

Strategic review of health and medical research in Australia

Submission from the
Queensland Institute of Medical Research

EXECUTIVE SUMMARY

QIMR's submission first discusses the importance of health and medical research and the significant roles universities, hospitals and medical research institutes play in all levels of research. The different specificities of each segment of research has to be appreciated and supported in order to have impacts on the health and well being of Australians.

Our submission then goes on to respond to the Review's Terms of Reference.

- **Why is it in Australia's interest to have a viable international health and medical research sector?**
 - We provide 11 responses to this question
- **How might health and medical research be best managed and funded in Australia?**
 - Some general problems such as manpower planning and the need for a predictable commitment of support for research are highlighted
 - An integrated approach is needed and Academic Health Centres are the mechanism that should be promoted to achieve this
 - Coordinated research is needed to achieve defined end-points
 - Some operational aspects such as infrastructure support and eligibility criteria need attention
- **What are the health and medical research strategies and priorities and how might we meet them?**
 - We suggest that attention is given to research into the avoidance of illness in addition to the traditional research topics; Prevention is better than cure
 - Strategies to address specific topics require investment in all parts of the research pipeline
- **How can we optimise translation of health and medical research in better health wellbeing?**
 - The structures that underpin research from basic to clinical have to be optimal and all phases of research are needed to achieve translated outcomes
 - Translation has to be an integral part of the research that is planned
 - Selection processes must align with the specific nature of translational research

Additional comments

Finally, we have offered some additional comments on medical research in Australia. These include reflections on:

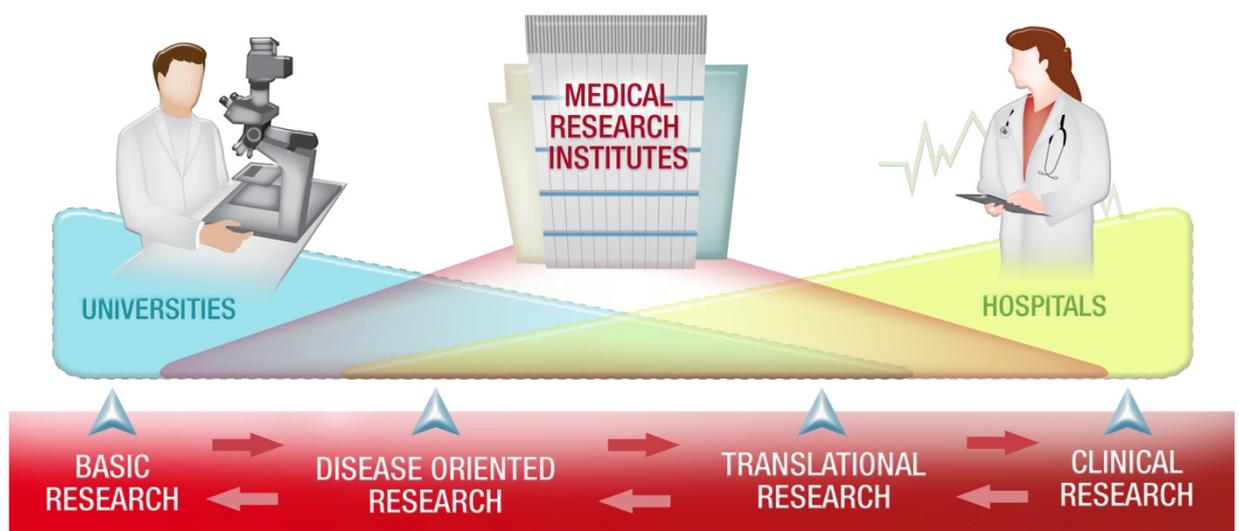
- Sustainability related to:
 - Research careers of individuals
 - Long term availability of assets generated by research
 - Long term perspectives for certain classes of research projects

- Operational Aspects
 - The application/selection process for funding
 - The regulatory environment
 - The eligibility criteria for research funding

INTRODUCTION

All societies have a duty to care for their citizen's health and well-being. Although the visible end-point of this process is often delivered through treatment in hospital or some general guidelines to society on how to avoid illness, there is a crucial role for research to ensure that the best and most efficient health service is available. It is timely therefore to participate in this strategic review of health and medical research in Australia.

