

Transcript

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PROFESSOR LEON ROSENBERG

CHAIR: Welcome to the National Press Club. Our address this afternoon is from Professor Leon Rosenberg, who has a distinguished career in medical teaching and medical research.

Before we hear from him, though, we have a very very special occasion to mark. Yet another achievement in Professor Rosenberg's remarkable career.

To tell you about it, could I please introduce Professor Alan Pettigrew, Chief Executive Officer of the National Health and Medical Research Council. [Applause]

PROFESSOR ALAN PETTIGREW: Thank you, Malcolm. Professor Rosenberg, Distinguished Guests, ladies and gentlemen, I'm very pleased and delighted to represent the Minister for Health and Aging, Senator Kay Patterson, in welcoming Professor Rosenberg to Australia. And it is a privilege to

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present him with the research medal on behalf of the Australian Society for Medical Research.

But you hear from me in a moment and from our guest in a few minutes, the ASMR has chosen a very worthy recipient of their medal, which is presented annually as one of several highlights during each year's medical research week.

There are at least two very important reasons why we are fortunate to have Professor Rosenberg with us at this time. Firstly, most of us are very aware of the government's recently announced process to identify national priorities in research. I am personally unashamed to indicate, and I know that my colleagues in both the NHMRC and the ASMR support the notion that the health of individuals and therefore the community must be a national priority.

To what extent that notion is refined to one or more foci of as yet unknown dimension is what lies ahead over the next few months.

The NHMRC will also be assessing how best to integrate any new national priorities with its own existing priorities that have been developed and established over recent years.

Secondly, there is an increasing urgency on the identification and measurement of outcomes that flow from public investment in research in any field. Much of the current discussion focuses on the

realisation of commercial outcomes related to growth in industries, jobs created and, dare I say, taxes realised.

But in the case of medical research there is also much more to be gained from realising the benefits that flow from a reduced burden of disease, reduced health care costs and improvements in the quality of a productive life.

What is often needed in these considerations is an understanding of the time course over which these outcomes flow from any period of investment.

I know that Professor Rosenberg's address today and his presentations around the country during this Medical Research Week will provide valuable insights for our consideration of both national priorities and the economic benefits of medical research.

Medical Research Week and the ASMR medal are well-established features of the Australian Calendar. And in the tradition of a series of distinguished recipients we are privileged to have Professor Rosenberg receive the award in 2002.

Professor Rosenberg established his academic reputation as a specialist in inherited metabolic disorders in children. He and his colleagues conducted pioneering laboratory and clinical investigations into the molecular basis of several

inherited disorders of amino and organic acid metabolism.

He is particularly well-known for his discovery of how Vitamin B12 is used in cells in the body. And how Vitamin B12 supplements can correct many health problems in affected individuals. In 1972 Professor Rosenberg helped establish the Department of Human Genetics at Yale University. And he was Dean of the Yale University School of Medicine from 1984 to 1991.

He has also served as the Chief Scientific Officer of the Pharmaceutical Company Bristol, Myers Squibb. And he has been a Member of the National Academy of Sciences since 1985 and a Member of the Institute of Medicine since 1982.

He has current faculty appointments at Princeton and Yale where he works to inspire young people about what can be achieved in a career in medical research.

More recently Professor Rosenberg chaired a congressionally mandated committee of the Institute of Medicine, a group of eminent people who are charged with assessing research priorities at the National Institutes of Health.

Professor Rosenberg is also immediate past-President and Chief Executive Officer of Funding First USA, which is an organisation that is

committed to full-time building the case for a sustained long-term national commitment to medical research.

Professor Rosenberg's career demonstrates his outstanding leadership in government circles, academia and industry. And he is well-placed to advise us all on all aspects of medical research.

He is an extremely deserving recipient of the Medical Research Medal.

Professor Rosenberg, I am delighted to present to you, on behalf of the Australian Society for Medical Research, the Society's Research Medal. And I ask you all to join me in congratulating Professor Leon Rosenberg.

[Applause]

PROFESSOR LEON ROSENBERG: Thank you very much, Professor Pettigrew. Mr Farr [phonetic], President Randall [phonetic], Members of the National Press Club, Members of Medical Research Community, ladies and gentlemen, I am honoured and delighted to be the 2002 medallist and National Lecturer of the Australian Society for Medical Research. And I want to thank Peter Schofield, Moira Clay [phonetic] and their many colleagues at ASMR for this distinct honour.



