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## LETTERS

edited by Etta Kavanagh

### HIV Testing and Individual Rights

IN THEIR POLICY FORUM "HIV TESTING IN CHINA" (9 JUNE, P. 1475), Z. WU *ET AL.* DESCRIBE THE new Chinese national program of active, provider-initiated HIV/AIDS testing among prisoners and other high-risk groups. For some groups, such as prisoners and government workers, individuals consent to health examinations that include an HIV test, rather than directly consenting to the test itself. As the authors admit, this strategy places community protection over individual rights. Although for some, routine HIV testing represents a standard public health response to a deadly epidemic, for others, this represents a dramatic reduction of individual control over when and how one is tested for HIV.

It seems likely that more aggressive HIV testing policies will be increasingly implemented globally as time progresses. Botswana and Lesotho have already initiated routine "opt-out" testing, whereby an individual must specifically request to not be tested (1, 2). This strategy is now being promoted in the United States and South Africa (3, 4). The new campaigns for testing are based on the premise that knowing one's status will reduce further infections and allow individuals access to treatment. However, for most people in low- and middle-income countries, no treatment is available and HIV-related stigma remains a reality. One can wonder what the next step will be if routine HIV testing policies do not make a large impact on the epidemic. Some already advocate mandatory testing in high-prevalence settings (5). Is the trend toward routine testing a transitional stage on the road to mandatory HIV testing?

We should scrutinize the efforts and social context of individual countries before considering routine testing an acceptable custom. China, for example, has a history of illegal incarcerations and torture among prisoners, drug users, and sex workers (6). The "great fire wall" of China prevents the dissemination of HIV prevention strategies from Web sites catering to men who have sex with men (6). HIV/AIDS in China is still associated with widescale and, at times, authority-supported stigma (6). Governments have a responsibility to ensure that HIV testing does not discriminate against any person or group (7). Before we can accept routine testing among oppressed populations as public health leadership, we need non-governmental evidence that these groups are benefiting from optimal health care options and that routine testing is not de facto mandatory testing with strongly adverse consequences for HIV-positive persons.

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2. S. Rennie, F. Behets, *Bull. World Health Org.* **84**, 52 (Jan. 2006).
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4. "Routine HIV testing urged for nearly all Americans," available at [www.msnbc.msn.com/id/6941258/](http://www.msnbc.msn.com/id/6941258/) (2005).
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#### Response

WE SHARE THE CONCERN EXPRESSED BY Mills and Rennie that human rights be respected in the midst of this terrible epidemic, both those of the HIV-infected and those of the HIV-uninfected.

The debate on whether to widely implement HIV testing has been gaining momentum in recent months, particularly because of the U.S. Centers for Disease Control's proposal to remove the need for pre-test counseling in light of available treatments (1–3). Because 25% of the estimated 850,000 persons infected in the United States (and much higher proportions worldwide) are unaware they are HIV-positive, the epidemic is driven by infected persons unaware of their status. In China, as a result of routine HIV testing between July 2005 and June 2006, 33,318 persons now know that they are infected with HIV and can both prevent infecting others and access treatment for themselves.

Routine testing requires that the individual actively refuse testing and may thus be considered by some as coercive (2) and as violating human rights. However, it is important to also consider the human rights of those being infected by persons who do not know their HIV status and to remember that the

primary responsibility of public health professionals is to protect the uninfected (who are the majority of the population) while doing as little harm as possible to those who are already infected. This approach will minimize the impact of the epidemic on society as a whole. For example, it was argued that the rights of an unborn child were violated if its mother refused HIV testing and therefore denied her child access to treatment. Thus, routine testing of pregnant women was introduced in some states in the United States (2). As Mills and Rennie have correctly pointed out, the social context needs to be taken into account.

In Botswana, where routine "opt-out" testing has been in place since 2004, public support for the strategy is high, with one



Yijuan Duan, deputy director of Ruili CDC in Yunnan, takes a blood sample from a male drug user for HIV testing.

