of patients that could benefit have access to the antiretroviral drugs that can considerably extend life expectancy.

Although immunologists and virologists are making progress in understanding, for example, how HIV affects the mucosal surfaces of the body — a process that seems to contribute greatly to HIV's destructive toll on the immune system — the search for a preventative vaccine has stalled. Only this autumn, a trial for a candidate vaccine from Merck was halted because it proved to be ineffective, and actually made some subjects more vulnerable to infection (see *Nature* **450,** 325; 2007). Some researchers are now claiming that disappointing lab results for this vaccine earlier in its development should have prevented it from getting to full-blown clinical trials. Those in the field have recently made attempts to ensure that new vaccine candidates meet rigorous scientific standards agreed to by the entire field — but this initiative began after the Merck vaccine had entered large clinical trials.

It seems that in vaccine development, researchers waited too long to coordinate their efforts fully. That could provide a lesson for the parallel quest for an effective microbicide — a chemical prevention method whose use, importantly, would be controlled by women. All the results of large microbicide trials to date have been disappointing — and duplicative microbicide trials are still being planned (see *Nature* **448,** 110–111; 2007). It is not clear that the most promising microbicide candidates are those that are being advanced most rapidly into trials, nor is there any consensus about what the most scientifically promising candidate would look like.

These are issues the microbicide field needs to resolve. With no vaccine in sight, the microbicide researchers are arguably those best placed to deliver something that will fundamentally alter the shape of the AIDS pandemic. That way, UNAIDS might one day deliver a downward estimate in the worldwide HIV burden that can be attributed to genuine progress against the disease, rather than to better statistical sampling. ■

Venezuela's way ahead

The opportunities currently opening up for Venezuelan science should not be squandered.

The president of Venezuela, Hugo Chávez, suffered his first electoral defeat for a decade on 2 December, when he unexpectedly lost a referendum on constitutional change that was supposed to cement his powers and accelerate socialist reform. The opposition was spearheaded by protest marches of hundreds of thousands of students, along with their professors. But the left-populist president, for all his flaws, has broadly supported universities and scientific research in Venezuela.

Chávez sees himself as the leader of a socialist revolution, modelled on the egalitarian ideals of Simón Bolívar, the Caracas-born general who led the liberation of much of South America from Spanish rule in the early nineteenth century. Chávez has nationalized major industries, including the oil companies, and has increasingly distanced Venezuela politically from the United States, its largest trading partner. Rapid economic growth has been sustained by the rising price of Venezuela's oil exports.

The Venezuelan president, while openly confronting the oil companies and other national élites, has taken steps to keep academics on his side. Like army officers, Venezuelan professors can retire at the age of 47 and receive generous pensions for the rest of their lives. Not everyone takes this up — but a sizeable fraction of the 33,000-strong academic workforce do just that. Professors also have the right to choose their own students. Their tendency to choose from the upper middle class may explain some of the student protests against Chávez's socialist government.

On the other hand, measures have been taken to strengthen the universities. In 2001, the government created a Ministry of Science and Technology, which distributes grant money on a competitive basis. And in January 2007 the Organic Law of Science, Technology and Innovation (LOCTI) came into effect, requiring Venezuela's 7,000 largest companies and commercial enterprises to pay a fraction of their annual taxes directly to universities and public research institutes. Overall public and private spending on science has quadrupled, to US$2.5 billion per year, the government says, reaching a very respectable 2.1% of gross domestic product in 2007.

As a result of these measures, some academics say, the Venezuelan science system is suddenly receiving more support than it can sensibly manage. Companies are investing in research projects as they see fit, without a proper system for evaluation of the proposed work. The government is now evaluating the first year of the work supported by LOCTI and must then find ways to channel more of the money into the most promising projects.

Obvious national research priorities range from infectious-disease research and rainforest ecology, to engineering and environmental problems related to oil retrieval. One problem is that few departments at Venezuela's 50 or so universities have sufficient staff and equipment to perform internationally competitive research. Another issue is that many professors are not especially interested in doing original research, as regular publication is not necessarily rewarded with promotion. Making research a prerequisite of a successful academic career — which should not end at the age of 47 — is the key to making Venezuelan science more productive.

"Few departments at Venezuela's universities have sufficient staff and equipment to perform internationally competitive research."

Plans also exist to turn the country's premier research institute, the Venezuelan Institute for Scientific Research in Caracas, into a full-blown research university. This will help to produce qualified and motivated graduate students who can take Venezuelan science forward. The institute should have enough income from public and private sources to set up new centres in the Andes, the Amazon region and in the oil-rich state of Zulia in northwestern Venezuela — all of which need to raise their research profiles.

The referendum result has raised hopes that Venezuela's democracy will outlive Chávez, and build on some of his genuine achievements. The advent of stronger science at Venezuela's peripheries, as well as in its capital, is one legacy that could prove invaluable. ■