MEDIA MONITORS

Being the ASMR medallist during National Research Week has given me a special opportunity to visit Australia again, and to see some cities and regions like Canberra that my wife and I didn't get to when we were here 22 years ago. Then places like Heron Island, the Sydney Opera House, The Fairy Penguins were indelibly imprinted in my memory box and this week I will add several more memories, not the least of which will be visiting Canberra on this beautiful winter day and seeing the lovely layout of your capital city.

As you heard from Professor Pettigrew, my career has taken a number of twists and turns, but it does contain a single common theme: involvement with health and medical research. I feel like I am a very lucky man to have been an investigator engaged in basic and clinical research, to have a chair of an academic department, to have been a dean of a research intensive school of medicine, to have been the chief scientific officer of a large company and to have been the president of a research advocacy initiative of a major foundation. Each of those experiences has reinforced my lifelong belief that medical research is instrumental to improvements in health. And what we sometimes forget to say, that it is extraordinarily exciting and fun.

The Nobel laureate Max Perutz said it as well as anyone, quote, 'Making a discovery is such a wonderful thing. It's like falling in love and getting to the top of a mountain all in one.' End quote.



MEDIA MONITORS

Now, for those of you with a less romantic inclination you might prefer the words of a President of the US, Franklin Roosevelt, who said: 'We cannot be a strong nation unless we are a healthy nation.'

Those of us who have grown up as medical scientists generally feel comfortable talking about the medical contributions of research. The basic scientific discoveries in genetics, cell and molecular biology, neuroscience and immunology for example. Or the organ systems that we've explored through physiology and pharmacology and imaging scientists. Where the patients we've studied and the volunteers who have stepped forward to help us do clinical trials, or the medicines that have been developed as a result of insights obtained from basic science, or the infectious diseases whose death tolls have been so dramatically reduced in the 20th Century it is like an honour roll of accomplishment.

The dramatic reductions in deaths due to influenza, tuberculosis, syphilis, diphtheria, pertussis, measles, poliomyelitis and, best of all, smallpox which has been eradicated worldwide.

And, finally, we like to remind ourselves of the lives that have been saved and extended. It is important that we not forget that life expectancy has increased by close to a decade in the past 30 years. A remarkable 12% increase that cannot be attributed to improvements in sanitation and public

health measures which increased longevity during the first two-thirds of the 20th Century.

The recent gains in life expectancy are a direct result of investments in medical research.

To me there is another treasured aspect of the field and that is its global nature. It is carried out by people in many countries for people in many countries. Australia has a rich heritage in medical research, as do many other developed lands. I know the names of your national heroes: Florey, Burnett, Doherty, Metcalfe, Marshall, Stanley and others. And you know the names of my heroes too. However vigorously scientists around the world compete - and we do compete vigorously - we applaud the accomplishments of those who reach the summit of Perutz's metaphoric mountain as well as most of the rest of us who simply don't get quite that high.

But today I'm going to leave my comfort zone and talk about something else that is equally important to the future of medical research. No, I don't mean genomics or proteomics. No, I don't mean reproductive or therapeutic cloning. No, I don't mean bioethics and the protection of human subjects, however important each of those topics might have been.

I'm here to talk about money. Money as it pertains to medical research. And so the real title of my



MEDIA MONITORS

remarks today might have been 'Exceptional Economic Returns on Medical Research Investments.'

During the next few minutes I'll try to do the following things: first, describe the US financial investment in medical research. Second, provide some estimates of the economic return on that investment. Third, extrapolate some of these findings to Australia. And, fourth, consider the global implications of medical research investment and productivity.

I start with the US not because I'm a national chauvinist, or because I'm an ardent follower of George W. Bush. I start with the US because it is US medical research that I know. And because the economic issues have been most elaborated and studied there.

Some of you may not realise how recent the US government's commitment to medical research is. Prior to World War II industry and philanthropy invested more than 90% of whatever paltry sums went to the support of research. The government was essentially a non-player.

Some major American figures lamented this situation. Just before the Great Depression of 1929, President Herbert Hoover said, quote, 'Some scientific discoveries and inventions have, in the past, been the result of genius struggling in poverty.'