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study reporting that 81% of 1251 people surveyed were extremely or very much in favor of routine testing and a further 8.4% indicating they were somewhat in favor (4). China, like Botswana, has introduced a policy of free access to antiretroviral treatment, which is a strong incentive for accepting testing (5). Recent legislation in China also guarantees people living with HIV/AIDS their rights to employment, education, and marriage as well as health care, including HIV treatment (6).

HIV testing is an important component of prevention, but it is not being championed as the only means of prevention in China—nor should it be anywhere. Behavioral and harm reduction interventions among high-risk groups are in place and are being rapidly scaled up, as are programs to combat stigma against those with HIV (7). This includes men who have sex with men, for whom there are a number of online resources, some of which are government supported (8), and whose perspective and issues have been discussed during prime-time television on China's biggest national network (9, 10). China has taken bold steps to reverse its prior attitudes and to stop HIV/AIDS. The international community should applaud this dramatic step forward and not dwell on past issues.

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8. Xinhua News Agency, "Gays cooperate with govt to combat HIV/AIDS," *Xinhua News Agency*, 8 Apr. 2006.

#### Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 6 months or issues of general interest. They can be submitted through the Web ([www.submit2science.org](http://www.submit2science.org)) or by regular mail (1200 New York Ave., NW, Washington, DC 20005, USA). Letters are not acknowledged upon receipt, nor are authors generally consulted before publication. Whether published in full or in part, letters are subject to editing for clarity and space.

9. China Central Television Network,  
<http://www.cctv.com/health/topic/health/UNAIDS/20050303/100612.shtml> (2006).
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 (2006).

## Operational Hurricane Intensity Forecasting

THE ARTICLE "A HURRICANE'S PUNCH STILL knocks out forecasters" (E. Kintisch, *News of the Week*, 1 Sept., p. 1221) describes conclusions reached in a report submitted to the Science Advisory Board of the National Oceanographic and Atmospheric Administration (NOAA) by a Hurricane Intensity Research Working Group. As noted in the article, a major conclusion of this report was the perceived need for high-resolution numerical modeling (with grid sizes as fine as 1 km) to ensure accurate forecasts of hurricane intensity. However, the Working Group also submitted a minority report, written by the present authors.

We have concluded that adoption of some prominent recommendations in the majority report will perpetuate a narrow focus on highly detailed computer simulation. That focus is incommensurate with both available NOAA in-house numerical-analysis support staff and available in-house computing power. It also presumes a detailed level of understanding of many phenomena that does not exist. The strong emphasis in the majority report on highly detailed computer simulation, and the need for greatly enhanced computer resources, obscure the fact that existing NOAA computational facilities are substantial by international civil-sector standards. Furthermore, NOAA's commitment of resources for further expansion of those computational facilities is impressive, within the constraints of the agency's overall budget. On the other hand, little attention is given to the possibility of using more traditional techniques of simplified analysis and numerical modeling (combined with laboratory experimentation), in conjunction with existing numerical models, to provide an alternative, rapidly executed aid for operational forecasters.

At the recent meeting of the Advisory Board, both reports were presented by John Snow, the Working Group Chairman. A motion to forward only the majority report was defeated, and the Advisory Board explicitly recommended that NOAA's Administrator consider both reports.

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## The Danger of Mathematical Models

