Template for submissions to the Strategic Review of Health and Medical Research

Please include your name and contact details

Submission summary: (300 words or less)

(paste this into the free text box when submitting online)

Australia needs to maintain and build on its health and medical research sector to ensure cutting edge access to treatments and representation at an international level. Innovative strategies should be explored to streamline the funding process and free up scientists to spend more time on research. The steady investment drain caused by early to mid career scientists abandoning research should be reduced by a) making grants cover actual research costs, b) offering more grant application time points, c) making track record evaluations more flexible, d) offering more funding options for older postdoctoral scientists, e) supporting parents better. In terms of direction, I would like to see greater recognition and funding for disciplines dealing with data management (e.g. bioinformatics and statistics). At the same time, we need to strengthen our capacity to do disease-relevant basic research in clinical studies by applying other support guidelines and expectations than those suitable for *in vitro* and animal models. Finally, translational research can only be successful if we avoid harbouring unrealistic expectations about the speed of translation and maintain a strong, unfettered basic research base to prevent a break in the pipeline of translational research in the future.

Please use the following questions to structure your submission:

1. Why is it in Australia's interest to have a viable, internationally competitive health and medical research sector?

The existence of an active network of accomplished scientists well versed in a wide range of fields of health and medical research ensures that Australian health interests are recognised and given priority in medical research. Local experts are essential for communication with the public, international representation, representation in multinational agendas and inclusion in clinical trials of new medication. Australia has a reputation for excellence in certain areas of medical research that attracts a steady flow of highly educated foreign researchers, who bring additional knowledge when they come and support Australia's international reputation when they leave. Australia's scientific reputation also contributes to its attractiveness to foreign students, whose fees greatly support our universities. Australia cannot rely forever on a finite hoard of mineral resources and what better way to develop future areas of economic growth than to invest in science?

2. How might health and medical research be best managed and funded in Australia?

The current funding process is immensely time costly both at the submission and review stages. Therefore innovative research into ways to streamline the system should be pursued vigorously.

Large numbers of good scientists leave science because of lack of opportunity, the burden of job insecurity, disinclination to face the growing administrative burden and frustration with being forced into hypercompetitiveness in lieu of cooperative efforts. Every scientist who

leaves research represents a large loss in investment. Areas that are especially important in encouraging these early and mid-career researchers to stay in science are:

a) Grants never cover full research costs

NH&MRC grants do not cover a number of essential costs. A wealth of indirect costs are shouldered by the scientist's institution, but these tend not to include gaps between actual salaries and the PSP scale, computers, publication costs and conference attendances. (The lack of funding for conference attendance is particularly unfair, as it is one of the judgement criteria for track records.) An early career researcher with only one or two grants will not have the opportunities for cross funding available to more advanced researchers. If they receive support from a more senior scientist (usually their former or current supervisor), they are penalised for lack of independence.

Solutions: Include a number of basics, such as realistic salaries, computers and essential indirect costs in grants and create a pot of money for publications and conference attendance that can be accessed with minimal bureaucracy. Anyone who had received a grant could apply for a capped number of times by submitting proof of an accepted manuscript or conference abstract during or up to 1 year after their grant period.

b) Single application time point

The existence of a main application time point for grant writing hits early career researchers particularly hard. At this stage of their careers, researchers will have only one or two projects suitable for funding applications. The fundable balance of having attractive ideas, enough preliminary data and the publication track record is hard enough to achieve without the restriction that it has to match the single annual grant intake time point. In addition, more senior researchers have little time for constructive criticism, because they are involved in their own grants.

Solutions: Multiple grant intake points throughout the year

c) Strictness of track record evaluation

Track records are quite variable early in scientific careers, dependent on factors such as luck, research area, delays in publication, suboptimal position choices. At the same time, the amount of content per paper and the number of involved authors have increased tremendously, adding great variability to the duration of the publishing process. Although there will always be grant applicants who have managed to follow the straight and narrow path that fulfils the strict criteria for a good track record, many promising scientists lose out or are dissuaded by the extreme competitiveness. This is exacerbated by the inability to include all of their achievements. How many postdoctoral researchers have done major unacknowledged grant writing and scientific review of papers or grants for their supervisors , because their "track record would have dragged down the proposal"?

Solutions: Trial an evaluation process, where peer reviewers judge the scientific merit of a paper with and without an accompanying track record to evaluate how strongly the opinion on the track records influences the grading of scientific merit. Make track record requirements more flexible (in terms of quantity and type of eligible achievements) for early career researchers and increase the amount of funding available to them. Explore mechanisms of allocating credit to junior researchers.

d) Insufficient funding opportunities for older postdocs

Funding opportunities are more readily available for early postdocs (either 2 or 5 years after their PhD) and then again for established group leaders. Older postdocs, especially in the 5-10 year range find fewer opportunities. This group contains many scientists of great value to the lab due to their experience, collaborative and supportive activities even though these accomplishments may not be reflected in a string of high impact papers.

Solutions: Diversify funding to recognise a wider range of contributions to science.

e) Supporting parents in the scientific community

Current NH&MRC strategies do not sufficiently take the effects of parenthood into consideration, making people choose between science and family. Absences from work for parental leave and part-time work are added up and this amount of time can be added onto the 5 year publication time frame. Furthermore, the current timing of Australia's main grant writing period is also decidedly family unfriendly, placing a high work load on scientists during the main school holidays.

Solutions: Make track record evaluations reflect that the number of available hours in a working day or week are vastly different for a childless scientist and a parent of a young child. Have multiple grant intake rounds.

3. What are the health and medical research strategic directions and priorities and how might we meet them?

One priority is to strengthen our capability to manage the rapidly ballooning masses of data. This involves recognition of bioinformaticians and statisticians as scientists worthy of dedicated project funding, not just as minor add-ons to other projects. It also involves universal training in data management techniques.

Another priority is to strengthen our capacity to do basic research on diseases in clinical studies. These studies are much harder to plan, fund and implement than molecular and animal model research, so there needs to be recognition of these difficulties.

4. How can we optimise translation of health and medical research into better health and wellbeing?

Translational research has become a major buzzword and a lot of funding and institutes are trying to push strongly in this direction. We must guard against three serious dangers: 1) Unrealistic expectations regarding the speed of translation: Unmanageably short time frames and funding that only suffices for the first stage of translation handicap many promising projects. 2) Cutting off the pipeline of basic research: Today's translational research rests on basic research performed anywhere from 7-30 years ago and at the time and at the time, the translational benefits were not even remotely imaginable. Many pharmaceutical companies are experiencing a drying up of pipelines for new drug candidates. Basic research requires an open mind set unfettered by restrictive expectations and the need to justify every avenue of research with a totally overhyped promise of a cure.

Translational medical research requires a strengthening of collaborations between clinicians and scientists. Clinicians working in a science background raise understanding of the medical issues, whereas scientists in a clinical background bring a more mechanistic, causal approach to medical issues. It is important to support both types of collaborations and give more recognition to the slow incremental validations of repeat clinical studies that do not each result in a high impact paper.