

**International Research Collaboration  
House of Representatives Industry, Science and Innovation Committee.  
Chair: Maria Vamvakinou.**

**Submitted by:**

Professor Fiona Stanley AC  
Director, Telethon Institute for Child Health Research  
Member Prime Minister's Science, Engineering and Innovation Council;  
Australian Social Inclusion Board; Indigenous Implementation Board; Chair,  
Australian Research Alliance for Children and Youth

**Introductory comments:**

Whilst I come from the perspective of health and medical research with examples from that area, many of the principles are similar across most research disciplines. This is a most important review at a time when we as societies are facing very challenging issues across health, demographic change, environmental and climate changes, food production, water and energy resources, and social unrest, to name a few. The best way forward with most of these is to avoid the problems associated with them in the first place, but often we are faced with the need to prevent their most damaging aspects or to adapt in clever ways to ameliorate already obvious changes. These challenges are universal and cross borders – the more that we can collaborate internationally and bring the best teams of brains together around these issues, the more likely we are able to succeed in addressing them.

Health and medical research must be an international activity if we are to amass the evidence to underpin preventive strategies, to enable discovery, to address which new drugs or technologies will make a positive difference across all groups in society, and realise the advantages of new information and methodologies such as those associated with the human genome. Sharing new information, methods, ideas, concepts and approaches across international teams of researchers is also cost-effective. Imagine the time and costs if we all had to produce our own genomic information or we had to re-discover the Polymerase Chain Reaction (PCR) for getting large amounts of DNA or if each country had to work out all the new epidemiological techniques to enable population health studies? International collaborations are particularly vital for countries like Australia with small populations – with limited scientific capacity across all areas. (Having said that I am always amazed at how well we as a small nation perform internationally across many scientific disciplines: we perform in science nearly as well as we do in cricket even though to do so is a lot more challenging). And it is exciting for groups of researchers to work across countries and to benefit from different cultural ways of thinking.

I will address your terms of reference as follows:

**1. The Nature and Extent of Existing International Collaborations:**

Existing collaborations vary from as few as two groups in different countries working together as a result of training together or friendships developed, to

very large international consortia such as those to evaluate clinical care or to work on the human genome. Successful examples from our Institute include

- i) The Children's Oncology Group (COG) – this is a very large group of North American, Australian and some European childhood cancer hospitals and associated research centres focussing on the sharing of basic and clinical science discoveries. The benefits for patient care are huge as all the member hospitals are involved in cutting edge randomised clinical trials of new curative regimes. The COG activities have resulted in childhood leukaemia survival rates increasing from less than 20% to over 90% over the last 30 years. Research done in any of the centres is picked up and evaluated quickly through all the other centres, with much quicker and more rigorous evaluation of effectiveness than if any one centre were trying to do this alone. The numbers of some of the rarer childhood cancers are too low in Australia for us to do scientifically valid research on them and demand us to collaborate internationally to get answers about causes, natural history, management and outcomes.
- ii) The International Clearing House for Birth Defects – this is a collaboration of national and other population birth defect registers established after the thalidomide catastrophe to enable all the world's birth defects researchers to monitor trends in malformations. It aims to detect the environmental and other causes of birth defects rapidly and to encourage collaborative research (aimed at prevention) when any increases are found. This has been extremely successful with many countries involved, large numbers of births monitored and many important epidemiological studies done.
- iii) Informal groups working on asthma and allergy – we are part of about five major groups in USA, Canada, UK, and Sweden who have collaborated to understand why childhood asthma and allergy rates have increased so dramatically over the last 30 years. The teams include clinicians, respiratory physiologists, immunologists, and more recently geneticists and psychologists. The groups meet regularly and have collaborative projects, share data, PhD students and post-docs. They have given the world a set of answers as to how genes, pregnancy exposures, infections, inhaled allergens, air pollutants all interact in susceptible families and this work has now opened up real possibilities for prevention. Improved care of asthma has also resulted. The comparisons between countries has been an important part of this research and one that could not have been achieved by one group in one country because the inter-country differences in either exposures or allergens were important to identifying the pathways.
- iv) The international childhood cancer epidemiology network – this is a similar group to the International Clearing House for birth defects. Thus each country has data based on cancer registries from which childhood cancer data can be provided for international studies. They have focussed on rare cancers which any one country (particularly as small in population as Australia) could not do alone.
- v) International Rett Syndrome collaboration which we run via the Internet to collect data on all cases in over 20 countries on this very rare genetic disorder. It involves both clinicians, geneticists, epidemiologists

and interestingly, parents who have encouraged the research and helped to fund it as well.

