

(3) F. M. Scherer is Aetna Professor Emeritus in the John F. Kennedy School of Government, Harvard University; and lecturer with the rank of professor, Woodrow Wilson School of Public and International Affairs, Princeton University.

CIPHIH has asked me to comment on the proposed Medical Research and Development Treaty, whose enactment has been endorsed by a stellar constellation of prominent world citizens. My comments follow.

There can be no doubt that important problems exist in the funding of medical research and development. It is well known in particular that the principal private enterprise approach to drug development provides meager (not zero) incentive for work on so-called tropical diseases. It is unfortunate that the treaty draft does not provide an estimate of how important such neglected diseases are in the panoply of world diseases. In the report issued by the World Bank, "Health, Nutrition and Population Development Goals" (2002), the leading items in a ranking of contributors to the global disease burden in 1999 are HIV/AIDS, perinatal conditions, maternal conditions, childhood diseases, malaria, and tuberculosis. All of these are health problems in the first world too, and, ignoring the special case of mutant strains, there are substantial incentives for the development of effective therapies. Malaria is perhaps the principal exception, but there is a lot of work on it currently. To be sure, some diseases occur primarily in the third world, but the magnitude of the problem that is uniquely without solution ought to be brought into sharper perspective.

Even before I know what is going to happen in the travesty over proposed appointment of John Bolton to be U.S. representative in the United Nations, I concur with Richard Nelson's scepticism about the feasibility of a new international treaty. I think it would be much wiser to incorporate the proposed treaty's goals and actions in something that has already been widely accepted by the community of nations: the Millennium Development Goals crystallized at a summit conference in September 2000, which, among other things, seek to have wealthy nations devote 0.7 percent of their GDP to official development assistance. The Millennium goals expressly include health care as an important subset toward which that assistance would be directed. The 0.15 to 0.2 percent advocated for rich countries in MRDT for qualified medical research could easily be accommodated within the Millennium framework. To be sure, although some European nations appear to be coming close, reaching the 0.7 percent Millennium goal will be a stretch. The United States are far from compliance. The U.S. development aid record in recent years is best described by the title of a song popular during the 1950s: "Heap Big Smoke But No Fire." If the world's wealthiest nation is so reticent about funding development obligations and joining in treaties concerning global warming and war crimes, it is unrealistic to expect it to ratify MRDT.

Suppose, however, that the U.S. agreed to cooperate. What would be its qualified research and development target? As nearly as I can tell from section 4.2 of the treaty draft, it would be on the order of \$18 to 24 billion per year. The U.S. National Institutes of Health R&D budget for 2004 was \$27 billion, roughly half of which was for basic research. Drug companies belonging to PhRMA report 2003 domestic R&D expenditures of \$27 billion. Thus, even ignoring medical school research financed by philanthropic institutions and state funds, current U.S. expenditures already exceed the minimum levels prescribed by the treaty. The constraint is not binding. To be sure, U.S. outlays may not reach the target of \$2.4 billion for priority medical research. But with a bit of creative accounting, I suspect I could manipulate the roughly \$10 billion of annual research and development expended by U.S. biotech firms and other agencies work on HIV and resistant bacteria to satisfy that constraint.

Given this, I find the special credit trading scheme proposed in Section 12 to be puzzling. For the United States at least, if I'm correct that the overall constraint is satisfied, the shadow price of special credits would be zero. If so, the U.S. would at best be a supplier of special credits. For what would the credits be exchanged? Cash? Why should relatively poor nations pay a rich nation for credits? What incentives or penalties are there to induce a nation supporting insufficient QMRD to buy credits, or otherwise to comply? Who are the most likely deficiency nations? If there would be few, the credits would be of little value.

How would one actually measure the magnitude of the special credits? Definition of what is "open," what is technology transfer, and what is priority would be indisputably subjective, engendering many quarrels. And if a nation did not directly satisfy its QMRD targets, I can see lots of imaginative accounting under e.g. finance method 6.v., "creating incentives for investments in QMRD." Take the United States again, which I know best. In 2001, gross margins of the U.S. pharmaceutical industry were on the order of \$58 billion. Those margins induce drug R&D. How much? On that, reasonable people will disagree – perhaps violently. My simpleminded estimate would be that they induce all the observed R&D, which, again, would satisfy the U.S. target.

