Latin America, Africa, and Asia.[3] If the quality of antiretroviral drugs was poor this might lead to therapeutic or prophylactic failure and the emergence of resistant strains of HIV.

Establishing an effective HIV treatment service requires high quality kits and reagents for diagnosing and monitoring HIV/AIDS. The sensitivity and specificity of HIV assays decline if they are inappropriately stored or used after their expiry date. This decline compromises the reliability of blood testing for HIV before blood transfusions.[4]

A global strategy to tackle the HIV epidemic must therefore incorporate regular sampling of drugs for HIV infection and diagnostic laboratory reagents from the field to assess drug potency and the sensitivity and specificity of diagnostic reagents. The addition of chemical stabilisers to drugs and reagents may help to maintain their quality: the least stable of the common childhood vaccines, the oral polio vaccine, is stabilised by the addition of pirodavir and deuterium oxide, which allow it to resist even a 10 hour exposure to 42°C.[5]

Subhash C Arya *research physician*
Centre for Logistical Research and Innovation, New Delhi 110048, India
subhashji@hotmail.com

1 Department of Health. *British pharmacopoeia: 2001*. Vols I, II. London: Stationery Office, 2001.
2 Shakoor O, Taylor RB, Behrens RH. Assessment of the incidence of substandard drugs in developing countries. *Trop Med Int Health* 1997;2:839-45.
3 Po ALW. Too much, too little, or none at all: dealing with substandard and fake drugs. *Lancet* 2001;357:1904.
4 Consten EC, van der Meer JT, de Wolf F, Heij HA, Henny PC, van Lanschot JJ. Risk of iatrogenic human immunodeficiency virus infection through transfusion of blood tested by inappropriately stored or expired antibody assays in Zambian hospital. *Transfusion* 1997;37:930-4.
5 Verheyden B, Andrus K, Rombart B. Capsid and RNA stabilization of the oral poliovaccine. *Vaccine* 2001;19:1899-905.

Therapeutic consultation centres are helpful in developing countries

Editor—The increasing global gap between rich and poor countries leads to inequalities in access to drugs and to the knowledge and skills needed for their rational use. It also leads to qualitatively different information needs.

Therapeutic information on the management of HIV infection and AIDS flows at two separate levels: although some doctors debate about the potential benefits of new viral transmembrane protein blockers, others are wondering how to manage a patient with pneumocystis pneumonia because of insufficient financial resources to purchase co-trimoxazole. These people could benefit from local therapeutic consultation centres, especially in countries where the prevalence of HIV infection and AIDS is high and access to appropriate treatment (not only to triple antiretroviral therapy) is unaffordable.

Therapeutic consultation centres are one of the most relevant service activities of clinical pharmacology,[1] supplying problem oriented information for inquiries on individual patients or on factual knowledge.[2–5] In prevention and control programmes for HIV infection and AIDS such a centre specialising in managing these conditions can give quick, expert, and locally focused answers to common problems. For example, it can give advice on prescription and dose adjustments needed in special situations such as pregnancy, paediatrics, and anaemia; best available management for opportunistic infections; confounding side effects (that is, side effects not identified as such); failure to identify drug interactions; best alternatives when there is no drug (or when drugs are scarce or unaffordable); and advice when appropriate treatment proves ineffective.

A therapeutic consultation centre could:

- Develop local guidelines
- Develop the content of and tools for undergraduate teaching and continuous education
- Participate in campaigns on general health and sexual education
- Give advice to policy makers, drug regulatory authorities, and healthcare providers on drug selection
- Monitor prescription and use of treatment to identify inappropriate practices, with particular emphasis on outcome research
- Contribute to the management of international drug donations
- Design and conduct studies on specific issues (for example, transferability of the results of clinical trials performed in other settings, identifying subgroups for which evidence is lacking, cultural perceptions, interactions with non-conventional treatments, adherence).

Such a centre would need political will and support from local authorities, training, continuous external support, and funding. It should include people trained in both infectious diseases (particularly HIV infection and AIDS) and clinical pharmacology, an internet connection, and access to essential drug information sources and medical publications. One such centre will be set up in the Dominican Republic with the support of the World Bank as part of the framework of the multicountry HIV/AIDS prevention and control programme for the Caribbean region.

Albert Figueras *assistant professor*
afs@icf.uab.es

Joan-Ramon Laporte *professor*
Departament de Farmacologia, Terapèutica i Toxicologia, Universitat Auto noma de Barcelona, Barcelona, Spain

1 WHO Working Group on Clinical Pharmacology in Europe. Clinical pharmacology in Europe: an indispensable part of the health service. *Eur J Clin Pharmacol* 1988;33:535-9.
2 Rodríguez C, Arnau JM, Vidal X, Laporte JR. Therapeutic consultation: a necessary adjunct to independent drug information. *Br J Clin Pharmacol* 1993;35:46-50.
3 Davies DM, Ashton CH, Rao JG, Rawlins MD, Routledge PA, Savage RL, et al. Comprehensive clinical drug information service: first year's experience. *BMJ* 1977;i:89-90.
4 Spector R, Heller A, Johnson MW. The structure and function of a clinical pharmacology consulting service. *J Clin Pharmacol* 1979;19:257-60.
5 Öhman B, Lyrvall H, Alván G, Sjöqvist F. Clinical pharmacology and the provision of drug information. *Eur J Clin Pharmacol* 1992;42:563-8.

Animal studies and HIV research

Animal studies are inaccurate for HIV research

Editor—As Yamey et al highlighted, HIV will have killed 55 million people by the year 2010.[1] Now, 20 years since the first appearance of the virus, is a good time to review the advances to date and identify promising avenues for future research.

To estimate the amount of money spent on research on HIV and, within that, the amount spent on animal studies is difficult. Assessments of the efficacy of animal studies in HIV research are, however, easier to come by.

Thomas Insel, former director of the Yerkes Regional Primate Center in Georgia, said: "[An animal model] that takes 12-14 years to develop doesn't sound to me to be ideal … I can't tell you what it is that those studies [with chimpanzees] have given us that has really made a difference in the way we approach people with this disease."[2] Animal models of HIV have been notoriously inaccurate for two reasons.

Firstly, the immune response is intensely complicated and there are many disparities between the human immune response and those of other animals. Secondly, viruses are usually species specific.

In terms of treatment, the efficacy of zidovudine—originally an anticancer drug—was shown in 1985 from the results of in vitro studies rather than animal research. Similarly, combination antiretroviral therapy was developed using in vitro methods, rational drug design, and clinical research.

In vitro research has also enabled other advances in understanding and potentially treating HIV. These include elucidating the structure of the virus (and recently the rare b12 antibody), finding that an HIV-1 entry inhibitor could prevent HIV from fusing with the cell membrane,[3] and discovering that certain strains of HIV do not use the normal 2-receptor binding process but bind directly to T helper cells via the CD8 receptor.[4] Epidemiological studies determined the routes of HIV transmission. Gene variants that influence HIV progression were identified using longitudinal epidemiological cohort studies, high throughput genotyping and polymorphism discovery methods, and computational algorithms to detect gene associations in cohorts with the disease.[5]

The fact that 20 years on there is still no cure or vaccine for HIV is surely partly because too much money, time, and effort have been invested in animal research which has produced little, if nothing, in return. To make any impact on this global pandemic during the next 20 years, funding needs to be concentrated on research methods that have come up with the goods.

Ray Greek *president, Americans for Medical Advancment*
2251 Refugio, Goleta, CA 93117, USA

Pandora Pound *freelance researcher (medical sociology)*
Radford Mill, Timsbury, Bath BA2 0QF

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