- vi) The Cochrane Collaboration is possibly the largest and most successful clinical research network in the world. It aims to provide timely evidence of the effectiveness of medical care (diagnostic testing, treatments including drug regimes, surgery, where care is provided and by whom and many other aspects). Information from international randomised controlled trial consortia (such as breast cancer treatments and the children's oncology group mentioned earlier) and from gathering results from all published trials and other data is sought systematically by international working groups, with results of these systematic reviews made freely available to all clinicians around the world to aid in their decision making. It has provided the impetus for evidence based medicine. Australia has been a major player in the Cochrane Collaboration since the 1990s when we lobbied Michael Wooldridge, then Federal Minister for Health to fund the Australian Cochrane Centre in Melbourne.
- vii) International childhood longitudinal studies collaborations (particularly around genome wide association scans for complex diseases)
- viii) We have just set up an international group with expertise in record linkage of health and related data for epidemiological and health services research, involving international comparisons. Such data will enable Australia to benchmark its health services against the worlds best as well as to conduct large studies leading to the prevention of major diseases and problems.

As well there are effective national networks in areas such as childhood obesity research, neonatal intensive care, vaccine trials, public health research, and the Australian Research Alliance for Children and Youth (ARACY) to name a few. Many of these link into similar groups in other countries. These are all clearly child and youth examples – adult clinical and medical researchers could provide even larger numbers of examples in areas from the human genome to specific diseases such as cancers and heart disease. Collaborations can be disease specific (eg cancers, obesity) or combine expertise in one area of science (eg genomics, public health/epidemiology, record linkage etc) or in application of science (eg tobacco control).

## **2. Benefits to Australia of engaging in international research collaborations:**

I strongly believe that the benefits of international linkages and collaborations are so great that we should not do research without them. The benefits range from sharing of ideas, data, methods and results to enhance the capacity of our research to be more successful and effective, Australian researchers bringing in more international funding to Australia, increasing the likelihood of successful translation of research into improved outcomes, reducing the time taken to get answers (particularly for rare diseases where the numbers in any part of Australia prohibit adequate scientific analysis) and quickly getting better understanding of the causes of, and possible new treatments for,

complex diseases where large numbers and a diversity of populations aid the investigation of risk and protective factors (eg it would seem obvious that variation in genetic and environmental pathways into disease causation is best studied by comparing populations with different genetic and environmental exposures).

Whilst there are strong arguments for each country having expertise in the range of sciences needed to investigate local problems, the sharing of data and ideas across nations will lead to more effective use of resources to address the big questions common to all nations. Hence research consortia and international collaborations in childhood cancers can address the causes by each nation providing data on specific cancers and comparing the patterns of exposures and genetic/familial factors within and between countries. Studies of new treatments are best addressed by very large clinical trials such as those conducted by international consortia with results coming much more quickly and best practice being implemented locally. Such studies done in isolated settings may take such a long time to get evidence of effectiveness of new treatments that they are outdated before they are finished. Such networks also give us the ability to see if different centres in different countries have better outcomes than those overall and why. There is considerable evidence that children enrolled in international clinical trials have better outcomes, independently of which arm of the trial they are in because centres involved in international clinical trials are the best centres and provide better general care of their patients.

Such benefits are generic as I mentioned in my introductory remarks – sharing environmental research includes how best to manage salinity or prevent bushfires; the causes and management of youth disengagement are also international problems with collaborative research possibly providing the best ways to intervene/act.

The benefits to Australia also relate to our scientists, and hence our community, being at the international table of ideas, capacity and how such are used to improve society generally. Scientists working internationally observe, for example, how science is funded in different jurisdictions, how decisions are made to encourage good science, to bring young people in to science, and how science is translated effectively for the communal good. Our young people become inspired by such contacts. I have just had the pleasure of observing some of our Aboriginal PhD students and post-docs come back from study trips to Canada, New Zealand and USA as part of an international group of Aboriginal researchers with huge excitement, new ideas, increased self esteem and commitment to keep going in their work (and to continue these international linkages – see funding issues below).

### **3. Key Drivers of International Research Collaboration at government, institutional and researcher levels:**

For governments, international collaborations mean that they know that Australia is at an international table with the likelihood that this results in excellence, better outcomes from the investment in research dollars, more effective translation and the ability to evaluate impact with international

benchmarks. Australia is a small country in terms of its research population, relatively isolated compared with the major research centres in Europe and North America. If we observe those small countries that punch above their weight in terms of research they tend to have a rich network of international collaborations.

Given the nature of many of the challenging problems of the 21<sup>st</sup> Century, most of which cross borders, such as climate, diseases and societal problems (eg obesity, disengaged youth, mental health), a key driver may well be the international nature of research solutions to these global problems. Another driver, in my opinion, for the Australian government in particular is the moral imperative we have as a wealthy nation in our region with many nearby poor countries such as Papua New Guinea, to work collaboratively with them to achieve cost-effective solutions. Such cultural exchanges and collaborations in our region can only reduce the problem of security threats, reducing the risks of our own populations being affected by disease or other problems coming in from nearby nations etc. I chair the “Buttressing Coalition” of international research institutes which support the Institute for Medical Research in Goroka in PNG – this consortium is a fantastic model and we could do well to extend to other nations in our region (along with the Prime Minister’s aim of countries in the region linking up for trade and other reasons).