THE CONTROVERSY ENGENDERED BY STRING theory ("A 'landscape' too far?", T. Siegfried, *News Focus*, 11 Aug., p. 750) illustrates the dangers of assuming that mathematical models that seem to account for our real universe are in fact substantive and actually underlie the universe. String theory, by admitting mathematically the possibility of many universes including our own, suggests the relevance of an anthropic principle (which, as Siegfried writes, is used "to explain features of the universe by pointing out that had they been otherwise, life would be impossible"), which is objectionable to many physicists in that it is more a tautology than an explanation of anything. The universe we inhabit, and its operational principles, exist independently of our observation or understanding; mathematical models of the universe, and indeed mathematics itself, are descriptive tools that exist only in our minds. Mathematics is at root a formal description of orderliness, and since the universe is orderly (at least on scales of space-time and mass-energy, which are within our power to observe), it should come as no surprise that the real world is well modeled mathematically. The mistake comes in turning this relationship on its head and expecting that every sequela of a mathematical model enjoys some real-world counterpart. This is akin to believing in the abilities of a fortuneteller on the basis of a few correct predictions. In both instances, when vastly more than what is true or real is described, the occurrence of a description of real tidbits is neither remarkable nor significant. Significance arises when only that which is real is described. A mathematical model of reality that makes untestable predictions is not necessarily wrong, but it is irrelevant. Cosmology should stick to explaining that which has consequences for us, not that which cannot possibly do so.

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## The "Source" of Drug-Resistant TB Outbreaks

MUCH HAS RECENTLY BEEN WRITTEN ABOUT extensively drug-resistant tuberculosis (XDR TB) outbreaks in South Africa ("Extensively drug-resistant TB gets foothold in South Africa," J. Cohen, *News of the Week*, 15 Sept., p. 1554). Although mono-, multi-, or

extreme drug resistance can be acquired in a strain of *Mycobacterium tuberculosis* through inappropriate therapy or poor compliance, this is arguably infrequent. In South Africa, XDR TB has been reported as an “outbreak,” which implies transmission by definition. The real problem from a public health perspective,

therefore, is to prevent transmission. Transmission can occur almost anywhere, and this problem is exacerbated in immune-compromised individuals. In much of the developing world, treatment relies on smear-based diagnosis followed by a standard regimen of first-line drugs and monitoring for

sputum conversion at 2 to 3 months. In the absence of conversion, the patients are classified as possible resistance cases, and samples are sent for limited resistance testing (usually to the drugs isoniazid and rifampin only). Only if resistance to these is confirmed are further tests requested. Even then, testing is not routinely done for all antibiotics, so there can be a continuation of treatment with inappropriate antibiotics, ongoing transmission, and further acquisition of resistance. A proactive intervention is needed where the full spectrum of tests for all antibiotics are used at the outset. This is not generally part of most programs, partly because of the cost and difficulties involved. With the help of the local health authority and implementation of rapid molecular tests, we were able to stop a multidrug-resistant TB outbreak in the Cape Town environment by PCR-based genotyping of isolates and rapid intervention. Unless we accelerate diagnosis, we will not defeat TB.

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### TECHNICAL COMMENT ABSTRACTS

#### COMMENT ON “Stability via Asynchrony in *Drosophila* Metapopulations with Low Migration Rates”

Esa Ranta and Veijo Kaitala

Dey and Joshi (Reports, 21 April 2006, p. 434) studied replicate laboratory populations of *Drosophila* and reported that low migration led to asynchrony among subpopulations. We argue that this unexpected outcome may be due to variation in the initial size of the subpopulations and uncontrolled stochasticity in the experiments.

Full text at [www.sciencemag.org/cgi/content/full/314/5798/420a](http://www.sciencemag.org/cgi/content/full/314/5798/420a)

#### RESPONSE TO COMMENT ON “Stability via Asynchrony in *Drosophila* Metapopulations with Low Migration Rates”

Sutirth Dey and Amitabh Joshi

Ranta and Kaitala find asynchrony in our experiment unexpected and suggest stochasticity as a possible causal mechanism using simulated two-patch metapopulations. However, their mechanism can yield either subpopulation synchrony or asynchrony. We extend their approach to a nine-patch system approximating our experiment and show that asynchrony is not only not unexpected but extremely likely in real metapopulations with low migration.

Full text at [www.sciencemag.org/cgi/content/full/314/5798/420b](http://www.sciencemag.org/cgi/content/full/314/5798/420b)

## HIV Testing and Individual Rights

Edward Mills and Stuart Rennie

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