There is a tendency in some discussions to fuse all of areas of research into two broad categories: basic and applied. The reality is much more complex. As shown in Figure 1, research from the laboratory through to the patient or indeed society is characterised by a number of different phases each of which has its own characteristics. Knowledge-generating fundamental, basic or frontier research is the core activity that allows further investigations that are of practical relevance to be performed. The examples are legion where studies on a fundamental research aspect gives rise to unexpected, unpredictable and paradigm changing outcomes. The applications of therapeutic compounds increasingly demand knowledge of the mechanism of action of the compound. This can only happen if there is a major body of research available on those fundamental steps that eventually become the targets for therapy. Fundamental research therefore is not a luxury in the spectrum of activities that is research in the medical area; it is the foundation and core on which everything else is built. All parts of the pipeline of research have to perform well if the end point of having an impact on clinical practice is to be achieved.



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Figure 1

Medical research institutes have a crucial core and inevitable role to play in health and medical research in Australia (see Figure 1). Most of the research performed at medical research institutes are of relevance to this review, and can be described as oriented basic research (Frascati definitions) or disease oriented research and translational research. Disease oriented research is a critical bridge towards societal impact through successful translational research.

QIMR) has the size, tradition, location and track-record of delivery of solutions to the clinic that epitomises many of the components of a medical research institute and as such is well placed to provide a specialist insight into this review (see Appendix 1). This submission is structured to (a) address the specific questions that address the Terms of Reference and (b) provide a more broad analysis that examines the context of this review and the future of health and medical research in Australia.

ADDRESSING THE TERMS OF REFERENCE

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

1. Every advanced country in the world recognises both its responsibility and benefit of performing and engaging in research, in particular where it has impact on health and medical outcomes. The responsibility comes from the fact that new treatments are needed for many established and emerging diseases and those countries that are impoverished depend on wealthier countries to invest to make advances that will reduce diseases and their impacts. Citizens in financially strong countries also expect, as a corollary of financial well-being, that there will be improvements in health care and that new methods and treatments are available rapidly. This is a crucial component of the quality of life that is the anticipated consequence of a strong economy.
2. Investment in research related to medicine and health are expected also to have direct and indirect influences on the economy. Internationally, the level of expenditure on research, frequently expressed as Gross Expenditure on Research and Development in relation to the GDP of a country is frequently used as a surrogate measure of the technical and industrial capacity of a country. Emerging economies often use investment in Research and Development and Innovation (RD&I) as a way to move from a commodity and low tech economy to one with more high-tech jobs and high value exports. When the Global Economic Crisis was in its early phase, the reaction of countries from the USA to Ireland was to protect and increase their investment in RD & I as it would be the basis for economic recovery. Arising from health and medical research, there are major markets for therapeutics, diagnostics and medical devices. The economic benefits therefore are a significant reason to have a vibrant, and not only viable, health and medical research sector.
3. There is a paradigm shift that is well advanced in the way that patients are treated by clinicians. The fruits of research, which are built on the sequencing of the human genome and obtaining greater mechanistic understanding of the basis of disease, have allowed clinicians today to develop a much more evidence-based approach to diagnosis and treatment. This demands more medical and related personnel to be skilled in the new challenge of generating, analysing and interpreting genetic and other data such that they can be introduced into clinical practice. The training of all those that will incorporate these new developments into daily practice occurs through relevant research experience. The best transfer of knowledge about new diagnostics takes place when doctors are either working closely together in a co-located hospital and research environment or when clinicians are themselves engaged as part of the research.

