To enable this policy to be put into effect, parents have to accept that the welfare of their own children is interdependent with that of the population with which their children interact. This is most likely within the civic culture typically associated with developed countries and their urbanisation, where evidence and infrastructure also favour the campaign. An analogy for treating vaccination as something normal is the discipline of driving vehicles on public roads. Even though the high densities of traffic in urbanised countries would otherwise increase the probability of collisions, cross-nationally road casualties are inversely related to traffic density.[4]

Yet by 2002 the United Kingdom had become the deviant case in global MMR policy.[5] Having reached one of the highest levels of MMR coverage by a relatively early date, it actually lost ground. Paradoxically, one of the lowest levels of coverage of MMR is now to be found in the most urban of the world's populations, that of London, at around 75%.

Health professionals found a scapegoat for this reversal in a researcher, Andrew Wakefield, who claimed in 1998 that the MMR vaccination campaign might account for what he took to be the coincident rise in cases of diagnosed autism. Subsequent epidemiological research did not support this claim.[6] Yet Wakefield's views gained credibility with some parts of the public.

Parents who refused MMR vaccination for their children were not necessarily irrational.[7] The high level of coverage achieved before that point had so far reduced the risk of contracting the diseases that parents began to see the vaccine itself as more of a threat to their children. In a developed world context, measles less often leads to death and disability. A short illness might seem a price worth paying if a greater hazard, such as autism, might conceivably follow the vaccine.

Arguably, the explanation for the reversal lies not with Wakefield or even with parents who took his claims seriously, but with a failure of leadership by health professionals, lack of support for them from policy makers (including the prime minister), and mischief made by journalists.

A pervasive belief prevails among health professionals and scientists in the United Kingdom that the public has lost trust in them, but surveys have repeatedly shown that the public has faith in them and much less in politicians and journalists. A corollary of their mistaken belief is evidence that some health professionals, in offering individual advice on the safety of MMR, acquiesced in their clients' anxieties rather than attempting to allay them.[8]

Many of course were robust in defence of the evidence, yet evaded opportunities for public dialogue. The solution is not to affect disdain for the bearers of false news but develop two way communication about risk between experts and the public as equals, which Richard Horton, who published the paper by Wakefield's study group of 1998 in the *Lancet*,[9] has subsequently suggested. Its focus would be: MMR and autism—learning the lessons.[10] If the United Kingdom has all but lost the battle for MMR, the war itself can still be won by openness.

Meanwhile journalists fill the void. They sometimes have more interest in amplifying risk than allaying public anxiety. But *Dispatches* on Channel 4 television on 19 November 2004 notably chose instead to discredit Wakefield for an interest in marketing a single vaccination for measles.[11] This may be a turning point.

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1 Osborne K, Gay N, Hesketh L, Morgan-Capner P, Miller E. Ten years of serological surveillance in England and Wales: methods, results, implications and action. *Int J Epidemiol* 2000;29:362-8.
2 Tischer A, Gerike E. Immune response after primary and re-vaccination with different combined vaccines against measles, mumps and rubella. *Vaccine* 2000;18:1382-92.
3 Nokes JD, Williams JR, Butler AR. Towards eradication of the measles virus: global progress and strategy evaluation. *Vet Microbiol* 1995;44:333-50.
4 Adams J. *Risk*. London: University College Press, 1995.
5 Owens SR. Injection of confidence: the recent controversy in the UK has led to falling MMR vaccination rates. *EMBO Reports* 2002;3:406-9.
6 Taylor B, Miller E, Farrington CP, Petropoulos M-C, Favot-Mayaud I, Li J, Waight PA. Autism and measles, mumps and rubella vaccine: no epidemiological evidence for a causal association. *Lancet* 1999;352: 2026-9.
7 Fitzpatrick M. MMR: risk, choice and chance. *Br Med Bull* 2004;69:143-53.
8 Ramsay ME, Yarwood J, Lewis D, Campbell H, White JM. Parental confidence in measles, mumps and rubella vaccine: evidence from vaccine coverage and attitudinal surveys. *Br J Gen Pract* 2002;52:912-6.
9 Wakefield AJ, Murch SH, Anthony A, Linnell J, Casson DM, Malik M, et al. Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children. *Lancet* 1998;351:637-41.
10 Horton R. The lessons of MMR. *Lancet* 2004;363:747-9.
11 *Dispatches: MMR: what they didn't tell you*. www.channel4.com/health/microsites/M/mmr/index.html (accessed 20 Jan 2005).

Patients' safety

Progress is elusive because culture in health care has not changed

Since 2000, when "To Err Is Human" stimulated action to eliminate errors and mitigate the resultant harm in the United States[1] and "An Organisation with a Memory" initiated similar efforts in the United Kingdom,[2] healthcare systems worldwide have devoted considerable attention to the safety of patients. Yet despite attempts to reduce adverse events through multilevel interventions and information technology, widespread change in the culture of health care remains elusive.