Governments may also be interested in the way that other countries manage their research budgets and activities, conduct peer review of science, support their scientific community and enhance the career paths of young scientists. International collaborations mean that governments are more likely to be informed of such important activities around research governance and support, the necessary infrastructure to enable research excellence and the roles of universities, and other educational and higher training institutions in producing well trained scientists. Other key drivers may relate to how research is developed and the successful strategies other countries may have to enhance the uptake of research discoveries or new knowledge into either commercialisation or policy/practice.

For Institutions like the Telethon Institute for Child Health Research which I head, the key drivers are to improve the excellence of the research, the sharing of ideas, data and methods, the increased likelihood of successful results, the increased ability to win international grants and the increased chances of being published in top international journals. Increased international collaborations also enhance our capacity to recruit top scientists to isolated places like WA; once our international collaborators visit us they are likely to a) come themselves or b) encourage others to come.

For individual researchers the key drivers are similar but I would add the enjoyment and collegiality of working with international colleagues with friendships built up over several years, travelling to other centres of excellence and observing the different ways in which research is organised and conducted – can add enormous value to an individual’s research career. As well, the sharing of post-doctoral researchers between institutions and

increasingly of PhD students, adds considerably to the capacity and competence of our people here. Such collaborations usually lead to a greater success with winning local and international grants. International collaborations open up more opportunities for Australian researchers to obtain training in new or established techniques and research methods which helps their research capacity and those with whom they work back here. Our success in winning US National Institutes of Health grants has been markedly increased by our international collaborations.

#### **4. Impediments faced by Australian researchers when initiating and participating in international research collaborations and practical measures for addressing these:**

Impediments include cultural, funding and the tyranny of distance. There may also be a fear of losing Australians to top overseas centres. However encouraging international collaborations by Australian scientists may be the way they will be happy to stay here as long as they can travel to the work with the world's best.

**Cultural** impediments relate to environments in research organisations that do not encourage or support international collaborations. The way to overcome that is to reward scientists and organisations here if they are part of international consortia or other research collaborations. For example, in awarding research grants one of the criteria for getting the grant is that you are already collaborating internationally or plan to do so. It is already part of the "track record" ie the way in which your research career is assessed when applying for grants, but this aspect could be increased considerably. More interest by governments (at all levels) in international research results and experience would also change the culture here in Australia. Support for international meetings in Australia to encourage participation in international collaborations would also be a way to engage local scientists. Whilst there are several university networks with international universities, they are sterile unless driven by the passion and commitment from individuals and research groups – hence the collaborations should come first and once successful and working, you can then add on the bureaucratic and administrative supports. But international research collaborations will not succeed unless the **researchers** lead them. Being able to enrol to do PhDs and other degrees across two institutions, one in Australia and one international, would be another help to encourage students to be part of the collaborative teams.

**Funding** is a big issue for us as it is always expensive to travel from or bring international collaborators to, Australia. Travel grants, funding for visiting fellows, funding to establish networks exist but we are really behind other countries here. We feel this particularly in Western Australia (which sometimes seems to be a long way from everywhere!). I strongly believe that we need a lot more funding to send our younger people to attend and participate in fruitful international activities. Scientists at senior levels get invited with fares paid all the time to the top meetings or can afford to pay their own way. The most important group to get into the international arena are those at early and mid-career levels ie early post-docs through to senior post-doctoral fellows. Your committee may wish to look at strategic areas for

Australia in which international collaborations are inadequate and to recommend that funds be made available for Australia to set them up or to run a workshop here to gauge international interest. That is not to say that existing networks should not also be better funded to make them more effective and to get the younger people to participate.

#### **5. Principles and strategies for supporting international research engagement:**

One strategy would be to provide funds to travel for PhD students in their last year of study to visit top international groups to present seminars and seek good post-doctoral placements but with strong sense to return to Australia for subsequent post-doctoral work. Other strategies have been mentioned earlier.

#### **Summary**

In summary this is a most vital area for Australian science right now as we continue to lag behind other OECD countries in scientific funding and capacity; as the challenges facing us are so universal; as the benefits of being internationally engaged are overwhelming and clear; and we have so much to lose if we do not keep up and expand our international linkages and so much to gain if we can manage to increase them.

I wish the committee well with its deliberations and hope that these comments, thrown together rapidly, are helpful.

29 January 2010  
Professor Fiona Stanley AC  
[Fiona@ichr.uwa.edu.au](mailto:Fiona@ichr.uwa.edu.au)  
(08) 9489 7967