BIOMEDICINE

Research 'Summit' Ponders Health Funding Shortfall

OTTAWA, CANADA—In what was informally referred to as the G-14 summit, health officials from 14 countries met here earlier this month for an unprecedented gathering. For 2 days, these health mandarins sat around a giant horseshoe-shaped table with leading economists, pharmaceutical industry titans, and heads of the world's largest biomedical philanthropies, volleying ideas about innovative ways to raise money for research (see 492). That subject was, however, often pushed into the background as the participants agonized over how to lobby for more of their traditional lifeblood: annual governmental appropriations, from the politicians who hold the purse strings. And while they did not reach any tangible conclusions or recommendations, one clear theme emerged: In spite of better-than-expected budget increases in a few countries, including the United States, biomedical researchers around the world are worried sick about their financial health.

Held in a regal hotel ballroom located in the heart of Canada's capital city, the "Innovations in Funding Health Research in the New Millennium" meeting* was the first get-together of its kind ever organized. "I felt it was somewhat obvious that a group like this should have been meeting regularly," said Henry Friesen, president of Canada's Medical Research Council (MRC) and the meeting's chair. "A setting like this allows more in-depth analysis of the issues we face and a frank discussion."

The frank discussions were kicked off when Canada's minister of health, David Dingwall, described the central problem facing representatives of many of the countries sitting around the table: shrinking research budgets and a greater demand for accountability for the money they do receive. Canada's MRC, for example—that country's largest funder of health research—saw its budget drop from roughly $187 million last year to $181 million for 1996–97. The Netherlands and Sweden are also facing serious cuts (see table), while Italy, Germany, Switzerland, and the United Kingdom are not even keeping up with inflation. And even countries that are enjoying healthy increases, such as the 6.9% boost that the U.S. National Institutes of Health (NIH) will receive next year, are concerned that the burgeoning opportunities in biomedicine outstrip the resources.

"If we have such a good product, and we do, we must find better ways to communicate that to the masses," said Dingwall. Philippe Lazar, the former director-general of France's INSERM, echoed that sentiment: "We have to be more convincing to the governments to show them what we are able to do."

PHOTOS BY MARIO SAINT-JEAN

Head of the horseshoe. Health officials *(from left)* Philippe Lazar (France), Henry Friesen (Canada), David Dingwall (Canada), and Wendy Baldwin (United States).

The premise behind the investment in basic research is that it benefits public health, which, in turn, saves money. But even arguing that research spending benefits public health can be tricky. Although no one at the meeting seriously questioned whether basic research is worth the amount spent on it, several pointed out that important gains in public health often have had little to do with what happens in laboratories. Stanford University economist Nathan Rosenberg cited a study showing that between 1838 and 1970 in England and Wales, the sharp drop in mortality from infectious diseases was due primarily to rising incomes and concurrent improvements in nutrition—not medical intervention. Similarly, he noted that the state of Utah, 70% of whose inhabitants are Mormon (who don't drink alcohol or smoke), is significantly healthier than its neighbor, Nevada. "Clearly, conducting one's life so that it is consonant with certain religious beliefs may make a great deal of difference," Rosenberg quipped.

And communicating the benefits of basic research to corporate chiefs and politicians who are looking for economic payoff can be even harder. "The tools presently available to measure our performance are archaic and blunt," contended Craig Saxton, an executive vice president at Pfizer, a major pharmaceutical company. As a result, Purnell Chopin, president of the Howard Hughes Medical Institute, and other participants acknowledged that there are few studies that prove research yields a healthy return on the money invested in it. "Our difficulty with basic research is that you have to get anecdotal," said Chopin.

Seth Berkley, an associate director at the Rockefeller Foundation, added that positive results may come in well beyond the terms of office of politicians and company officials. "The problem is that it's a good investment over 50 or 100 years," said Berkley, who helped put together a recently released World Health Organization report, "Investing in Health Research and Development," that addresses these issues.

The issue is made even murkier when the heads of biomedical research agencies argue for, say, a 5% budget boost. "How can you demonstrate that a small, marginal increase in funding will automatically buy a return?" asked Nick Winterton, an administrative secretary at the U.K.'s MRC.

Some participants, such as Glaxo Wellcome Chief Executive Officer Richard Sykes, went even further, saying they aren't convinced that, in strict financial terms, government-funded basic research is a good

PUBLIC FUNDING FOR BASIC, BIOMEDICAL RESEARCH*
(in $U.S. millions)

Country	1996	1997	Change
Australia	57.8	62.4	+6.5%
Belgium**	51.6	52.5	+1.7%
Canada	187.5	181.5	–3.2%
France	~726	NA	~+5%†
Italy	350.0	350.0	None
Germany	2,990.0	2,990.0	None
Japan	996.0	1,200.0	+21%
The Netherlands	87.0	~82.6	Up to –5%
New Zealand	11.4	13.1	+1.5%††
Sweden	73.5	64.5	–12.2%
Switzerland	134.0	134.0	None
United Kingdom	431.7	438.0	+1.5%
United States	11,900.0	12,800.0	+6.9%

* ABSOLUTE NUMBERS MAY NOT BE COMPARABLE BECAUSE DIFFERENT ITEMS MAY BE INCLUDED IN DIFFERENT COUNTRIES
** YEARS ARE 1996–97, 1997–98
† INCREASE FROM 1994–96
†† NEW ZEALAND IS FUNDED IN 3-YEAR BLOCKS AND HAD A 30% JUMP FROM 1995 TO '96

SOURCE: MEETING PARTICIPANTS

* "Innovations in Funding Health Research in the New Millennium," 3–4 October, Ottawa, Canada.