MEDIA MONITORS

But poverty does not clarify thought not furnish laboratory equipment.'

Albert von Svent-Gyorgyi, who received the Nobel Prize for discovering Vitamin C said, quote: 'Research is four things: brains with which to think, eyes with which to see, machines with which to measure and, fourth, money.'

Things began to improve in our country in the 1950s, thanks to the birth of today's National Institutes of Health, NIH. The advocacy of a few members of Congress, and there have always been only a few, and the lobbying efforts of Mary Lasker [phonetic], the first Citizen Advocate for Medical Research, who stalked the halls of Congress urging greater appropriations for the NIH by saying things like, 'If you think research is expensive, try disease.'

The past 40 years have witnessed an impressive ramp up in the national investment in medical research. These increases occurred first in the expenditure of public funds through NIH and, to a much lesser extent, other federal agencies.

As basic science burgeoned in academia as a result of this infusion, this enormous infusion of government grants, discoveries in academia were translated into new commitments and investments in R&D by the pharmaceutical industry and into the birth and growth of the biotechnology industry.



MEDIA MONITORS

This pattern has continued to the present. Governments still sponsors the vast majority of research in academia. Industry still invests a significant fraction of its profits to discover and develop new medicines, devices and diagnostic tests.

So let me give you a snapshot of the current picture. In 1999, the last year for which we have complete data, total investments in medical and health research in the US were approximately \$57 billion, or about \$250 per capita in the country. There were six sponsors of this research, the Federal Government, industry and local governments - I'm sorry. Industry, State and local governments, university funds, voluntary health associations and philanthropy and independent research institutions.

Industry has now become by far the largest financial sponsor. More than 55% of the total investment in medical research in the US now comes from large and small companies.

Though the Federal Government's contribution is more than 30%, it is important to point out that the other sponsors, even though fractionally smaller, make up a total of \$7 billion and add a great deal of flexibility and synergy to the national investment.

In 1998 advocates inside and outside of government called for a doubling of the NIH budget by 2003 from 13 billion to \$27 billion, believing that there



MEDIA MONITORS

were a great number of opportunities that weren't being addressed. And this is coming to pass thanks to increases voted by Congress and approved by the President of about 15% annually in each of the past four years.

What is less appreciated and as important as these federal funds have grown, industry funding has grown as much and even a bit more. So in 1999 the federal investment was about 59% of that in industry. And this year the federal investment is about 55% of what is being done in industry. This relationship between priming the scientific pump by government and having industry respond by using the information gained toward translation is a point that I think we all must be very aware of.

So some people would say the US spends a lot on medical research. I say we don't spend enough. We only spend about five cents on the health dollar. And the public funding of medical research is more like two cents on the health dollar. To me it seems that since research is such an important way of changing health outcomes that's a rather small investment.

But increasingly, those of us who advocate for medical research, are asked what about the return on this investment? What is the public gaining for these funds? Congress asks that of us regularly, as do investors. There are many ways to estimate the economic return on medical research investments



MEDIA MONITORS

such as the jobs created in the private sector, health care costs saved, the value of increased longevity, the value of reduced morbidity and disability and the benefits of newer medicines compared to old. But I only have time this afternoon to talk about a few of those issues. So I'm going to concentrate on talking about the first three.

Job creation in the private sector is the easiest parameter to gauge. It is estimated that there are more than 500,000 people employed in the biopharmaceutical industry in our country because of commitments to R&D there. These high-paying high-demand jobs require the kind of education and technical sophistication that developed countries emphasise today.

These jobs would not be there if industry wasn't standing on the shoulders of public funding and academic findings.

Now, a few words about health care costs saved. For approximately 15 years people in the US have been estimating the cost-savings attributable to medical research. Such savings include costs saved from hospitalisations avoided. Costs saved from productive work gained. Costs saved from medical procedures not required as a result of medicines or technologies discovered through research.

In 1995 there was a comprehensive study of annual cost savings that one could attribute to research



MEDIA MONITORS

gains. \$69 billion annually could be tabulated and this was an incomplete summary of the savings. Heading the list were savings in the field of psychiatry where the development of medications for schizophrenia and manic depressive illness alone saved \$30 billion a year in hospitalisation costs avoided.