4. Not all of those that train in a research environment will remain in research. This should be viewed as an enrichment of the complex technology-rich society we live in. To take as one example the discussion in point three on prognosis based on genetic analysis, there is a need for communicators, those working in charitable foundations, administrators, marketing and others to have a good understanding of concepts such as risk and probability such that society is informed in its decision making in a balanced manner.
5. Public health problems and outcomes are frequently defined by the context, habits and environment of the people. It follows that the impact of the conditions and practices in Australia can best be analysed in this country. Similarly the disease spectrum in a country can be specific to its geographical location and societal norms. Again this means that some diseases are of particular relevance to Australia (skin cancer is one such example, other examples are found in some infectious diseases, e.g. Hendra virus) and hence there needs to be a focus of research here, for the Australian people. It is unlikely that other nations in the world will invest in preventing or curing diseases either specific to or mostly prevalent in another developed nation like Australia.
6. The current national expenditure on health care is large and with an affluent but ageing population, the burden of health care will progressively consume a greater proportion of the wealth of this country. Federal governments of all political persuasions have variously invested in nation building programmes for example in infrastructure and education. It is in both Australia's economic and social interest that it continues to invest in and accelerate efficient health and medical research. These are the building blocks to achieve better health of the population and to proactively curb a future explosion of the national health budget. Clinical care and the health dollar cannot be viewed in isolation from the research which underpins it. There should be an agreed formula that links expenditure on research with the total health care budget. Australia has invested in the buildings to do the research, it has invested in the education of our students and is a welcome recipient of the best minds in the world through its immigration policies. None of this investment should be wasted. It is now time to invest in and co-ordinate a major push in medical research to prevent, prepare for and respond to the otherwise inevitable increase in chronic disease which will have major economic impact in the future.

Occasionally the headline question posed above can be interpreted as "Australia does not need to carry out research, it can just benefit from the research of others and thereby improve health and medical care". There are a number of fallacies in this perception:

1. If researchers here are not active in an area that is advancing elsewhere in the world, then knowledge about that will be transferred very slowly to Australia. To build on an earlier example; if there was no genomic research ongoing in Australia then clinicians would not be adequately aware of the changes in their practices that were occurring in the advanced nations of the world.

2. All new developments require new skills. The expertise which is required to allow the transfer of new methods for new treatments will be in place only if there are the recipients trained through related research. Without this cohort, Australia will not be able to benefit from developments elsewhere and hence benefits of research elsewhere.
3. The assumption that Australian scientists and clinicians will be able to select and beneficially build on research from elsewhere in the world is unrealistic, as inevitably access to the information will be difficult for those that are not engaged in the research operation and any development of real value will be exploited by other countries before it comes (at a much higher price tag) to Australia. Therefore it is not realistic to consider that Australia can sit, wait and scan the literature and find the nuggets that it wishes to apply to medical and health research.
4. Australia today has a very large and positive influence on research that has of value worldwide. The quality of the health and medical researchers has been recognised by multiple honours up to the level of Noble Prizes. The very important vaccine that provides protection against Cervical Cancer was developed here and there are multiple other examples where Australian research has been translated into products and procedures that are of very significant benefit to the world. If the best scientists are in Australia, then disengagement or cutting back on support for research would not only be felt by Australia but would have an impact worldwide.

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

It might be instructive to define some of the current deficiencies in the system before making proposals for the future delivery of research support.

- There is a lack of clarity on future manpower requirements. A significant study would be needed to define the projected needs of Australia. This should take into consideration factors such as those that will have a phase in research but will not remain in that sector, the changing technical needs, the need for critical mass of researchers in some strategic areas, the balance needed between those that create new opportunities from research and those that adapt and use them. Sometimes the technological strength and potential of a country is defined by the number of fourth level graduates with a PhD or MSc in the work-force. It could be timely to analyse how this number is deployed in the different areas of the economy. By having some planning goals it could provide some strength to the decisions to invest in research and, in turn, should ensure that students who are considering their future careers will be attracted to this sector. It would also provide factual guidance to questions such as how many research institutions are needed and promote the concept of ensuring support for personnel in newly constructed institutes.
- There is a failure to make a sustained commitment to research. Funding is not the only component of a research system but is very clearly an obvious element that will define what can be achieved. Predictability of funding provides a context in which research strategies can be planned; if there is no multi-annual financial strategy then there is great difficulty in defining the ambition and scale of the research that will be performed. There are options in how to decide this figure. This could be to increase the current level annually at a predefined percentage, or to increase the level at a rate that is a compound of growth in the annual GDP (many countries aim to have RD&I investment increase at twice the national GDP growth level) or to achieve a long term goal, such as the USA did to double the investment in the National Institutes of Health (NIH). A final option is to maintain a balance between the health care expenditure that is directed to delivering services to the ill and the investment in progress and improvements through research. Ideally in this model there should be an agreed percentage of the total health care that should be spent on health and medical research and this figure should be bench-marked against best practice in other countries of similar economic strength.

