**Readers discuss declining human fertility in the world and how to address it. Two members of a team that inspected a Japanese laboratory in 1997 comment on their biosafety findings. They state that "[l]aboratory-acquired infections are well documented...including Japanese reports.... It is possible that such infections can be transmitted into the community." And two representatives of the DuPont Merck Pharmaceutical Company clarify their firm's Cre-loxP patent policies.**

## Declining Fertility

John Bongaarts displays broad knowledge of world demographic trends (Policy Forum, *Science*'s Compass, 16 Oct., p. 419), but when he slips from statistics into advocacy, the result is questionable.

Below-replacement fertility levels in the developed world do not herald an imperative for economic incentives to enhance fertility. If the richer nations perceive a need for offsetting the modest population declines that would otherwise ensue over the next century, they need only relax immigration rules, expanding opportunities for the best-educated and most industrious aspirants from the third world.

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As Bongaarts mentions, the United Nations (UN), in its just issued *1998 Revision: World Population Estimates and Projections* (*1*), has revised its population projections sharply downward. The 1998 revisions now estimate that population at the mid-century mark will reach only 8.9 billion, a net loss of nearly a billion souls from the earlier number.

Even this figure is probably an overestimate. The UN "low-fertility projection," historically more accurate than its "medium-fertility" one, sees only 7.3 billion people inhabiting the world in 2050. Given that world population now stands at 5.9 billion, this means we will only add about a quarter of our present number to the human family before beginning what could be a wrenching descent.

What accounts for these dramatic declines? The answer is falling fertility, rising rates of AIDS, and more accurate prognosticating by the United Nations. Nearly half the world's population—44%—has now decided, for various reasons, not to completely replace themselves, or they are dying of AIDS before they can. The remainder is having far fewer children than their grandparents. The UN Population Division reports that the global average fertility level now stands at 2.7 births per woman, a mere 0.6 above the replacement level. In the early 1950s, women averaged 5 births. Fertility is now declining in all parts of the world. Over the past 25 years, the number of children per couple has fallen from 5.1 to 2.6 in Asia, from 5.0 to 2.7 in Latin America, and from 6.6 to 5.1 in Africa.

Europe has fallen to a mere 1.42 children per couple, one-third less than the 2.1 required to maintain population stability. To call a projected loss of 100 million people in Europe by mid-century, combined with the senescence of a substantial percentage of the remaining population, a "small decline" minimizes the massive social and economic disruption this will cause.

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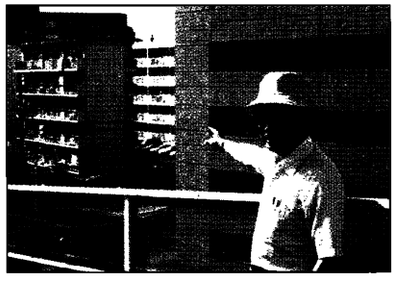
**References**

1. *1998 Revision: World Population Estimates and Projections* (Population Division, Department of Economic and Social Affairs, United Nations, New York, 1998).

## Laboratory Safety

We took part in the inspection on 18 June 1997 of the Japanese National Institute of Infectious Diseases (NIID) (D. Normile, "Court hears fight over safety of lab," News of the Week, 9 Oct., p. 213). We are reluctant to comment on a case that is still before the Tokyo district court, but feel that statements presented in Normile's article need a response.



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**Is Japanese laboratory (right) too close to apartment buildings (left)?**

First, Shudo Yamazaki, Director-General of NIID, is quoted as saying, "We think that [our] safety precautions are equal to or exceed those at America's National Institutes of Health." There should be documented evidence to support this. Such evidence would have to be derived from comparative, contemporaneous independent inspections of both institutes.

Yamazaki is also quoted as saying "There has never been a single case of disease caused by an escaped organism in Japan." This should also be taken with a pinch of salt, because there is no suitable public health surveillance program to back it up. Laboratory-acquired infections are well documented (*1*), including Japanese reports (*2*). It is possible that such infections can be transmitted into the community. On the day of the inspection, NIID workers were not provided with medical contact cards. Without these, how would a physician reliably be alerted to the possibility of an occupational origin for an infectious disease under investigation?

It is suggested that the World Health Organization's (WHO's) recommendation about siting laboratories away from public areas is taken out of context. We cannot accept that WHO intends this (*3*) solely to apply to hospital laboratories. The possibility of escape of pathogens can never be ruled out, and if the laboratory is located away from public areas, there are fewer members of the public available to act as hosts, thus reducing overall the risk of transmission of infection.

The article cites the "essential message" of the Oviatt-Richmond report, which is currently before the court. Taken verbatim from our report, also currently before the court, our message is

> If NIID wishes to engender confidence in the minds of the local residents' group that it really is able to guarantee that its location and activities are not a risk to public health and safety, or—more realistically—that its location and activities are of such a low order of risk as to be acceptable to the local residents' group, it will have to be prepared to provide the necessary hard evidence.

Such evidence was not available in June 1997, the absence of a procedure for dealing with accidental leakage or breakage of vials of frozen pathogen cultures being just one shortcoming.

We think that these are very important issues and that much would be gained by a wider debate. In particular, there would be an opportunity to widen the scope of biosafety science to include quality assurance of safety claims.

Finally, in view of the differences in the reports, we suggest that there is an urgent need for a body like WHO to develop an official protocol for the inspection of laboratories. Not only would this help to ensure common standards of inspection, it would help to focus the minds of laboratory management on biosafety performance needs.

**C. H. Collins**