I hope most people in this room know that lithium, the treatment of choice for manic depression, was discovered serendipitously in Australia by a young psychiatrist named Cade.

Further on down this list of cost-savings are savings in the areas of infectious disease, cardiovascular disease, dental health. There's huge numbers that total up to a figure that when these estimates were done in 1995, said that for every dollar invested throughout the public and private sectors there was a return of at least 3 to 1 from the cost savings alone. Now, most people don't get a 3 to 1 return on money they invest. I would love to get that kind of return on my savings.

Let me then turn to the third area. As large as these cost-savings are, they are dwarfed by the return estimated from the value of the lives saved through research. In 1999 the Alaska Foundation, through its funding first initiative, asked nine ranking economists from Columbia, Harvard, Stanford, the University of Chicago and Yale, to address new ways to estimate the return on the medical research



MEDIA MONITORS

investment. These individuals chose to focus on the increase in life expectancy and the impressive decline in mortality due to cardiovascular diseases during the past half century and, more specifically, between 1970 and 1990.

When people ask us what have medical researchers done for us lately, we should never fail to remind them that in the past 40 years the number one killer of people in your country and mine, cardiovascular disease, has been reduced, in terms of the number of deaths, by half. And by 30% between 1970 and 1990.

So this was the kind of database that these economists used. And the primary methodology they employed looked at the relationship between the extended healthy lives of Americans attributable in part to advances in medical research using standard methodologies for assessing the dollar value of each additional year of life.

Initially I must say attaching a dollar value to life did not please me very much as a physician. Life, I always thought, was invaluable. But if we're going to estimate economic return we have to use the tools that economists use. And they do put estimates on the value of life by asking things like, 'How much more do you have to pay someone to do a very risky job?' And there are standard ways of getting that kind of information, and that's what these economists did.



MEDIA MONITORS

And they wrote a report called 'Exception Returns', which contains some dramatic findings which I'd like to summarise for you. First, increases in life expectancy between 1970 and 19990 were worth in the US roughly \$2.8 trillion dollars per year. That's with a 'T'. That's a rate of return greater than a hundred to one.

Gains in longevity from cardiovascular disease alone were worth \$1.5 trillion per year. Improvements in health account for nearly half of the actual gain in American living standards during the past 50 years. And these experts concluded by saying that the likely returns for medical research are so high that the pay off for any plausible portfolio of investments in research will be enormous. They used as an example that research that would lead to reducing cancer deaths by as little as 10% would be worth \$4 trillion.

I was stunned by their findings. I knew, of course, that research had given us longer and more productive lives. But I was always taught to consider these outcomes as invaluable. To have an economic value put on our national investment and to have it be so large was surprising and exhilarating.

So now let me try to extrapolate some of this information to Australia. Yours, after all, is a highly developed country like the US with similar profiles in life expectancy and major causes or



MEDIA MONITORS

morbidity and mortality. Your country has a number of outstanding universities, medical schools and research institutes. Your country too has committed itself to doubling the budget of the NH&MRC in the five year period period between 1999 and 2004. And I must say I envy Professor Pettigrew to be the CEO of the NH&MRC at this very exciting moment in Australia's history.

So much for similarities, but what about some differences? Your per capita federal investment of dollars for medical research, about \$11 per capita, lags well behind that of a number of other developed countries including Switzerland, Denmark, Japan, Sweden, France, the UK and the Netherlands. And is less than 10% of the per capita investment in my country.

Your biotechnology in pharmaceutical industries are less robust than those in a number of the countries that I've just named. Your NH&MRC infrastructure and the funds that go to support it appear less than adequate for the job that you are asking the NHMRC now to do.

And finally, and I now direct my comments to all those in the audience who are members of the scientific community, I'm told that your scientists are generally not very willing to speak out on behalf of research to politicians or to the public. Yet scientists know the subject better than anyone else.



MEDIA MONITORS

And politicians want to hear from people who know what they're talking about.

And I've been told repeatedly if scientists won't come and tell politicians what we want them to do, why should we expect that they will do what we hope they will do?

Now, I mention these issues as challenges to be met, not as finger pointing criticisms. Your research enterprise is young, as is your country. Based on the scientific traditions you've already established and the commitments that you've made and are making I'm confident that the issues I've mentioned will be addressed and will be solved. And that there will be an exciting vista for Australian medical research in the years to come.