Irrespective of the process that is selected, there are multiple benefits that will flow if the financial commitment is decided upon as it would allow for better planning of all components of the health related system. If such parameters were agreed upon the exercise of reaching different delivery goals could be better planned. If there is no such planning, or worse, a reduction or capping of the investment in research then the consequences of this should also be analysed and measured against any savings that would be achieved.

The following three positive action areas address the question; “*What can be done to best manage and fund health and medical research in Australia?*” and would greatly improve productivity, sustainability and return on investment in health and medical research.

An integrated approach: Academic Health Centres

At a time when there is a great focus on the optimisation of the uses of resources, it is essential to re-examine the way in which funds invested in medical and health research are used. Referring to Figure 1, it would be an error to conclude that the only research that will give a return on investment is the last step of clinical research. Clinical researchers cannot find new approaches or add to the underpinning comprehension of the diseases that present if they are reliant on available information. The opportunities to do better in the clinic will “dry-up” rapidly if the input of new possibilities is not replenished constantly. The earlier stages of the pipeline are an essential source of paradigm shifting insights (basic research), discoveries of direct relevance to diseases (disease oriented research) and the move towards making this knowledge be of practical use (translational research) are all the necessary foundations for applications in the clinic and hence a return on investment. From this analysis it is clear that an integrated approach to health and medical research is necessary. Resources must be available in each step in the chain from laboratory research through to the clinical action. A greater understanding of this should be coupled, however, with a realisation by those in different parts of the chain that ultimately the research has to have an impact in efficiency, care or economic benefit. These elements should be factored into the support of projects and the culture of the medical and health research community should be such that it embraces this coupling of support for fundamental and disease oriented research and the consequences that represent a return on investment for the taxpayer.

Behind the generality of the need for better integration lie some specific choices to ensure that this happens. If the research is performed in close collaboration with clinicians it is more likely to have the desired outcome than if there is little or merely cosmetic and distant connections with the “end users”. If all of the research in the institute or department has a medical endpoint as its strategic driver then it is more likely that the desired culture will prevail. If the size of the institute is large enough to include researchers working on complementary parts of the research spectrum, then the cutting edge fundamental research will strengthen those working on more applied topics and those with new understanding of complex biological processes will be better able to find partners that can provide information on the practical opportunities and limitations of application.

All of these considerations point to the urgent need to establish Academic Health Centres. Although there are some variations on what constitutes an Academic Health Centre, the core idea is that an entity brings together clinical, research and training activities. Co-location and scale are important aspects but the most significant one is a shared commitment to integrate activities across some traditional boundaries such that there is progress in the outcomes of patient treatment, efficiencies in the system and that these are accompanied by reduced health care costs. Funding will be needed to move institutions from an isolated position to one where joint actions are the norm. The funding should support new research activities defined by consultation with the clinicians, new training modalities where those at the training phase of their medical careers spend time in the research laboratories and resource provision to allow active clinicians to have time to devote to research.

Coordinated research to achieve defined end-points

At a macro level it could be timely for Australia (and research world-wide) to co-ordinate dispersed research activities such that defined end points are reached by the collective efforts. The sequencing of the human genome was an example of the research community delivering what had been promised in a timely manner. There should be more examples of that nature. The first step would be to define a limited number of targets that need attention and are of a scale that the provision of solutions would have economic and well-being benefits such as stopping cancers from metastasising or developing an early diagnostic test for Alzheimer's Disease that is coupled with a treatment that delays or stops its onset. The decision on this priority list should include reflection of needs of society and the steps that researchers should take in order to match these needs. Inevitably, there would already be many groups that work on the selected topics but progress towards a goal of improved treatment is fragmented and slow. What is needed now is a milestone-driven and more precise articulation of the steps between the definition of the need, the identification of the research and researchers that are apt to provide a solution and the planning of the delivery of the programme through a series of sequential change making steps. Expert committees should oversee the process and, using information from world-wide research inform and guide the programme to its predefined conclusion.

