George Orwell coined the term "doublethink".

Doublethink can mislead even experienced public-health practitioners. An example is the term "post-eradication immunization policy" for poliomyelitis.[2] It describes preventive strategies, such as routine immunisation with inactivated polio vaccine in low-income and middle-income countries, which will have to be implemented once the eradication of poliomyelitis has been achieved.[3] "Eradication", as defined by WHO, is the "achievement of a status whereby no further cases of a disease occur anywhere, and continued control measures are unnecessary".[4] By definition, in a post-eradication scenario, there will be no further need for any strategy against either poliomyelitis or poliovirus. In short, there is no such thing as a "post-eradication immunization policy".

The term misleads lay people and professionals alike by implying that the polio eradication initiative will soon come to a successful ending—an interpretation in line with the needs of donor agencies.[1] The implicit concession that there is a need for continued control measures, however, confirms the very opposite, namely that we are still far from achieving polio eradication. In an attempt to solve this contradiction, a redefinition of the meaning of eradication has even been suggested: "the extinction of a pathogen in the human population worldwide, though not. . . necessarily followed by the cessation of all control measures such as vaccination".[5]

Confusing and unclear language of this kind should be avoided in a scientific approach to public health.

*Oliver Razum, Onkar Mittal, Ritu Priya, K R Nayar, C Sathyamala

*Department of Tropical Hygiene and Public Health, Heidelberg University, Im Neuenheimer Feld 324, 69120 Heidelberg, Germany (OR); Society for Action in Community Health (SACH), New Delhi, India (OM); and Centre of Social Medicine and Community Health, School of Social Sciences, Jawaharlal Nehru University, New Delhi, India (RP, KRN, CS)
(e-mail: oliver.razum@urz.uni-heidelberg.de)

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Registering clinical trials

Sir—I share the view of Timothy Evans and colleagues (May 1, p 1413)[1] that much research is wasted because some important studies are not published. Evans and co-workers are also concerned that researchers in developing countries whose first language is not English might experience difficulty publishing in international indexed journals. However, the notion that WHO leading universal registration of studies in developing countries will allow equitable access to the results of relevant research might not happen in practice.

Like many international agencies, including the International Monetary Fund, World Bank, and the World Trade Organization, WHO has been hijacked by the alliance of dominant classes[2] in dictating its policies and practices. One example was the failure of the WHO Global Outbreak Alert and Response Network (GOARN)[3] in responding to the severe acute respiratory syndrome (SARS) outbreak in China.

SARS is a timely reminder of the growing threat to humanity from infectious disease. WHO set up GOARN to maintain global-health security, but it was frustrated by the influence of dominant nations; in this instance, China managed to delay everything that WHO aimed to do. Moreover, since the 23 million people of Taiwan are excluded from WHO, there is a serious gap in the GOARN network.

Outside WHO, my friends and colleagues in Taiwan are compromised in matters of global-health policy discussions, technical connections, and disease control and prevention. Scholars in Taiwan are inhibited in developing public-health policy and promoting good practice owing to lack of support. They were barred from attending the WHO influenza symposium in March—an example that contradicts the spirit behind universal access to health-related knowledge for health improvement.

For the universal registration of controlled trials to succeed, I agree with Vicente Navarro[2] that WHO should be faithful to its constitution and charters, which state that health is one of the fundamental human rights of every human being, and that it should stop ostracising the people of Taiwan.

Many parliamentarians from the UK, the USA, Canada, Australia, and the European Parliament, together with the British Medical Association and the World Medical Association, have recognised the dangers and pitfalls of allowing China to hold WHO ransom in matters of global health.

The Lancet Editorial[4] echoed the difficulty of China's weak commitments to international human-rights agreements. I hope that the initiative of universal sharing of health-related knowledge for health improvement will allow WHO to turn a new page and succeed in their essential role.

Frank Lie

Department of Cardiology, Whipps Cross University Hospital, London E11 1NR, UK
(e-mail: frank.lie@whippsx.nhs.uk)

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Global human resources crisis

Sir—We agree with Vasant Narasimhan and colleagues (May 1, p 1469)[1] that in many developing countries, international players have substantial influence over the agenda-setting and policy-making with respect to human resources for health. The joint poverty-reduction strategy paper and debt initiative for heavily indebted poor countries (PRSP-HIPC) is a prime example of an interface between international actors and national decision-makers with real clout. Unfortunately, human resources for health often do not even figure on its agenda. A review of the PRSP in six selected African countries by the UK's Department for International Development Health Systems Resource Centre indeed shows that, at best, the human resources crisis is merely acknowledged, and that an in-depth analysis of the issue and how it relates to civil service conditions is conspicuously absent in most papers.[2]

Cynics might say that these findings simply confirm the worrying tendency among both national and international policy-makers to skirt the very problems that will undermine any attempt to improve health and social services, let alone poverty reduction

efforts. But the extent of the human resource crisis in Africa in general and particularly in the countries with a high HIV/AIDS prevalence, forces us to act decisively. We believe that we need to reconsider approaches that used to be politically incorrect. If not, the current staff deficits will continue to undermine the absorption capacity of all the new international initiatives.