Let me close with a few comments about looking forward. Media in my country are filled these days with hyperbolic phrases like 'the days of molecular medicine'. Or 'the decade of the human genome project'. Or, 'The Century of the Brain'. These words and others like them convey a sense of the excitement in today's medical science and tomorrow's as well. But it may be worth noting that Lewis Thomas [phonetic], physician, scientist, philosopher and author wrote a bare 20 years ago, quote, 'It is not that there is more to do, there is everything to do. Biological science with medicine bobbing somewhere in its wake is underway, but only just underway.' Unquote.



MEDIA MONITORS

When we reflect on the major health problems yet to be understood or prevented or treated or cured, like congestive heart failure of cancers of the lung and breast and prostate and colon or aids or malaria or diabetes or asthma or schizophrenia, I think it's important that we accept humbly the truth of Thomas's words, 'we still are just barely underway.'

When I travel abroad I am regularly reminded about how small today's world is and how important it is that we be part of that world. Not just part of our own institution or part of our own State or even part of our own country. Wil Dorant [phonetic] the historian, wrote many years ago, quote, 'The health of nations is more important than the wealth of nations.'

Those of us who live in countries like the US and Australia and have both health and wealth must pay far more attention, I believe, to people in less well-developed lands than we have to date. First, because the health problems that ravage those countries, malaria, aids, malnutrition, pericitic [phonetic] disease, demand humane attention from humane societies.

Second, because diseases of the so-called 'third world' are increasingly capable of becoming diseases of the 'first world'.

And, third, because improving the health of people in these countries will surely increase the wealth of

these nations. And by so doing, permit the governments of these countries to offer better lives to their citizens. After all, it is better, longer, healthier lives that we all want for ourselves and our families.

And in the final analysis, it is better, longer and healthier lives that we, as medical researchers, work toward and are dedicated to. Thank you very much.

[Applause]

CHAIR:

There'll be a few questions from reporters and then we'll be able to open up to the floor. So, keep an eye out for the microphone as it comes around. First up, Mark Metherall.

QUESTION:

Professor, Mark Metherall from *The Sydney Morning Herald*. Thank you for your speech, and congratulations on your award. I've always been intrigued by the lack in support for Australian medical research. We seem to be strong on the ideas but not so strong on the application. And your comments about our fairly low level of funding were interesting, however I wonder if you can give me any idea as to why this might be so. You've visited here before, you seem to know about one or two Australian scientists.

And also, you ended by saying we want to make lives longer and better. I don't know if lives are better in Australia, but they are significantly longer



MEDIA MONITORS

than in your own country. Could it be that as we enjoy a relatively high longevity in the population, this gives us less incentive to invest in medical research?

PROFESSOR ROSENBERG: Well, I think that the reason why Australians have the longevity that you have, which very much mirrors that in Europe and the US, is because of medical research. The reason why the death rate due to cardiovascular disease has fallen by half is because we've learned how to treat hypertension. We've learned how to deal with the emergency management of acute coronary thrombosis. We've learned that taking an aspirin a day is a very important preventive measure. So these are all contributions that the support of medical research has provided. And there's no reason to believe that there won't be more such contributions as we support more medical research.

Australia has certainly a proud tradition in its scientific world. And I think that the reason why your funding base is less frankly is that you haven't had, perhaps, enough vocal members of your parliament to advocate for greater sums.

I mentioned earlier that in my survey of the history of US medical research it is remarkable that during the past 50 years there have never been more than a handful of advocates in the Senate and House of Representatives of the United States for more research funding. And without those individuals we

would be nowhere near the level of funding that we have.

CHAIR: Roger Houseman.

QUESTION: Professor, you mentioned in your speech that scientists should engage politicians more. Have you got any anecdotes that you could share with us here as to how scientists have done that successfully in terms of getting politicians to, shall we say, pick up a ball and run with it and actually score something?

PROFESSOR ROSENBERG: Well, yes I think I do. I hate to use myself as an anecdote, but I will. In the years that I spent in industry I continued to be very concerned about the public funding of research by NIH. And in 1995 there was a threat, not only to not increase the NIH budget but to decrease it by 10% because there were other priorities that were deemed more important.