This would represent a major change from the current system where researchers are supported to perform research that is restricted to the aspects of an important problem that are of interest to their research team, without reference to the work that could be added to it to reach a defined end point. It is important to note, in keeping with our belief in support being provided for all parts of the research pipeline, that support for individualistic research projects would have to continue in order to sow the seeds for

future novel developments that in turn will and provide new approaches to overcoming bottlenecks in improving treatments.

Operational aspects

Careful attention should also be paid to the question of support for overhead and infrastructure for research. It is self evident that there are real costs that must be met by the institute, hospital or university that hosts an active research group. The internationally accepted way to do this is to add to the research award a percentage that goes to the host institution to facilitate the performance of the research. Currently in Australia there are complex processes for the calculation of the infrastructure support, peculiarities in the timing when this is paid, and an illogical and unfair differentiation of the manner in which medical research institutes are paid compared to universities.

Another discrimination against medical research institutes relates to the ineligibility of researchers from MRIs to apply for grants from the Australian Research Council (ARC). It is self-evident that to obtain the maximum benefit from investment, competition for research funding should be open to all, irrespective of their address.

A final “detail” is that competition for research funding should be open to all who are performing their research in Australia. The current rules that require permanent residency before a researcher can apply for a fellowship or is a CIA on a proposal act to dissuade researchers from moving to Australia and do not bring any advantage.

What are the health and medical research strategies and priorities and how might we meet them

Prevention is better than cure

Although the tendency is to consider how to treat those with various illnesses, there should be greater emphasis on how to avoid reaching the stage where treatment is required. Prevention is better than the cure. The importance of population health studies and epidemiology has to be recognised and reinforced and the manner in which these studies are reflected in clinical practice is a topic of importance. There is a practical consequence to this proposal, however. Many epidemiology studies have slow trajectories (sample collection) and long time lines. The dominant project-based funding that is available looks to shorter time frames, and greater flexibility is required for population health and epidemiological studies. The same is true for major genetic analysis studies when the onset of disease is an end point.

Specific topics and strategies

Any group of professional would put together rapidly a list of the major health challenges for Australia. The strategies that should be associated with the priorities may be more important. If there is an inadequate skill base in the country, then the benefit of directing funds to priority topic areas will be limited. Mediocre research will not deliver solutions. The effort then should be to attract and train researchers who will be able to contribute at a world-class level.

The mixture of inputs from all types of research (basic, disease oriented, translational and clinical) is needed to have a real impact on any health research topic. Multi-disciplinary approaches also are needed. And, as outlined earlier, much better integration of these approaches and end point driven programmes should be a significant component of any strategy.

How can we optimise translation of health and medical research in better health wellbeing?

Earlier parts of this document addressed some of those questions. The need to put in place correct structures to allow translation to occur is of particular importance. The specifically relevant role of large medical research institutes that co-locate with hospitals has to be recognised and supported as a priority. These co-localisations (together with university functions, especially medical schools) should form the basis of Academic Health Centres (see above). The process of translation is complex and requires a conscious commitment that is most likely to occur when those with skills at different parts of the chain of transitions from the laboratory through to the clinic are working in harmony and proximity.

Too often, translation of research is the next step to be performed by others. There is a need for cultural changes in laboratories funded to perform health and medical research such that translation is recognized as an integral part of the work that is performed. To achieve this there will have to be a greater emphasis on judging performance by the twin criteria of scientific excellence (a *sine qua non*) and, where appropriate, impact of the research on health and well being. Leadership in institutes, universities and hospitals will be needed to make this happen. And, simultaneously, in each entity the full range of activities, be it supporting fundamental research or ensuring that patients are cared for, must be protected. The challenge is to get the balance right.

If translational research is the stated goal of some programmes then the selection process used to judge such applications has to be apt for that task. Frequently proposals from researchers that are working on topics that are of practical relevance in the clinic are judged by panels that are more familiar with assessing output in the form of research papers and their quality than on the success in moving research from the knowledge generating phase to that where the knowledge is integrated into medical practice. The panels used for the assessment of translational research projects must be constituted therefore by experts with the appropriate mix of skills and background.

Finally, balance must be achieved in the distribution of research funding across the spectrum of research activities. Also there is a balance to be maintained between the health care expenditure that is directed to delivering services to the ill and the investment in progress and improvements through research. Ideally there should be an agreed percentage of the total health care that should be spent on health and medical research, and this figure should be benchmarked against best practice in other countries of similar economic strength.