Naturally, the inducements and the actual R&D cannot be double-counted, but in other parts of the national R&D accounting system, it's difficult to separate out the double counting. Tax avoidance games, e.g., in the allocation of R&D and the profits therefrom to jurisdictions with the most favorable income tax laws -- could also wreak havoc with attempts to attribute R&D financing to the actual sources of incentive. See "Drug Makers Reap Benefits of Tax Break," New York Times, May 8, 2005, p. 1.

Let me note too that given the wide fluctuations experienced during recent years in exchange rates, getting a common denominator in which the R&D targets are expressed would not be simple. What looks like a satisfactory plan in the year 2002 could, with the devaluation of the dollar since then, fail the test. What

experience we have on such trading schemes to date is mainly on such stable common denominators as tons of SO₂ or CO₂. At the very least, to support the proposal, one ought to have an extensive simulation analysis using numbers gathered from national accounts.

I believe an implication of sections 12 and 13 is that, when drug or medical device research is sponsored by public authorities, movement should be encouraged away from granting exclusive rights to profit-seeking organizations in the resulting inventions and/or data. This seems to imply movement away from CRADA (cooperative research and development) agreements between government laboratories and private companies, and the assignment of patents obtained by university and hospital laboratories under government grant financing to private companies, which proliferated in the 1980s under favorable new U.S. legislation. I agree that there have been abuses, e.g., in the arrangements under which AZT was marketed by Burroughs-Wellcome during the 1980s. But there is a reason for the apparent madness. Academic research on new drug targets is wonderful, but to bring the drugs into actual clinical practice, pre-clinical screening and extensive clinical testing are necessary. Academic researchers typically lack capabilities to carry out such testing. In 1962, according to a report published by the U.S. Committee on Government Patent Policy, the U.S. Department of Health, Education, and Welfare published a new regulation implying that private companies screening and testing new therapeutic candidates invented with government funds could not receive exclusive patent rights. Up to that time, companies regularly screened the molecules emerging from government and academic laboratories. After the regulation was published, the screening ceased abruptly. It resumed only after HEW relaxed its policy in 1968, a policy endorsed with formal law changes in 1980.

Getting the right balance between openness of basic research and maintaining incentives to ensure that possibilities discovered by research are developed and tested to the commercialization stage is very important. I agree with the drafters of MRDT that we have not yet found the right balance. Important to getting the balance right is recognizing the distinction between drug discovery phases, development and testing phases, and commercialization phases. Different institutions play a key role, or can do so, at different stages in the process. The levels of uncertainty differ radically among the stages. The incentives that elicit desired behavior also differ. I believe the draft treaty is too blunt an instrument to deal with these subtleties.

In section 12, how will the CMI obtain the funds to provide economic incentives for investment by member nations? Is there danger of another Oil for Food program?

Finally, let me add a few words in support of Roy Widdus on what I would call demand-pull

incentives. He is right: one of the flaws in current vaccine programs is the lack of certainty that if one comes up with an important new vaccine, it will be purchased in quantity. The United Kingdom in particular has taken commendable initiatives to ensure that such demand will exist through advance purchase commitments. There are cases in which such clearly articulated and credible willingness to purchase is sufficient to induce desired technological progress. The invention of the integrated circuit is a prime example. During the late 1950s, the U.S. Department of Defense recognized that it would be extremely desirable to miniaturize the size of transistors and perhaps even to move away from monolithic semiconductors altogether. It placed a dozen or so "technology-push" contracts with industry to encourage the desired breakthroughs. All failed. However, in placing the contracts, it signalled its willingness to purchase miniaturized transistors, and this motivated the work of Jack Kilby at Texas Instruments and Robert Noyce and Jan Hoerni at Fairchild that formed the basis for the integrated circuit revolution. Neither company had a government contract, although Fairchild's predecessor company had sought one unsuccessfully. Pharmaceuticals differs from integrated circuits in the sense that the work done by Kilby et al. could be brought to the proof stage at relatively low cost, whereas testing the efficacy and safety of a new drug can cost tens of millions of dollars.

Creating a system that gets the incentives right for developing drugs and medical devices but at the same time ensures widespread diffusion of the resulting technology to low-income nations remains an unsolved problem. Because the devil hides in the details, I don't believe MRDT reaches that goal.