And a group of us, literally a half a dozen of us, went to visit with the Speaker of the House of Representatives, Newt Gingrich, and told him why we thought that idea was so dangerous for the country's long term future. And he wasn't so surprised to hear advocacy coming from academic scientists who were going to be the beneficiaries of that money.

But he turned to me and he said, 'I don't understand why you're here. You're the Chief Scientific Officer



MEDIA MONITORS

of a major pharmaceutical company.' And I told him that as far as I was concerned, it was every bit as important that the government increase the support of public funds for medical research as it was that I continued to support the R&D activities in a company.

So this was a moment when being in the right place at the right time made a very considerable difference. And I could tell you many other examples where a visit to a congressional committee by a significant scientist or group of scientists made all the difference in convincing the government to continue its support, particularly when you can go and talk about a particular disease that is very common and that strikes emotional as well as geopolitical strings for these elected officials.

QUESTION:

Professor, there are some countries in some geographical regions where breakthroughs might not necessarily occur because they're just too expensive. Obviously the treatment of aids is one example. There are entire nations that can't afford the latest treatments. You touched on this in your speech. What were you advocating? That private pharmaceutical companies slash their prices as a humanitarian gesture? Or that governments fund other governments to help pay for these treatments?

PROFESSOR ROSENBERG: I think both and more. I think that pharmaceutical companies have, in some important



MEDIA MONITORS

instances, been shortsighted in their lack of appreciation that there were some times when they had to do good if they were going to do well.

And one of those was in the pricing of pharmaceuticals for aids. Another would be in the willingness to begin to consider new R&D activities in diseases like malaria which, after all, kill as many people in the world today as aids does.

But I think there needs to be commitments from governments as well. I'm not proud of the US for its willingness to think about the diseases that ravage the third world. And I don't know what your situation is in Australia, but I would not be surprised if you were not remarkably more generous.

I think this is an area that is slowly beginning to dawn on us on countries like yours and mine.

CHAIR:

Another quick question from Mark Metherall then just put up your hand, please, and the microphone will find you.

QUESTION:

Professor, as you may be aware, we have here a system by which the government is a monopoly buyer of prescribed pharmaceuticals. And recently the government announced quite a significant increase in the co-payment that the patient or consumer pays for that prescription.



MEDIA MONITORS

This has raised a lot of debate about why are drugs costing so much and why are they increasing in cost so much. And a suggestion that if we don't pay these sorts of prices we discourage the pharmaceutical companies, many of them based in your own country and in Europe, from investing in any of the R&D that goes on here.

And it also has incited a question from a senior official as to why should these drugs cost so much? Can you tell me why they do cost so much and do you defend it, given that the fortune 500 has recently said that the pharmaceutical industry worldwide is by far the most successful. Are they earning too many profits? And is there a problem that they will kill the golden goose by making it too expensive?

PROFESSOR ROSENBERG: It's a very important issue. I've been reading your papers about your pharmacy benefits scheme and the increased co-payments. I can give you some idea of why pharmaceuticals are very expensive and it has to do with how few of them are successful and how most things that you begin in a pharmaceutical company fail. For every drug that gets into human beings only 1 out of 10 make it to the marketplace. So there's a 90% failure rate, and that doesn't even go into the issue of how much loss of ideas there are in the preclinical period.

It is a very risky business and that is why pharmaceuticals cost a lot during the limited



MEDIA MONITORS

number of years that they are under patent protection.

Do I accept the idea that pharmaceutical companies make too much? I think I'll probably dodge that one. But I will say - I would only say this: as a medical researcher if I had to pick an industry that was remarkably successful among the fortune 500 I think I'd be happy, as a citizen, to have that industry be the pharmaceutical industry based on what the medicines that they generate do.

Remember, all these things that I've been talking about and health gains, the treatment of high blood pressure, the treatment of depression, these all come through the pharmaceutical industry. And we wouldn't have this translation of basic science into health gains if we didn't have that industry.

CHAIR:

We have a question over here. Sir, could you just identify yourself?