ADDITIONAL COMMENTS

In the previous sections, responses are given to the questions that had been asked by the review committee. But a review is a time to consider the question of the future of health and medical research in Australia from every perspective as the impact of the review will be felt for the next decade. QIMR, as outlined in Appendix 1 is a well established and functioning medical research institute. It has scale, clarity of its mission, focus on its activities and a strong tradition of translations of research and collaboration with clinicians and with researchers elsewhere. Nonetheless QIMR has concerns that are echoed by other medical research institutes and researchers in universities or hospitals. These concerns reflect directly on the topic of this review. If they are not addressed properly then the future of health delivery in Australia will itself be undermined.

The QIMR concerns can be summarised under the following headings:

1. Sustainability
2. Operational aspects

Sustainability

1. Research Careers

Life for a researcher in a medical research institute such as QIMR is precarious. Generally, there is no long-term guarantee of salary even for the most advanced and well respected researchers. While the provision of “permanent” positions is one that can readily lead to stagnation and under-performance, the uncertainty of one’s future makes many practical decisions, such as seeking a mortgage, less than routine. A balance between zero security and excessive security has to be sought.

The career problems are at every level. There is a bottleneck for those who have progressed through PhD and several years of postdoctoral training and wish to become independent researchers. In addition to getting a personal salary, albeit for a defined and short period, funds to perform the research are obtained only after an annual time-consuming competition where the chances of success are low. Added to this is the constant (occasionally overt) questioning of the *need* to perform research in Australia. For those embarking on or engaged in a research career, this translates into the message that a career in research is not respected. This, of course, feeds into and creates problems with attracting the best and brightest students into the research exercise. The current review of health and medical research addresses some of those questions but not the more profound career-related topic.

The Australian mechanism of funding research careers could be characterised as a national tenure track system. In the USA each university puts in place a series of selection processes that ultimately reduces the number of potential professors in universities to the number that is required by the system. Researchers know that there are difficulties in passing through the various phases of selection, but equally the award at the end of the process is tenure (i.e. a guarantee of salary support for those that are selected), and with this comes the peace of mind that is necessary for long term research.

In Australia a similar series of gated selections are made, for example by the NHMRC. Competition is a very positive aspect of this but the guarantee of a long period of support that comes with standard tenure is not given. More significantly, with the NHMRC system dominant in the research mode for those in medically-related research, the failure to have a Fellowship renewed effectively means the end of one's career. This means researchers have constantly to engage in relatively short term programmes of research that will ensure delivery of the required publications that are necessary for a renewal of their Fellowship. This is not appropriate for some research topics and can give rise to relatively unambitious research that will yield a respectable number of publications but militates against more daring projects that are the source of paradigm changing results.

Reflection should be given to mechanism that provides longer term assured research salary support for those who are effectively "tenured" in the Australian system.

Recommendation: A rolling period (ten years for example) of salary support should be provided to those that have had at least ten years of success in obtaining their salary by competitive processes. This could be provided by, for example, the NHMRC or through a limited block grant to the Institutes to allow them to retain key high quality personnel.

2. Longer term utility of funded research assets

Much of funding for research in Australia is defined to support research projects of 3-5 years duration. Although this may be adequate time for a defined component of research, there may be resources accumulated that have a permanent value to the community and acquire a status of infrastructure because of their nature.

Mechanisms should be put in place to ensure that infrastructures such as Bio banks are preserved and remain useful to the community after the end of the supported project.

Recommendation: Platform resources that act as an Infrastructure for a research community should be preserved either by continuation of the grant, by being transferred to a more competitive applicant, or by funding and adequately resourcing the

establishment of repositories in primary research centres, such as Academic Health Sciences precincts.

3. Longer term view of individual research projects

A different aspect of sustainability is the need to provide longer term funding for some projects. Medically relevant end-points often require time to measure the outcome, for example, of a treatment, or of an epidemiology study. Currently it is very difficult to be assured that there will be long term funding for those projects that require it. Projects that are supported by short term grants can fall foul of timing of output of results and judged at an inappropriate time in the cycle of that project.

It should be recognised that some projects are, by their nature, long term.