PRSPs should be grasped with both hands if the root of the crisis is to be tackled across sectors. A national human resources for health plan should be part of any PRSP as a condition for approval. Moreover, the recruitment ceilings imposed under the structural adjustment programmes represent a relic from the past and need to be removed. International actors should no longer shun the funding of recurrent expenditure with the excuse that this amounts to unsustainable interventions. For example, international development agencies need to reconsider contributing to funding salaries and wages in the new recruitment drives. Also bilateral agencies need to critically review their policies. Sending out expatriate medical personnel as a short-term measure or hiring medical professionals from the brain drain diaspora are options.

In short, the context and the challenges besetting health systems in developing countries have changed dramatically and paradigm shifts are called for to come up with effective strategies.

*Bruno Marchal, Vincent De Brouwere

Department of Public Health, Institute of Tropical Medicine, Nationalestraat 155, 2000 Antwerp, Belgium
(e-mail: bmarchal@itg.be)

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Risk of cancer from diagnostic X-rays

Sir—In their otherwise balanced Commentary on cancer risks from diagnostic X-rays, Peter Herzog and Christina Rieger (Jan 31, p 340)[1] make the assertion that "there are no reliable data proving that radiation doses as used in diagnostic X-rays do induce cancer". This statement is a central issue because, if true, the risks of diagnostic X-rays would be at most hypothetical, dependent on the substantial uncertainties associated with low-dose radiation-risk extrapolation[2]—and not something for the practising physician to be overly concerned about. For adults, however, their statement is probably not correct, and for children it is almost certainly incorrect.

To take the common adult CT examinations as an example, depending on the machine settings, typical equivalent doses in examined organs are in the range of 20–30 mSv for a single examination;[3] the average number of CT scans for a given medical problem for which CT is used is about two,[3] giving an average total dose of 40–60 mSv. Is there direct evidence of increased cancer risk in this dose range?

The individuals in the lowest dose group of atomic-bomb survivors that showed a significant rise in cancer incidence, received doses in the range of 5–100 mSv (mean 29 mSv).[2] The corresponding lowest dose group that showed significantly increased cancer mortality was very similar (5–125 mSv, mean 34 mSv).[2,4] Thus, there are reliable data showing increased cancer risk at the doses (40–60 mSv) used in adult diagnostic CT.

The situation is still clearer for paediatric CT for which, depending on the age and settings used, the doses for the same examinations are up to four times higher than in adults.[3] Additionally, depending on their age, children are three to five times more sensitive than adults to radiation-induced cancer.[4] Therefore, there can be little doubt that diagnostic CT examinations in children result in an increased cancer risk. Although the individual risk is small, use of paediatric CT is increasing; therefore the public-health risk is not negligible.[1,3]

Are the atomic-bomb exposures relevant to radiological examinations? The major differences are (1) radiological exposures are less uniform, so fewer organs are effectively at risk; and (2) radiological examinations use lower-energy X-rays, which, since they are more densely ionising, are more carcinogenic than the high-energy γ rays to which atomic-bomb survivors were exposed. Therefore, atomic-bomb exposures are relevant to radiological examinations, but there is also direct evidence from in-utero radiological examinations, where the increased sensitivity of the developing embryo and fetus allows significantly increased cancer risks to be seen at doses as low as 6 mSv.[2]

We applaud the recommendations of Herzog and Rieger[1] that physicians should carefully consider the risks and benefits before ordering radiological examinations. However, particularly for CT examinations, which increasingly dominate the radiologically related population dose, we would add that the radiation risks have a much firmer scientific basis than Herzog and Rieger imply.

*David J Brenner, Eric J Hall

Center for Radiological Research, Columbia University, New York, NY 10032, USA
(e-mail: djb3@columbia.edu)

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Authors' reply

Sir—David Brenner and Eric Hall make the assumption that our statement[1] regarding the probable impreciseness of the estimate of cancer risk from diagnostic radiological exposure, from Berrington de Gonzalez and Darby's work,[2] is incorrect.

Brenner and Hall disregard the different quality of radiation derived from X-ray tubes and detonation of nuclear devices. The atomic-bomb survivors were not only directly exposed to γ rays emitted from radionuclides—which would be comparable to X-ray radiation—but also to neutron radiation from the bomb detonations and, most importantly, to radionuclides, from contaminated food, water, and air (dust), emitting γ, β, and high-energy α radiation. Some of these radionuclides have a long half-life and are embedded into bone metabolism and stored there for almost the whole life of the individual. This additional exposure is not apparent in patients undergoing radiological examinations, but it contributes to the morbidity and mortality of the atomic-bomb survivors. Different radiation qualities are only poorly accounted for by use of weighting factors. The difference between incorporated radionuclides and short-time external radiation sources is not accounted for at all. Additionally, the γ rays the atomic-bomb survivors were exposed to were of a different