The numbers of affected patients are astounding. In the United Kingdom, adverse events with resultant harm were estimated to occur in some 10% of hospital admissions, equating to more than 850 000 events annually. In the United States, extrapolations based on medical record reviews imply that 44 000-98 000 lives were lost because of medical errors each year. Although some posit that these numbers were inflated, ongoing work indicates that these estimates may be conservative. For example, Davis et al found that 12.9% of hospital admissions in New Zealand were associated with an adverse event.[3] Zhan and Miller examined the incidence of 18 hospital based diagnoses suggestive of errors and found that injuries may add 2.4 million

extra days in hospital and more than 32 000 deaths per year in the United States.[4]

Numerous systems for error identification have been developed, the most promising of which combines analysis of automated data, medical record review, and active event reporting.[5] The Australian Patient Safety Foundation and the United Kingdom's National Patient Safety Agency have implemented systems for event surveillance. In the United States, legislation is pending that would facilitate sharing reports and analysing errors without fear of increased litigation. This legislation would complement the actions taken by states. Currently, 21 states have mandatory reporting systems; but under-reporting remains a serious challenge.[6]

Although implementation of reporting systems will shed additional light on threats to safety, unresolved dilemmas remain regarding the appropriate balance between breadth and depth of reports, confidentiality, and the public's right to know, and whether to focus on actionable processes (that is, medical errors) or harms irrespective of antecedents.[7] The overarching challenge, ripe for transnational collaboration, is identifying the most effective strategies for translating information on errors and near misses into safety for patients.

Numerous resources can help organisations in implementing evidence based safety interventions. The United States Agency for Healthcare Research and Quality produced an evidence report that reviewed 79 patient safety practices, as well as the first online journal on patients' safety, *WebM&M* (www.webmm. ahrq.gov). The journal highlights five cases of errors or near misses each month, along with the strategies deployed to prevent recurrence and commentary from national experts.[8] Some successful practices in reducing errors have been highlighted by the John M Eisenberg patient safety award of the Joint Commission on Accreditation of Healthcare Organisations. The National Patient Safety Agency has produced a toolkit that includes learning modules to help in analysing root causes.[9]

The implementation of information technology also offers great promise. Recently, the Institute of Medicine called for the continued development of a national health information infrastructure, providing real time access to complete information on patients and decision support.[10] In 2004 the Agency for Healthcare Research and Quality plans on spending nearly $60m to support research and implementation of information technology that improves patient safety. Moreover, the United States Department of Health and Human Services and other purchasers are collaborating to identify incentives to accelerate the use of health information technology. These efforts, coupled with the transformation of the NHS through implementation of a national information technology infrastructure, will accelerate the impact on safety.

Despite these steps, we have not seen substantial progress in one critical area—culture—that has the greatest potential to produce sustainable improvements in safety. Both the National Patient Safety Agency and the National Quality Forum, a US public

and private consensus development organisation, list a safety culture among its priorities for a safer healthcare system. Culture encompasses commitment to open communication about errors to encourage reporting and analysis. Prerequisite to such openness is the recognition that errors usually result from an imperfect system and that dealing with them through individual blame only discourages reporting. Ensuring openness also entails alignment between the legal and medical staffs; but the medical profession has not embraced the concept that medical error is a systems issue. One study found that 55% of doctors and the public blamed individual health professionals for serious medical errors.[11] Similarly, open communication around errors is still not the norm. Liam Donaldson, England's chief medical officer, recently termed the safety culture "weak."[12] Although the concept of culture may be somewhat nebulous, methods exist to assess where an organisation stands.

From the first day of medical school, we are taught: *Primum non nocere*—above all, do no harm. In recent years, healthcare professionals have awoken to the harm our patients are experiencing despite our best intentions. Through the work of many worldwide, our understanding of the epidemic has increased tremendously and is beginning to pay dividends. More substantial and sustainable improvements, however, will occur only when healthcare organisations truly commit to safety through open communication that does not blame individuals but identifies and addresses flaws in systems.

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1 Kohn LT, Corrigan JM, Donaldson MS, eds. *To err is human: building a safer health system.* Washington, DC: National Academy Press, 2000.
2 Department of Health. *An organisation with a memory.* London: Stationery Office, 2000.
3 Davis P, Lay-Yee R, Briant R, Ali W, Scott A, Schug S. Adverse events in New Zealand public hospitals I: occurrence and impact. *N Z Med J* 2002; 115:U271.
4 Zhan C, Miller MR. Excess length of stay, charges, and mortality attributable to medical injuries during hospitalization. *JAMA* 2003;290;1868-74.
5 Battles JB, Lilford RJ. Organizing patient safety research to identify risks and hazards. *Qual Saf Health Care* 2003;12 (suppl 2):ii2-7.
6 Marchev M, Rosenthal J, Booth M. *How states report medical errors to the public: issues and barriers.* Portland ME: National Academy for State Health Policy, 2003.
7 Layde PM, Cortes LM, Teret SP, Brasel KJ, Kuhn EM, Mercy JA, et al. Patient safety efforts should focus on medical injuries. *JAMA* 2002;287: 1993-7.
8 Shojania KG, Duncan BW, McDonald KM, Wachter RM, eds. *Making health care safer: a critical analysis of patient safety practices.* Evidence report/technology assessment no. 43 (Prepared by the University of California at San Francisco–Stanford Evidence-based Practice Center under contract no. 290-97-0013). Rockville, MD: Agency for Healthcare Research and Quality, 2001. www.ahrq.gov/clinic/ptsafety/ (accessed 12 Dec 2003).
9 National Patient Safety Agency. *Root cause analysis toolkit.* www.npsa.nhs.uk/rca/default.asp#toolkit (accessed 12 Dec 2003).
10 Aspden P, Corrigan JM, Wolcott J, Erickson SM, eds. *Patient safety: achieving a new standard for care.* Washington, DC: National Academies Press, 2003.
11 Blendon RJ, DesRoches CM, Brodie M, Benson JM, Rosen AB, Schneider E, et al. Views of practicing physicians and the public on medical errors. *N Engl J Med* 2002;347:1933-40.
12 Hargreaves S. "Weak" safety culture behind errors, says chief medical officer. *BMJ* 2003;326:300.