QUESTION:

My name's Toss Gascoigne, I'm the Director of the Federation of Australian Scientific and Technology Societies which is, for that reason, known as FASTS. The question I wanted to ask you was really about short-termism and I guess medical research and, indeed, lots of other research is in fact a long-term activity. And the benefits are a fair way down the track. And yet we inhabit a short-term - or a society which has a short-term outlook, for instance the Australian Federal Parliamentary term



MEDIA MONITORS

is three years, and so our parliamentarians tend to approach things with that three year outlook in mind.

Now, we do have an event where scientists come regularly to Canberra to meet with their Federal parliamentarians. It's based loosely on your congressional visits day in the States. What would be your advice, because this must be an issue that you've tackled, what would be your advice on how to persuade politicians with the short-term views in mind of the benefit of making long-term investments in scientific and medical research? What should we be saying to them?

PROFESSOR ROSENBERG: Pretty much what you just said. I think part of this - a major part of it - is educating people who are elected officials. They need to understand that you don't go from an idea to a medicine in three years. No one does. This isn't just because we're not smart enough. It's just that it's not possible to move through the range of activities that fast.

But I think more directly what I would say to you is scientists should have a capacity to interact with the voluntary health agencies in your communities that are, in many ways, better advocates than the scientists themselves. The most vocal and effective advocates for medical research funding in the United States are the American Cancer Society, the American Heart Association, the Diabetes Foundation, the Parkinson's Disease Foundation,



MEDIA MONITORS

because congressman listen to their constituents. And if their constituents remind them in very personal terms about the importance of finding the new cures for the diseases that maim and kill, congressmen listen. And yours will too.

CHAIR:

As luck would have it, Professor, we have an elected official here and it's your next questioner.

QUESTION:

Thank you, Malcolm. John Murphy, Member of the House of Representatives, also a member of the government in waiting. [Laughter]. Professor, congratulations on your absorbing address. I would like to ask you what advice do you have for me in addition to speaking out in relation to securing more public funding for Australia's medical researchers?

PROFESSOR ROSENBERG:

Well, I'm delighted, sir, that you are here. And I commend you for your support of this area. I guess I would say, my experience tells me, that you just need to keep saying what you just said about the importance of greater investment in medical research. You need to find a few colleagues in the House and in the Senate to join you and you need to be sure that people in the ASMR and beyond recognise your solidarity with them because that is the way the process works in countries like Australia and the US.

QUESTION:

Professor Rosenberg, Tony Oldfield, Research Manager for the Canberra Hospital. I've never fallen in love on a mountain top, but I fell in love



with science as a 10 year old. And we live in a country where people who play rugby just down the road and AFL are worshipped. And people who make dramatic contributions to the Australian economy through science research are unknown. As a result a lot of children in high schools want to make a career on the financial markets in Sydney or Melbourne and don't see science as a viable option. And yet the advances in medical research, in particular, that we're going to enjoy in Australia during the next 20 years are going to come from what is happening in high schools now.

Do you have any advice to educators here in the audience. Thank you.

PROFESSOR ROSENBERG: Well, your situation is no different than ours. It's true that more people in my country know Mel Gibson and Paul Hogan than Peter Doherty. That's unfortunate, but true. It is also true that most people in my country know Julia Roberts than Harold Varmice [phonetic]. And that's also unfortunate. But it is the way it is and I don't think we should spend a lot of time weeping about that lack of celebrity.

What we must continue to do is educate our young people about what really is so extraordinarily exciting about the world of health and medicine. And health research.



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I'm teaching undergraduates now at Princeton. I'm teaching first year undergraduates at Princeton. I've tried an experiment this year of seeing whether I could take kids right out of high school and teach them a serious course in the genetics of man without going through fruitflies or bacteria or worms. And I'm absolutely convinced that they were ready, willing and able. They were excited. They were inspired. And that's what we have to do.

The importance of getting educators in our secondary schools, in our universities to remind young people of the excitement of a life in science is the only thing that we can do. We'll try to get our words on television, we'll try to get our special programs on nova and so on. But in the final analysis, this is a matter of long term educational change.

[Applause]

CHAIR:

Professor, thank you very much for your address today, which I think will be seen as an important contribution to a very important debate.

Now, you already have a quite splendid memento of your visit here. The National Press Club cannot quite hope to match that. We do have a much more modest token. You won't have to lock this one up, but please we hope it'll remind you of your visit here today.



PROFESSOR ROSENBERG: Thank you very much.

[Applause]

* * **END** * *