A 'Reforestation Plan' for Biomedical Research

Although leaders of medical research from 14 countries came to Ottawa earlier this month to discuss innovative ways to fund their enterprises, innovative ideas were in short supply. Still, the few that did surface—including auctioning off rights to commercialize the results of academic research and offering big cash prizes for specific advances—raised intriguing possibilities that many participants had not considered. One idea, however, floated by Canadian physician and entrepreneur Calvin Stiller, became perhaps the hottest topic discussed at the 2-day conference. Stiller outlined a breathtaking plan that would turn Canadian universities into venture capitalists: Armed with a pot of government funds and assisted by a slew of tax shelters, they would invest in companies that would commercialize their researchers' findings. Revenues would later be plowed back into medical research.

Stiller described the idea as a "reforestation plan," in which commercial enterprises would reseed the universities. That notion clearly resonated with the leaders of Canada's hard-pressed biomedical research establishment, which is in the throes of absorbing a staggered 13%, 4-year cut in government funding through the year 1998–99. "I did find Dr. Stiller's approach was in some ways the most creative and original [proposed]," said Canadian Medical Research Council (MRC) President Henry Friesen. And, although some at the meeting voiced concerns that universities might shift funding from basic research into areas more likely to generate profits, Stiller's proposal seemed to have legs. "It's a very, very innovative approach, and certainly one that attracted a great deal of interest and will attract more elsewhere," said Philip Lee, assistant secretary of health at the U.S. Department of Health and Human Services.

At the heart of Stiller's proposal, which he has developed with a team of accountants and economic consultants, is a new National Health Science Endowment Equity Fund to which the government would allocate $100 million Canadian ($75.7 million U.S.) a year for up to 10 years. Universities and research institutes could draw on this so-called SEED fund to match private-sector investments in fledgling companies that aimed to commercialize biomedical and health research done at these institutions. A key part of the package is a collection of tax incentives that would be used to lure private investors into the partnerships. And the plan closes the circle by calling for the institutions to kick back a chunk of their earnings—assuming they make any—into the medical research enterprise, either by funding new projects within their own faculties or by funneling those revenues to the MRC for disbursement through peer review.

Stiller argued that his plan would give the institutions substantial equity in research that they are now selling to industry for a pittance, generally in the form of a "small" royalty from licensing fees. He also contended that the scheme would ultimately create a "more self-sustaining" source of research funding. But there is a big tax and subsidy kicker: Stiller thinks it would take 10 years for his plan to generate enough earnings to show much of a return on the investment, during which time he would like the government to provide an "interim" $1.5 billion cash injection in the MRC's base budget. This money, in turn, would rev up the research engine, theoretically producing more new ideas that would lead to more commercial products. That notion, however, might face strong opposition in an austerity-obsessed government increasingly averse to the use of incentives targeted at a single economic sector.

Fraser Mustard, founder of the Canadian Institute for Advanced Research, a public policy think tank, also cautioned that Canadian universities would likely have to create new affiliates to handle the equity holdings and industrial partnerships. Mustard added that the plan is more likely to generate revenues for biomedical research than for health services or population-based studies and may compromise the undergraduate teaching function of universities by steering efforts toward commercially driven R&D. But properly managed, he said, the plan might be "quite doable" because it allows "industry to collect the money by a tax privilege, which is what this is, and to kick it back to steer the fundamental research more directly to their interests."

MRC head Friesen said the impact of such steering effects will have to be carefully examined before the proposal is recommended to government. But he stresses that the idea warrants "very, very serious scrutiny" on the basis of Stiller's track record alone. Stiller was the chief architect of the Canadian Medical Discovery Fund, a wildly successful tax shelter created in 1994 that has attracted $200 million (Canadian) from 40,000 individuals for investment in small biotechnology, medical devices, and health firms. And in a country where the MRC budget is $242 million, that's no small change.

Although no other proposal offered at the meeting made quite the splash that Stiller's created, two more modest suggestions—at least by comparison—raised some interest. Stanford University economist Paul Romer argued that one way to break away from the "tax and subsidy" model of funding for biomedical research would be to strengthen property rights, perhaps through extended patents. Romer specifically proposed that countries could test whether such incentives would promote basic research within industry by, say, auctioning the patent rights to a randomly selected portion of the human genome and comparing the outcome with that achieved through public financing. Another novel idea, described by Seth Berkley of the Rockefeller Foundation, is to offer researchers prize money for making advances in critical areas. This plan, at least, has one thing going for it: It is already being tested. Rockefeller is offering $1 million to anyone who develops a simple test to diagnose sexually transmitted diseases in women.

–Wayne Kondro

Wayne Kondro is a science writer in Ottawa.

investment. He and others noted that the clearest payoffs come in less direct ways, such as seeding the R&D done by industry. France's Lazar noted that basic research also makes scientists and clinicians "superior" teachers, a point he said is "often forgotten."

Wendy Baldwin, deputy director of NIH, agreed that economists sometimes seek too precise an answer to the question of whether biomedical research is a good investment. "I think that level of detail can be mischievous," said Baldwin, who ticked off a long list of basic research discoveries—including the tissue culture methodology used to make the first polio vaccines and the more recent link between *Helicobacter pylori* and stomach ulcers—that obviously have saved untold millions of dollars. Judith Whitworth, chair of Australia's MRC, had similar misgivings. "The whole point in science is it's creative," said Whitworth. "If you're not picking losers, you're doing something wrong."

In spite of such misgivings, organizer Friesen felt by the end of the meeting that the gathering itself was unquestionably a good investment. "This was, after all, an experiment, and it was a great success," said Friesen. One measure of proof: A second meeting is already being planned for 2 years hence.

–Jon Cohen