Recommendation: When projects are identified that require a period of research and observation that is longer than the standard period of support through project grants, provision should be made at the outset for sequential funded phases dependent on success and delivery of research outcomes at each.

Operational Aspects

1. Application/selection process for funding

Competitive funding systems are an excellent way of distinguishing between the optimistic and the realistic project and also to stratify applications on the basis of the quality of researcher and the research that is being proposed. Theoretically this should drive efficiency. A perversity of the Australian system is that most researchers appear to spend perhaps one third of the year writing grant applications such that their projects can be funded. The manner in which the proposals have to be prepared is disproportionately complex given the opportunity cost of time spent on some aspects of the application and the modest chances to obtain funding (perhaps 80% will be rejected). A further unintended consequence of large and detailed application forms is that those that are asked to judge them must either dedicate more time to this to do it correctly or do not in fact examine every aspect of the application. The more likely outcome when the material that has to be considered is of over 100 pages per application is that researchers decline an invitation to be on a selection committee.

The application process needs to be re-examined to allow for a reduction of the time needed for application writing.

Recommendation: The process should be streamlined such that the essential information required for the decision on whether to fund or not to fund is presented in a clear and concise manner. Many details related to administrative aspects can then be postponed until the contract discussion phase.

2. Regulatory environment

A further burden on the medical research sector is that of the growing and very extensive series of requirements for the ethics of human research, the controls of clinical trials, the ethics related to animal use, the burgeoning number of health and safety rules and regulations, the need to have extensive documentation on genetically modified organisms, the need for extensive certification of the laboratories in which research is carried out etc. In addition to performing each of these tasks at the onset of a project, research performing institutes also have an obligation to monitor that all of these requirements are being adhered to on all projects at all times. While each of the different measures that are brought into place have their origin in the need to perform research that is safe for society (and the researchers), *it has to be recognised that the industry of administration and bureaucracy related to research actions carries with it a very high cost of time and focus of the researchers and institutes.*

Recommendation: The plethora of rules and regulations that control activities in research laboratories should be re-examined with a view to simplifying the process and diminishing the administrative burden while ensuring that safety and ethical matters are treated responsibly.

3. Eligibility criteria for research funding sources

The range of research which is required to have an impact on medicine and health is very broad and, as outlined in Figure 1, often is grounded in research that is disease oriented but fundamental or frontier in nature. Trends in recent years are such that applicants from medical research institutes are now ineligible for a significant range of ARC funding. This would appear to be an example of policy drive that has overlooked some of its consequences.

It is illogical and counterproductive to exclude from any national funding scheme, applicants that are competitive - irrespective of where they come from.

Recommendation: The eligibility rules for all agencies have to be re-examined such that Australia gets the full benefit of the input from the best researchers irrespective of their work address.

APPENDIX 1

A pen picture of QIMR

QIMR is a large institute, with over 500 researchers that will grow to approximately 1000 in the next decade. The Institute has been established since 1945 and has excellent building infrastructure, with a major new extension to be opened this year. The Institute is well linked to medical/hospital centres, as it is based on the same campus as the Royal Brisbane and Women's Hospital, one of largest hospitals in Queensland. QIMR is collaborative with clinicians throughout Queensland and the rest of Australia, with over two thirds of the QIMR faculty in active collaborations with clinicians, and strong linkages with Queensland university bases.

QIMR recently redefined its research targets, now focussing on cancer, infectious diseases and mental health/complex disorders. In doing so, QIMR has adopted a broad-based approach to research with the cancer research programme including studies from basic mechanistic processes, to genetics, population health studies, the development of therapeutic compounds and the development of immune-therapies. The Infectious Diseases Program focuses on tropical health diseases that are of particular relevance to the Indigenous population and northern parts of Australia, with a concentration on vaccine development. The Mental Health/Complex Disorders Program has a range of activities from relevant genetics through to imaging and studies such as the genetics causes of asthma and the impact of iron metabolism on a wide range of diseases.

QIMR is also successful in grant applications reflecting its quality and receives approximately \$40 million per annum in research grant revenue from the NHMRC and Australian Research Council. The Australian Cancer Research Foundation and Queensland Health, plus Smart State funding from the Queensland Government is complimented by funds that QIMR have obtained from donors. The total budget of QIMR is approximately \$80 million per annum.