM food was easy and cheap to produce. But as things currently are in the West, the fact that GM food is unpopular may matter more than the fact that its unpopularity is due to scientific ignorance or prejudice. It is not as if people will come to harm by eating alternatives to GM food. It is not as if alternatives to GM food are scarce or unduly expensive.

In the GM food case, then, though expert knowledge is not out of its element, and though it may conflict with incorrect popular belief, other things—the fact that there is a free market in food and that people are unlikely to buy GM food; the fact that there is enough non-GM food to satisfy demand and hunger—these facts make the consequences of incorrect popular belief less than disastrous. In the MMR case, on the other hand, expert knowledge is relevant *and* the consequences of being guided by non-expert knowledge may in fact be very bad.

It might be thought that the authority of expert knowledge counts for less than the advisability of playing it safe, and that it is the principle of playing it safe that needs to be given maximum weight in the MMR and GM food cases alike. Since we don't know for sure what the effects of MMR or of growing GM food are, we should have nothing to do with either. After all, it is possible that the effects of both will be bad in ways we can't predict *and* irreversible. This argument is hard to assess, because mere possibilities on both sides cut no ice. One needs to know how *probable* it is that the dangers will be realized, or how good a *reason* there is to think that the ill effects will be irreversible. Not knowing what will happen by itself may not be enough. It is true that *sometimes* not knowing what will happen is a conclusive reason for doing nothing. It does not seem to be in the case where an effective treatment for a serious and widespread disease might well be available or in the offing, and where the dangers on the other side are hard to state convincingly. The precautionary principle, which assigns the burden of proof to innovators where the innovation might be dangerous, is harder to support the more obscure the

dangers are, the less probable the occurrence of *big* dangers is, and the bigger the probabilities of big benefits to weigh in the balance against the big dangers.

The precautionary principle sometimes *seems* to be compelling in an unqualified form, because it is quietly harnessed to the assumption that the natural order is benign, so that any interventions in it or changes to it are bad or dangerous just in virtue of being interventions, other things being equal. There were signs of this in the statement quoted earlier from Healthy Child Online. The assumption that the natural order is benign may in its turn be harnessed to the principle that in a scientifically innocent state human beings would be greater beneficiaries of the natural order, because all the interventions we have already made in nature have already altered mechanisms that were present in nature to protect us. These are strongly question-begging assumptions, and we need not subscribe to them in order to subscribe to some version of the precautionary principle.

Besides, people need to be careful when they think about nature. Even if it is true in some sense that the natural order is benign, it is not necessarily going to mean that the natural order benefits the *human* members of the natural order to the extent required to prevent vast amounts of human pain and disease. Perhaps nature is impartial and seeks to benefit the life in the universe *on balance*. It's a big universe. Nature does not begin and end on this planet, still less with the species that live on it, still less with just our species. So it may be a mistake to expect the natural order to have a soft spot in its heart for this cosmically tiny speck of itself, still less a soft spot for the fraction of the speck that is human. Science may be what we need to help ourselves within the considerable limits left to us by a benign but vast and inclusive nature. My conclusion is that the precautionary principle is not as compelling as it looks, and that consensuses built upon it may be criticisable, even when it is the consensus of a large majority who want to make it an issue in a piece of democratic decision-making. In particular, an anti-GM or an anti- MMR consensus built upon the precautionary may be questionable.

This is not to say that supposed risks can simply be ignored by the political authorities, even where big numbers of affected people have no good reason to believe the risks exist. Public health measures require co-operation, and co-operation can only be got if even false public beliefs are taken seriously. 'Taken seriously' does not mean 'accepted', of course; but it does mean investigation and explanation.

Investigation is what the UK Medicines and Health Care Products Regulatory Agency (as it now is) undertook in 1998 in response to those who believed that MMR had harmed their children. Working through a solicitor's firm representing those who were bringing legal claims for damage supposedly resulting from the MMR vaccine, the Agency carefully reconstructed the medical histories of those children in whom bowel disease and autism or a more general developmental disorder could be confirmed. In many cases they found a family history of developmental disorder, difficulty in pregnancy, GP records of symptoms in the affected children before they had the MMR vaccine; in short, a host of possible causes of symptoms *other* than the MMR vaccine. The MHRA has also attempted to rebut a 2001 article by Wakefield and Fletcher alleging that the MMR vaccine had been licensed in the UK without being sufficiently studied.<sup>12</sup>

Although the UK authorities do not seem to have been entirely successful in getting across to the general public the results of their studies or the efforts they have made to look into the individual cases of children, they do seem to me to have taken the right steps in response to claims about the vaccine, and they do seem to be right to carry on with a policy of licensing the MMR vaccine, even in the face of public disquiet about it. Not all public disquiet is well-founded, and sometimes the consequences of trying to assuage it are worse than forceful disagreement on the part of those in power.<sup>13</sup>

<sup>12</sup> For MHRA reports see: <http://www.mhra.gov.uk> (accessed 28 March 2006).

<sup>13</sup> I have been helped by discussions with, and comments on earlier drafts from, Heather Draper, Angus Dawson, Marcel Verweij, and an audience at Hull University.